RELATIONSHIP BETWEEN ORGANIZATIONAL CHARACTERISTICS AND LEVEL OF CORPORATE SUSTAINABILITY: A STUDY CARRIED OUT IN THE COMPANIES OF THE SUGAR AND ALCOHOL SECTOR OF THE STATE OF PERNAMBUCO

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ABSTRACT

The present article had the objective of assessing and analyzing the level of corporate sustainability in agro-industry companies in the sugar and alcohol sector. It is a descriptive research, using a quantitative approach. The research universe consisted of 15 agro-alcohol industries operating in the state of Pernambuco. The sample corresponded to 86.66% of the universe. The organizational characteristics and level of business sustainability of the investigated agro-industries were considered. In order to estimate the level of corporate sustainability, the procedures proposed by the Business Sustainability Grid were adopted. The research findings indicate the presence of statistically significant evidence between two of the characteristics tested and the level of corporate sustainability.

Keywords: Corporate sustainability; Model of Measurement; Sugarcane Agro-industries.

1. INTRODUCTION

In the last decades, the increasing concern of society with the degradation of the environment and with the social aspects related to the quality of life made evident the deficiencies of the State (Federal, State and Municipal Government) in providing the various social and environmental needs of the present time.

In this context, there is a demand on companies to develop a management that reconciles economic development with respect to the environment and society. Organizations are seeking adaptations to meet new demands; thus, the controller is an ally in this information support process for decision making.

Increasingly, companies seek to integrate sustainable practices into their production processes, believing that these practices can bring greater profits to the company in the medium and long term (Dias, 2007). Donaire (1996) already foresaw that companies that were unconcerned about environmental issues, with the exclusive objective of maximizing their profits and socializing losses, would be outside the narrow doors of the global market.

According to Assis et al. (2009), sustainable development is based on the harmonious interdependence between three pillars: ecological, economic and social. Economic and technological progress to the detriment of environmental degradation cannot be considered legitimate. Although profit has historically been regarded as the main purpose of companies, there is now a reconciling trend between profitability and social interests and environmental preservation. Considering the great territorial occupation, the intense use of manpower and the set of natural assets that it has, it is emphasized that the agribusiness in Brazil has a productive process of high environmental and social impact, enabling a more thorough relationship between economy and environment.

Business sustainability presupposes simultaneously expanding economic activity, reducing environmental impacts, and contributing to the improvement of the quality of human life, also considered a profitable management over time. Aware of the importance of sustainability for business management, it is a fundamental issue for managers to seek the use of indicators that consolidate quantitative and qualitative information that allows the visualization of the efficiency and effectiveness of the company in the use of the resources available for the generation of an end product from the economic, environmental and social point of view (Cantarino *et al.,* 2007).

The measurement of corporate sustainability reflects the inherent complexity of this concept. However, it is signifi-cant for organizations to internalize and combat threats, and especially to take advantage of the various opportunities presented by them (Delai et Takahashi, 2008).

According to Leite et al. (2011), traditional performance evaluation systems were based on cost accounting, financial and productivity indicators, but are gradually seeking sustainability as a driver of changes in terms of performance measurement systems.

The participation of the sugar and alcohol industry in Brazilian agribusiness is very relevant. According to information from the Ministry of Agriculture (2015), Brazil is the world leader in the production of sugar and ethanol, achieving more and more participation in the foreign market with the use of biofuel as a clean energy alternative.

In the sugar and alcohol sector, many issues are observed by the government as well as by society: how to manage the various environmental impacts, soil compaction, and loss of biodiversity; generation of residues, burning of sugarcane straw, and application of vinasse; unemployment due to the insertion of the harvester, low qualification of labor, and slave labor; among others.

According to Procana (2015), the sugar and alcohol industry accounted for approximately 2% of Brazil's gross domestic product (GDP) and 31% of Brazil's agricultural GDP in 2012, employing around 4.5 million people.

Brazil is the world's largest producer of sugarcane, according to UNICA (2015); the largest producer and exporter of sugar, according to the United States Department of Agriculture (2015); and the world's second-largest ethanol producer. In sugarcane production, basically two regional subsystems coexist in Brazil, one in the Center/South (C/S) and the other in the North/Northeast (N/Ne). The sugar and alcohol industry in the state of Pernambuco occupies the 7th place in the Brazilian national ranking and the 2nd position in productivity in the Northeast.

It is a segment that has a strong impact on the national GDP and generates a significant number of jobs. Specifically in Pernambuco, it should be noted that this productive activity corresponds to 55% of the state's seasonal crop; therefore, it is mainly responsible for 26% of exports and sugar is the most exported product (CONDEPE/FIDEM, 2013).

Considering that the sugar-alcohol sector of Pernambuco was the forerunner of the productive activity in Brazil, it began the 21st century with the need to adapt to a globalized economy. In the face of economic, political and environmental adversities and in an attempt to overcome the various problems faced, corporate sustainable performance becomes a fundamental aspect of maintaining the compe-

titiveness of sugarcane agro-industries. In this way, the objective of this article is to analyze the relations between the organizational characteristics and the level of corporate sustainability of the companies in the sugar and alcohol sector of the state of Pernambuco.

2. CORPORATE PERFORMANCE

In the last decades, performance measurement has become a basic tool in providing essential information on various dimensions to guide good organizational management. It is also fundamental for the continuity of organizations, whether private or public, whether or not for profit, regardless of size, because if done properly, it can reduce problems of lack or poor quality of data that are used by almost all organizations to make decisions (Mason et Swanson, 1981).

According to Ensslin et Lima (2008), performance measurement can be considered a management process that establishes and propagates knowledge through the identification, organization, measurement and integration of aspects necessary to reach the strategic objectives of a given company.

Melnyk et al. (2004) reinforce the link between performance measurement and organizational strategy. For authors, a strategy without performance metrics has no utility and metrics without strategy has no meaning. They also point out that the measurement of performance allows the organization to achieve its objectives, in addition to translating its mission.

The measurement of organizational performance provides a response to the management team on why certain results are obtained and provides improvement solutions (Souza, 2011).

According to Rentes et al. (2002), identifying strategic objectives, organizing measurement teams, building performance metrics structures, performing performance measurement diagnostics, and creating scorecards are steps in the process of developing a performance measurement system.

Adequate performance measurement enables managers to communicate performance expectations to subordinates; know what is actually happening in the organization; identify, analyze and eliminate failures; provide feedbacks; present rewards; and have a decision-making process based on effective information (Rummler et Brache, 1994).

Melnyk et al. (2004) consider a performance measurement system as the highest level of measurement, on the base where the individual metrics that form a set of metrics are grouped. Each set of metrics guides and regulates

a particular activity that contributes to the achievement of strategic objectives. And the coordination and management of individual measures and sets of measures represent the performance measurement system.

Neely et al. (1995) differentiate measures of performance, performance measurement and performance system. For the authors, the performance measure represents a metric used to quantify the efficiency or effectiveness of a given action; the performance measurement is the achievement of the calculation of the efficiency and effectiveness of the action; and the performance measurement system, in turn, is defined as the set of performance measures used to quantify the efficiency and effectiveness of actions.

Indicator is an instrument that allows obtaining information about a given reality, having as primary function to synthesize diverse information, retaining only the essential meaning of the analyzed aspects (Mitchell, 1996).

According to Moura (2002) there are several definitions for indicator, which score objectives and characteristics and always emphasize the purpose of measuring processes and communicating information to a particular group.

According to Frigo (2002), the use of performance indicators should help synchronize strategic activities, facilitating the perception and execution of activities; strategic performance measurement should reflect management's thinking and performance and ensure the viability of strategies.

For Callado et Fensterseifer (2010), indicators are central tools that allow monitoring the main variables of interest of the company and allow the planning of actions for the purpose of better performance.

For Coelho et al. (2008), the studies carried out on performance indicators are increasingly common because, in addition to presenting themselves as a managerial tool, they constitute a strategic measure of business survival (Coelho et al., 2008). In this sense, it is necessary for organizations to develop managerial processes that assist them in evaluating their performance.

In general terms, indicator is a quantitative or qualitative measure derived from the observation of facts that may reveal relative positions in a given area (Ciegis et al., 2015). According to Moura (2002), there are quantitative indicators when variables are quantifiable and qualitative when results cannot be expressed in numbers, but in opinions, satisfaction, etc.

Constant changes in the business environment modify product concepts, consumer preferences and requirements, forcing companies to maintain a flexible approach to proces-

ses. Against this background, strictly results-based information is insufficient to support companies to remain strategic. Thus, it is important to monitor elements of performance that go beyond the traditional financial and accounting measures so valued so far (Julião, 2003).

According to Teló (2000), the performance or measure of success of the business can no longer be measured by traditional standards or directed only by analysis of facts that occurred in the past. A number of companies attempt to identify and define non-financial performance indicators to address the constraints of those who rely only on financial measures.

Developing good performance measures is not always easy. The traditional financial measures are established between companies and economic sectors and are subordinated to the norms dictated by the authorities, besides being supported in well-accepted consolidated accounting practices. However, predictive measures that make it possible to prevent, anticipate and influence future results are set as trend indicators. This is because the environment is driven by processes where aspects that seek to ensure the use of opportunities, learning speed, innovation, cycle length, quality, flexibility, reliability, and responsiveness that need to be measured prevail (Pace *et al.*, 2003).

In the early 1990s, criticisms of performance indicators intensified, as they no longer met the goal of signaling organizational performance. As a result of the restricted use of financial indicators, several companies were not able to perceive the loss of market share. Thus, the search began for indicators that met the various needs, such as: customer orientation, market participation, capacity for innovation, etc. (Silva, 2003).

In a comprehensive analysis of performance measurement methodologies, Neely et al. (2002) point out six characteristics that, in their view, can identify an appropriate set of measures to evaluate the performance of an organization:

- Measures must be balanced or, in other words, should reflect financial and non-financial data, internal and external, of efficiency and effectiveness;

- They should provide a succinct and simple view of reality, enabling a quick understanding on the part of all users;

- They should be multidimensional, reflecting all areas that are important to the success of the organization, yet there is no general consensus - prescriptive - about what areas these are;

- The general frameworks should enable an understanding on what is happening, making it possible to check for omissions or failures;

- They should be integrated across the organization's areas and hierarchy, facilitating the congruence between goals and actions;

- They should explain how outcomes are achieved through the factors that guide or determine them, enabling both a view of control over the past and a contribution to planning for the future.

3. CORPORATE SUSTAINABLE PERFORMANCE

From the 1970s, issues related to environmental conservation, the environment and sustainability emerged significantly between discussions in various parts of the world.

The first major meeting held for discussions on environmental issues and the first global attitude to try to preserve the environment was the United Nations Conference on the Human Environment held in Stockholm, Sweden, in 1972.

As pointed out by Araújo et al. (2013), in that Conference were approved 25 fundamental principles guiding international actions, among them the valorization of man within the environment as a being that transforms him, but that depends on him to survive; and has resulted in numerous issues that continue to influence and motivate relations between international actors.

Another important outcome of the discussions on sustainability came in 1987: the publication of the document Our Common Future, also known as the "Brundtland Report", which was drafted by the United Nations, through its Committee on the Environment and Development. The report went on to use the term "sustainable development", defining it as the process that meets present needs without compromising the ability of future generations to meet their own needs.

However, it was the Conference held in the city of Rio de Janeiro, RJ, Brazil, Eco-92, which represented a milestone, from which discursive renewal, which integrates social, economic and environmental aspects, became relevant and primordial internationally. At the time, several international agreements were concluded, such as the Biodiversity Convention, the Rio Declaration, the Climate Convention and Agenda 21.

These important events brought together the strengthening of the concept of sustainable development based on

the tripod of economic and social development and the guarantee of environmental protection. The consolidation of this concept was fundamental for the change of the paradigm of the companies, whose main objectives were the economic ones.

According to Barbieri et Cajazeira (2009: 69-70), a sustainable organization "seeks to achieve its objectives while meeting the following criteria: social equity, ecological prudence, and economic efficiency".

According to Callado et Fensterseifer (2010), companies were motivated to consider the adoption of sustainability practices based on the perception that the pursuit of profitability oblivious to the principles of sustainability could not guarantee the continuity of the organization, and that the integration of aspects economic, environmental, and social factors would allow it to extend its activities for a longer period and generate an increase in the market value of its shares.

From the presence of sustainability in corporate strategy, new approaches to performance measurement have emerged, including sustainability indicators, to address changes and developments in the organizational environment, and concern about the business impact on future generations (Neely et al. 2002).

Based on companies' understanding of socio-environmental concerns, motivated by several issues, but mainly by taking advantage of opportunities and reducing future costs, there was a need to use indicators that enable monitoring, measuring and monitoring the results of economic and social integration actions and socio-environmental aspects of organizations over time.

According to Ciegis et al. (2015), sustainability indicators are simplified communication tools that support decision making in order to achieve economic, social and environmental development.

Sustainable performance indicators are useful tools for business management, whose purpose is to synthesize information about the efficiency and effectiveness of the company in the use of available resources for the generation of an end product, from an economic, environmental and social point of view (Cantarino *et al.*, 2007).

Marzall et Almeida (2000) emphasize the impossibility of determining the sustainability of a system considering only one indicator, or indicators that refer to only one aspect of the system; for them, sustainability metrics should encompass a set of economic, social, and environmental factors. These metrics have the purpose of identifying whether the organization is favorable or against the interrelation of the

economic, social and environmental dimensions (Veleva et Ellenbecker, 2001).

In this sense, the creation and monitoring of the results of sustainability indicators makes it possible to monitor changes in the production process and to identify the effectiveness of these changes with regard to achieving social, economic and environmental sustainability (Callado et Fensterseifer, 2010).

Sustainability indicators, therefore, allow measuring the level of sustainability and, consequently, the development of best practices in the pursuit of sustainable performance and the creation of value for all its stakeholders: employees, suppliers, shareholders, society, government, and, above all, customers (Araújo *et al.*, 2013).

4. METHODOLOGY

The first methodological aspect was the definition of the typology of the research. In order to meet the proposed objective of this research, a descriptive and exploratory research was carried out in the scope of agro-industries of the sugar and alcohol sector of the state of Pernambuco.

According to Marion et al. (2002), a descriptive research aims at describing the characteristics of a given phenomenon or population, correlating facts or phenomena, without, however, changing them. Andrade (2002) goes on to point out that this type of research is concerned with observing the facts, recording them, analyzing them, classifying them and interpreting them without the interference of the researchers. Exploratory research is presented by Gil (2008) as that in which an overview of the fact is properly used when the chosen theme is little explored and it is difficult to formulate precise and operable hypotheses about it.

The second methodological aspect considered was the definition of the universe to be investigated, considering that agribusiness is a segment of recognized importance for the country's economy, since it reflects a significant generation of income and employment and gives Brazil a prominent position in the world trade, and the sugar and alcohol sector is part of the group of relevant activities in the Brazilian scenario.

According to Marconi et Lakatos (2003), the population or universe of a study is constituted by the set of elements that will be researched having at least one characteristic in common. Gressler (2004) defines universe or population, as the aggregate of elements that have certain characteristics defined in the body of the research. According to Leite (1978), the definition of the universe delimits the field of research in terms of time, geographical, sectoral or any other

dimension that may be based on the availability or the ease of obtaining data or based on the objectives and costs of research execution.

Thus, some factors were considered in the delimitation of the universe searched. The first factor was related to the type of activity developed by the companies surveyed. The production of sugar and alcohol is a branch of agribusiness that has a strong social and environmental impact. The second factor considered was the geographical aspect. The study was delimited to the state of Pernambuco, since it has the eighth largest sugarcane production among the Brazilian producing states and assumes the second position in the Northeast region.

The Geographic Meso-region of Mata Pernambucana, an area favorable to the cultivation of sugarcane due to soil and climate conditions, comprises the following geographic microregions: a) Northern Mata Pernambucana; b) Vitória de Santo Antão; and c) Mata Meridional Pernambucana. It is confined to the North with the state of Paraíba, to the South with the state of Alagoas, to the East with the Atlantic Ocean and to the metropolitan geographic mesoregion of Recife, and to the West with the mesoregion of Agreste Pernambucano and with the state of Paraíba. The 15 (fifteen) agribusinesses of the sugar-alcohol sector in operation in the state of Pernambuco are located in it (Table 1).

Picture 1. List of agro-industries in operation in the state of Pernambuco

NORTHERN FOREST	
Agro-industry	**Municipality**
Cia agro Industrial De Goiana - Usina Santa Teresa	Goiana
Usina Central Olho D´Água S/A	Camutanga
Usina Petribu s/a	Lagoa de Itaenga
Usina São José s/a	Igarassu
Usivale Indústria e Comércio ltda - Usina Laranjeiras	Vicência
MICRO-REGION OF VICTÓRIA DE SANTO ANTÃO	
Agro-industry	**Municipality**
Companhia Alcoolquímica Nacional - Alcoolquímica	Vitória de Santo Antão
SOUTHERN FOREST	
Agro-industry	**Municipality**
Cachool Comércio e Indústria S/A	Escada
Interiorana Serviços e Construções Ltda.	Ribeirão
Usina Bom Jesus s/a	Cabo de Santo Agostinho
Usina Cucaú - zihuatanejo do Brasil Açúcar e Álcool ltda.	Rio Formoso
Usina Ipojuca s/a	Ipojuca
Usina Trapiche s/a	Sirinhaém
Usina União e Indústria s/a	Primavera
COPERSUL Indústria de Açúcar , etanol, e energia elétrica ltda.	Cortês
AGROCAN - Cooperativa do Agronegócio de Cana de Açúcar	Joaquim Nabuco

Source: Sindaçúcar-PE, 2016.

The identification of variables was the third step in the construction of this research. According to Levine et al. (2011), a variable represents characteristics of items or individuals and constitutes what is analyzed when using a certain statistical method. Crespo (1998), in turn, defines variable as the set of possible results of a phenomenon.

To reach the proposed goal of this research, we considered the groups of variables detailed by classifications and measurement scales in Table 2.

Picture 2. Groups of variables used in the survey

Group I – Company profile		
Variable	**Classification/Treatment**	**Measurement scale**
Time of operation	Qualitative	Ordinal
Gross annual revenue	Qualitative	Ordinal
Number of employees	Qualitative	Ordinal
Market breadth	Qualitative	Ordinal
Production volume	Qualitative	Ordinal
Group II - Corporate sustainability		
Variable	**Classification**	**Measurement scale**
Partial Economic Sustainability Score (EPSE)	Qualitative	Nominal dichotomous
Partial Economic Sustainability Score (EPSE)	Qualitative	Nominal dichotomous
Partial Economic Sustainability Score (EPSE)	Qualitative	Nominal dichotomous
Global Corporate Sustainability Score (EGSE)	Qualitative	Ordinal

Partial sustainability scores related to the economic, social and economic dimensions, as well as the overall corporate sustainability score, were calculated based on the procedures proposed by the Corporate Sustainability Grid (*Grid de Sustentabilidade Empresarial* – GSE) (Callado, 2010).

Data collection was the fourth methodological aspect considered. Rudio (1986) defines data collection as the research phase whose objective is to obtain information from reality. According to Marconi et Lakatos (2003), the data collection begins with the application of the elaborated instruments and the selected techniques; consists

of an arduous task, requires time and patience and personal effort of the researcher, besides the careful recording of the data and a good previous preparation. Still according to the authors, several techniques and instruments of data collection are applied, depending on the circumstances or the type of investigation.

In order to achieve the objectives of this study, structured interviews were carried out. According to Rampazzo (2002), the interview is the collection technique that is operationalized by the meeting of two people, so that one of them may obtain information through professional nature of conversation, and it is considered structured the one in which the interviewer follows a predefined script. To obtain data collection, telephone contacts were initially maintained with the 15 companies that make up the studied universe, of which two could not provide the information regarding the considered variables. Thus, the information collected represented 86.66% of the studied universe. The interviews lasted from 40 to 60 minutes and were performed *in loco*.

The fifth methodological aspect referred to the technique of results analysis. In this research the quantitative method was used, characterized by the use of statistical instruments, emphasizing the importance of guaranteeing the accuracy of the results, as well as avoiding distortions of analysis and interpretations, allowing a margin of certainty regarding the inferences made. The quantitative approach is generally adopted in descriptive research, and its purpose is to discover and classify the relationship between variables (Beuren, 2012)

In order to meet the objective of this study, the Spearman correlation coefficient was used, since there is a classification of the data to the assumptions of said statistical test, namely: non-parametric data, non-quantitative variables and universes with small number of observations. The non-parametric Mann-Whiteny U test was also used, due to the existence of dichotomous variables, since this test is applied for small samples and comparison of independent groups, which may have different dimensions but whose variable must be of ordinal measurement.

5. RESULTS

Considering the objective proposed for this research, as well as the methodological procedures adopted, the data collected were used to obtain the results. Initially, the characteristics of the companies investigated were identified. The results regarding the time of operation of the companies in the market are presented in Table 1.

Table 1. Pernambuco's agroindustry activity time in the market

Time	Frequency
Up to 10 years	4
10 to 50 years	0
50 to 100 years	2
More than 100 years	7
Total	13

Source: The authors themselves

The results show that more than half (n = 7) of companies have been active for more than 100 years, while four others reported operating less than 10 years ago. A number of factors, such as the surplus of sugarcane due to the deactivation of many productive units in the Zona da Mata region, coupled with the increase in the price of gasoline, as well as the favorable exchange rate in sugar exports favored the reopening of some previously deactivated agro-industries.

Another feature considered for the companies was size, based on gross annual revenues, using the criteria adopted by the National Bank for Economic and Social Development (*Banco Nacional de Desenvolvimento Econômico e Social* – BNDES, 2015) and the Brazilian Micro and Small Business Support Service (*Serviço Brasileiro de Apoio* às *Micro e Pequenas Empresas* – SEBRAE, 2015). The related results are set forth in Table 2.

Table 2. Size of agro-industries in the state of Pernambuco investigated, according to the level of turnover and number of employees

Billing level according to company size	Classification	Frequency
Up to 2.4 million	Micro enterprise	0
Above R $ 2.4 million up to R$ 16 million	Small business	0
Above R $ 16 million up to R$ 90 million	Average company	0
Above R $ 90 million up to R$ 300 million	Medium-large company	4
Above R $ 300 million	Big company	9
Total		**13**

Number of employees	Classification	Frequency
With up to 19 employees	Micro	0
From 20 to 99 employees	Small	0
From 100 to 499 employees	Average	2
Over 500 employees	Big	11
Total		13

Source: The authors themselves

The research findings indicate that, considering the revenue, four of the agro-industries surveyed are in the medium-large company range (above R$ 90 million up to R$ 300 million), while the other nine are in the large enterprise range (above of R$ 300 million). Considering the number of employees, the results show that almost all the companies surveyed (eleven) can be considered as being large in size, having more than 500 employees. In this way, it can be seen that, from the two classifications, the sector can be characterized as consisting predominantly by large companies.

The third aspect related to the companies of the sector was the volume of sugarcane crushing of the last harvest. The results are shown in Table 3.

Table 3. Volume of production of agro-industries in the state of Pernambuco by grinding sugarcane

Volume	Frequency
Up to 500 thousand tons	1
Above 500 thousand tons up to 1 million tons	7
Above 1 million tons up to 1,5 million tons	3
Above 1.5 million tons up to 2 million tons	2
Above 2 million tons	0
Total	13

Source: The authors themselves

The results show that a little more than half of the companies in the sector declared grinding between 500 thousand and 1 million tons of sugarcane, and the others presented quite diversified volume. Two agro-industries stood out with the largest volume of crushed sugar cane (from 1.5 million tons up to 2 million tons); three mills presented a milling rate of over 1 million tons up to 1.5 million tons; and only one mill has milled up to 500 thousand tons of sugarcane in the last harvest.

After identifying the characteristics of the companies investigated, the results of the survey were obtained on the level of business sustainability, initially detailing the results regarding partial scores in the economic, social and environmental dimensions (Table 4).

From the obtained results, it can be observed that the percentages related to satisfactory performance were very close to the three dimensions of sustainability tested, showing that a portion close to 60% (53.84% for EPSE and EPSS; and 61.54% for EPSA) of the companies surveyed presented satisfactory performance in the partial sustainability score, since the results obtained by these companies were higher than the mean score in this dimension.

After the estimation of EPSA, EPSE and EPSS, the EGSEs were calculated, as can be seen in Table 5.

Table 4. Levels of sustainability of agro-industries in the state of Pernambuco according to the economic, social and environmental dimensions

Dimensions of sustainability	Frequency	Percentage
Economic dimension		
Unsatisfactory	6	46,16
Satisfactory	7	53,84
Social dimension		
Unsatisfactory	6	46,16
Satisfactory	7	53,84
Environmental dimension		
Unsatisfactory	5	38,46
Satisfactory	8	61,54

Source: The authors themselves

Table 5. Global business sustainability scores of Pernambuco state agro-industries investigated

Sustainability score	Frequency	Percentage
Score zero	4	30,77
Score 1	1	7,69
Score 2	2	15,38
Score 3	6	46,16

Source: The authors themselves

The results obtained indicate that four of the investigated companies perform poorly on the three dimensions of sustainability (zero score), while six other companies obtained the highest level (score 3), being able to reconcile satisfactory performance in the three dimensions of sustainability considered.

Table 6 shows the results of the GRID sustainability positions, showing that most of the companies (6 out of 13) were allocated in position VIII, 4 companies in position I, and positions II, V and VII had only one company positioned.

Considering the results of the partial scores, as well as the four levels of corporate sustainability of the Corporate Sustainability Scores (ESE), it is possible to fit the companies into the spatial positions that make up the GSE, as shown in Figure 1.

Table 6. Position of companies surveyed in the Sustainability Grid (n=13)

| Position in GRID	Frequency	Characteristics that represent the different spatial positions
Position I	4	Companies with low economic performance that do not have good social interaction and are not committed to environmental aspects
Position II	1	Companies with low economic performance that do not have good social interaction, but are committed to environmental aspects
Position V	1	Companies with good economic performance that have good social interaction but are not committed to environmental aspects
Position VII	1	Companies with good economic performance that do not have good social interaction, but are committed to environmental aspects
Position VIII	6	Companies with good economic performance that have good social interaction and are committed to environmental aspects

Source: The authors themselves
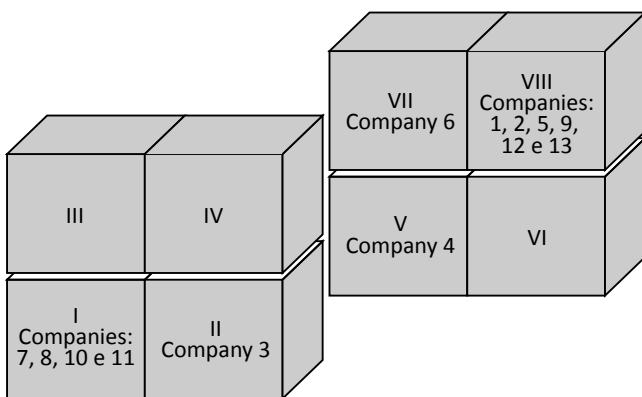
Figure 1. Positions of companies in the Business Sustainability Grid

Source: The authors themselves. Empresa: company

Finally, the significance of the relationship between the characteristics of the companies investigated and the level of business sustainability was analyzed. The results obtained are shown in Table 7.

The statistical findings presented a result of significance between the time the company operates and the level of sustainability and between the company's turnover and the level of sustainability.

In this way, it can be pointed out that the companies that had the longest time in the market and increased gross an-nual revenues obtained higher levels of corporate sustainability.

Table 7. Analysis of the relationship between the profile of companies and the level of sustainability

Characteristics	Coefficient	Meaningfulness (95%)
Time of operation	0,790705	Significant
Revenues	0,738675	Significant
Number of employees	0,548661	Not significant
Production Volume (milling)	0,599209	Not significant

Source: The authors themselves

6. CONCLUSION

The present research had the objective of assessing and analyzing the level of corporate sustainability in agro-industrial companies in the sugar and alcohol sector of the state of Pernambuco.

For this, the profile of the companies surveyed was mapped, as well as the level of sustainability was measured through the GSE.

As far as the profile of companies is concerned, there are basically two large groups. A group composed of the majority of the companies (n = 6), which have more than 50 years of operation in the market, and another whose companies have less than 10 years of operation (n=4).

Regarding the measurement of the level of corporate sustainability, the GRID application found that only four of the 13 companies investigated had a weak or unsatisfactory overall performance (score 0), in contrast with the other six companies that obtained a score of 3, which presented a high level of business sustainability, which leads to the finding of division of the companies studied in basically two groups: on the one hand, agro-industries that are attentive and connected with the best practices of corporate sustainability, which represent the group of companies with more than 50 years of operation in the market; on the other, a group composed of a minority of companies that have up to 10 years of market activity, which did not reach a satisfactory result in any of the sustainability dimensions investigated.

It is possible to conclude that, in the case of the companies studied, the time of operation in the market directly influences the level of corporate sustainability.

Despite possible limitations involving field research in this area, some suggestions for future research may be repor-

ted. It is suggested the development of this study in other regions of the country, with the purpose of increasing the number of sugar-alcohol agro-industries researched and, thus, better know the controller in this business area, and also comparisons of results by region. In addition, the use of other research methods can complement and deepen the understanding of the studied phenomena.

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