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ORGANIZATIONAL PERFORMANCE AND ADOPTION OF SUSTAINABLE PRACTICES IN THE AGRIBUSINESS INDUSTRY: AN ANALYSIS OF MULTIMODAL LOAD TERMINALS

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ABSTRACT

Agriculture contributes a lot to the Brazilian economy, especially for the production and export of grains. Thus, logistics gain importance in the national scenario as a way to discard crop production, transferring them to ports and multimodal terminals. Considering the definition of sustainable development as "development that meets current needs, allowing future generations to meet their own needs". In order to achieving peak performance in this scenario should be a matter of balance between actions companies take in order to meet their performance and sustainable practices. The method used was the exploratory descriptive, through mixed analyzes that allowed the more precise characterization of the exposed subject. This study presents an analysis of the sustainable practices adopted by multimodal cargo terminals to comply with regulations and legal requirements. It was concluded that sustainable actions influence the performance variation of multimodal terminals, but the discussion and adoption of these practices are still superficial. In addition, sustainable actions may be related to company performance, although this theme needs further exploration.

Keywords: Sustainability. Performance. Multimodal Terminals.

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RESUMO

A agricultura contribui muito para a economia brasileira, especialmente para a produção e exportação de grãos. Assim, a logística ganha importância no cenário nacional como forma de descartar a produção de cultivos, transferindo-os para portos e terminais multimodais. Considerando a definição de desenvolvimento sustentável como o "desenvolvimento que atende às necessidades atuais, permitindo que as gerações futuras atendam às suas próprias necessidades", para alcançar o pico de desempenho nesse cenário, deve ser uma questão de equilíbrio entre as ações adotadas pelas empresas para cumprir seu desempenho e práticas sustentáveis. O método utilizado foi o exploratório descritivo, através de análises mistas que permitissem a caracterização mais precisa do tema exposto. Este estudo apresenta uma análise das práticas sustentáveis adotadas por terminais de carga multimodal para atender aos regulamentos e exigências legais. Concluiu-se que as ações sustentáveis têm influência na variação de desempenho dos terminais multimodais, porém a discussão e adoção dessas práticas ainda são superficiais. Além disso, as ações sustentáveis podem estar relacionadas ao desempenho da empresa, embora este tema precise ser mais explorado.

Palavras-chave: Sustentabilidade. Desempenho. Terminais Multimodais.

RESUMEN

La agricultura contribuye mucho a la economía brasileña, especialmente para la producción y exportación de granos. Así, la logística gana importancia en el escenario nacional como forma de descartar la producción de cultivos, transfiriéndolos a puertos y terminales multimodales. Considerando la definición de desarrollo sostenible como el "desarrollo que atiende a las necesidades actuales, permitiendo que las generaciones futuras atiendan a sus propias necesidades", para alcanzar el pico de desempeño en ese escenario, debe ser una cuestión de equilibrio entre las acciones adoptadas por las empresas para cumplir su desempeño y prácticas sostenibles. El método utilizado fue el exploratorio descriptivo, a través de análisis mixtos que permitieran la caracterización más precisa del tema expuesto. Este estudio presenta un análisis de las prácticas sostenibles adoptadas por terminales de carga multimodal para atender a los reglamentos y exigencias legales. Se concluyó que las acciones sostenibles tienen influencia en la variación de desempeño de las terminales multimodales, pero la discusión y adopción de estas prácticas todavía son superficiales. Además, las acciones sostenibles pueden estar relacionadas con el desempeño de la empresa, aunque este tema necesita ser más explotado.

Palabras clave: Sostenibilidad. Rendimiento. Terminales Multimodales.

INTRODUCTION

One of the most predominant sectors of the Brazilian economy nowadays is agriculture, especially the production and export of grains. Cepea (2013) reported that, over a period of 14 years, Brazilian agribusiness heavily contributed to the creation of foreign currency in the country, generating export growth of 230% and increasing the trade balance by more than 460%. Logistics gained great national importance in terms of transporting crops produced in each region of the country, moving them to ports and multimodal terminals so that they could be sent to different sales destinations.

Considering the importance of Brazilian agribusiness, and the high values transacted annually in crops in the national territory, it is necessary to develop studies and analysis that allow the description and understanding of the country's flow corridor. In this context, sustainability stands out as an important aspect in the strategic strengthening of the grain transport network, considering the capacity of these structures to remain active over several years.

The aim of this study is to observe the implications in organizational performance linked to the logistics of grain transport, specifically multimodal cargo terminals, because of the adoption of sustainable practices. The methodology adopted is exploratory and descriptive, so as to facilitate the construction of hypotheses and improve familiarity with the subject (Gil, 1991).

The paper begins with a theoretical understanding of the variables related to sustainable practices, which, presumptively, influence organizational performance. Next, the data collected from the survey of a sample of 33 cargo terminals in Brazil is presented. In addition to characterizing the sample, the data reflects the respondents' perceptions regarding the identified variables. Finally, the analysis of the data is presented, suggesting the occurrence of changes in the performance of organizations that adopt sustainable practices.

LITERATURE REVIEW

Sustainable practices as a strategy for sustainable performance

It is natural to immediately associate the search for best performance in an organization with the implementation of strategies, or rather, with the process of turning intentions into actions. The process of strategy formulation, although extensively studied, is most often confronted with the problem of “how to” and not “what to” do (Hrebiniak & Joyce, 2001; Mintzberg, 1994; Pfeffer & Sutton, 2006). Generally, managers spend considerable time creating scenario analyses and formulating projections of optimal strategies, without concentrating their efforts in putting the strategy into action (Pfeffer & Sutton, 2006). According to Murphy (2007), creating a strategy for an organization is important, but maintaining it is what is more essential.

Weick and Roberts (1993) highlighted that the competitive edge that reflects the superior performance of an organization is not presented as a result of the strategy itself, but as a result of “how” it was implemented, requiring the understanding of activities in terms of “what people do,” how they interact, as well as what influences their own behavior. For Whittington (1996), when the strategy is presented as one of the functions in the management of organizations, it is shaped by a mixture of instinct, routine, analyses, spontaneity, mistakes, and luck.

In a broader analysis of the concept of strategy, Pettigrew (1977) defined it as comprising of a set of events, values, and actions that develop as a result of the context in question. This context specifically involves the positioning of the strategy over time, the culture of the organization, the environment for actions regarding to change and stability, the structure and activity of the organization focused on technology and, finally, the organization of the company in terms of leadership and internal policies. In consideration of these aspects, analyses are formed at various levels, such as micro (daily activities), meso (company culture and leadership systems used), and macro (relating to environmental activity), which are located and interrelated as they compose the contexts of the company.

Thus, we believe that the practices adopted by the company have a significant influence on organizational results, illustrating that good performance is not necessarily linked to excessive rationalization with regard to plans. The implementation of appropriate strategies may even be the result of unilateral actions in the company, developed in parallel with the core strategies of the organization (Barley, 1986).

On the other hand, when we associate sustainable practices with superior performance – or competitive advantage – new dimensions beyond economic advantage should be observed. Diniz *et al.* (2011) state, as expressed in the Brundtland Report, that the classic definition of sustainability would be "development that meets the present needs without compromising the ability of future generations to meet their own needs" (World Commission, 1987). According to Diniz *et al.* (2011), this idea has been discussed moderately, without defending "preservation at any cost"; however, criteria to offer guidance for decision-making concerning this topic are needed (Krugman, 2012).

Several studies have demonstrated the contribution generated by the balance between social, economic, and ecological factors derived from Brazilian companies. Those companies choose to adopt sustainable practices in their processes, since these serve not only their direct but also their indirect stakeholders, investing in maintaining their ability to serve them in the future (Pimenta & Gouvinhas, 2012; Cunha, Spers, & Zylbersztajn, *et al*., 2011; Demajorovic *et al*., 2012; Brito and Berardi, 2010; Benedetti, Lima, Mellato, & Silva, 2009). A possible generic strategy is to make its environmental, social, and economic capital grow without ceasing to contribute to the sustainability of the public domain (Dyllick & Hockerts, 2002). To put the strategy into action, one good alternative lies in choosing the level of sustainability desiring the creation of sustainable practices that are geared to its stakeholders (Marrewijk, 2002).

Kaydos (1991) stated that the need to achieve peak performance is a balance between the actions pursued, not just the optimization of one variable in particular. Thus, having a clear definition of the company's strategies and what performance means for everyone involved in the processes prevents independent efforts, assisting in the search for the desired result.

In the current context, achieving high levels of performance has proven to be strongly linked to corporate sustainability; Barbieri and Cajazeira (2010) argue that sustainable businesses contribute to sustainable development, since they can continually pursue high levels of performance in social, economic, and environmental terms, through so-called social responsibility.

Murphy (2002) indicates that financial measures alone are insufficient for a performance analysis that justifies investment in a company, as in the case of Information Technology. An integrated set of measures is necessary to shed light on what will help achieve the goals and objectives in the environment and generate high performance. Among the justifications for

financial performance measures are, inter alia, a short-term focus as well as a lack of expertise in the evaluation of intangible assets, focusing on future or past performance. Measures of a non-financial nature include staff turnover, response time, delegation of power to employees, customer satisfaction, and customer retention.

Several agents such as NGOs, governments, investors, insurers, media, consumers, and civil society have begun to hold companies responsible for actions that take into account the impacts that their activities caused, in a global movement aimed at rescuing trust, ethics, and solidarity. Zago and De Paula (2007) state that this pressure on the products and processes of companies ultimately causes a conflict between different values and visions, such as long-term versus short-term, corporate name versus maximization of expected profits, cooperation versus competition, and economic sustainability versus social sustainability.

Measurement of sustainability

After the 1992 conference, a proactive position was created in Brazil to solve problems and find possible solutions to the issues concerning eco-efficiency and corporate social responsibility through technologies that pollute less or even by perfecting means of new environmental management models. "Carmargo and Haddad (2004) state, based on the Brazilian Agenda 21, that the practical spirit of this business sector has assimilated the idea that eco-efficiency and the environment, rather than hindering productive activity, actually help to create positive results. Preparing Brazilian companies to compete internationally in optimum conditions of eco-efficiency and social responsibility is necessary for the expansion and internationalization of businesses in a competitive environment according to current patterns".

With this, one can observe the importance of sustainable actions in the context of businesses today, since their expansion is closely linked to such projects. However, mechanisms are needed that can mediate and measure these actions to allow them to provide benefits to companies.

Amidst the development of the issues concerning corporate sustainability and the performance of adopting certain strategies, certain means have emerged for measuring sustainability, seeking to measure the adopted practices in a business context. Corporate sustainability indicators function as a basis for decision making among managers, being more specifically defined by Bellen (2005) as helping decision makers understand the operational significance of the concept of sustainable development, as well as acting as an educational tool. Other authors have also contributed to this idea, saying it is a tool that discloses phenomena and trends that are not always immediately detectable, thus anticipating future conditions and trends (Moldan & Bilharz, 1997; Gallopin, 1997; McCool & Stankey, 2004). Major initiatives for the measurement of sustainability include the following indices:

- Indicators of Sustainable Development of the United Nations (CDS), 1995: addressing four dimensions (institutional, environmental, economic, and social).
- Dashboard of Sustainability, 1998: marking the dimensions of sustainability with a dashboard divided into four segments.
- Global Reporting Initiative (GRI), 1997: helping stakeholders and businesses understand and communicate its contributions to the DS.
- Sustainability Barometer: measuring sustainability at local, regional, and national levels.
- Sustainability Metrics of the Institution of Chemical Engineers of England (IChemE): only for industries; based on environmental responsibility, economic return, and social development.

There is a worldwide trend of investors seeking companies that are socially

responsible, sustainable, and profitable. These investments are termed "socially responsible investments" (SRI), in that they consider value creation on the part of sustainable companies for long-term shareholders, since such companies are more well prepared to face economic, environmental, and social problems. As a result, this demand has started to grow stronger over the years, now widely attended to by various instruments of the international market (BM&F Bovespa, 2012).

The emergence of this new trend in Brazil, along with an expected growth and rapid consolidation, has facilitated the BM&F Bovespa, as well as other institutions (*Associação Brasileira das Entidades Fechadas de Previdência Complementar* [ABRAPP], *Associação Brasileira das Entidades dos Mercados Financeiro e de Capitais* [ANBIMA], Associação dos Analistas e Profissionais de Investimento do Mercado de Capitais [APIMEC], *Instituto Brasileiro de Governança Corporativa* [IBGC], *Instituto* Federal *de* Santa Catarina [IFSC], *Instituto ETHOS*, and *Ministério do Meio Ambiente*) to create an index of referential actions for those investors who seek "socially responsible" opportunities. Thus, the Corporate Sustainability Index (CSI) has been created, whereby such organizations form an Advisory Board chaired by BM & F Bovespa, with the Exchange being responsible for management and calculations concerning the index. The objective of this index is to reflect portfolio returns composed of stocks of companies committed to sustainability and corporate responsibility, thereby acting as a promoter of good practices in Brazilian companies (BM & F Bovespa, 2012).

A study based on a sample containing 124 companies aimed at investigating the variables that can influence the adherence of companies to the CSI. This study (Nunes, Teixeira, & Nossa, 2009) concluded that the existing relationship existed, statistically, between the sector of activity and the size of the organization, these being the determinants for adoption of the CSI.

METHODOLOGY

This paper is characterized, with regard to its specific objectives, as descriptive and exploratory. To facilitate the construction of hypotheses and improve familiarity in the studied subject through further explanation, exploratory research is defined by Gil (1991) as having its main objective in the development or discovery of new ideas on the studied subject, involving bibliographic surveys, questionnaires, and interviews, along with adopting a more flexible character.

Descriptive research, on the other hand, focuses on the description of an establishment and its relationship with its variables, with the employment of systematic observation and the application of questionnaires being its most striking features. It is grounded in descriptive statistical analysis in order to relate the studied variables, create a coherent description, and thereby serve as both quantitative and qualitative research at the moment at which it represents studies of non-random samples (Malhotra, 2001).

The approach used in this paper was mixed, with both qualitative and quantitative methods being used (Creswell, 2007). The combination of these two allows for a vision that is both phenomenological as well as positivist, taking advantage of the benefits of each type (Araújo & Oliveira, 1997). In addition to conceptualizing variables such as sustainability and performance, we look to create a descriptive exploratory analysis of the influence of sustainable practices in the performance of multimodal terminals of the transport chain of grains in Brazil. The focus of the analysis was on the multimodal load terminals, precisely because of their importance in the integration of the different transport logistics networks for the flow of the crops, often

allowing the process to gain efficiency by allowing the change of modes, besides Transport coverage in the various regions.

The data used in the study were drawn from questionnaires employed in the project "Multimodal Terminal Performance of the Grain Supply Chain," involving this and other related studies. To develop the theoretical foundations and basis of the terms used in the analyses, bibliographic research was conducted using secondary data sources, thus allowing a better approach to the topic of study (Cervo & Bervian, 1996).

Data was collected on the multimodal terminals, which characterize the focus of the study, with questionnaires being applied in all regions of the country. The total sample comprised of 33 respondents, consisting of 9 terminals from the Midwest region, 10 from the South, 5 from the Northeast, 13 from the Southeast, and 4 from the Northern region. The questionnaires used in the field research were of a semi-structured form, with both closed and open questions, expanding the possibilities of qualitative and quantitative analyses. The collected data were analyzed in a qualitative way, being used tools of basic calculation of proportions and percentages (quantitative) to aid in the argumentation and to allow a clearer definition of the reality of the studied scenario.

The questions addressed in the questionnaire were intended to cover descriptive characteristics of multimodal terminals. The initial part of the questionnaire sought to describe types of operations, services offered, projected, number of grains moved, hours of operation in days, number of balances, static capacity, average annual occupancy rate, among other variables that clearly characterize each terminal. As part of a larger project aimed at working on broader questions about the grain chain and the Brazilian crop, only two parts of the questionnaire were used for analysis, the first being the previously described part, and the second questions addressed for activities linked to the sustainable actions developed by localities.

Although it is a study of mixed techniques, with the purpose of describing the terminals and the impacts of adopting sustainable practices, the analysis is based on qualitative interpretations supported by basic quantitative data such as percentages and proportions. Percentage tables were worked out by considering the number "n" of positive answers for each question on all the answers obtained in the questionnaire.

The questionnaires were applied by academics of the postgraduate course in Administration of the Federal University of Mato Grosso do Sul. They traveled to the locations of each multimodal terminal and applied the questionnaires to those in charge.

RESULTS

The data collected through the questionnaires refer to several terminals in all the regions of the country, namely the Midwest, North, Northeast, Southeast, and South. Figure 1 presents information that helps characterize the study sample, indicating the amount of grain handled in the previous twelve months by each terminal included in the research. It can be seen that the bulk of handling occurred in the Midwest region (4CO), amounting to seven million tons per year, followed by terminals located in the South, Southeast, and North of the country.

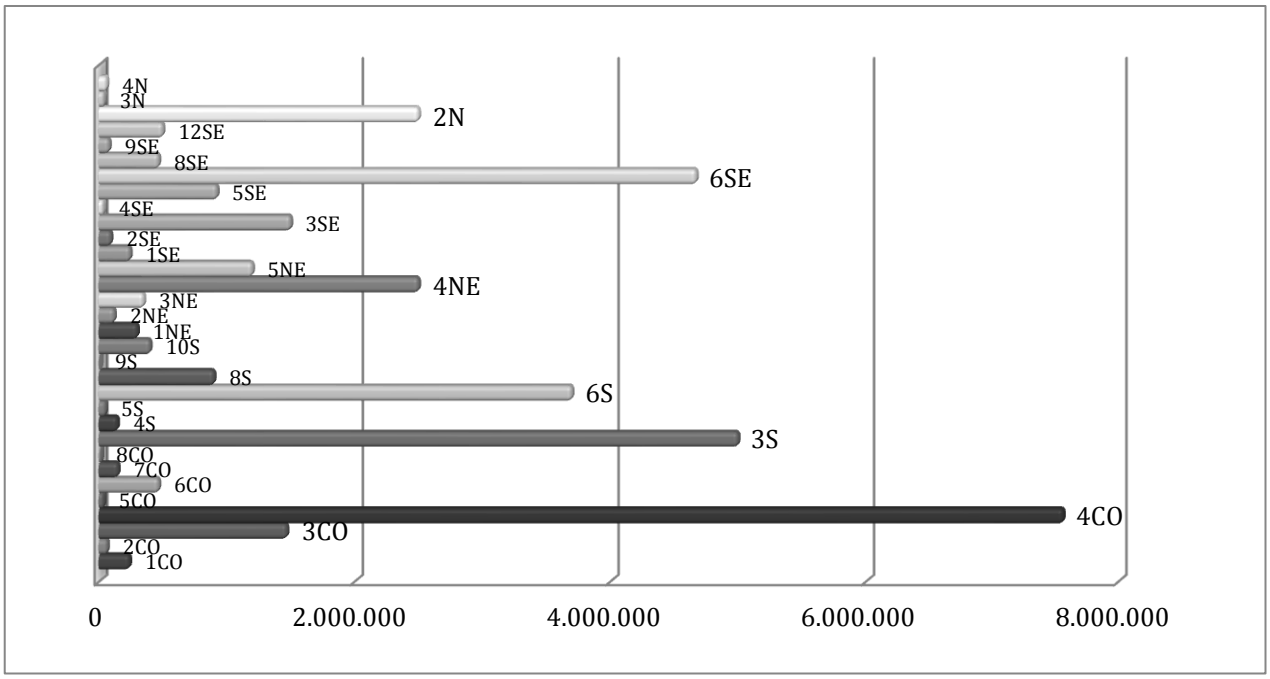


Figure 1. Amount of Grain Handled in the Previous 12 months.

Note. Source: Research data. CO = Midwest, S= South, NE = Northeast, SE=Southeast, N=North.

Through a percentile analysis (Figure 2), we can view the amount of handling in each region, outlining a chart that reflects the degree to which each region is responsible for the overall handling of grain in the country. Looking at the chart, the two regions that are seen to have contributed the most to the handling of crops in the previous year were the South and Midwest, together composing more than 50% of the amount handled nationally. The Southeast also shows an influence, representing 24% of all cases in the study period. Next, we observe the North and Northeast regions, comprising the remaining 20%.

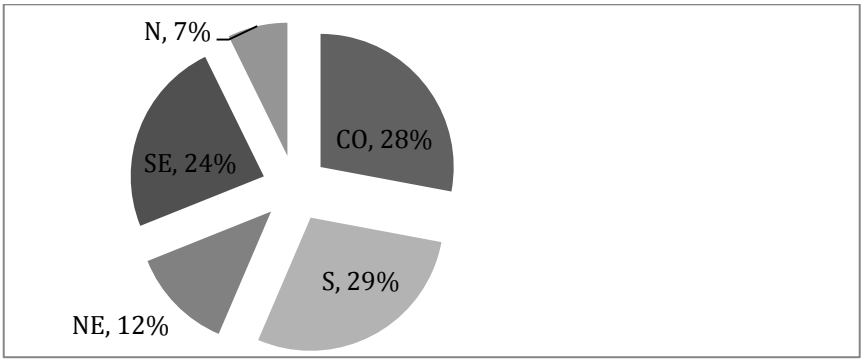


Figure 2. Percentage of Quantity of Grain Handled (by region).

Note. Source: Research data. CO = Midwest, S= South, NE = Northeast, SE=Southeast, N=North.

Table 1 shows the characteristics of each terminal and their transaction possibilities between logistical modes such as road, rail, and waterway. Of all the terminals interviewed, only 55% responded regarding modes. Of this, 44% presented

road transport to rail transpositions, 33% conducted road-waterways movements, and only 17% reported performing transactions between all three types of modes described, all of these being located in the South.

Table 1

Methods of Modal Transportation Found in the Terminals

Terminals	CO	S	SE	NE	N	Total	%
Interviewed	8	8	8	5	4	33	100%
Respondents	8	6	0	1	3	**18**	**55%**
Road-rail	4	2	SR	0	2	8	44%
Road-waterways	4	0	SR	1	1	6	33%
Waterways-rail	0	0	SR	0	0	0	0%
Road-rail-waterways	0	3	SR	0	0	3	17%
Rail-road	0	1	SR	0	0	1	6%
Rail-waterway	0	0	SR	0	0	0	0%
Waterway-rail	0	0	SR	0	0	0	0%

Note. CO = Midwest, S= South, SE=Southeast, NE = Northeast, N=North.

The remaining 6% of respondents who claim to have conducted rail-road transport are also in the South, the Midwest composed only of multimodal transport involving road-rail and road-waterway modes. The Southeast region did not provide any response with regard to these items.

Table 2 shows the services offered by the studied terminals. Through the data, we were able to verify that the terminals have activities mostly related to storage, transshipment, drying, and cleaning. The other services were cataloged as rare due to their presence in national terminals, such as the customs service, found in only a few places such as the Midwest and Northeast.

We can see that the terminals that have a greater number of activities aimed at processing crops are those found in the Midwest and South. The Northeast had the lowest rates of available services. Again, the Southeast provided no responses.

Table 2

Services Offered by the Terminals

Terminals	CO	S	SE	NE	N	Total	%
Pre-cleaning	4	4	SR	0	2	10	**56%**
Transshipment	6	6	SR	1	2	15	**83%**
Purging	4	3	SR	0	1	8	44%
Storage	7	6	SR	1	3	17	**94%**
Custom Services	2	0	SR	1	0	3	17%
Cleaning	4	4	SR	0	0	8	44%
Drying	4	4	SR	0	2	10	**56%**
Blend	4	2	SR	0	0	6	33%
Segregation	2	3	SR	0	1	6	33%
Other *	0	0	SR	0	0	0	0%

Note. CO = Midwest, S= South, SE=Southeast, NE = Northeast, N=North.

The following charts illustrate the actions taken by the terminals in each region with respect to the concept of the environment and sustainability, that is, how many of these follow specific policies in this context, and how many follow the previously established standards. The data were divided into regions, seeking a more general view on these measures present in Brazil.

We noticed how many of the respondent terminals have environmental policies in the business environment (Figure 3). Most are concentrated in the Midwest region, followed by the South and North. In the Northeast, only one terminal confirmed having policies concerning the environment in their processes. In the following chart, the percentage of terminals that have policies in relation to the respondents is presented.

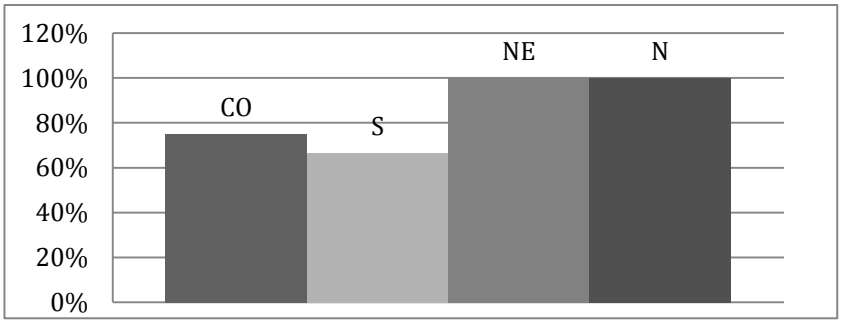
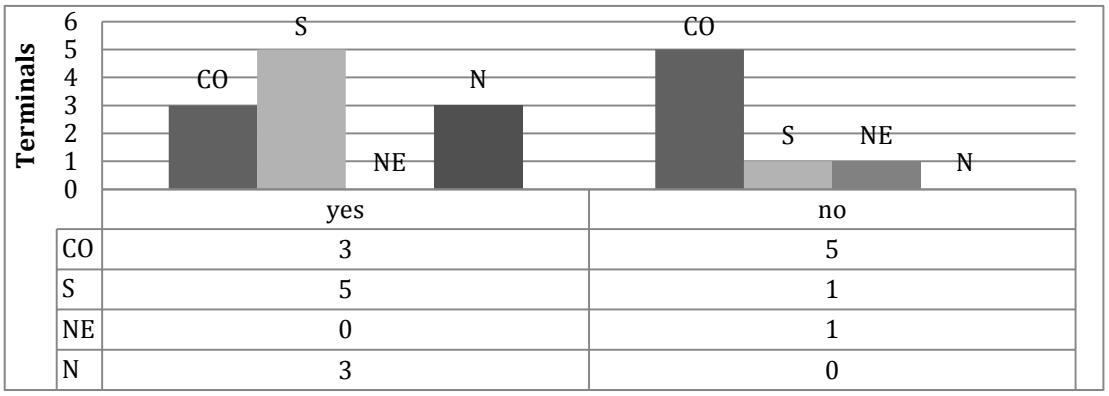


Figure 3. Terminals with Environmental Policies (by region).

Note. Source: Research data. N=North, NE = Northeast, S= South, CO = Midwest.

As previously noted by other authors, such environmental policies have become important in the current business environment, since investors and even stakeholders are looking for companies that take steps aimed at sustainability with regard to work, whether concerning their resources or making business contacts. Despite the small number of terminals involved in this development, we can see a link between the volume of transport of logistical points and the development of such policies.

Respondents in the sample were also classified as to whether they complied with established environmental standards. As can be seen from Figure 4, most terminals that comply with the standards are located in the Southern region. Analyzing the proportion of terminals that answered the questions, only the North region had 100% of its terminals meeting the specifications, with only 37% of respondents in the Midwest region doing so.



	yes	no
CO	3	5
S	5	1
NE	0	1
N	3	0

Figure 4. Terminals that Comply with the Established Standards.

Note. Source: Research data. CO = Midwest, S= South, NE = Northeast, N=North.

Through Table 3, we can examine the percentage of responding terminals that adopt sustainable practices, whether this is compliant with established legal standards,

or even if they have documented policies. It can be observed regarding the question of "health and safety" that the majority of respondents have formal procedures related to both health and safety at work (94%) as well as to the environment (89%). Moreover, only 17% have not adopted a minimum standard for environmental management of the terminal. Regarding the acceptance and dissemination of environmental activities between the parties, the index is still lower, with 78% of respondents reportedly having a policy with such characteristics. Despite this, we observed that only 61% of respondents claim to comply with legally established environmental standards.

Table 3
Percentage of Positive Responses Regarding Sustainable Actions

Variable	% of positive responses
Formal procedures for receiving, recording and responding to the demands concerning: health and safety at work.	*94%*
Formal procedures for receiving, recording and responding to demands concerning: the environment.	*89%*
There is no formally established minimum standard for environmental management of the terminal.	*17%*
Does the terminal have a documented environmental policy approved by management and widely disseminated among the parties?	*78%*
Complies with established legal standards	*61%*

In Table 4, we observe that, although few in number, there are terminals that reported having practices that surpass those required by law, adapting themselves to the concepts of searching for differentiation and competitive advantage. The table shows that 11% of respondents have actions that go beyond the legal standards required and that these are associated with cost reduction and revenue generation for the terminal, whereby the adopted practices not only contribute to the image of a sustainable company but also provide financial benefits to the terminal, generating changes in earnings performance and creating a rare competitive advantage over others.

Table 4

Percentage of Positive Responses Concerning Actions Surpassing Those Required

Variables	% of positive responses
Surpasses legal standards and is associated with cost savings or revenue generation for the terminal. In this case, cite at least one adopted practice	*11%*
Is superior to the legal standards and provides for pollution prevention and/or cleaner, continuous production improvement. In this case, cite at least one adopted practice	*17%*

Continuing the data analysis, we can see that 17% of respondents say they have practices that surpass those that are required, but that such actions are more strongly connected to pollution prevention and cleaner improvements. Thus, we see that only a few terminals can surpass expectations concerning their actions related to the environment, and only a small portion of these can connect sustainable practices to financial and revenue gains.

Finally, in Tables 5 and 6, we present a comparative analysis that considers the degree of performance and sustainable

action among certain terminals in the sample. Analyzing the variable of "price" (Table 5), almost 90% of respondents that have a high degree of performance are seen to conduct some kind of environmental practice, while only 36% of terminals with average performance act in this manner. Based on the same table, it is observed that while no terminal with average performance adopts practices that surpass those required by law, because of the reduction of pollution, 22% of respondents with high performance actually do so. These results point to a possible connection between the level of sustainability developed by a company and its market performance.

Table 5
Performance X Sustainable Actions (Variable of Price)

Price		
Degree of performance	Average	High
Total	11	9
Implementation of environmental practices, recycling, educational campaigns	36.3%	88.9%
Existence of waste treatment of equipment maintenance offices	18.2%	55.6%
Surpasses legal standards and is associated with cost savings or revenue generation for the terminal.	9.1%	0%
Surpasses legal standards and provides for pollution prevention and/or cleaner, continuous production improvement.	0%	22.2%

When analyzing the performance variable of "quality of service" (Table 6), this perception is repeated, since only 25% of respondents with an average performance level claim implementing sustainable practices, showing no positive responses to any other variable related to the environment. The terminals that have a high degree of performance participate in all the items connected with the sustainable actions, amounting to almost 70% of terminals that perform environmental practices; these also involve recycling and educational campaigns as part of their processes.

Table 6
Performance X Sustainable Actions (Variable of Quality of Service)

Quality of Service		
Grade of Performance	Average	High
Total	4	13
Implementation of environmental practices, recycling, educational campaigns	25%	69.2%
Existence of waste treatment of equipment maintenance offices	0%	38.5%
Surpasses legal standards and is associated with cost savings or revenue generation for the terminal.	0%	7.7%
Surpasses legal standards and provides for pollution prevention and/or cleaner, continuous production improvement.	0%	15.4%

DISCUSSION

The presented terminals are characterized, initially, by the quantity of grains stored in the last 12 months, showing the volume of transations. In this case, the highlights were for the terminals of the South, Center-West, and Southeast, respectively. This characteristic is maintained in the percentage analysis, so that the South region accounts for 29% of the grain storage, followed by the Central West region (28%) and the Southeast region

(24%). Of the percentage of respondents (only 55% of respondents), the majority was composed of terminals that interconnected road and rail modalities. A smaller part (6 respondents) were multimodal terminals of highways and waterway. Only 17% were characterized as modals that linked the 03 major modes. Regarding the activities offered by the multimodal terminals, they were mainly characterized by storage, transshipment, pre-cleaning and drying.

Thus, the research sample (18 terminals studied) is defined as terminals in all regions of the country, although the major activities are concentrated in the South, Center-West and Southeast regions, which interconnect road and rail, or road and waterway modes and only a small part of terminals that interconnect the 03 modes. Finally, the activities developed by them are mostly: storage, trans-shipment, pre-cleaning and drying.

Considering Barbieri and Cajazeira (2010), considering that sustainable businesses contribute to sustainable development, since they have high social, economic and environmental performances, multimodal terminals initially have strong characteristics that link them to sustainable practices.

This can be observed by the number of companies that have environmental policies. In the cases of the North and Northeast, all terminals have environmental policies, and even in regions with less policies, such as South and Central West, the percentage is around 60% and 80% of cases. Although some of the terminals studied (6 of 17) do not meet the established sustainability standards, the main issues can be observed with great frequencies in the terminals, such as health and safety at work (94% of respondents), Environmental issues (89% of respondents) and acceptance of environmental policies accepted by managers (78%). This is highlighted by the analysis made by Marrewijk (2002) that stakeholders are fundamental at the moment of operating the strategic actions, regarding the levels of sustainability.

In addition to this, the most frequent responses given by the respondents are in line with the outstanding studies on the social-environmental balance in the adoption of sustainable practices (Pimenta & Gouvinhas, 2012; Cunha *et al.*, 2011). The situation presented appears to be a positive scenario regarding the characterization of multimodal cargo terminals, as regards sustainable actions linked to the strategy. However, when evaluating the number of companies that exceed the previously defined standards on sustainable performance, few respond positively (11% and 17%, respectively).

If we evaluate Pfeffer and Sutton (2006) that, generally, managers spend much of their time creating scenarios for analysis and formulating strategic projections, as well as the need to maintain strategies (Murphy, 2007) In the multimodal terminals, tends to show a reduced concern about the strategic and competitive dimensions in front of the other companies and greater on meeting the standards demanded and determined by the government and society.

Based on the dimensions addressed by several authors, the focus was on two key points of competitive development in the terminals that carry out actions focused on sustainability: price and quality of services. Table 5 presents, among the 17 respondents, those who have medium and high performance, in relation to the price practiced. Each column indicates the proportion of terminals with medium or high performance, which perform environmental and recycling practices, have waste treatments and apply actions superior to legal standards based on cost reduction and pollution prevention.

As observed, terminals that have a high degree of performance based on price are more frequent in the execution of environmental practices, waste treatments and population prevention; however, they do not excel in the execution of practices that go beyond what is stipulated when it is simply cost reduction or revenue generation.

As for Table 6, which develops the same analysis based on service quality, we can verify that a larger number of terminals is characterized as high performance (13 in 17), and only four of them is defined as medium performance. With the same questions of environmental practices, waste treatments and execution of practices superior to those demanded, it is noted that the high performance terminals stand out in all the questions, indicating that the presence of a sustainable thought is more present in the multimodal terminals that have such a characteristic.

CONCLUSION

Through the analyses, and backed by the literature, we can conclude with regard to the terminals studied that the adoption of sustainable practices in such companies may be associated with their superior performance. It is noted that there is an apparent vocation for creating performance strategies aimed at using sustainable practices that corroborate established superior performance, not only in economics terms but also in environmental and social terms.

The presentation of high rates of adoption of sustainable practices, in contrast with the lower proportion of 61% of respondents that claim to comply with established legal environmental standards, points to an apparent interest in developing sustainable practices for these terminals. This is because such actions are present in most companies, including those that did not claim to adopt practices that are intended to comply with legal requirements. According to Schwartz and Carroll (2003), companies that, in their legal domain, surpass compliance may not just be avoiding litigation, but anticipating it in relation to the understanding of their role in fulfilling social responsibility.

Furthermore, we emphasize that only a small proportion of respondents (11%) could in fact create a connection between the adoption of actions aimed at improving environmental problems and a return that can now be measured by policymakers. This points to a gain in revenue, which can be reflected in the direct performance of these terminals.

When confronted with data concerning the competitive performance of the sample terminals with the adoption of sustainable practices, one can also see an apparent connection between such actions and better performance on the part of the companies, since the majority of respondents with a high degree of competitiveness presented the implementation of some practice or another focused on the environment.

Thus, we conclude that sustainable actions can indeed influence the performance variation of multimodal terminals. However, both the discussion based on a multivariate data analysis and the broader verification of the adoption of these practices still need to be explored further so that forms of conducting sustainability aimed at organizational performance beyond the economic competitive advantage of organizations can be substantiated.

REFERENCES

Araújo, A.O., & Oliveira, M.C. (1997). *Tipos de pesquisa. Trabalho de conclusão da disciplina Metodologia de Pesquisa Aplicada a Contabilidade - Departamento de Controladoria e Contabilidade da USP.* Mimeografado, São Paulo.

Barbieri, J.C., & Cajazeira, J.E.R. (2010). *Responsabilidade social e empresarial e empresa sustentável: da teoria à prática*. São Paulo: Saraiva.

Barley, S.R. (1986). Technology as an occasion for structuring: evidence from observations of CT scanners and the social order of radiology departments.

Administrative Science Quarterly, *31*(1), 78-108.

Benedetti, M.H., Lima, P., Mellato, L., & Silva, M. (2009). Possíveis interações entre o desenvolvimento sustentável e a logística de combustíveis. *Produção, 19*(1), 129-142.

Brito, R.P., & Berardi, P.C. (2010). Vantagem Competitiva na Gestão Sustentável da Cadeia de Suprimentos: um metaestudo. *Revista de Administração de Empresas, 50*(2), 155-169.

Cervo, A.L., & Bervian, P.A. (1996). *Metodologia científica*. São Paulo: Makron Books .

Creswell, J.W. (2007). *Projeto de Pesquisa: Método qualitativo, quantitativo e misto* (2 ed.). Porto Alegre: Arimed.

Comissão Mundial sobre Meio Ambiente e Desenvolvimento (1991). *Nosso futuro comum* (2 ed.). Rio de Janeiro: Editora da Fundação Getúlio Vargas.

Cunha, C.F., Spers, E.E., & Zylbersztajn, D. (2011). Percepção sobre Atributos de Sustentabilidade em um Varejo Supermercadista. *Revista de Administração de Empresas*, 51 (6), 542-552.

Demajorovic, J., Huertas, M.K.Z., Boueres, J.A., Silva, A.G. da, & Sotano, A.S. (2012). Logística reversa: como as empresas comunicam o descarte de baterias e celulares? *Revista de Administração de Empresas*, *52*(2), 165-178.

Diniz, E.M., & Bermann, C. (2011). Economia Verde e Sustentabilidade. Recuperado em 5 de maio, 2017, de http://www.scielo.br/scielo.php?Pid=S0103-40142012000100024&script=sci_arttext&tlng=pt.

Dyllick, T., & Hockerts, K. (2002). Beyond the business case for corporate sustainability. *Business Strategy and the Environment, 11*(1), 130-141.

Gallopin, G.C. (1997). Indicators and their use: information for decision-making. In: Moldan, B., & Billharz, S. *Sustainability indicators: report of the project on indicators of sustainable development*. New York: J. Wiley and Sons.

Gil, A.C. (1991). *Como elaborar projetos de pesquisa*. São Paulo: Atlas.

Kaydos, W. (1991). *Measuring, Managing, and Maximizing Performance.* Cambridge: Productivity Press.

Krugman, P. (2012). The Fall and Rise of Development Economics. In: Krugman, P. *Implementing Strategies in Complex Systems: Lessons from Brazilian Hospitals*. Rio de Janeiro: BAR.

Malhotra, N.K. (2001). *Pesquisa de marketing: uma orientação aplicada* (3 ed.). Porto Alegre: Bookman.

Marrewijk, C. van (2002). *International trade and the world economy*. Oxford, UK: Oxford University Press.

Mintzberg, H. (1994). *The rise and fall of strategic planning: reconceiving roles for planning, plans, planners*. New York: The Free Press.

Moldan, B., & Bilharz, S. (1997). *Sustainability Indicators*. New York: John Wiley and Sons.

Murphy, J. P. (2007). Tensões entre a missão e o empreendimento institucional: obstáculos à criatividade. In J. P. Murphy, & V. Meyer Jr. (Orgs.*), Liderança e gestão da educação superior Católica nas Américas* (pp. 19-42). Curitiba: Editora Champagnat.

Pimenta, H.C.D., & Gouvinhas, R.P.A. (2012). produção mais limpa como ferramenta da sustentabilidade empresarial:

um estudo no estado do Rio Grande do Norte. *Produção, 22* (3), 462-476.

Pettigrew, A.M. (1977). Strategy formulation as a political process. *International Studies of Management and Organization***,** *7*, (2), 78–87.

Pfeffer, J., & Sutton, R. I. (2006). *Hard facts, dangerous half-truths and total nonsense*: profiting from evidence-based management. Massachusetts: Harvard Business Press.

Schwartz, M.S., & Carroll, A.B. (2003). Corporate Social Responsibility: A Three-Domain Approac. *Business Ethics Quarterly*. *13*(4), 503-530.

Weick, K.E., & Roberts, K.H. (1993). Collective mind in organizations: heedful interrelating on flight decks. *Administrative Science Quarterly*, *38*(3), 357-381.

Whittington, R. (1996). Strategy as practice. *Long Range Planning*, *29*(5), 731-735

World Commission on Environment and Development. (1987). *Our Common Future*. Oxford: Oxford University Press.

Zago, A.P., & Paula, G.M. de. (2007). Sustentabilidade corporativa: o caso "Dow Jones Sustainability Index". In: *Anais... XXXI EnANPAD.* Rio de Janeiro: ANPAD, 2007. Recuperado em 18 de dezembro, 2010, de http://www.anpad.org.br.