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SUSTAINABILITY PRACTICES ADOPTED BY INDUSTRIAL COMPANIES

PRÁTICAS DE SUSTENTABILIDADE ADOTADAS POR EMPRESAS INDUSTRIAIS

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ABSTRACT

Objective: This study aims to examine the efficiency of sustainability practices in industries in the region of Chapecó-Santa Catarina.
Design/Methodology/Approach: The research is descriptive, conducted through a survey with 63 companies. The questionnaires administered shows the perception of top managers with respect to the economic-financial, social and environmental dimensions. For treatment of data, a quantitative approach and information entropy analysis were used with ranking by TOPSIS.
Results: The results show that the companies have different practices and concerns about corporate social responsibility. The companies are drawn up in a rank, allowing to observe and compare that the sustainability actions and practices are weak in 20 companies, which exhibit a performance below 0.50; 24 companies are ranked between 0.51 and 0.70; 14 companies have practices between 0.71 and 0.89, and only 5 companies are ranked above 0.90. In general, the results indicate that some companies have been using sustainable practices, but an alignment of the business strategies with the sustainability dimensions is still lacking. Also, the analysis shows that companies have not yet realized that natural resources are scarce, their leaders are not committed with sustainable management, which would provide an evidence of the efficiency of business practices with sustainable development.
Originality/value: The study shows comparatively distinct positionings of the companies studied, indicating that 70% of the companies still have weak or rare initiatives in regard to sustainable management. The study indicates the need for actions and initiatives to improve the managers' knowledge through training, qualification and awareness-raising toward sustainable development.

Keywords: Corporate sustainability; sustainability performance; sustainability assessment

RESUMO

Objetivo: O presente artigo teve por objetivo verificar a eficiência de práticas de sustentabilidade das empresas industriais da região de Chapecó-Santa Catarina.
Desenho/Metodologia/Abordagem: A pesquisa é descritiva, realizada por meio de levantamento junto a 63 empresas. Os questionários aplicados evidenciam a percepção dos gestores quanto as dimensões econômico-financeira, social e ambiental. Utilizou-se para o tratamento dos dados abordagem quantitativa e análise da entropia informacional, com ranqueamento pelo TOPSIS.
Resultados: Os resultados demonstram que as empresas possuem diferentes práticas e preocupações em relação a responsabilidade social corporativa. O posicionamento das empresas foi ranqueado e permite observar e comparar que as ações e práticas de sustentabilidade são frágeis em 20 empresas que possuem desempenho inferior a 0,50; 24 empresas possuem posicionamento entre 0,51 e 0,70; 14 empresas possuem práticas entre 0,71 e 0,89 e apenas 5 empresas possuem posicionamento acima de 0,90. De modo geral, os resultados indicam que algumas empresas têm se utilizado de práticas sustentáveis, contudo, ainda falta alinhamento estratégico do negócio com as dimensões da sustentabilidade, observa-se por meio da análise a ausência do reconhecimento de que os recursos naturais são escassos, a carência de comprometimento por parte dos gestores com a gestão sustentável, no intuito de evidenciar a eficiência das práticas empresariais com o desenvolvimento sustentável,
Originalidade/valor: A pesquisa evidencia de forma comparativa posicionamentos distintos entre as empresas estudadas, sendo que 70% das empresas ainda possuem iniciativas frágeis ou escassas em relação a gestão sustentável. O estudo demonstra a necessidade de ações e iniciativas voltadas a capacitação e conscientização dos gestores para com o desenvolvimento sustentável.

Palavras-chave: Sustentabilidade empresarial, Desempenho em sustentabilidade, Avaliação da sustentabilidade.

1 INTRODUCTION

Organizations become sustainable as they link the vision of economic prosperity with concern with the environmental and social impacts generated by their activities (Veber; Oliveira, Estivalete & Kneipp, 2016). Organizations have started to evaluate performance based on the sustainability tripod, or, as Elkington (2015) called it, the "triple bottom line", comprising the economic, social and environmental pillars of sustainability. According to Kocollari (2015), corporate social responsibility requires from businesses an ethical and transparent organizational conduct, for which they are accountable to their stakeholders.

Corporate social responsibility (CSR) is a company's commitment to the stakeholders with respect to ethical issues, contributing to economic development, without neglecting the environmental and social aspects (Mior, 2001). CSR practices are responsible attitudes held by organizations to their stakeholders, both internal (employees) and external (clients, suppliers, environment and the society in general) (Blasi, Caporin, & Fontini, 2018). Martinez-Conesa, Soto-Acosta and Palacios-Manzano (2017) emphasize that CSR is related to sustainable practices linked to the business' strategies, considering the sustainability aspects in the economic, social and environmental scope.

To Choi, Kwak and Choe (2010), CSR goes beyond company's obligations. In this regard, it is necessary not only to create economic value but, also importantly, to find ways of engagement with their stakeholders to promote social and environmental actions (Freeman, & Phillips, 2002). Companies that act with CRS have competitive advantages over their competitors (Kruger, Pfitscher, Uhlmann, & Petri, 2013). Thus, it is necessary to measure the economic, social and environmental impacts to provide support to the creation of strategies, to improve the relationship with stakeholders (De Camargo, Zanin, Mazzioni, Moura, & Afonso, 2018; Zanin, Dal Magro, Mazzioni, & Afonso, 2020) and to align business strategies with responsible processes in order to create solutions to reduce the impacts generated by the company's operations (Lopes, & Pacagnan, 2014).

Researches in the field of corporate sustainability have gained scope among scholars in recent years. To assess the companies' behavior in promoting actions that contribute to sustainability helps disseminate the important role that they play in developing a sustainable environment for their activities, both in regard to their own organization and the environment where they operate as well (Rodriguez, Ricart, & Sanchez, 2002).

Mello & Mello (2018) examined the sustainability practices of companies of the furniture industry in the state of Rio Grande do Sul, showing that these companies are concerned with the employees' well-being, provide support and assistance to needy entities, promote lectures and training on the subject, and invest in technology to reduce wastes in production processes. Albanio & Tatsch (2016) investigated the perception of footwear companies also in Rio Grande do Sul about sustainability practices, and found that the respondents have knowledge about sustainability, but actions to be implemented are still lacking, most likely because the consumer market does not value and differentiate companies on the basis of sustainability.

Previous studies indicate that there still a long way to go by companies concerning the understanding on sustainability as well as the key role that they have as boosters of sustainable practices. (Carrol, 1991, Rodriguez et al., 2002, Albanio, & Tatsch, 2016, Welzel, Luna, Bonin, & Martins, 2017, Mello, Mello, 2018, Kneipp, Gomes, Bichueti, Muller, & Motke, 2018, Eccles, Ioannou, & Serafeim, 2018). From this perspective, understanding the actions and practices of sustainability by companies is of vital importance, especially to identify advances in sustainable management.

According to the World Business Council for Sustainable Development (2000), corporate social responsibility should be understood as a continuous process of commitment to sustainable development and requires from companies an ethical behavior toward environmentally correct and socially fair practices, aiming to contribute to economic growth, improvement of the employees' quality of life and the well-being of local community.

In this context, the goal of this study is to investigate the efficiency of the sustainability practices of industrial companies in the region of Chapecó-SC.

The importance of this study is justified by the analysis and measure of the business environment according to Kruger, Zanella, Barichello and Petri (2018). Often, organizational goals are focused only on economic-financial performance, failing to consider a balance between the environmental, social and economic-financial variables, as required by sustainability. Kruger & Petri (2019) question the effectiveness of the measures and advances towards sustainable development, showing a demand for studies focused on an analysis of actions and practices of organizations in the scope of sustainability.

Corporate Social Responsibility (CRS) is a theme with a broad and interdisciplinary concept, but to advance in the discussions on the topic concerning businesses and society, it is necessary to recognize the role of companies in the process of practices oriented to CRS principles and values, in order to effectively achieve a sustainable society (Welzel et al., 2017).

The importance of the study is also justified by the contribution of the leaders' perceptions of the actions and practices of sustainability. According to Campos, Andrade, Estivalete, Costa & Stefanan (2015), sustainability and practices of corporate social responsibility are still restricted to large companies; so, studies involving small and medium sized companies are necessary considering the importance of these organizations in the economic, social and environmental context.

2 ASPECTS OF SUSTAINABILITY AND CORPORATE SOCIAL RESPONSIBILITY

Sustainability can be defined as an approach that encompasses economic, social and environmental issues in a well-balanced way and with a long-term vision, that is, for the benefit of future generations and stakeholders (Lange, Bush, & Delgado-Ceballos, 2012). The "triple bottom line" of sustainability, as Elkington (2015) called it, i.e., the economic, social and environmental pillars that support sustainability, suggests that an organization can develop and grow economically if it does not neglect these triple pillars and is committed to conduct their activities in a responsible way. Therefore, the success of an organization depends on how it relates with the environment where it is located and how it relates with clients, suppliers and community, which may influence the performance of their activities (Freeman, & Phillips, 2002).

Thus, creating economic value is not sufficient because it is necessary to consider the social effects of organizational actions (Freeman, & Phillips, 2002). Discussions on sustainability have gained scope in recent years due to the ever-growing environmental impacts and social problems. As a result, sustainable development has become all-important for building strategies on how organizations may contribute to the premise of disseminating and putting into practice the sustainability tripod (Veber *et al.*, 2016; Zanin et al., 2020).

To Carroll (1991), CRS involves societal expectations for businesses to perform under economic, social and environmental perspectives. In a current approach, Carroll (2015) conceptualizes CRS as actions that are not mandated, not required by law, i.e., that are above the expected ones, but which the company intends to accomplish because they involve the stakeholders. As a result, in addition to complying with ethical and legal standards, the company develops actions that aim to improve the community on a voluntary basis, motivated by the desire of being engaged in these causes. Such engagement many times comes from the fact that consumers, investors and other stakeholders expect that the company be engaged in strategies that involve the community where it is based, exerting a pressure from the outside to the inside of an organization (Carroll, 2015).

Discussions on CRS, according to Wang, Tong, Takeuchi and George (2016), began in the 1960s and since then they have increased not only in the corporate setting but in the academy as well, with the purpose of understanding the means through which the companies promote strategies of engagement with stakeholders and which go beyond the creation of economic value. Socio-environmental responsibility refers to the implementation of actions for the benefit of the environment and the community where the organization operates. Projects involving the local community, campaigns to reduce wastes, reuse of materials, are actions that promote not only the company's economic development but its social and environmental role as well (García-Granero, Piedra-Muñoz, & Galeano-Gomez, 2018, Di Domenico, Mazzioni, Gubiani, Kronbauer & Vilani, 2015).

The pyramid model introduced by Carrol (1991) of corporate social responsibility has four different categories: (i) economic responsibility (the company must make profits); (ii) legal responsibility (the company must comply with laws and regulations); (iii) ethical responsibility (the company must have an ethical behavior, i.e., honesty, fairness and loyalty, and act with responsibility); (iv) discretionary responsibility (the company must be engaged in social projects and develop actions that contribute to society).

Likewise, CRS seeks to improve the business relationships with their stakeholders effectively, concerned with social issues and in creating ways to promote social inclusion and optimization of resources in favor of the environment (Kopnina, 2017). Building strategies that promote CRS surpasses the organizational boundaries because the pressure applied by external agents for businesses to adopt best practices and maximize resources also impact corporate actions (Kopnina, 2017).

Bénabou & Tirole (2009) identified three visions of CRS: vision 1 consists of companies' adoption of a more long-term CRS, strengthening their position in the market by adopting responsible practices and using CRS to prevent future problems that might arise from their activities. Vision 2 comprises the adoption of a responsible social behavior involving philanthropy practices to accomplish stakeholders' demands and supporting causes by providing goods or services for the needy more efficiently because of the business expertise in the sector where it operates. Vision 3 refers to philanthropy, but started inside the company, through which the organization itself is interested in supporting causes involving the stakeholders, as a form of engagement to local community, providing recourses for the development of actions.

In the study by Irigaray, Vergar and Araujo (2017), the authors investigated organizational perceptions on the CRS concept. The authors reported that companies consider themselves as "transforming agents", having CRS included in the corporate strategies and values. However, there is no agreement about the concept of CRS in companies, making it broad and often described with poor clarity and understanding.

Sustainable management has as basic premise the need for organizations to recognize that natural resources are scarce and that businesses and society are responsible for the rational use of resources and to seek alternatives to minimize the environmental impacts of their activities (Rodriguez, Ricart, & Sanchez, 2002).

Studies in the area of sustainability have also increased in corporations with the goal of understanding how firms are adopting sustainability in their businesses and which actions have been promoted (Albanio, & Tatsch, 2016; De Camargo et al., 2018; Kneipp et al., 2018; Eccles et al., 2018).

The study of Veber et al. (2016) investigated the perception of managers of a healthcare cooperative about the sustainability dimensions. The results show that sustainability is present in the cooperative, but concerning the social dimension some aspects still need to improve in the organization, such as the implementation of new practices related to the environmental dimension, which can also contribute to the development of best practices in the cooperative, and the study also proposes the community engagement to include it in the sustainable context.

lbanio & Tatsch (2016) analyzed the perception of agents of the footwear industry in Rio Grande do Sul, and their findings indicate that the respondents have knowledge about sustainability but practices have not yet been largely implemented in the companies. They indicate that sustainability included in the corporate environment is still a new subject to many companies, but putting sustainability into practice can make the business more competitive in the market, where social pressures for adoption of sustainable practices by organizations have motivated them to implement actions to reduce environmental impacts and also to ensure the effectiveness of the economic and social pillars.

The study of De Camargo et al. (2018) discusses the application of a system of sustainability indicators for the swine industry in the state of Santa Catarina. The results indicate that the pig farms can be classified as "in search of sustainability", except for the social dimension, about which the study indicates that this dimension is considered "unsustainable". Accordingly, the results propose the need for implementation of corrective measures as a way to achieve the three dimensions of sustainability: economic, social and environmental. By identifying and monitoring the problems in the scope of sustainable practices, it is possible to implement strategies to mitigate the impacts and improve the sustainability level.

Kneipp et al. (2018) analyzed Brazilian companies of the industrial sector to characterize the managerial profile with regard to sustainable innovation, and the results indicate that strategies and innovation are associated with the sustainable management of the companies studied, which promote actions to mitigate the impacts of their activities, consisting of reducing the consumption of resources, promotion of waste recycling, engagement with the community and the development of sustainable practices related to processes and products.

Eccles et al. (2018) surveyed 180 North-American companies to identify the adoption of voluntary sustainability practices. For this study, the authors divided the firms into two groups: firms with high sustainability and firms with low sustainability. In the firms with high sustainability, it is clear that the encouragement of these practices come from the board of directors and other stakeholders, who understand that they are beneficial, also in the long term, while companies with low sustainability keep waiting that the government or laws mandate corrective actions for their activities.

In general, the present study differs from previous studies in that it adopts a sample of industrial firms not listed in B3, aiming to contribute to discussions about the evidence of sustainability-related actions and practices, considering the environmental, social and economic dimensions and the assumption that such actions are voluntary and add to the corporate behavior in view of the challenges of sustainable development.

3 METHODOLOGICAL PROCEDURES

This study consists of a descriptive survey with a quantitative approach, having as population industries located in Chapecó, Santa Catarina. The questionnaire of the survey was administered to the leaders of the industries in Chapecó (owners, partners, managers or heads of units), using a set of closed questions and 5-point Likert scale, 1 for Totally Disagree and 5 for Totally Agree. Table 1 describes the survey sample:

Table 1 – Survey Population

Industries in Chapecó, SC	Quantity	Balance
Companies of the industrial sector (population)	288	288
Companies of the same economic group	3	285
Total of responses obtained	66	66
Sample of valid questionnaires	63	63

Source: Developed by authors

To define the study population, we considered 288 companies that are members of the Commercial and Industrial Association of Chapecó (ACIC) as well as those linked to the entity's business groups. The ACIC has a sustainability group, which promotes awareness-raising actions and discussions on this topic. After sending the questionnaire to the companies, the sample contained 63 respondents. Among the economic activities, the sample comprised industries of the plastic, printing/graphic, packaging, equipment making, metallurgy and metal-mechanic sectors.

The questionnaire was divided into four blocks. The first block was designed to characterize the respondents, containing questions about the position and length of service in the firm, education and time of activity of the business. The other questions were divided into three blocks: Economic Dimension (9 questions), Social Dimension (8 questions) and Environmental Dimension (6 questions), as shown in Table 2.

Table 2: Survey Construct

Economic Dimension		
EcD1 Responsible suppliers	When contracting a supplier, the company not only requires a good commercial proposal (quality, price and delivery time), but it also investigates the existence of socioenvironmental practices.	Kneipp et al. (2018)
EcD2 Water reduction practice	The company adopts in its facilities actions to reduce consumption of water (installation of self-closing faucets and reduced-flush toilets, or the use of rain water for cleaning and maintenance activities).	Kneipp et al. (2018)
EcD3 Power reduction practice	The company adopts in its premises actions to reduce energy consumption.	García-Granero et al. (2018)
EcD4 Raw-material reduction practice	The company practices in its installations actions to reduce consumption of raw materials/inputs.	García-Granero et al. (2018)
EcD5 Paper saving practice	The company seeks to implement paper-saving actions (such as the use of front and back of paper sheets)	Kneipp et al. (2018)
EcD6 Quality improvement	The company has taken measures to improve the quality of goods and/or services offered.	García-Granero et al. (2018)
EcD7 Expanding product variety	The company has taken measures to increase the scope of goods and/or services offered.	Kneipp et al. (2018)
EcD8 Increasing supply of products	The company has taken measures to expand the supply of products/services.	Kneipp et al. (2018)
EcD9 Increasing value-added	The company has adopted measures to enhance the added value of products and services supplied.	Dangelico and Pontrandolfo (2015)
Social Dimension		
SoD1 Documental Parameters for stakeholders	The company has a formal document that describes the parameters that are desirable in its relationships with the stakeholders.	Kneipp et al. (2018), Eccles *et al.* (2014)
SoD2 Involves stakeholders in this document	The company seeks to involve the stakeholders (employees, customers, suppliers, community and board of directors) in the preparation and revision of this document.	Kneipp et al. (2018), Eccles *et al.* (2014)
SoD3 Pleasant and safe environment	The company does its best to offer to its employees a pleasant and safe workplace. Example: it offers counseling for good body posture at work.	Kneipp et al. (2018)
SoD4 Accessibility	The company provides facilities and resources to facilitate movement and coexistence with people with disabilities (such as ramps, safety notices in Braille, sign language, etc.).	Kneipp et al. (2018)
SoD5 Values diversity	The company values diversity, not using discriminatory practices in relation to gender, race, sexual orientation, age, religion and political beliefs of candidates as well as with disabled people in the personnel selection process.	Kneipp et al. (2018)
SoD6 Development of the Community	The company considers important and implement actions for the development of the local community through the creation of jobs and income generation, as well as to reduce poverty and increase inclusion in the society.	Kneipp et al. (2018)
SoD7 Encouragement to volunteer work	The company encourages volunteer work of its employees in the community and recognizes the importance of employees' volunteer work, publicizing it in bulletin boards, internal or local newspaper.	Kneipp et al. (2018)
SoD8 Practices encouraging communication	In company communications (publicity contracts and media), the company encourages and educates consumers to adopt conscious and responsible attitudes toward consumption (e.g., appropriate disposal of packages).	Kneipp et al. (2018)
Environmental Dimension		
EnD1 Assesses/ reports activities	The company knows, understands and assesses the impacts of its operations on the environment (such as the emission of pollutants and high consumption of energy, water and fuel), maintaining indicators and reports to measure and monitor these impacts.	Kneipp et al. (2018), Eccles et al. (2014)
EnD2 Process reduces damages	The company uses in its processes materials that may reduce environmental damages. For example: it controls and reduces sound, visual and air pollution caused by their processes.	Kneipp et al. (2018)

EnD3 Partnership for return of recyclable materials	The company discusses partnerships with suppliers for the purpose of returning reusable materials (such as expired products, batteries, tires and lamps used, packages, etc.) to the manufacturer.	Kneipp et al. (2018)
EnD4 Preservation of environment	The company implements in its facilities and activities actions that aim to preserve the environment, e.g., selective garbage collection, using identified trash cans for discard of paper, glass, metal, plastic and organic material.	Kneipp et al. (2018)
EnD5 Proper disposal of wastes/ residues	The company practices actions for proper final destination of wastes that require specific treatment, such as batteries, oils, tires and hospital wastes.	Kneipp et al. (2018)
EnD6 Environmental education	The company promotes environmental education to employees, their families and community members as an effective manner of reducing environmental impacts.	Kneipp et al. (2018)

Source: Developed by authors.

After data collection, the method used for data analysis was information entropy. Information entropy, according to Beuren, Cunha, Theiss & Cordeiro (2013, p.71), "allows to know the element that transmits more information, which is the one that demonstrates greater dispersion in the group, higher weight, indicating different opinions" [our translation]. Thus, according to Beuren *et al.* (2013, p.74) "information entropy refers to the measure of dispersion of data. For data with great probability distribution, the entropy value will be low, while for data with narrow and nonpeak distribution, the entropy value will be high" [our translation].

The TOPSIS method was used for ranking the businesses, which attributes a given score to the set of information, which, according to Gollo and Silva (2015, p. 49) "the smaller the distance between observation and the ideal point for that set of information, the higher the score. On the other hand, the closer to the non-ideal point, also known as anti-ideal, the lower the score of that observation." [our translation].

The analysis allows to identify the general classification of the 63 companies of the sample with respect to sustainability performance and the individual ranking for the economic-financial, social and environmental performance, permitting to observe the individual classification of the companies and the variations between the three dimensions of sustainability in relation to the other companies of the sample.

4 ANALYSIS AND INTERPRETATION OF RESULTS

In this section, the data that characterize the respondents, the descriptive statistics of the data obtained and the entropy of the questions are analyzed.

4.1 Descriptive analysis of the respondents' characteristics

Table 2 shows the identification of the managers that responded the questionnaires, considering their position, length of time in the company and educational background, as well as the age of the company or its length of time in business.

Table 2 – Characterization of respondents and the age of the company where they work

Position	Absolute frequency	Percentage	Accumulate
Partner/Owner	28	44.44	44.44
CEO/Director/ Manager	7	11.12	55.56
Responsible for sector/ unit	28	44.44	100
Total	63	100	-
Length of time in the company (years)	**Absolute frequency**	**Percentage**	**Accumulate**
Up to 5 years	19	30.16	30.16
6 to 10	22	34.92	65.08
11 to 15	6	9.53	74.61
16 to 20	5	7.93	82.54
Over 20 years	11	17.46	100.0
Total	63	100	-
Education level	**Absolute frequency**	**Percentage**	**Accumulate**
Master's degree	3	4.76	4.76
Specialization	9	14.29	19.05
Higher Education (Complete)	20	31.74	50.79
Higher Education (Incomplete)	13	20.63	71.42
Secondary Education (Complete)	13	20.63	92.05
Secondary Education (Incomplete)	5	7.95	100.0
Total	63	100	-
Length of time in the company (years)	**Absolute frequency**	**Percentage**	**Accumulate**
Up to 5 years	12	19.04	19.04
6 to 10	11	17.46	36.50
11 to 15	8	12.70	49.20
16 to 20	5	7.93	57.14
Over 20 years	27	42.86	100.0
Total	63	100	-

Source: Survey's data.

Table 2 contains the respondents' characteristics and the company's time in business. Firstly, the table shows that most of the respondents are partners/owners of the company (44.44%) and/or in charge of a sector/unit (44.44%). That is, they are people who are in positions that require an overall knowledge of the company' strategies and actions.

Most of the respondents (34.92%) work in the company for 6 to 10 years, which is a considerable time to acquire knowledge about the organizational processes and particularities. Following are the respondents with up to 5 years in the company, representing 30.16% of the sample.

With respect to education, it can be seen that most of the respondents (31.74%) have a college degree and that 9 respondents (14.29%) have a graduate specialization.

4.2 Analysis of entropy

After administering the survey questionnaire, the responses were arranged in tables. Table 3 shows the entropy and weight relating to the economic performance according to the responses obtained for each question.

Based on the analysis of entropy, it can be seen that question 2 (EcD2), relating to water consumption, achieved the highest weight 0.26127, indicating a higher entropy between the respondents, of 0.97345. So, reduction of water consumption is a practice that generated disagree-

ment in the perceptions of the companies investigated, which indicates that it is a practice not used by the majority of the companies, as there is a dispersion in responses observed by entropy. With respect to the practice of contracting responsible suppliers, a high entropy (0.97907) was also found, and a weight of 0.20598, also showing a higher entropy between the respondents, i.e., the practice of contracting suppliers aligned with socioenvironmental responsibility is not common in the companies studied, as the high entropy indicates disagreement in the responses of the sample.

Table 3: Sustainable Economic Performance

Economic performance variables	N	Min.	Max.	Average	SD	Entropy	Weight
EcD1- Responsible suppliers	63	1.00	5.00	3.317	1.317	0.97907	0.20598
EcD2 - Water Reduction	63	1.00	5.00	3.190	1.435	0.97345	0.26127
EcD3 - Power reduction	63	1.00	5.00	3.651	1.207	0.98491	0.14843
EcD4 - Raw Mat./Input reduction	63	1.00	5.00	3.905	0.995	0.99163	0.082377
EcD5 - Paper reduction	63	2.00	5.00	4.381	0.887	0.994631	0.052834
EcD6 - Measure of improved quality	63	1.00	5.00	4.349	0.864	0.994473	0.054394
EcD7 – Increase of products line	63	2.00	5.00	4.190	0.820	0.995052	0.048692
EcD8 - Increase of products supply	63	1.00	5.00	4.159	0.901	0.993655	0.062438
EcD9 – Increase of value-added	63	1.00	5.00	3.937	0.997	0.991509	0.083560
						8.89839	1

Source: Survey's data.

By analyzing Table 3, one can see that question 7 exhibited the lowest entropy, with 0.995052, relating to the increase of the products line. The low entropy results from the fact that the respondents agree that the company has pursued to expand the scope of goods offered. Question 5 is related to paper saving practices, which also exhibited a low entropy level, of 0.994631, which indicates that in general there are efforts to reduce paper consumption.

Question 6, relating to measures to improve the quality of the products supplied, also had a low entropy, of 0.994473. The low entropy level indicates that the companies recognize that improving the quality of products is also a sustainable measure adopted. The low entropy found for question 8, with 0.993655, indicates that the respondents agree on the fact that the company has made efforts to expand the products offered. Question 4, which is related to the practice of reducing raw material/inputs, had a low entropy, of 0.99163, that is, the respondents agree that the company makes efforts to reduce the consumption of raw materials/inputs. Question 9 investigated if the company has adopted measures to increase added value, which also exhibited a low entropy, of 0.991509. Thus, it can be seen that there is an agreement that the company have pursued to increase added value

Table 4 describes the questions relating to the companies' social performance.

Table 4: Sustainable Social Performance

Social performance variables	N	Min.	Max.	Average	SD	Entropy	Weight
SoD1 – Doc.parameters stakeholders	63	1.00	5.00	2.841	1.472	0.96651	0.18791
SoD2 – Involves stakeholders in doc.	63	1.00	5.00	2.746	1.379	0.96862	0.17608
SoD3 – Pleasant/safe workplace	63	1.00	5.00	3.889	1.094	0.98911	0.0610
SoD4 – Accessible facilities	63	1.00	5.00	3.190	1.446	0.97294	0.15186
SoD5 – Values diversity	63	3.00	5.00	4.508	0.715	0.9967	0.01799
SoD6 – Community development	63	1.00	5.00	3.889	1.165	0.9877	0.06849
SoD7 – Encourages volunteer work	63	1.00	5.00	2.921	1.495	0.9663	0.18868
SoD8 – Communication on practices	63	1.00	5.00	3.365	1.473	0.9736	0.14786
						7.8218	1

Source: Survey's data

With respect to the social responsibility pillar, the highest weight can be seen for question 7, with 0.18868, indicating a high entropy for volunteer work encouragement, showing that this is not practiced by all companies studied. Question 1, relating to a formal document describing the desirable parameters to be followed in the relationships with stakeholders also exhibited high entropy, i.e., a greater dispersion of opinions among respondents, with a weight of 0.18791, showing that such document has a low adherence by the companies studied.

A higher weight is also found for question 2, of 0.17608, which indicates the stakeholders' involvement in the writing of the formal document, an evidence that this item is not practiced by the majority of the companies, showing a high entropy due to the level of disagreement among the respondents. Question 5 exhibits a low entropy among the respondents, of 0.9967, showing that the companies agree in valuing diversity when selecting new employees. Question 3, relating to company's efforts to offer a pleasant and safe workplace, achieved a low entropy, of 0.98911, showing that the respondents agree that this item is important in the workplace, that is, they agree that a pleasant and safe environment is a variable of social performance usually related to the employees' satisfaction with the workplace.

Table 5 contains data relating to the environmental dimension.

Table 5: Sustainable Environmental Performance

Environmental performance variables	N	Min.	Max.	Average	SD	Entropy	Weight
EnD1- Assesses environ. impacts	63	1.00	5.00	3.651	1.1382	0.98717	0.16025
EnD2- Process reduces damages	63	1.00	5.00	3.810	1.0295	0.99046	0.11918
EnD3- Return of recyclables	63	1.00	5.00	3.603	1.4090	0.97858	0.26758
EnD4- Environment preservation	63	2.00	5.00	4.270	0.9017	0.99419	0.07253
EnD5- Proper waste disposal	63	1.00	5.00	4.286	1.0384	0.99164	0.10435
EnD6- Environ. educ. stakeholders	63	1.00	5.00	3.286	1.3492	0.97790	0.27608
						5.91998	1

Source: Survey' data

The highest weight is for question 6, of 0.27608, showing a high entropy among the respondents, which indicates that they disagree on the perception of how the company promotes environmental education to the stakeholders (employees and families, community). However, promoting environmental education to the stakeholders can effectively help reduce environmental impacts. It can be seen that question 3 also had a high entropy regarding partnerships with suppliers for the return of reusable materials (reverse logistics), with a weight of 0.2675, and a greater dispersion in the responses. A high entropy can also be seen for question 1, of 0.98717 and weight of 0.16025, indicating low agreement among the respondents with respect to knowledge, understanding and evaluation of the impacts of their activities on the environment.

Question 4, which had a low entropy, of 0.99419, refers to the implementation, inside the company and in their activities, of actions aiming to the preservation of the environment. The low level of entropy shows that the companies promote environmental preservation through actions such as selective garbage collection.

Table 6 contains an analysis of the responses with respect to the company's overall sustainable performance by observing the average between the economic-financial, social and environmental variables.

Table 6: Entropy between the groups of Sustainable Performance Practices

	N	Min.	Max.	Average	SD	Entropy	Weight
EcD average	63	2.33	5.00	3.897	0.611	0.9970	0.18170
SoD average	63	1.50	5.00	3.418	0.859	0.9921	0.47755
EnD average	63	1.66	5.00	3.817	0.812	0.9943	0.34073
						2.9835	1

Source: Survey's data

In Table 6, one can see the entropy per group of sustainable performance practices. The highest weight was found for the Social Sustainable Performance group, which exhibits a high entropy, of 0.9921, and weight of 0.46755. This means that the respondents were not unanimous in their responses, showing that the manages' perception with respect to social performance is disperse among the sampled companies and represents the focus with greatest fragility. Accordingly, in the Sustainable Economic Performance group, a low entropy was found, with 0.9970, i.e., the respondents were more unanimous in their observations about economic performance. In general, the companies studied are under a low social pressure about corporate social responsibility, making that they mostly prioritize the economic aspects to the detriment of environmental and social aspects.

After carrying out the entropy analysis for each sustainability dimension (economic, social and environmental), a ranking of the companies was drawn up using the TOPSIS system, and arranged according to the order shown in the SDP column, which encompasses the three sustainability dimension pillars. The companies ranked first indicate more efficiency in the three sustainability dimensions, as shown in Table 7.

Table 7: TOPSIS of the companies' efficiency

Ranking	Company	**SDP**	Company	**EcD**	Company	**SoD**	Company	**EnD**
1st	31	0.97406	8	1.00000	18	1.00000	18	1.00000
2nd	26	0.97188	30	1.00000	26	1.00000	26	1.00000
3rd	18	0.93173	31	1.00000	31	0.90780	30	1.00000
4th	53	0.90636	40	1.00000	53	0.88138	31	1.00000
5th	8	0.90262	53	0.90264	2	0.84971	40	1.00000
6th	2	0.87882	26	0.88472	45	0.81858	45	1.00000
7th	28	0.85650	22	0.87126	9	0.80434	54	1.00000
8th	40	0.85047	2	0.85961	8	0.80023	53	0.92244
9th	45	0.81340	46	0.83176	46	0.76946	28	0.91729
10th	30	0.80427	28	0.81204	28	0.74680	36	0.90449
11th	51	0.77498	5	0.77680	51	0.73685	24	0.87759
12th	36	0.75617	56	0.76988	12	0.72665	52	0.87513
13th	46	0.75396	9	0.76211	39	0.69417	2	0.85951
14th	14	0.75079	18	0.75429	14	0.68667	15	0.83050
15th	12	0.74894	25	0.74452	55	0.67015	8	0.82146
16th	11	0.74619	37	0.74452	40	0.65569	12	0.81027
17th	15	0.73667	47	0.74425	50	0.65175	14	0.77469
18th	9	0.73315	10	0.72842	30	0.64934	11	0.77331
19th	50	0.72831	14	0.72725	15	0.64460	23	0.76698
20th,	52	0.69159	44	0.71951	36	0.59671	33	0.76352
21st	39	0.68889	12	0.71058	62	0.58851	9	0.74612
22nd	29	0.67877	17	0.67007	11	0.58196	61	0.74612
23rd	44	0.64539	55	0.66260	13	0.58148	63	0.72745

Ranking	Company	**SDP**	Company	**EcD**	Company	**SoD**	Company	**EnD**
24th	32	0.62871	15	0.65074	32	0.56825	29	0.71594
25th	55	0.62435	58	0.64426	1	0.56284	34	0.70749
26th	48	0.62390	39	0.64361	16	0.55351	25	0.69701
27th	33	0.61491	16	0.63982	33	0.55350	46	0.69701
28th	63	0.60535	32	0.63913	48	0.55334	16	0.68432
29th H	16	0.60439	33	0.63443	25	0.55210	51	0.67005
30th	25	0.60439	13	0.62310	61	0.55111	50	0.66291
31st	62	0.59424	51	0.61898	4	0.54271	27	0.66269
32nd	38	0.57489	1	0.61128	52	0.53768	44	0.65497
33rd	61	0.57047	34	0.60584	29	0.53696	22	0.63437
34th	10	0.56538	59	0.60545	10	0.53480	37	0.62576
35th	27	0.56522	38	0.59374	38	0.53360	56	0.62437
36th	34	0.56189	23	0.59024	44	0.52962	48	0.60420
37th	4	0.55825	11	0.58822	27	0.51529	32	0.59262
38th	22	0.54948	4	0.58560	56	0.48640	39	0.58237
39th	13	0.54919	52	0.58452	63	0.47211	42	0.56633
40th	56	0.53662	24	0.56750	58	0.45275	55	0.54667
41st	23	0.53387	36	0.55111	6	0.44650	1	0.54547
42nd	24	0.53282	42	0.54853	23	0.44494	10	0.52975
43rd	37	0.51084	29	0.54313	17	0.44275	35	0.52782
44th	54	0.48826	7	0.54203	37	0.43899	41	0.51934
45th	5	0.45834	48	0.53700	41	0.43724	38	0.51664
46th	1	0.45155	63	0.51472	59	0.42464	60	0.50099
47th T	58	0.44894	50	0.51192	34	0.41377	13	0.49301
48th	42	0.43602	54	0.51012	24	0.40040	19	0.49301
49th	47	0.42839	62	0.50551	57	0.39871	47	0.47484
50th	41	0.41617	35	0.49635	47	0.38737	7	0.44838
51st	17	0.40843	41	0.49113	5	0.37911	43	0.44595
52nd	6	0.39941	60	0.47734	22	0.37881	17	0.44140
53rd	59	0.36478	27	0.46528	7	0.30275	62	0.43328
54th	7	0.36434	61	0.46136	3	0.29026	58	0.40590
55th	57	0.33941	43	0.43430	21	0.27976	59	0.39724
56th	35	0.32741	45	0.42627	42	0.27491	21	0.38978
57th	60	0.29007	19	0.41421	20	0.26112	5	0.38665
58th	19	0.27720	20	0.40701	43	0.24442	4	0.38626
59th	43	0.25538	49	0.40377	54	0.21876	49	0.38187
60th	20	0.24479	57	0.39591	49	0.19452	6	0.32428
61st	21	0.21401	21	0.37898	19	0.18346	57	0.30792
62nd	49	0.18601	6	0.37786	35	0.12779	20	0.26446
63rd	3	0.15084	3	0.30147	60	0.06340	3	0.12872

SDP = overall TOPSIS of the three sustainability dimensions; EcD = TOPSIS of the economic dimension;
SoD = TOPSIS of the social dimension; EnD = TOPSIS of the environmental dimension.
Source: Survey's data.

It can be seen in Table 7 that the company 31 achieved the best overall score, that is, the best performance for the sustainability dimensions in the companies examined, with only a few positions below for the social dimension, but in the overall assessment, it can be seen that the company has effective sustainability practices in all dimensions. When observing company 31 for each dimension of sustainability, considering the economic dimension, we can see that the company is engaged in promoting actions that contribute to resource savings, such as raw material/inputs, water, energy and paper, which also contributes to reducing wastes. In addition, still considering the economic dimension, the responses show that the company is concerned with offering quality and varied products, which can contribute to maximizing results and its perpetuity in the marketplace.

Thus, for the social dimension, the company was also effective in employees-related actions such as maintaining a pleasant and safe workplace, in valuing diversity, and engaged with the stakeholders. To the company, these are important factors to legitimize itself in the market, being seen as a responsible company and engaged with society, which can ensure good outcomes. Finally, for the environmental dimension, the company was also effective in the actions presented in the questionnaire, relating to proper waste disposal, environment preservation and environmental education actions, for example. Actions like these not only reflect in a positive image of the company but also in saving the resources that it uses.

It is noted that, when a company is responsible in sustainability-oriented actions, in addition to creating a favorable environment for its relationship with the stakeholders, it can also benefit from positive results, including profit increase. In the sequence, we can see that company 26 is ranked second in performance of sustainability practices. This company is in lower position only for the economic dimension, but achieved the highest score for the social and environmental dimension. Companies 18, 53 and 8 also achieved high scores, which indicates that they strongly adopt sustainability actions.

If we observe each of the scores alone, companies 8, 30, 31 and 40 achieved the highest scores for the economic dimension, which shows the willingness of these companies to take actions that promote the sustainability practices described in the questionnaire. If we observe the social dimension, companies 18 and 26 were the ones that achieved the highest scores for social sustainability. It can be seen that they are not the same companies that obtained a high score for the economic dimension. This indicates the need for these companies to promote actions to ensure a balance between the dimension pillars. Finally, when observing the environmental dimension, one can see that this is the dimension that achieved the greatest number of high scores, with seven companies attaining score 1. Of these companies, some are also present with score 1 in other dimensions, while others only in this dimension obtained the highest score, which again shows that in some companies there is not an ideal balance in their sustainability practices.

Companies 3, 49, 21 achieved the lowest scores, a clear evidence that their social, environmental and economic-financial practices are far from ideal compared to the practices adopted by the other companies studied.

The analysis allows to observe the ranking composed by the variables described in Tables 3, 4 and 5, considering the sustainability practices adopted by the sampled companies. The ranking allows to compare the sustainable management performance because all companies were assessed with the same criteria (according to the items already presented) and, irrespective of the size, the conditions for assessment of social, environmental and economic-financial practices can be compared between the companies by observing the individual performance. On this regard, by observing the ranking, the companies can analyze themselves and seek ways to improve their performance in relation to their competitors.

The results corroborate the findings of Kneipp *et al.* (2018), who also demonstrate that sustainability practices are present in the implementation of strategies that include the three sustainability dimensions. However, according to Veber *et al.* (2016), organizations not always deal with

sustainability practices in a balanced manner, considering that their findings indicate weaknesses regarding the practices of the social dimension, suggesting an improvement of these practices in the organizations. Albanio & Tatsch (2016) add that organizations are aware of sustainability, but regarding the implementation of sustainable practices the organizations still have doubts and difficulties.

On this regard, by observing the ranking, it could be seen that sometimes a certain dimension of sustainability overlaps the others. De Camargo *et al.* (2018) also identified a lack of balance between the three dimensions in sustainability practices, and suggested the implementation of strategies designed to monitor the actions in order to ensure an improved sustainability level and the balance of the three dimensions, economic, social and environmental.

The findings corroborate previous studies, indicating the lack of understanding about sustainability as well as the importance of the role that companies have to enhance and promote advances in sustainable practices (Carrol, 1991, Rodriguez et al., 2002, Albanio, & Tatsch, 2016, Welzel, Luna, Bonin, & Martins, 2017, Mello, Mello, 2018, Kneipp, Gomes, Bichueti, Muller, & Motke, 2018, Eccles, Ioannou, & Serafeim, 2018). Considering that the results evidenced weaknesses in sustainable management, especially when we observe that 70% of the companies still have poor initiatives with regard to social and environmental actions, such results indicate a need for training, development and qualification of top managers.

5 FINAL CONSIDERATIONS

Sustainability in the corporate environment is perceived through responsible practices and attitudes implemented under the light of three dimensions: economic, environmental and social. Implementation of sustainability practices by businesses is accomplished by pursuing efficiency in the utilization of resources, reduction of consumption, in addition to social policies defined in the corporate setting. On this regard, this study aimed to analyze the efficiency of sustainability practices according to the perception of the CEOs of industries located in the municipality of Chapecó, Santa Catarina.

With respect to the economic dimension, in general a low entropy was observed in the responses, indicating that the companies have adopted practices that were listed for this dimension. However, the questions EcD1 and EcD2, relating to the contracting of responsible suppliers and reduction of water consumption, respectively, exhibited a high entropy, which demonstrates a larger dispersion in the responses, indicating that not all companies studied adopt these practices.

Concerning the social dimension, a higher entropy was observed in the respondents' perception relating to this dimension. Questions SoD1, SoD2 and SoD7, which refer to the formal document that specifies parameters relating to the stakeholders, the stakeholders' participation in building this document, and formulation of policies encouraging volunteer work, respectively, showed a high information entropy, with a greater dispersion in the leaders' response, indicating that they are practices not utilized by all companies investigated in this study. Positive scores in social dimension can be seen for the questions SoD2 and SoD5, relating to efforts made by the company to ensure a pleasant and safe workplace and in valuing diversity, respectively, which exhibited a low entropy, indicating a good performance of these practices in the companies studied.

About the environmental dimension, there was more agreement between the respondents, which can be observed by the low entropy for question EnD4, which refers to measures that the company implements towards environmental preservation. The greater dispersion in the responses, identified by the high entropy, was found for questions EnD1, EnD3 and EnD6, relating to the companies' assessment and awareness of the environmental impacts of their operations, return of recyclables (reverse logistics) and promotion of environmental education, respectively.

Based on the ranking that was built using TOPSIS, it was observed that there are companies with high levels of performance in sustainability practices, while some other companies have low levels of sustainability practices that could be captured from the respondents' perceptions. On this regard, it can be seen that there is still a long way to travel with respect to the implementation of sustainable actions to ensure the accomplishment of the three dimensions: economic, social and environmental.

The findings of this study show that the companies investigated have used sustainability practices in their processes. However, considering the responses obtained, it was found that the sustainability practices are not widely used by all companies, indicating weaknesses with respect to the efficiency of the sustainability practices adopted by the companies under study. The ranking allows to identify that some companies have high levels of sustainability, but the actions and practices have not been implemented in a balanced way in the three dimensions. On this regard, we suggest that these companies seek to implement aligned actions, aimed at developing practices that enable a balance between the three sustainability dimensions. We also suggest that the companies seek to implement strategies that aggregate in a broad way the concerns relating to the social, economic and environmental aspects. For the companies that exhibited low levels of sustainability practices, it is necessary that they build and implement policies and actions that aim to the insertion of sustainability-oriented practices into the company, aligned to the business context.

Considering that sustainability-oriented actions and practices are voluntary, i.e., they depend on organizational decisions and interests, it is expected that the survey showed that concerns and efforts towards best socioenvironmental practices exist in the corporate setting, irrespective of the company' size or stakeholders' demands. Likely due to the perceptions of an increasingly competitive environment, the companies have been forced by society to invest in, and clearly evidence, actions and practices aligned with the expectations of sustainable development.

The contribution of this research to the academy and the literature on the subject is that it identifies how effective is the adoption of sustainability practices in the business context in the municipality of Chapecó, SC, as well as it assesses and ranks sustainable management practice by the companies. The survey also suggests the need for training and qualification of top managers to strengthen sustainable development. It is expected that the findings can help the participation of the university in programs and actions that are beneficial to the stakeholders and the promotion of sustainable actions.

The conclusions are limited to the surveyed sample, and the findings cannot be generalized because it is a research conducted locally, which can be considered a limitation. Further studies with a greater number of companies and leaders' perception of other cities or regions are recommended.

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Contribution of authors

Every author should account for at least one component of the work. Paper approved for publication need to specify the contribution of every single author.

Contribution	[Author 1]	[Author 2]	[Author 3]	[Author 4]
1. Definition of research problem	√	√		√
2. Development of hypotheses or research questions (empirical studies)	√	√	√	√
3. Development of theoretical propositions (theoretical work)	√	√		
4. Theoretical foundation / Literature review	√	√		
5. Definition of methodological procedures		√	√	√
6. Data collection	√	√		
7. Statistical analysis	√		√	√
8. Analysis and interpretation of data	√	√	√	√
9. Critical revision of the manuscript		√	√	√
10. Manuscript writing	√	√		
11. Other (please specify)				