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Identification of Sustainable Practices Developed by the Industrial Sector

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Abstract

The inclusion of sustainable practices in industrial concerns and decisions may become essential to sustaining future business in the coming decades. Accordingly, this article sought to present the most widely implemented sustainable practices in the selected industries, the benefits of sustainable practices to industries and measures of efficiency of the use of sustainable practices. For this, a systematic review of the literature was carried out through the databases Web of Science, Google Scholar and Scopus. The key words were identified from a previous reading on the topic in articles and closely related to the focus areas of this research. For studies used were considered by means of criteria: those of inclusion encompass national and international academic articles through established keywords and those of exclusion encompass dissertations, theses and books. As a result, 914 articles were observed, of which 215 articles were selected through the reading of titles and abstracts. Of these 215 articles, 44 were selected observing the selected criteria. Of these selected articles, 27 articles were from the ISI - Web of Science database and 17 from the Scopus search database. Among the articles, waste management was the most cited sustainable practice. Industrial sectors of Engineering and Construction, followed by the Wine and Automotive sectors are the target of several researches. Nevertheless, the systematic review of literature showed which sustainable practices adopting has been a determining factor in the success and maintenance of the industry in the market.

Keywords: Climate change; energy depletion; Energy Management System; Country certification level

1. Introduction

The large industrial development, population growth, increased demand for production and increased consumption are factors which trigger a great strain on natural resources (Severo et al. 2017). Accordingly, sustainable development is a concept that has been widely applied in the various industrial sectors. It emerged from the 1970s and sought to meet the present generation without compromising the needs of future generations (World Commission on Environment and Development 1987). Currently there are several definitions of sustainable development elaborated by various sectors present in society, but all aimed at common a sustainable future for humanity. In the mid-1990s there were more than 100 definitions for sustainability (Marshall and Toffel 2005). Given the different definitions, one of the main challenges of sustainable development -is involves actions that cover social, environmental and economic concerns. In this sense, the triple bottom line (TBL) can help in the long-term environmental balance, consequently improving the quality of life of people (Bagheri and Hjorth 2005).

TBL is the three dimensions of sustainability (environmental performance, social responsibility and economic contribution) that the sector should have over the environment (Elkington 1994). Sustainability issues have become essential in the industrial reality to reduce the negative impact of industries caused to the environment (Connelly 2007). These sustainable actions increase business competitiveness and are seen as innovations needed for research and development of sustainable products (Fernández et al. 2003). Thereat, several researches have been developed in the area of TBL focusing on industrial impact (Kucukvar et al. 2014; Svensson et al. 2016; Wang et al. 2013).

The adoption of sustainable practices involving TBL principles in all industrial sectors is a trend (Chaturvedi et

al. 2017; Raut et al. 2017). Thus, decisions in the corporate environment have highlighted the environment as one of their concerns, and actions such as a decrease in the use of resources and raw material, eco efficiency and waste reduction are some of the sustainable practices that can be exemplified (Despeisse et al. 2012). Some sectors are more focused on activities aimed at sustainable development through the creation of goods and services that are less harmful to the environment, less polluting, use less raw materials, less energy. This has led to the creation of products or services that are ecologically / socially / economically viable in accordance with the principles of TBL and encompass the interests of all stakeholders, which are considered as key components for the adoption of sustainable practices (Bhaskaran et al. 2006).

However, a stakeholder demand is not the only factor that explains the increasing adoption of sustainable practices. In addition, the difficulty in accessing raw material and regulatory pressures to control the environment impact are other factors to increase of sustainable practices (Lai et al. 2012; Martinsen and Huge-Brodin 2014). Adopting these practices improves the environmental performance of the industry and encourages the creation of a greener awareness of the corporate environment as well as of all parties involved (Nidumolu et al. 2009). Nevertheless, some factors are considered barriers in the implementation of sustainable actions in the industries. Among these the non-reuse of waste products, because they are relatively cheap, not taking into account the ecological costs that this causes in the long term. Moreover, differences in culture and communication are barriers that hinder the implementation of sustainable practices (Revell and Blackburn 2007). Therefore, in view of these factors that promote and prevent the adoption of sustainable practices by the industries, some questions were raised in this work:

a) What sustainable practices are implemented in the selected industries?
b) What benefits do sustainable practices bring to the industrial sector?
c) How are the benefits / efficiency of using sustainable practices measured?

Thus, the objective of this paper is to answer these questions through the systematic review of articles related to this topic. For this, research was carried out with several articles available on the subject, seeking to clarify and structure the existing knowledge about the sustainable practices adopted by the various industrial sectors. For this purpose, this article was structured as follows: The section 2 covers a brief literature review that introduces sustainability, sustainability in industries and sustainable practices, presenting its origins, synthesizing its conceptual definition and illustrating its relevance to research and practice. The subsequent section describes the research design, presenting the research questions and the method employed. Section 4 presents the results and discussion of the research, first illustrating the relationships between sustainable practices and research in the different industrial dimensions selected. This is followed by a discussion of the findings and answers to the proposed questions. The paper concludes with final comments on the contributions of this research, its limitations and interesting fields for future research.

2. Literature Review

2.1 Sustainability

In 1987, from the Brundtland report "*our Common Future*" a more elaborate and formal definition of sustainable development was elaborated as "(...) it is one that meets the needs of the present without compromising the possibility of future generations to meet their own needs. The concept of sustainable development permeates the same sustainable perspective since its initial elaboration, addressing the continuous search for a balance between the environment, economic development and commitment to future generations (Fayezi et al. 2018).

The term sustainable development, since its first appearance, has obtained several definitions and contradictions as to its meaning, with various and often ambiguous definitions (Glavič and Lukman 2007). The term sustainable development covers an ecological vision encompassing the whole life cycle of the product or service directing the concept to the environmental area, referring to ecological systems, aimed at preserving the environment (Dyllick and Hockerts 2002). Sustainability can be more broadly defines sustainability as a means of business that meets both the needs of companies and stakeholders, seeking the balance of natural resources guaranteeing them to future generations (Long et al. 2016). In general, sustainable development concepts cover the needs of addressing current day needs in order to preserve resources so that they are present and able to meet the needs of future generations.

Sustainable development allows better evaluation of human behaviour towards the environment and brings collaborations in the adoption of government policies aimed at adopting more sustainable actions. Faced with the diversity of definitions of sustainability, all must include the three pillars of sustainability: social, economic and environmental equally, so that one pillar does not overlap the other, but together they complement each other (Mihelcic et al. 2002).

The TBL -triple Bottom Line concept is a balanced approach between the environmental, social and economic aspects in companies, that is, it measures the performance of a corporate environment according to its social, economic and environmental performance (Gimenez et al. 2012). Companies that seek decisions according to these indicators tend to be more developed and profitable over time (Longoni and Cagliano 2018). The advantage of adopting these social, environmental, and economic indicators is that they include the direct and indirect effects, immediate or not of the performance of sustainability-oriented companies (Foran et al. 2005). It also has an interpretation of sustainability that places equal importance on environmental, social and economic considerations in the decision-making process (Pope et al. 2004).

The need to exercise more sustainable attitudes are necessary issues for changes that aim at a balance between the social, economic and environmental dimensions, whose purpose is to bring balance to companies in relation to the environment (Mebratu 1998). In Figure 1, through the Venn diagram, it is observed that each region of the diagram is a subset of social, environmental and social focus, having four intersection areas (Webb and Ayyub 2017)

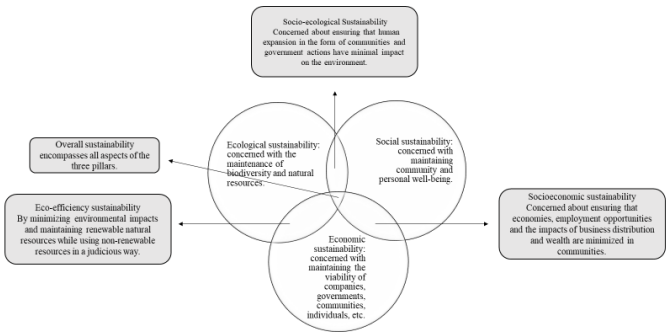

Figure 1. Venn diagram of the three pillars approach for sustainability

Source. (Webb and Ayyub 2017).

The regions are interconnected and interdependent since any change in the subsets can have positive or negative influences on the other. One cannot influence the economy without the consequent social change. Not so much influence the economic without changing the environmental or social aspects.

2.2 Sustainability in the Corporate Environment

As organizations embrace sustainability in their actions, the challenges to operationalize these sustainable issues in corporate decision-making also rise. Sustainability has great importance in corporate environments, only 30% claim to pursue actions aimed at sustainability in the business environment (Haugh and Talwar 2016).

The opportunities for seeking innovations and improving decision-making processes within an organization by integrating activities related to the sustainability bias, encompassing all stakeholders, not disaggregated to sustainable factors, focusing economic, social and environmental interests (Boons and Lüdeke-Freund 2013). Companies that have sustainable strategies are more evolved, have a competitive advantage over companies that do not have this sustainable reality because they are able to combine decision making taking into account the social, environmental and economic aspects (Markley and Davis 2007).

Companies that have a vision for the tripod of sustainability are better able and subject to greater economic growth, contributing to the quality of life of the stakeholders, who are key components for the companies' motivation to adopt environmental practices and consequently achieve sustainability goals, due to society's most critical position regarding concerns about environmental aspects that permeate the environment (Wu et al. 2015).

In view of the current environmental scenario, it is necessary for the business sector to focus their endeavours to primarily meet the concepts of ethics, social responsibility and quality corporate governance, seeking to mitigate environmental impacts by promoting well-being and quality of life for all the stakeholders, maintaining a balance between the social, economic and environmental aspects. These three dimensions serve as indicators to evaluate sustainability in a company (Strezov et al. 2013).

2.3 Sustainable Practices

The industrial growth occurred due to the demand of the society to supply its needs generating greater environmental deteriorations, arising from there the need to worry about these deteriorations in relation to the future generations, allowing the rupture with old paradigms that the natural environment has infinite resources.

The society has taken as new precepts the concern with the environment, in this way stakeholders have become one of the factors that influence the industrial society to adopt practices that aim to mitigate the harmful effects of industrialization. Current research indicates that the adoption of sustainable practices brings benefits both to the reputation of the corporate environment and to the economic environment and consequently higher customer satisfaction (Tan et al. 2011).

Sustainable practices bring the need for new attitudes often demanded by different stakeholders. Stakeholders can positively or negatively influence projects that permeate the corporate environment, directly or indirectly influencing decision making, to ensure that sustainable practices are incorporated into the corporate environment (Lindgreen 2012).

The demands of stakeholders - government and society - are geared to push for more environmentally sustainable practices across the industry (Behera et al. 2012; Geng et al. 2016). In this way, the industrial sector, which is growing on a global scale, in both developed and developing countries gradually and slowly seeks to combine industrial interests with the interests of stakeholders, which are motivators in the adoption of sustainable practices.

Although sustainable practices are much cited in articles on the subject, it can be seen that there is no clear delimitation of the term, or a consensual definition as observed in the articles (Akadiri and Fadiya 2013; Blancas et al. 2018; Drohomeretski et al. 2015; Høgevold et al. 2015; Smith 2009; Stål and Jansson 2017). Given the difficulty in finding definitions supported by research on the theme, a definition was proposed for sustainable practices as actions aimed at putting into practice the theories about sustainability supported by the social, environmental and economic tripod of sustainability, seeking to mitigate or even eliminate damage to the environment and to all stakeholders.

The definitions of sustainable practices, although scarce, are identified in the literature as a range of sustainable practices used in industries in the various sectors. Industries can adopt various sustainability practices, such as: reduction of waste and pollution prevention (Sarkis et al. 2010); recycling and waste reduction waste management, return of packaging, eco-labelling, recovery of end-of-life products from the company, providing consumers with information on sustainable products and / or production methods, transport use; energy conservation (Rao and Holt 2005), waste reduction, pollution prevention among other practices that will be listed in this paper, describing the diversity of practices focused on sustainability (Ameer and Othman 2012).

3. Methods

3.1 Systematic Review of Literature

The systematic review of literature was the method used in this article to get the results and try to answer the questions raised. Since the systematic review of the literature is a tool, used to organize a diversity of knowledge to find specific academic answers (Tranfield et al. 2003), It allows a process capable of being replicable, with scientific, robust and clear bias, that aims to eliminate the infinite and exhaustive searches in the literature that compose the databases, providing faster conclusions of the subjects sought (Cook et al. 1997). The effect of this process is a time gain and union of conclusions, provided by the inclusion in researches. For this, the following steps highlighted in Figure 2 were approached in the systematic review in order to achieve the objectives described in this research.

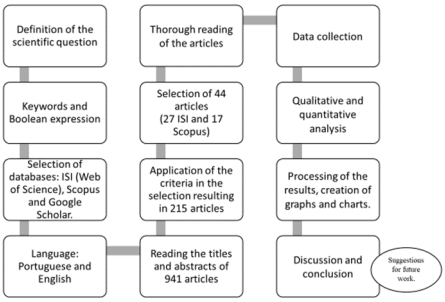

Figure 2. Flowchart to represent the methodological sequence developed in the Systematic Review of Literature -RSL

Source. The author himself.

Within the review process, the proposal was the search for academic articles that answered the following inquiries, formulated by seven questions that are part of the scope of the research:

a) What sustainable practices have been developed in the industries?

b) Which sector was used to develop the research?

c) What criteria define practices as sustainable?

d) What is the methodology used to evaluate sustainable practices in the industrial sector?

e) Is the implementation of sustainable practices really effective?

f) How much benefit do Sustainable Practices bring?

g) How are the benefits / efficiency of the use of such practices measured?

The databases used for the research were Web of Science, Google Scholar and Scopus (Green et al. 2006). The key words were identified from a previous reading on the topic in articles and closely related to the focus areas of this research, justifying the use of the following expressions: ″sustainable practices", "good practices in sustainability", "green practices", sustainability and industry. The Boolean expressions "and" and "or" were used to combine the terms used in the research, resulting in "sustainable practices" or "good practices in sustainability" or "green practices" and sustainability and industry, with all terms combined.

The studies were considered by means of criteria: those of inclusion encompass national and international academic articles through established keywords and those of exclusion encompass dissertations, theses and books. There was an evaluation of the titles and abstracts, obeying strictly the criteria of inclusion and exclusion mentioned previously in the research. When the article was not enlightening in the title or abstract, it was sought the full reading of the article so as not to run the risk of exclusion of important articles in the systematic review. From the selection that was based initially on the presence of sustainable practices cited in the article, 44 articles were selected and are listed separately in the reference section at the end of this paper.

After the selection of the articles, an initial analysis was carried out on which sustainable practices were described in the articles and later on, which industrial sectors and research methods that were developed in the articles, region addressed in the article, business sector, publication period, periodical, year, the scope of the article and answers to the questions to be answered were also collected. Subsequently, an organizational structure was developed through Excel software to assist in the systematic review of Literature. All the information described was processed in spread sheets in Excel software, which were subsequently isolated and analysed graphically. Since the systematic review of literature is intended to investigate and compare the results obtained through a qualitative and quantitative analysis of the data.

4. Results and Discussions

From the reading of 941 articles, 215 articles were selected through the reading of titles and abstracts. Of these 215 articles, 44 were selected observing the selected criteria, as first focus the identification of Sustainable Practices and later collection of the other questions proposed in the article. Of these selected articles, 27 articles were from the ISI - Web of Science database and 17 from the Scopus search database. From this total of 44 articles, 5 were found only in ISI, 7 articles only in Scopus and 32 articles in both search engines. And after

refinement of the research, no results in the Google Scholar search database were selected because they did not answer the questions that make up the scope of the research or because they were already listed for being found in another base, from those previously mentioned. Of the excluded articles, some are cited as Sehnem et al. (2016); Viana and Perez (2013); Hall and Lopez (2010); Huq et al. (2014); Schubert et al. (2010). Some of these were not possible to make a full reading due to fact that the non-citation of the types of sustainable practices present in the article led to consider that they did not answer the questions regarding the research determined in the scope.

Through reading the articles (Table 1), it was identified which sustainable practices were addressed, with the respective authors and number of times cited, and similar actions were grouped in order to better organize the information collected. The sustainable practices named in Table 1 cover a wide range of areas, based on the TBL-Triple Bottom Line proposition, encompassing a company's ability to manage its profits, along with concern for environmental aspects and the development of its social relationships inside and outside the corporate environment (Høgevold et al. 2015). The practices found address the most various actions inside and outside the corporate environment and emphasize all the areas that may be affected by the action of the industry in question, in all the existing industrial diversity.

The sustainable practices (Table 1) present in the articles address several issues, among the most cited are Waste Management, Use of Clean Technology or Clean Production, Reuse and Recycling, Water / Waste / Energy Management, Environmental Management System, Stakeholder Management, Sustainable Use of Natural Resources, Training and Development, Community Relations / Corporate Citizenship and Philanthropy and Design for the Environment - DFE packaging. They are practices that address aspects that independently of the sector are very important for the development of sustainable aspects. One of the most cited practices, such as Waste Management, confirms the great need to re-evaluate the entire life cycle of a product or process without neglecting the end of the life cycle, and stresses that regardless of the industrial sector the concern with waste is action that guarantee less impact for the future as the concept of Sustainable Development states. The waste management, in addition to being recognized in one of the Sustainable Development objectives of Agenda 21, is an important action that encompasses the pillars of sustainability and reflects the practices present in the articles analysed (Fuss et al. 2018).

Table 1. Description of practices / authors / citations

Sustainable Practices	Authors	Number
Waste Management	(Esfahbodi et al. 2017); (Sehnem et al. 2016); (Bonn et al. 2016); (Ju and Chang 2016); (Drohomeretski et al. 2015); (Wu et al. 2015); (Vintró et al. 2014); (Ene et al. 2013); (Bamgbade et al. 2017); (Gabzdylova et al. 2009); (Marteel-Parrish and Newcity 2017); (Yusof et al. 2017); (Akadiri and Fadiya 2013); (Khatri and Metri 2016); (Xu and Gursoy 2015); (Evangelista 2014); (Yates 2014); (Teare 1990); (Luthra et al. 2016); (Vanalle and Santos 2014).	20
Use of Clean Technology or Clean Production	(Drohomeretski et al. 2015); (Golini et al. 2017); (Ene et al. 2013); (Bellantuono et al. 2017); (Luthra et al. 2016); (Vanalle and Santos 2014); (Hsu and Chang 2017); (Wu et al. 2015); (Diabat et al. 2014); (Abidin 2010); (Chopra and Wu 2016); (Yates 2014); (Xu and Gursoy 2015); (Esfahbodi et al. 2017); (Sehnem et al. 2016); (Dawal et al. 2015); (Teare 1990); (Alonso-Almeida et al. 2017); (Wang et al. 2013).	19
Reuse / recycling	(Jang 2016); (Golini et al. 2017); (Teare 1990); (Alonso-Almeida et al. 2017); (Mariadoss et al. 2016); (Sehnem et al. 2016); (Bonn et al. 2016); (Ju and Chang 2016); (Dawal et al. 2015); (Drohomeretski et al. 2015); (Ene et al. 2013); (Yusof et al. 2017); (Xu and Gursoy 2015); (Luthra et al. 2016); (Vanalle and Santos 2014); (Wu et al. 2015); (Marteel-Parrish and Newcity 2017); (Esfahbodi et al. 2017); (Evangelista 2014)	19
Water / waste / energy management	(Alonso and Ogle 2010); (Dodds et al. 2013); (Carrasquer et al. 2017); (Ju and Chang 2016); (Vintró et al. 2014); (Yusof et al. 2017); (Jang 2016); (Bamgbade et al. 2017); (Marteel-Parrish and Newcity 2017); (Sehnem et al. 2016); (Pomarici et al. 2015); (Gabzdylova et al. 2009); (Yates 2014); (Teare 1990); (Alonso-Almeida et al. 2017); (Evangelista 2014); (Ene et al. 2013).	17
Environmental Management System (EMS)	(Dawal et al. 2015); (Esfahbodi et al. 2017); (Sehnem et al. 2016); (Ene et al. 2013); (Xu and Gursoy 2015); (Diabat et al. 2014); (Bellantuono et al. 2017); (Wang et al. 2013); (Yates 2014); (Evangelista 2014); (Lo 2014); (Prasad et al. 2016); (Alonso-Almeida et al. 2017); (Hsu and Chang 2017); (Luthra et al. 2016); (Wu et al. 2015); (Khatri and Metri 2016).	17
Stakeholder management	(Hsu and Chang 2017); (Monastyrnaya et al. 2017); (Teare 1990);	15

	(Drohomeretski et al. 2015); (Wu et al. 2015); (Yates 2014); (Jang 2016); (Diabat et al. 2014); (Khatri and Metri 2016); (Vanalle and Santos 2014); (Monastyrnaya et al. 2017); (Chopra and Wu 2016); (Esfahbodi et al. 2017); (Luthra et al. 2016); (Wang et al. 2013).	
Sustainable use of natural resources	(Bellantuono et al. 2017); (Alonso-Almeida et al. 2017); (Abidin 2010); (Drohomeretski et al. 2015); (Monastyrnaya et al. 2017); (Sehnem et al. 2016); (Marteel-Parrish and Newcity 2017); (Bamgbade et al. 2017); (Dawal et al. 2015); (Luthra et al. 2016); (Vanalle and Santos 2014); (Yates 2014); (Ene et al. 2013); (Teare 1990); (Pomarici et al. 2015).	15
Training and development	(Hsu and Chang 2017); (Masri and Jaaron 2017); (Monastyrnaya et al. 2017); (Alonso-Almeida et al. 2017); (Wu et al. 2015); (Tan et al. 2011); (Bellantuono et al. 2017); (Evangelista 2014); (Luthra et al. 2016); (Marteel-Parrish and Newcity 2017); (Vanalle and Santos 2014); (Teare 1990); (Dodds et al. 2013).	13
Community relations	(Hsu and Chang 2017); (Ju and Chang 2016); (Wu et al. 2015); (Vintró et al.	13
Corporate Citizenship and Philanthropy	2014); (Huq et al. 2014); (Diabat et al. 2014); (Wang. et. al.,2013); (Bellantuono et al. 2017); (Dodds et al. 2013); (Carrasquer et al. 2017); (Teare 1990); (Akadiri and Fadiya 2013); (Palomo-Lovinski and Hahn 2014).	
Design for environment (DE) (packaging).	(Golini et al. 2017); (Esfahbodi et al. 2017); (Sehnem et al. 2016); (Yates 2014); (Xu and Gursoy 2015); (Diabat et al. 2014); (Marteel-Parrish and Newcity 2017); (Luthra et al. 2016); (Teare 1990); (Bonn et al. 2016); (Vanalle and Santos 2014).	11
Certifications of the environmental management system of suppliers	(Luthra et al. 2016); (Teare 1990); (Drohomeretski et al. 2015); (Monastyrnaya et al. 2017); (Dawal et al. 2015); (Yusof et al. 2017); (Mariadoss et al. 2016); (Vanalle and Santos 2014); (Lo 2014).	9
Risk and crisis management	(Hsu and Chang 2017); (Pomarici et al. 2015); (Drohomeretski et al. 2015); (Diabat et al. 2014); (Marteel-Parrish and Newcity 2017); (Dodds et al. 2013); (Teare 1990); (Golini et al. 2017); (Esfahbodi et al. 2017); (Wu et al. 2015).	10
National environmental regulations (eg waste emissions, cleaner production, etc.).	(Esfahbodi et al. 2017); (Drohomeretski et al. 2015); (Yates 2014); (Ene et al. 2013). (Diabat et al. 2014); (Tan et al. 2011); (Sehnem et al. 2016); (Vintró et al. 2014); (Wu et al. 2015); (Prasad et al. 2016).	10
Eco design	(Bellantuono et al. 2017); (Alonso-Almeida et al. 2017); (Sehnem et al. 2016); (Drohomeretski et al. 2015); (Diabat et al. 2014); (Palomo-Lovinski and Hahn 2014); (Tan et al. 2011); (Khatri and Metri 2016); (Lo 2014).	9
Contract with suppliers that have environmental policies and action plans	(Teare 1990); (Luthra et al. 2016); (Esfahbodi et al. 2017); (Mariadoss et al. 2016); (Drohomeretski et al. 2015); (Xu and Gursoy 2015); (Diabat et al. 2014); (Wang. et. al.,2013); (Bellantuono et al. 2017).	9
Life Cycle Assessment - LCA	(Monastyrnaya et al. 2017); (Sehnem et al. 2016); (Dawal et al. 2015); (Baydar et al. 2015); (Luthra et al. 2016); (Vanalle and Santos 2014); (Vintró et al. 2014); (Alonso-Almeida et al. 2017).	8
Technology and innovation	(Tan et al. 2011); (Monastyrnaya et al. 2017); (Wu et al. 2015); (Vanalle and Santos 2014); (Lo 2014); (Evangelista 2014); (Masri and Jaaron 2017); (Sehnem et al. 2016).	8
Sustainable transport management	(Bellantuono et al. 2017); (Teare 1990); (Golini et al. 2017); (Esfahbodi et al. 2017); (Yates 2014); (Bamgbade et al. 2017); (Evangelista 2014).	7
Carbon Management	(Drohomeretski et al. 2015); (Teare 1990); (Esfahbodi et al. 2017); (Alonso-Almeida et al. 2017). (Vanalle and Santos 2014). (Hsu and Chang 2017).	6
Sustainable consumption	(Sehnem et al. 2016); (Vanalle and Santos 2014); (Alonso-Almeida et al. 2017); (Teare 1990).	4
Green chemistry	(Sehnem et al. 2016); (Ju and Chang 2016); (Tarasova et al. 2014); (Gabzdylova et al. 2009); (Marteel-Parrish and Newcity 2017).	5
Eco efficiency	(Sehnem et al. 2016); (Alonso-Almeida et al. 2017); (Ju and Chang 2016); (Wu et al. 2015); (Prasad et al. 2016).	5
Reducing social impact	(Drohomeretski et al. 2015); (Wang. et. al.,2013); (Wu et al. 2015); (Jang 2016).	4
Eco certification (ISO 14000, ISO 50001, LEED, GBI, GRADE, EMAS)	(Chopra and Wu 2016); (Evangelista 2014); (Luthra et al. 2016); (Prasad et al. 2016).	4
Reduction of solid waste	(Yusof et al. 2017); (Sehnem et al. 2016); (Wu et al. 2015).	3
Reduction in energy consumption	(Teare 1990); (Alonso-Almeida et al. 2017); (Ju and Chang 2016).	3
Reduction in water consumption	(Teare 1990); (Esfahbodi et al. 2017); (Alonso-Almeida et al. 2017).	3
Recycling of rainwater / gray	(Teare 1990); (Sehnem et al. 2016); (Wu et al. 2015).	3

water and industrial water		
Supply chain management	(Monastyrnaya et al. 2017); (Yusof et al. 2017); (Vanalle and Santos 2014);	3
Code of conduct / compliance / corruption and bribery	(Hsu and Chang 2017); (Drohomeretski et al. 2015); (Wu et al. 2015).	3
Health and safety (working conditions and safe training)	(Huq et al. 2014); (Diabat et al. 2014).	2
Eco-friendly flooring	(Teare 1990).	1

As to the number of published articles related to the year of its publication (Figure 3), the result restricts the total number of publications in the databases that correspond to the scope of the work, whose initial objective was to research the Sustainable Practices present in various sectors of industries, as described among the items for inclusion and exclusion of articles in the selection process.

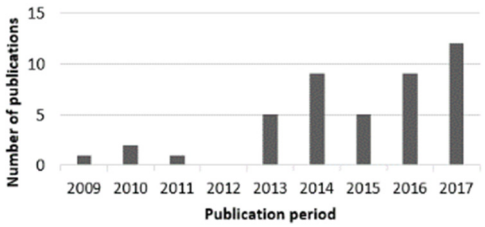

Figure 3. Demonstration of the period of publications of the selected articles

What has been seen in the last decades is an increase in the number of publications related to sustainability and especially the approach of adopting sustainable practices. The absence of publications in the year 2012 does not indicate that there were no publications related to sustainability, but the presence of publications that did not fit the scope of the research. Of these publications (Olugu and Wong 2012; Umeda et al. 2012) are example of authors related to sustainability but, they did not answer the questions in the scope of the research.

Regarding the methodology of studies addressed in the 44 articles selected (Figure 4), it is observed an equality of adoption in the methodology of Case Study and Survey. In relation to the Case Study Method, its use is justified because it has a qualitative character, allowing a better knowledge of the characteristics of the industries that develop its sustainable focus (Fresner and Engelhardt 2004). It also allows a deeper understanding of the organizations, although in a particular way of each case studied, and thus cannot generalize the results obtained (Ghisellini and Thurston 2005).

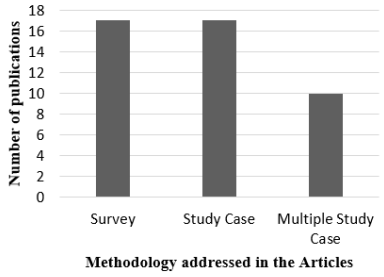

Figure 4. Methodologies present in the selected articles

The Survey methodology is present in 17 articles, and the use of questionnaires has the objective of trying to analyse the various internal sectors of the industry investigated, producing quantitative descriptions to analyse the characteristics of the management systems and sustainable practices adopted by the industries surveyed allowing a more general view of the industries surveyed.

Although industries are seen as one of the most polluting, they are a source of economic growth and development, being an important sector of research and development of sustainable practices that seek growth tied to attitudes that benefit economic, social and environmental factors. It is determined that industries seek greater sustainability strategies due to external pressures, which encouraged them to make decisions taking into account their responsibilities towards the TBL principles (Azapagic 2004; Lindgreen 2012).

The industrial sectors of Engineering and Construction, followed by the Wine and Automotive sectors are the

target of several researches (Figure 5) (Alwan et al. 2017; Li et al. 2018).

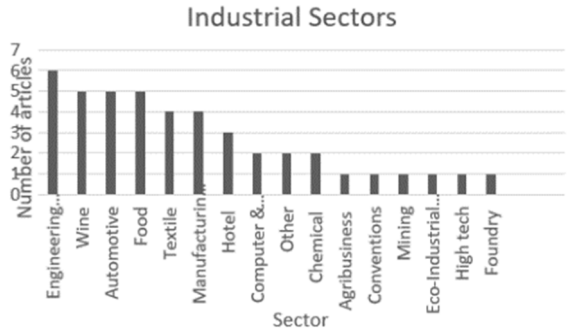

Figure 5. Demonstration of the sectors covered in the selected articles.

The results showed in Figure 5 demonstrate the diversity of industrial sectors and the diversity of sustainable practices selected in the articles and the presence of similar practices in different sectors. The various industrial sectors seek answers and methods that lead to full economic, social and environmental development associated with the sustainable issues that are expressed in the context of the researches present in the selected articles. Diversity of sectors confirms the variety of sustainable practices that can at the same time benefit various sectors. However, the types of methodology used to evaluate the adoption of sustainable practices in industries are not mentioned in most of the articles (Figure 6).

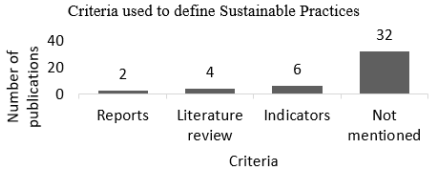

Figure 6. Criteria used to define Sustainable Practices

The absence of this information does not prevent the use of these practices in the researched sector, but the lack of use of methods that evaluate practices as being sustainable or not. Other industries use sustainability indicators to evaluate the sustainability index or make use of Sustainability Reports to evaluate and control the implementation of practices in the corporate environment.

In industries that make use of Sustainability Reports, we must cite the Sustainability Report established by the Global Reporting Initiative (GRI), which enables organizations to assess social, economic, and environmental development by publicly relating all aspects of the company or industry. These reports are encompassed by indicators that are used for sustainability performance (Azapagic 2004). It is the most well-known structure for sustainability reports that can be used independently of the size of the company, bringing unified information to the stakeholders assessing the organization's socioeconomic and environmental performance (Calabrese et al. 2016).

In the process of selecting indicators without the use of sustainability reports, the articles make use of literature review where the support of the selected publications is found. Improved environmental performance indicators are inevitable and crucial to the industry, they are broad and focused on the social, economic and environmental pillars of sustainability, but only 13.6% cite the use of indicators to affirm practices as sustainable. More than 70% of the articles selected did not mention the criteria that define the practices as sustainable, they make use of the practices selected from other articles through a literature review.

With the apparent increase in awareness about the importance of environmental protection, industries focus on the pursuit of a more sustainable performance, but the adoption of criteria on how to evaluate the practice as sustainable is not yet evident in industrial sectors. There is still some reluctance to implement sustainable practices, mainly on expected economic benefits. Within the sectors surveyed, the adoptions of practices are present in all sectors, but not all industries adopt a wide variety of practices (Esfahbodi et al. 2017; Gabzdylova et al. 2009; Ju and Chang 2016; Monastyrnaya et al. 2017; Tan et al. 2011; Tarasova et al. 2014; Wang et al. 2013;

Xu and Gursoy 2015).

The results also indicated that implementation of Sustainable Practices is perceived, but it not become the main objectives of corporate decisions. This behaviour is more pronounced in developing or smaller countries, since they are linked to consumer interests (Evangelista 2014; Golini et al. 2017; Sehnem et al. 2016).

The rate of implementation of Sustainable Practices in industrial sectors was analysed from the citation in the text itself of the article on the presence or absence of sustainable practices in all industries in the sector surveyed (Figure 7).

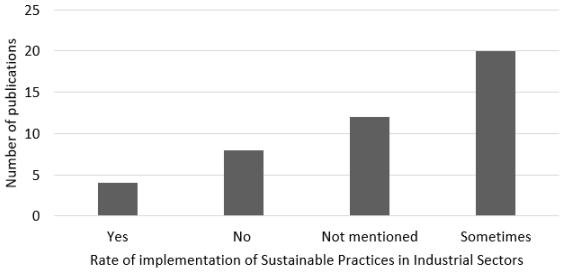

Figure 7. Implementation of Sustainable Practices in Industrial Sectors

The implementation of sustainable practices are not fully present in industrial sectors with the same proportion. The term "sometimes" implies that the sectors implement sustainable practices, but it is not represented in all industries of the same sector, there is a statistical difference of application in the sector surveyed (Masri and Jaaron 2017). It is also concluded that in some sectors the implementation is still at an early stage or that the industries only apply the sustainable practices that are mandatory and required by the regulations, standards and current legislation. Another observation pertinent to the sustainable focus is that surveyed industries located in developed countries guarantee greater implementation of sustainable practices when compared to industries located in developing countries (Sobhani et al. 2012). However, adoption of sustainable practices tends to improve corporate performance through the built-in benefits.

The sustainable practices present in the industrial sectors bring benefits observed in the results presented below through the data collection in the researched works (Table 2).

Table 2. Description of benefits in adopting sustainable practices / citations

Benefits in adopting sustainable practices	**Citations**
Attract investors, improve sustainable industry performance, improve corporate reputation	(Hsu and Chang 2017; Masri and Jaaron 2017)
Compliance with customer requirements	(Ju and Chang 2016)
Economic competitiveness, operational efficiency and / or compliance with legal requirements	(Carrasquer et al. 2017)
Reduction in emissions, energy, raw materials, waste and recycling, improving product quality	(Masri and Jaaron 2017)
Increased productivity and keeping a business profitable	(Monastyrnaya et al. 2017)
Reduction in carbon footprint	(Tarasova et al. 2014)
Reduction in costs, improved business performance	(Golini et al. 2017)
Enhanced commitment, improved competitive position	(Alonso-Almeida et al. 2017)
Better environmental performance	(Alonso-Almeida et al. 2017; Yusof et al. 2017)
Improving good image for customers and raising awareness of valuable contributions that benefit the customer and the community	(Ju and Chang 2016)
Creation of new manufacturing capacities	(Dawal et al. 2015)
Improved production parameters	(Alonso-Almeida et al. 2017; Dawal et al. 2015; Marteel-Parrish and Newcity 2017)
Reduction of environmental impacts, technological innovation. Increase in operational efficiency and greater rationing of natural resources, increase in the sector□s	(Drohomeretski et al. 2015)

Benefits in adopting sustainable practices	Citations
competitiveness	
Reduced costs and increased sales	(Wu et al. 2015)
Improved environmental situation in the country	(Tarasova et al. 2014)
Stakeholder satisfaction, creation of benefits for the local community	(Xu and Gursoy 2015)

The benefits cover the TBL principles, encompassing economic, environmental and social benefits in the corporate environment together with stakeholders' interests. Another important factor in adopting sustainable practices is reputation management, which promotes investment interest, and explores new business opportunities that bring future economic benefits. Economic practices were another important factor to incentives to implement sustainable practices. This because the main objective of industries to adopt Sustainable Practices is the search for a cleaner production methodology leading to minimize environmental impact in the process of production, in the use of raw material, energy use, allowing greater productivity, competitiveness and performance in the organization (Luken et al. 2016), generating advantages that will be consolidated in the long term (Severo et al. 2017).

This new management paradigm focused on the issue of sustainability implies a change in the organizational structure of the corporate environment, ranging from changes in human, cultural and behavioural conceptions, to the way in which resources and raw materials are used aimed at sustainability focus (Jackson et al. 2011). Industries that fail to reconcile innovation in their products and services with a focus on sustainability and still ensuring stakeholder satisfaction will find it difficult to remain active in the future market (Esty and Porter 2005). Attitudes that guarantee the well-being of Stakeholders and the environment will guarantee the permanence of a certain industry in the market increasingly focused on the concern with sustainable attitudes.

The ability of the industry to adapt to technological growth in the pursuit of new practices, with increased knowledge about adopting technologies that reconcile sustainable attitudes and new economic skills, strengthens industry, enhances competitiveness and improves its credibility with consumers generating industrial growth in the sector. According to this view, actions aimed at sustainable vision, besides being an industry responsibility, serve the organization's main objectives, bringing innovation and establishing a competitive advantage compared to other organizations (Hens et al. 2018).

5. Conclusion

The systematic review of literature showed which sustainable practices adopting are becoming important in industries, these practices has been a determining factor in the success and maintenance of the industry in the market. To respond to this challenge different sustainable practices in various industrial sectors, bringing a sense of the diversity of practices considering the three pillars of sustainability. However, many sectors that adopts sustainable practices, showing that although they are not being applied in their entirety as confirmed by the data, they are present and being implemented in an increasing way. This is because the adoption of sustainable practices brings benefits to the corporate environment that are demonstrated by the industries that were interviewed. These benefits are social, environmental and economic and are widely perceived by the industries that implement them. Nevertheless, limitations in the criteria and methodologies that define practices as sustainable in the industries, which allows concluding that this implementation is still at an early stage, although in some cases the indicators are applied as a means of sustaining the adoption of such practices. Yet the research gaps provide opportunities for further research on the implementation of sustainable practices also in small, medium and large companies. Future research may be focused on certain sectors to analyse more comprehensively the implementation of sustainable practices, their benefits, among other characteristics of interest. Lastly, it is expected that the selection of sustainable practices to be used as a source of research and bring practical value to businesses and industries to engage in the adoption of these actions in their corporate environment, ensuring a more sustainable vision in their decisions and hence future market stability.

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