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SCANNING INSIGHTS ON SUSTAINABILITY AND SUPPLY CHAIN MANAGEMENT IN BRAZIL

ABSTRACT

This paper aims to analyse how the publications in Brazil are considering the relationship between sustainability and supply chain management. For this end, a literature review was carried out in 120 Brazilian academic journals in which 124 papers were identified, from 2008 until 2013. When considering the Triple Bottom Line approach, the results show that sustainability research in Brazil is focusing on the environmental dimension and SCM research is focusing on the economic dimension. Additional inputs are provided by integrating the governance dimension in the analysis to underline which actions and policies are discussed in Brazil at a corporate level. To support the results a consultation of experts in the field of sustainability in Brazil was fulfilled, and three case examples are presented to explain some of the research results. The findings on publications in Brazil contrast with international studies, particularly on the topic of social performance and management in supply chains. One of the main conclusions is that there are large opportunities to increase publications about sustainability and SCM in the country and that Brazil presents some specificities in the field that researchers and managers shall consider.

KEYWORDS | Sustainability, supply chain management, governance dimension, literature review, Brazil.

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INTRODUCTION

Over the last few years, sustainability-related publications have been increasing around the world (Silvestre, 2016) and are stimulating discussions in different contexts. Despite its recent progress, Baumgartner (2011) believes that the effective benefits for the society occur slowly and need to be more deepened in the academic debate. Considering this idea, some papers highlight that it is necessary to position the role of businesses in bringing sustainability closer to Supply Chain Management (SCM). When these topics are related, it is commonly agreed to talk about “Sustainable Supply Chain Management (SSCM)” (Ashby *et al.*, 2012; Tatticchi *et al.*, 2013). However, according to Pagell and Schevchenko (2014), there is “no future” for the term SSCM and research in this field, because there is no truly Sustainable Supply Chain (SSC) yet. This paper is taking this perspective in the methods applied by studying sustainability and supply chain management in Brazil.

While sustainability and supply chain concepts are being discussed in the mainstream of publications worldwide, Brazilian publications have been following this trend to a certain extent only (Gold, 2016; Silva *et al.*, 2015). However, Brazil can be considered as the most active country in Latin America with regards to sustainability research as well as SCM. Hence, considering globalisation, the overseas expansions of some Brazilian multinationals (Fleury & Fleury, 2011) like Natura (Kaltenecker, 2016; CAF, 2014; Actis, 2013), as well as the growing outsourcing of activities from foreign multinationals to Brazil (e.g. in the automotive industry, Lema *et al.*, 2015), it is interesting to understand which sustainability aspects are the most discussed in the Brazilian literature. This will then allow future research to contrast it with the sustainability aspects that are in the focus of scientific literature on SSCM in other regions of the world and derive recommendations for Brazilian companies and multinationals installed in the country.

According to Jabbour and Jabbour (2014), sustainability and supply chain management is coming as an important research field to Latin America. For Silva *et al.* (2015), this also happens in the Brazilian context since several actions (e.g. workshops, research projects) have been conducted to increase the focus in both topics. To contribute with a more comprehensive view of Brazilian literature on SSCM the present paper expands the traditional perspective, which is based on the Triple Bottom Line, to a new approach

for the topic considering that three dimensions are not enough to understand the research topic. As presented by Elkington (2014), a management approach should be introduced in the debate and support the development of new research studies. For the purpose of this research the relation between sustainability and supply chain management needs to consider four dimensions, which are the following: social, economic, environmental and governance.

Based on that argument, this paper focuses on answering the following research question: what are the main concerns in Brazilian literature with regards to sustainability and SCM? To answer this question, the paper is structured as follows. The first section presents a brief discussion around the theoretical background of the research. Then, it is explained how the literature review and the expert consultation were used to answer the research question and an overview of sustainability and SSCM approaches is given to justify which sustainability aspects are analysed and how the topics have been linked together. Section 3 demonstrate the methods used in the research. Afterwards, the findings of the literature review and the experts’ perspective are presented as well as some case examples from Brazilian research papers. Finally, the findings are discussed and some conclusions are drawn with regards to the status quo of research in the field and future implications.

THEORETICAL OUTLINE

The current discussion about sustainability has been focusing on understanding the impacts of different actors in the society. This occurs because sustainable development is defined as a “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987). In this context, Elkington (2002) developed the concept of Triple Bottom Line (TBL) seeking to make sustainability more tangible. For the author, the following three dimensions are necessary to ensure sustainability: economic, social and environmental.

However today, Elkington (2014) claims that these three dimensions are not enough anymore and that a holistic perspective is necessary to make a whole system change and be more sustainable, which involves taking into account a governance dimension. In line with this approach, Fritz *et al.* (2017) and Schögl *et al.* (2016) propose to analyse sustainability in the sup-

ply chain according to four dimensions, namely: environmental, economic, social, and governance. In this paper we consider this approach in order to provide a more holistic view on sustainability aspects and practices that contribute to creating value for the company and along the supply chain (see Table 1).

Table 1. **Dimensions of Sustainability**

Dimension	Definition	Sustainability aspects
Environmental	To be understood as in the Triple Bottom Line approach.	Hazardous substances; Wastes; GHG and other air emissions; Energy consumption; Environmental-friendly production processes; Environmental-friendly products and services; materials; Water; Environmental preservation; Environmental in general (i.e. abstracts that only mention the word "environment" but no specific aspect).
Economic	To be understood as in the Triple Bottom Line approach.	Competitive advantage; Productivity; Competitiveness; costs management; Flexibility; Profitability; Financial Performance; Efficiency; Economic in general (i.e. abstracts that only mention the word "economic" but no specific aspect).
Social	To be understood as in the Triple Bottom Line approach.	Socially responsible (behaviour); Child labour; Occupational health and safety; employee training; Non-discrimination; Use of conflict minerals; Securing minimum wages; Confidentiality of data; Freedom of association and collective bargaining; Community engagement; Gender awareness; Temporary contracts; Job security; Social in general (i.e. abstracts that only mention the words "social, society" but no specific aspect).
Governance	It highlights aspects that show the organisation's commitment in raising awareness on sustainability and improving its values, strategies and policies towards a better sustainability performance.	Compliance with environmental regulations; Compliance with social regulations; Compliance with human rights regulations; Environmental performance and management; Compliance with product related regulations; Social performance and management; Quality management system; Risk management; Health and safety management system; Information and communication management; Knowledge management; Stakeholders inclusiveness; Expenses for sustainable R&D; Top management involvement towards sustainability; Assessment of suppliers (sustainability) performance; Ethics; Corruption and bribery; Governance in general (i.e. abstracts that only mention words like "sustainable development processes/activities, corporate sustainability" but no specific aspect).

Source: Adapted from Fritz et al. (2017) and Schöggel et al. (2016)

From Table 1, it is clear that to understand sustainability and its relation with SCM these aspects need to be considered and support the analysis from researchers and practitioners in this field. According to Hopwood *et al.* (2005), the way towards sustainability requires to assume a view of transformation rather than maintaining a status quo that is prone to collapse of natural resources or the social tissue (i.e., economic

dimension included). Therefore, a set of changes need to occur in both behaviours and practices. When applied to business, companies are challenged to create mechanisms to contribute to sustainability (Peattie, 2007). This further highlights the importance of analysing sustainability and supply chain by including the governance dimension since the contribution of managers and their involvement towards sustainability is

necessary to make changes happen. Thus, governance can be considered as a *sine qua non* condition in the research of corporate sustainability and supply chain.

As presented before, sustainability requires the participation of a set of actors. In the case of organisations these actors can be clustered in inter-organisational relationships, as follow: Alliances, Joint Ventures, Vertical Relationships, Franchising, Cross-sector Partnerships and Networks (Parmigiani and Rivera-Santos, 2011). This paper focuses on the structures and relationships called supply chain. The more widespread definition of SCM was presented by Mentzer *et al.* (2001), but the perspective of supply network can be introduced in several research papers (e.g. Chen and Paulraj, 2004). Therefore, the use of both supply chain management and supply network can contribute to the understanding of sustainability.

According to Ashby *et al.* (2012), the relation between sustainability and SCM is commonly referred to as “Sustainable Supply Chain Management (SSCM)”. Taticchi *et al.* (2013) suggest that many other expressions can also be used, but SSCM is actually the most prominent. The majority of authors working in this field consider sustainability as a synonym for the application of the TBL into supply chain (e.g. Ashby *et al.*, 2012; Carter and Rogers, 2008; Pagell and Wu, 2009; Seuring and Müller, 2008; Wolf, 2011), which increases discussions about the topic and clearly requests a more robust debate. However, other debates may lead to emerging discussions about a different approach to achieve the SSCM, which is more related to a broad viewpoint rather than the traditional view, as proposed in the current paper. Today, the definitions mostly used for SSCM are three presented by Carter and Rogers (2008), Seuring and Müller, 2008, and Pagell and Wu (2009). From a literature review comparing the use of the terms SSCM and Green Supply Chain Management (GSCM), Ahi and Searcy (2013) confirmed the use of these three definitions but show that at least nine more different definitions in relation to SSCM exist.

From these different inputs in defining SSCM it is possible to observe a clear lack of consensus since researchers in the field have not adopted a unifying definition yet. Furthermore, the focus of current concepts is mainly set on sustainability performance without discussing the relationship between sustainability and supply chain, as highlighted by Halldórsson *et al.* (2009), which could be considered as a serious problem. Therefore, Beske and Seuring (2014), and Varsei

et al. (2014) are presenting debates that contribute to analyse the results of sustainability performance into SCM. However, the majority of the discussions are based on conceptual contributions, hence more empirical research studies need to be conducted to discuss the topic better.

In the case of Brazil, besides theoretical and empirical research, the relation between SCM and sustainability is still not clear. For Gonçalves-Dias *et al.* (2012, p.529) “it is necessary to emphasise the country’s reality and highlight the (endogenous) innovations that are genuinely Brazilian [...] and practical initiatives that are not systematically incorporated by academia so far”. By interviewing ten organizations, Laquimia and Eweje (2014) found no significant differences in the way Brazilian and New Zealandese organisations manage sustainability, and organisations in both countries emphasize the importance of collaboration with key stakeholders. In both countries, organisations recognise benefit for knowledge sharing, effectiveness, reputation, supply chain management, and risk management. On the contrary, Delai and Takahashi (2013) show that Brazil as an emerging economy presents some specificities compared to other developed countries. They show that retailers play an important role in the SC to support the shift towards more sustainable consumption and production patterns, although such approaches are rarely studied. They highlight that the eight Brazilian retailers studied intensively focus on socially sustainable practices regarding their relations with employees and communities. Eco-efficiency measures are existing but limited to environment-oriented stores. SSCM is a raising concern as well as consumer awareness. All these sustainability aspects are integrated in the retailers’ practices without any specific management system, they hence occur sporadically and are not being monitored. Community engagement in Brazil is another important aspect highlighted by Hall and Matos (2010) in the biofuel production sector. They particularly show the need for research on how to integrate impoverished farmers and communities as productive supply chain members.

According to Silva *et al.* (2015), the number of publications in the country on sustainability and supply chain management is in general limited. That is why our purpose is to analyse both scientific publications and experts’ perspectives in order to enlarge the spectrum and draw a more comprehensive understanding of sustainability and supply chain management in Brazil. The following section will present the methods,

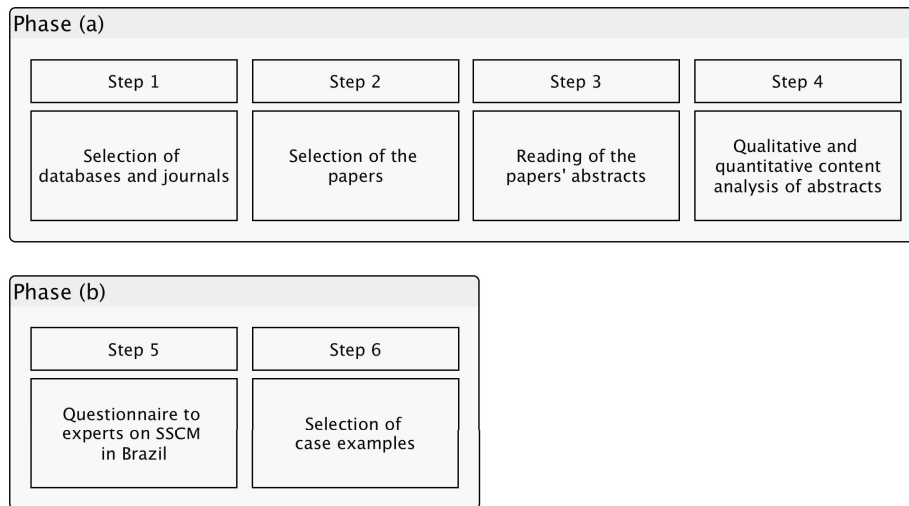
and the findings section will explain the main sustainability and SCM research focuses in Brazil. Then the discussion and conclusion sections will present the main contribution of the paper as well as some reflexions and opportunities to conduct further research in the field of SSCM.

METHODS

This paper is built on a literature review of Brazilian Journals followed by an exploratory bibliometric study based on content analysis. The research was performed in six steps within two phases. In Phase

(a) scientific journals and papers were selected and analysed (see Figure 1), which included steps 1 to 4. In phase (b) a questionnaire was designed and sent to experts on SSCM in Brazil (step 5) and in order to present more real world contributions, some case examples were selected to support the scanning of Brazilian research fields. As presented in Figure 1, the first action was to select the databases that contribute to the research. These were the main Latin-American databases, namely: Scielo (www.scielo.org), Latindex (www.latindex.com), Redalyc (<http://www.redalyc.org>) and Spell (<http://www.spell.org.br>, which is specific to Brazil).

Figure 1. Research design, Source: authors' own illustration



After selecting the databases, we identified the journals that have a publication scope related to our research purpose. For this end, journals were categorized per research field on each of the four databases (see Table A7 in the Appendix). This action resulted in a list of 120 peer-review academic journals. Out of these journals, we defined keywords in Portuguese, Spanish, and English to extract the papers to screen (i.e., *sustent*, *ambient*, *social*, *economic*, *respons*, *cadeia* and *verde*, declined in Spanish and English). Most manuscripts were written in Portuguese, but also in the other two languages. As a result, we obtained a list of 169 papers published from 2008 until 2013 in 54 different journals. We refined this selection by reading each abstract in order to assure that only papers related to sustainability, business or companies were included in our review. Eventually, our analysis counted with 124 papers after the final refinement based on the abstract analysis.

We then performed a qualitative and quantitative content analysis of each abstract according to the methods developed by Mayring (2003) and Neuendorf (2002) in order to identify the main sustainability dimension and the main related sustainability aspect of each paper. A sustainability aspect is here referred as a sub-category of each sustainability dimension (Fritz *et al.*, 2017). We considered that a dimension was a main dimension when the abstract contained most sustainability aspects from this dimension (see Table 1). The coding of sustainability aspects was also based on the dimensions and sustainability aspects identified by Fritz *et al.* (2017) in a context of Sustainable Supply Chain Management (SSCM) research and further adapted to the focus of our research as presented in Table 1. Thus, each paper was analysed based on the 36 sustainability aspects identified in Fritz *et al.* (2017) since these constitute, to our knowledge, the only set of aspects that address the environmental,

social, and governance dimensions of sustainability in supply chains. To these aspects, we added the economic dimension with the economic aspects identified in the content analysis of the abstracts.

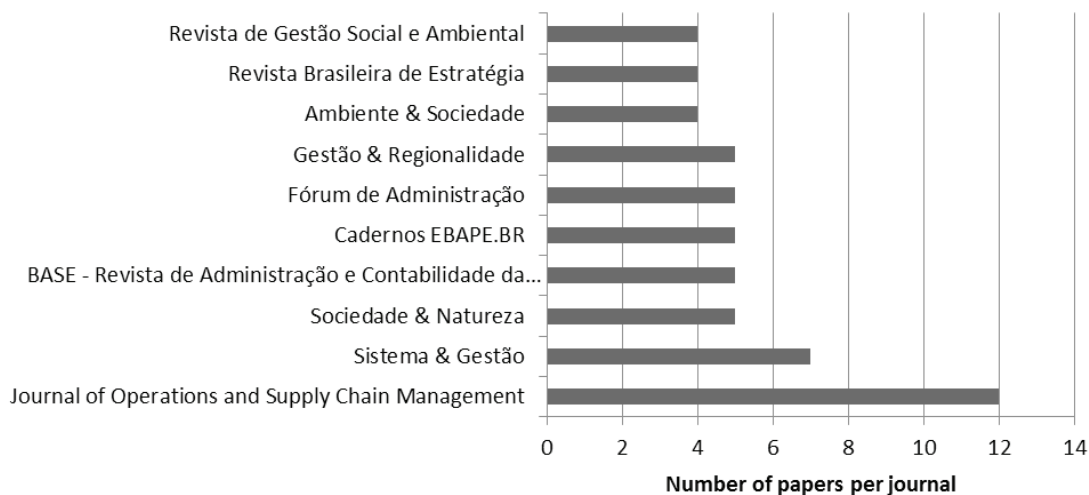
In parallel, we designed a questionnaire with open questions (Table A8 in the Appendix) targeting experts in sustainability and supply chain in Brazil. The proposal was to create an overview of the topic in the country and draw specificities of the field from local researchers. The questionnaire was sent out electronically to researchers who met the following three criteria: (1) have at least one publication related to sustainability and/or SCM in Brazil, (2) had finished their PhD on related topic and/or (3) have research projects on the topic. Out of the total of fifteen experts, seven returned the questionnaire filled out, that is to say a 47% participation rate. The questions were related to relevant publications on SCM and sustainability in Brazilian journals, the research field in the country and the relation between academy and enterprises. To select the case examples the

criteria used was a focus on in-depth research, which were based on thesis and master dissertation according to experts' indication. The case examples are all based on case studies following a qualitative approach and have been used to corroborate the results of the present paper. All the results are presented in the findings section of this paper.

FINDINGS

The findings demonstrate that 124 papers are setting their focus on sustainability. Among them, 47 papers are analysing the link between sustainability and SCM in relation to different dimensions (these 47 papers are presented in Table A9 in the Appendix). The selected papers are coming from 54 different journals from the databases mentioned in the method section. Among these 54 journals, Figure 2 shows the 10 most prominent ones in terms of number of papers published between 2008 and 2013.

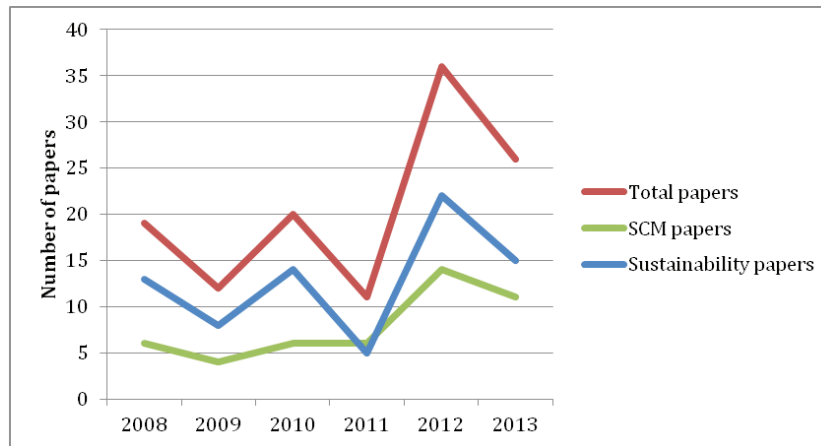
Figure 2. **Ten most represented Brazilian journals per number of papers analysed (N=54 journals)**



Most of the papers analysed were published in Portuguese, hence sharing knowledge on sustainability and supply chain in Brazil with the Portuguese speaking community. Out of the 124 papers, only 15 were published in English. These 15 articles are originating from the Journal of Operations and Supply Chain (12 papers), the Brazilian Administration Review (2 papers) and the Independent Journal of Management and Production (1 paper). However, it is important to

note that all journals request English abstract. Considering that, it was possible to identify authors from Brazil as well as other countries (e.g. India, Spain, Italy, Argentina and Bangladesh). It is also interesting to highlight that along the years, publications in the country are increasing (see Figure 3). It is hence becoming easier to identify the areas in which the papers have been published and the key sustainability aspects that are being considered.

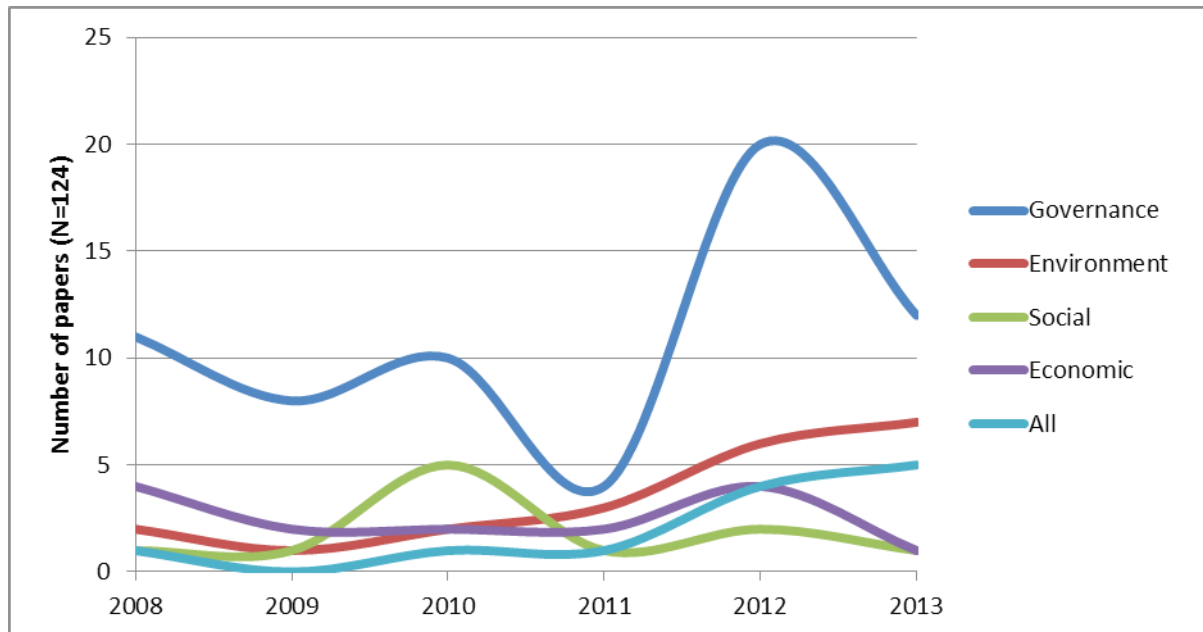
Figure 3. Evolution of the number of papers per year (N=124 papers)



When analysing the 124 selected papers, we can observe that they mostly relate to corporate sustainability in general (see blue line in Figure 3). Over the period 2008-2013, 47 papers considered the relationship between sustainability and supply chain management (green line). On the one hand, the interest in sustainability and SCM is constantly growing from 2008 until 2012. On the other hand, papers that do not focus on SCM had also a sharp decrease in publications in 2011 besides the significant decline in 2013.

Comparing these results with the discussion presented by Silva *et al.* (2015), it is possible to observe some correlations as these authors analysed conference proceedings and demonstrate an increase of publications in Brazil. Therefore, the sustainability-relating debate in the country seems to have increased over the past few years. In addition to the total number of papers, it is necessary to understand how the publications relate to the dimensions of sustainability (see Figure 4).

Figure 4. Main sustainability dimensions for each paper per year (N=124 papers)



Within the 124 publications analysed, only 12 papers consider all the sustainability dimensions (see Table 6). The governance dimension is the main dimension of the majority of the abstracts analysed with

65 papers. This result might be explained by the fact that the governance dimension contains sustainability aspects related to all dimensions (e.g. environmental performance and management, expenses for

sustainable R&D). Among these 65 papers, several focus on the aspects “Social performance and management” (16 papers), “Information and communication management” (10 papers), “Top management involvement towards sustainability” (9 papers), and “Environmental performance and management” (7 papers). The number of publications focusing on “Social performance and management” corroborates to some extent the fact that social sustainability is an important topic in Brazil (Delai and Takahashi, 2013). Between 2008 and 2013, the research output in the management dimension varied drastically. Small alterations in the years 2008, 2009, and 2010, were followed by a significant decline in 2011. However, the number of papers published rose again to its peak in 2012, and finally, decreased in 2013 when compared to the previous year (2012).

The second most relevant dimension in the studied abstracts is environment. We counted 21 papers with the environmental dimension as a main dimension. Among these 21 papers, the following environmental aspects were the most referred to: “Environmental-friendly production processes” (7 papers), “Materials” (4 papers) and “Environmental preservation” (4 papers). All over the period, the environmental dimension is gaining a growing interest in research. Economic is the third most important dimensions with 15 abstracts identified as having predominant economic focus. However, the interest in the economic dimension is characterised by an almost constant number of publications per year and a slight decrease starting from 2012. In this dimension, “Competitive advantage” was often mentioned (5 papers out of 15) as well as “Productivity” (3 papers). However, several abstracts also considered the economic dimension without mentioning a specific aspect (4 papers).

The social dimension is also the main dimension in a relative constant number of publications (11 in total), except in the period 2009-2011 where the attention on this dimension rose. Most social aspects are related to “Community engagement” (3 papers), “Socially-responsible behavior” (2 papers) and “Gender awareness” (2 papers). Here again, the results are in line with the findings of Delai and Takahashi (2013) who emphasized the importance of socially responsible activities and the engagement of communities for eight retailers in Brazil. But in this dimension several abstracts also consider this dimension in a general way (4 papers). This might be linked to the fact that really little research exist on the social di-

mension of sustainability and due to the fact that it is difficult to clearly define what social sustainability mean (Yawar and Seuring, 2015).

These results are aligned with literature reviews conducted by other authors in other databases and publications from other countries that show that environmental and economic sustainability are in the focus of many publications on corporate sustainability and SCM (e.g. Ashby *et al.*, 2012; Carter and Easton, 2011; Golicic and Smith, 2013; Seuring and Müller, 2008; Wittstruck and Teuteberg, 2012). As presented by Carter and Easton (2011), during the last 20 years this confusion is observed since “sustainability” and “environmental” are considered as synonyms. During the process of content analysis, we could also observe that these results are debatable due to the confusion between environmental sustainability and sustainability as a whole. There is hence a need here to elaborate further on the theories related to sustainability and SCM to define what sustainability and environmental sustainability mean or which existing definitions are the most appropriate. We believe there is a serious need for consensus on these definitions at a global level in order to assure a common understanding of research in sustainability.

As presented in the theoretical outline, many definitions exist and make it difficult to conduct research on the topics. However, some discussions are already solved by using for instance the TBL to understand better sustainability research. Although an overlap among the sustainability dimensions can be considered in the TBL approach, some aspects of these analysis should be used. According to Ashby *et al.* (2012), the main difficulty is to study the social dimension of sustainability because it involves the human nature. Considering these discussions and the need to clarify what is undertood by environmental, social, economic and governance sustainability, the next tables present each sustainability aspect studied.

The number of papers that are focusing on a specific sustainability dimension and/or aspect (when applicable), and the possible influences on supply chains, based on the dimensions and categories of Table 1 are presented in Table 2. Considering the governance dimension, it is possible to observe that many papers focus on this dimension as it covers a wide range of sustainability aspects and many papers were considering sustainability from a management perspective (see Table 2).

Table 2. Number of papers focusing on governance sustainability and on SCM

Sustainability aspects of the Governance dimension	Number of papers with governance as main dimension	Number of papers focusing on SCM with governance as main dimension
Assessment of suppliers sustainability performance	2	2
Compliance with environmental regulations	1	1
Compliance with human rights regulations	0	0
Compliance with product related regulations	0	0
Compliance with social regulations	1	0
Corruption and bribery	0	0
Environmental performance management	7	5
Ethics	1	0
Expenses for sustainable research and development	0	0
General	5	2
Health and safety management	0	0
Information and communication management	10	2
Knowledge management	4	3
Quality management	0	0
Risk management	3	3
Social performance and management	16	1
Stakeholders inclusiveness	6	3
Top management involvement towards sustainability	9	1
Total	65	23

As shown in Table 2, out of the total 47 papers focusing on SCM, 23 papers were particularly discussing the sustainability aspects “Environmental performance and management” (5 papers), “Knowledge management” (3 papers), “Risk management” (3 papers) and “Stakeholders inclusiveness” (3 papers). From the data presented in Table 2, it is possible to understand the importance of governance in discussions about sustainability. It is interesting to highlight that the aspect “Social performance and management” is indicated as a the main sustainability aspect for 16 papers, mainly referring to Corporate Social Responsibility. However, when this is applied to SCM, only one paper studies CSR in supply chain. In addition, it is also interesting to indicate that five papers studied

“Environmental Performance and Management” in relation to supply chain.

The data presented before explain several research gaps that may be used by new research studies as the main focus to sustainability as well as SCM. Among them it is possible to highlight, namely: compliance with different regulations, corruption and bribery, management aspects (health and safety, quality), ethics and expenses for sustainable research and development. These types of aspects are possible to be analysed in different contexts, among which in other emerging economy countries. Continuing the analysis, the following Table focuses on the Environmental dimension and its publications.

Table 3. Number of papers focusing on environmental sustainability and on SCM

Sustainability aspects of the Environment dimension	Number of papers with environment as main dimension	Number of papers focusing on SCM with environment as main dimension
Environmental preservation	4	0
Energy consumption	1	0

Sustainability aspects of the Environment dimension	Number of papers with environment as main dimension	Number of papers focusing on SCM with environment as main dimension
Environmental-friendly production processes	7	1
Environmental-friendly products and services	1	0
General	1	0
Greenhouse gases and other air emissions	1	1
Hazardous substances	1	0
Materials	4	3
Wastes	1	0
Water	0	0
Total	21	5

The environmental dimension is the second most important regarding sustainability, but only third in relation to SCM with 5 papers. These are mainly discussing the aspect “Materials” (3 papers). From the discussion presented before the environmental sustainability in relation to the other two dimensions from the TBL was the most studied in the publications in Brazil. However, only five papers focusing on SCM are also focusing on this dimension. This can demonstrate some difficulties to study the topic in the country. This also corroborates with the little attention retailers have on environmental aspects as observed by Delai and Takahashi (2013).

Nevertheless, in the governance dimension of sustainability some aspects related to the environmental dimension (but from a management perspective) are also included. When considering these aspects from the governance dimension (especially “Environmen-

tal management and performance” with 7 papers) and the environmental sustainability aspects presented in Table 2, the environmental dimension is the leading one in Brazil.

With the analysis carried out several research gap are identified. The most prominent is the aspect Water since no paper presented research in the journals analysed. Regarding the environmental dimension in the SCM these gaps are much more important since few papers were found with this focus. These results are totally different from the economic dimension of sustainability. As presented in Table 4, all the papers identified with the economic dimension as a main dimension (15 papers) are also considering the SCM strategies. Thus, it is possible to deduce that research in SCM is still closely related to the economic dimension, a traditional discussion on the topic of sustainability and SCM.

Table 4. **Number of papers focusing on economic sustainability and on SCM**

Sustainability aspects of the Economic dimension	Number of papers with economic as main dimension	Number of papers focusing on SCM with economic as main dimension
Competitive advantage	5	5
Competitiveness	2	2
Cost management	0	0
Efficiency	1	1
Financial performance	0	0
Flexibility	0	0
General	4	4
Productivity	3	3
Profitability	0	0
Total	15	15

Along the period 2008-2013, the papers focusing on the economic dimension were mainly highlighting the possible competitive advantages that a company could gain with Sustainable/Green Supply Chain Management (5 papers) and the related productivity (3 papers). But several of them referred to the economic dimension only in general (4 papers). The following gaps can instruct future research: cost management, financial performance, flexibility and profitability. This analysis brings relevant information for the debate on the topic since it is not usual to have research papers presenting details for all dimensions,

even for the economic dimension which is to consider as innate to SSCM research. The paper focuses on environmental, and on the social dimension with a broad view. Maybe this is related to the lack of consensus argued before.

In relation to the social dimension of sustainability, few papers are focusing on this dimension. When looking at the link with SCM, it is even more difficult to connect any social aspects as no papers could be identified in this area. This demonstrates a lack of research in the field (see Table 5).

Table 5. Number of papers on social sustainability and focusing SCM

Sustainability aspects of the Social dimension	Number of papers with social as main dimension	Number of papers focusing on SCM with social as main dimension
Child labour	0	0
Community engagement	3	0
Confidentiality of data	0	0
Employee training	0	0
Freedom of association and collective bargaining	0	0
Gender awareness	2	0
General	4	0
Non-discrimination	0	0
Occupational health and safety	0	0
Securing minimum wages	0	0
Socially responsible behaviour	2	0
Temporary contracts	0	0
Use of conflict minerals	0	0
Total	11	0

According to Silva and Nascimento (2015), studies on social issues facilitate the development of the reconceptualisation of the supply chain. Considering this view, it is necessary to take into account the “local” level in both the region of the focal company and the creation of strategies in collaboration with the supply chain. This is supported by the results of this analysis as most papers focusing on a specific aspect of social sustainability considered the aspect “Community engagement” (3 papers). But the majority of papers mentioned social sustainability only from a general perspective (4 papers) which may corroborate again the lack of clear definition for this dimension of sustainability.

We can hence say that the social dimension is not yet seriously identified as a source of value creation within supply chains in Brazil. The few evidences on SC activities in the social dimension refer only to retailers (Delai and Takahashi, 2013) and not the whole supply chain which remains hence understudied. However, this is also the case of the majority of studies related to sustainability and SCM as pointed out by several researchers (Ashby *et al.*, 2012; Benoît *et al.*, 2010; Hutchins and Sutherland, 2008). Since the papers found are not focusing on this dimension there are more prominent research gaps in both sustainability side and SCM. One of all the aspects presented in Table 5

that could be highlighted is Child labour which is a topic really important for the country according to some hystorical events and it is not into the re-search checklist.

Finally, it is necessary to understand the publica-tions in relation to all dimensions of sustainabil-ity. As presented in Table 6, only 12 papers were published with all dimension compared to the 124 analysed. This is a result that demonstrates a great opportunity to publish more on the sustainability

topic in Brazil from a comprehensive perspective. According to Silva *et al.* (2015), the major difficulty of Brazilian authors is related to the adaptation of some concepts to their own context. The transla-tion of English papers for example, lacks of preci-sion and differs from the terms that are commonly used at an international level. Thus, sometimes the authors understand the perspective but trans-late and use it wrong, which influences the final research outputs.

Table 6. **Number of papers in all dimensions of sustainability and focusing SCM**

All sustainability dimensions	Number of papers with all dimensions	Number of papers focusing on SCM with all dimensions
All	12	4

Generally speaking, there seems to be a trend towards a rising number of Brazilian publications considering all dimensions of sustainability since 2012 (see figure 4), but this trend is too recent to draw any conclusions at the moment and the number of papers focusing on sustainability and all dimensions (4 papers) is too low still. From these findings it is possible to highlight so much that sustainability is an emerging topic in the country and this gives large research opportunities for researchers. Considering the research performed with experts, a similar result can be identified since as indicated by one of them:

“[...] There are few researchers who are publishing in this area in Brazil [...] Thus, there is a broad field to be explored” (Expert 1).

This demonstrates that despite the increasing number of publications, more stimulation is needed for Brazilian researchers to achieve a higher academic impact of publications in both numbers and quality of papers. It should nevertheless be noted that only papers published in Brazil were analysed. Hence, other possible publications from Brazilian authors at an international level might have been omitted. When questioned about the dimension of sustainability emphasised in Brazil, four out of seven experts believe that the focus is environmental, mainly because it is very difficult to study social issues. Additionally, one of the experts pointed out:

“Research in the country is still very reactive or focused exclusively on the financial discussion” (Expert 4).

Notwithstanding this view, our literature review shows that the economic dimension is not the most important in the papers, which indicates a divergence in this case between expert perception and the actual research output. Concerning the relationship between sustainability and SCM, the experts present some similarities since they consider that a few researches and studies focus on this topic and they think that there is a great opportunity to develop this research field as expressed in the following quotes:

“There are few studies in Management science, which is in fact a good opportunity for future publications in this area” (Expert 1).

“The research is very much in its early stages. It is basically done via exploratory research and case studies. A large possibility to publish” (Expert 3).

“I believe it is growing as an extension of themes such as organisational sustainability and strategy” (Expert 6).

“To carry research in Brazil is always difficult. To investigate sustainability in the supply chain is no different. We still need to advance a lot” (Expert 7).

According to the last quote from expert 7, it is difficult to conduct research in Brazil. However, some alternatives for that need to be created. Perhaps partnerships with companies, governments and communities can be a possibility to change this trend. Beyond accepting the difficulties, it is necessary to change views, and that was presented by two experts, as follows:

“[...] the world has interest in understanding Brazil better in its various aspects of business (business environment, business practices, etc.). Thereby, it opens up the possibility of internationalising Brazilian research on various topics of business, including *Sustainability and Supply Chain*” (Expert 1).

“It is a topic that can make important contributions to the development of more responsible business and concatenated with a new way of thinking in business and in the development of society itself” (Expert 3).

From these discussions, even with a limited number of publications in sustainability and supply chain management in relation to all dimensions of sustainability, a research field on SSCM in Brazil can emerge as an important area of study mainly because with its great diversity, the country has a lot of issues that can be introduced in this discussion. As presented by Griesse (2007), to conduct research in Brazil it is necessary to consider multifaceted characteristics such as geographical diversity or inequalities in socioeconomic issues. Thus, Brazil needs to contribute more with empirical results and proposals that can be used in different countries with the same multifaceted characteristics. Based on that perspective some case examples are presented to stimulate new research on the topic.

Case examples of research on SSCM

In the last few years the research focus on SSCM is increasing, which is represented in thesis and master dissertations since 2012, and some of the related publications. The following summarises different researches carried out in Brazil. It is relevant to highlight that the case examples selected were indicated by experts during the fifth step of the research.

- **Natura.** This case example integrated the thesis dissertation of André Carvalho. Natura is a cosmetic company founded in 1969 which is based in Bra-

zil, but has activities in different countries of Latin America and France. Regarding sustainability six areas are relevant for the company, namely: biodiversity, Amazonia, GHG, product impacts, quality of relations and education. To perform in all of them the company has some projects and programmes focusing on sustainability. According to Carvalho (2011) the company orientation is based on reducing environmental impacts. There is a clear engagement with the supply chain and other stakeholders as well as the local community in Amazonia. The research was carried out with different members of the supply chain presenting several contributions for the SSCM topic in the country.

- **Braskem.** This case example is a part of the thesis dissertation of Daiane Neutzling. Braskem is a large company focused on plastics. For Neutzling (2014), Braskem is the largest producer of thermoplastic resins in Latin America. In order to contribute to sustainability the company produces a “green plastic” which is a huge innovation in that sector. The main suppliers are sugar cane and ethanol producers in Brazil (Neutzling, 2014) which support the company to achieve its strategies. The company was founded in 1979 and during the years was receiving investments and pressures to develop new technologies regarding sustainability. According to Neutzling’s analysis the company has a strategic orientation for renewable products based on their own engagement for that, since no collaboration on sustainability was identified among the members of the supply chain.
- **Mercur.** In turn the last case example mentioned by the experts is from the master dissertation of Ana Alves. Different from the other cases, this research focuses on a medium-sized company and its contribution to sustainability. The sustainability for the company is considered in four areas, which are: health, education, coating and handicraft. According to Alves (2014), the purpose of the company is the “well-being” of the society. In order to comply with this main purpose, several responsibilities emerged for the company such as the reduction of business relations with customers that worked with contradictory products (e.g., tobacco). The company was founded in 1924 and sells its products in Brazil and other countries from Latin America. Following Alves’ analysis it is a proactive company which has been focusing for many years on introducing the idea of sustainability throughout the supply chain.

When taking into consideration the contributions of other researchers in the field of sustainability and supply chain management in Brazil or the increasing interest of Master and PhD students in the field, it is possible to state that this research field in Brazil presents rich opportunities to those who want to further investigate related research gaps in the country. It is simply necessary that literature reviews and other research studies present these research gaps in order to encourage more empirical and conceptual work in the field. Thus, by having access to this paper, researchers and practitioners could identify more details and deep specific aspects around it and significant knowledge for the empirical field. That section responds to the call of Gold (2016, p.10) when he said that “SSCM researchers in Brazil may live up to their responsibility by engaging in empirical analysis of data collected on the ground that is led by practice-induced problem formulations.” Presenting three case studies there are prominent and potential research on the topic for next publications.

DISCUSSIONS

By applying a literature review method to identify what Brazilian journals have published about sustainability and supply chain management, the current paper contributes to research in several ways: (1) different from other literature reviews related to SSCM we added a new dimension to study sustainability and apply it for the supply chain. The governance perspective demonstrates that to study corporate sustainability the triple bottom line approach has several limitations. Thus this new dimension brings new insights and emphasizes particularly the importance of management practices; (2) different from all literature reviews about SSCM we are not limited to identify the sustainability dimensions presented in the papers, we also study in depth each one (four in our case) to figure out which aspects have been studied by researchers in Brazil; (3) this paper presents from all the sustainability aspects several research gaps that could be used by Brazilian researchers, researchers that are in countries with similar characteristics as Brazil, and other researchers interested in conducting research in Brazil. We deliver here an agenda of research that could be applied in various regions and also in other literature reviews that are not only related to supply chain management. Based on these three contributions, we believe that this paper has a significant contribution for the area in both Brazilian context and for other emerging economies

that want to study the same topic. Also, by consulting experts in relation to the outcome of the literature review and by explaining three case examples, it was possible to scan the current perspective of the country comprehensively.

In comparisons with Laquimia and Eweje (2014), our study shows that the practical issues of collaboration with key stakeholders (aspect stakeholder inclusiveness), knowledge sharing (aspect knowledge management), effectiveness (aspect productivity), and risk management are also present in the focus of scientific publications on SSCM in Brazil. The analysis shows that there are also some similarities between Brazilian publications and publications from more developed countries (i.e., Europe and North America) on the topics of environmental performance management and materials that are addressed under the topic of Green Supply Chain Management (e.g., Srivastava, 2007; Seuring and Müller, 2008). Our research highlights the typical lack of research on social issues in the supply chain research too (e.g. Ashby et al., 2012; Carter and Rogers, 2008; Golicic and Smith, 2013; Seuring and Müller, 2008), like the issue of community engagement (Hall and Matos, 2010). There is here an obvious and tremendous gap to fill on all the social aspects for SSCM in Brazil addressed in this paper. However, it is underlined that studies in Brazil also present their own characteristics such as governance since it is presented in the paper that this managerial perspective should be a reference for other studies, mostly for researchers (interested) in emerging economies. This confirms the observations of Delai and Takahashi (2013), Gonçalves-Dias *et al.* (2012, p.529), and we similarly encourage here further empirical studies to reveal these specific characteristics in Brazil and other emerging economies.

As recommended by Silvestre (2016, p.9), future directions for SSCM in Brazil should follow four ways: (i) Sustainable Supply Chain Drivers and Barriers, (ii) Sustainable Supply Chain Genesis, (iii) Sustainable Supply Chains and Innovation, and (iv) Supply Chain Sustainability Trajectories. We believe that this is possible based on all research gaps that we explain in the findings section of this paper demonstrating what has been published and how to follow new directions. That is possible by focusing more on empirical and significant researches that can bring more insights and theoretical advances for the topic. For instance, as presented by Nunes (2016), it is necessary to debate about priorities regarding motivations and pressures based on direct suppliers, and

also to investigate whether the suppliers may have more power of influence to introduce sustainability through the supply chain. From an international perspective, as presented by Gold (2016, p.14) “researchers should continue their efforts of teaming up with colleagues around the world, while keeping their empirical focus on the immediate sustainability challenges on the ground.” As indicated by Silva and Nascimento (2015), future research can indeed provide a strong contributions from the Brazilian perspective on the topic worldwide.

CONCLUSIONS

This paper contributes to 1) the analysis of sustainability and 2) the analysis of sustainability in supply chain management in Brazilian scientific publications. It is the first literature review combining the analysis of both sustainability and supply chain management trends in Brazil. The findings demonstrate that publications in Brazil in the field of sustainability and SCM are increasing along the past few years. As identified in other countries, the social issues are not in the focus of most papers as opposed to the environmental dimension that leads the research on sustainability. On the one hand Brazilian publications are aligned with publications from other more developed countries since we observed a focus on economic and green supply chain management aspects and an important gap on all social aspects of supply chain management.

On the other hand, publications in Brazil also present their own characteristics, particularly regarding the governance dimension of supply chain management, which confirms previous studies on social sustainability in Brazil. This shows also that it is necessary to analyse sustainability in supply chains more comprehensively. These main findings are furthermore acknowledged by Brazilian experts in the field. The three case studies presented demonstrate some empirical perspectives, which can serve as local reference for new researchers. However, the cases analysed present results focused on the focal companies and more research is needed to understand the dynamics between direct and indirect supply chain stakeholders and their power of influence to introduce more sustainability throughout the supply chain.

This paper has some limitations since it only considers publications on sustainability and supply chain in Brazilian Journals and some publications relevant to our study may have been omitted due

to the categorisation of journals in the online databases used. That is observed in the case of engineering journals that may bring some contributions for the debate. This analysis can be deepened by integrating international databases with papers that also investigated the situation in Brazil. Also, we chose to follow the approach of Fritz *et al.* (2017) and Schöggel *et al.* (2016) to define the sustainability dimensions and aspects to analyse. Hence the results could have been slightly different by choosing another approach or other definitions for the sustainability dimensions and aspects. Indeed, as it can be seen in the literature, there is a harmful proliferation of several terms related to sustainability such as corporate social responsibility (CSR), social business, socially responsible, which puts in jeopardy the research community in reaching a common agreement on these concepts when building a widely accepted and robust academic terminology.

This paper can help practitioners and academic researchers to gain ‘rapid’ knowledge on the *status quo* of sustainability and supply chain management research in Brazil. Insights for future research about SSCM in Brazil (and in other countries) can be identified through our study, allowing comparability and, eventually, generalisation of our findings. We recommend as a research agenda for SSCM in Brazil (and other countries) more theoretical and empirical studies on: all the social aspects for both sustainability and SCM research (e.g., corruption and bribery, child labour, an important topic for the country according to some hystorical events); the environmental aspect “water”; the specificities of Brazil and how these specificities can serve research in other similar countries or regions (e.g., the role of retailers, focal companies, local/national/international suppliers to integrate more sustainability practices in businesses and society); the analysis of sustainability for full supply chains; the theoretical contributions regarding the meaning of some sustainability aspects in Brazil and comparisons with other definitions (e.g., from North America or Europe) to eventually improve the understanding about sustainability and SCM for both researchers and practitioners and stimulate research for a common understanding.

For instance, the above issues can be translated into broad research questions to be part of the SSCM research agenda in Brazil:

1. How do SSCM practices tackle corruption and bribery in Brazil?

2. What are the environmental challenges that Brazilian domestic supply chains will face in the future?
3. What impact would globalising the supply chain have in both profitability and sustainability performance of Brazilian companies?
4. What are the necessary governance mechanisms to improve management of critical public resources such as water?

Finally since our findings underline that the multi-faceted characteristics of Brazil make it difficult to conduct research in the country, it is necessary to create partnerships with companies, governments and communities inside and outside Brazil to support sustainability research and practices in the country, thereby contributing to the development of more responsible businesses and society and the internationalization of research.

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APPENDIXTable A7. **Categories used for the selection of journals per topic**

Database	Category (in original language)	Category (English translation)
Scielo	Ciencias Sociales Aplicadas Humanidades	Applied Social Sciences Humanities
Latindex	Ciencias sociales, Multidisciplinarias Administración Ciencia política y administración pública Ciencias sociales y humanidades Derecho laboral Desarrollo económico Ecología Economía Estudios de género Estudios latinoamericanos Estudios locales Ética Humanidades Industria Recursos naturales no renovables Relaciones internacionales Trabajo social	Social sciences Multidisciplinary Administration Political science and public administration, Social sciences and humanities Labour law Economic development Ecology Economy Gender studies Latin-American studies Local studies Ethics Humanities Industry Natural and non-renewable resources International relations Social work
Redalyc	Administración y Contabilidad, Estudios Ambientales Multidisciplinarias Ciencias Sociales, Ciencias, Art y Humanidades	Administration and accounting Environmental studies Multidisciplinary Social sciences, Sciences, Art and Humanities
Spell	Administração, Contabilidade e Turismo	Administration, Accounting and Tourism

Table A8. **Questionnaire for experts in Portuguese and English**

Q01 - *Qual a sua opinião sobre a realização de pesquisa sobre a relação entre Sustentabilidade e Cadeia de Suprimentos no Brasil?*

What is your opinion about the research activity in sustainability and supply chain management in Brazil?

Q02 - *Como você visualiza a aplicação e o valor do conceito Sustentabilidade em Cadeias de Suprimentos por parte das empresas e dos governos no Brasil?*

How do you observe the applicability and value of SSCM concept by companies and governments in Brazil?

Q03 - *O Brasil possui estrutura (pessoas, empresas, pressões institucionais) suficiente para avançar no tema Sustentabilidade em Cadeias de Suprimentos?*

Does Brazil have enough infrastructure (i.e. professionals, companies, institutional pressures) to advance in the theme of SSCM?

Q04 - *Como você visualiza a abordagem da Sustentabilidade em Cadeias de Suprimentos nas publicações nacionais?*

How do you evaluate the SSCM approach in the Brazilian publications?

Q05 - Você poderia destacar alguma publicação sobre o tema no Brasil?

Can you please indicate any papers about SSCM published in Brazil?

Q06 - Em relação a representatividade, esta(s) publicação(ões) indicada(s) possui(em) nível de relevância para o desenvolvimento de pesquisas no país?

Are the above papers relevant to develop the field of SSCM in the country?

Q07 - Estaria o foco das pesquisas brasileiras voltado ao Green Supply Chain Management?

Is the research focus more aligned towards Green Supply Chain Management?

Q08 - Qual sua percepção sobre a utilização de outras abordagens teóricas para entender o tema Sustentabilidade em Cadeias de Suprimentos?

What is your perception about the use of other different theoretical approaches to understand the theme of SSCM?

Q09 - Qual a relevância para as empresas aplicar as recomendações que são realizadas em artigos científicos?

How relevant are the papers for companies to implement their recommendations and consider their practical implications?

Q10 - Você poderia citar pelo menos dois casos no Brasil que são trabalhados a partir da relação entre Sustentabilidade e Cadeia de Suprimentos?

Can you please identify at least two case studies in Brazil that are reference (or exemplar cases) of the relationship between sustainability and supply chain management?

Table A9. List of the 47 papers analysed

N=47	Journal	Authors and title of the manuscript
1	Sistema & Gestão	Rodriguez, D.S.S., Silva, L.S., Passos, M., Bertoloto, R., Luís, S., Filho, J.R.F., (2012), A Logística Reversa Utilizada no Gerenciamento da Cadeia de Suprimentos como Instrumento de Vantagem Competitiva, <i>Sistema & Gestão</i> , 7(4), 642-656.
2	Sistema & Gestão	Rodrigues, S.C., Peixoto, J.A.A., Xavier, L.S., (2013), Formação de Cadeia Verde de Suprimento a partir da Gestão Sustentável de Resíduos Industriais – Um Exemplo no Setor de Reciclagem, <i>Sistema & Gestão</i> , 8(1), 44-57.
3	Sistema & Gestão	Moura, L.L., Silva, R.F., Filgueiras, B.A.G., Correia, J.M.S., (2013), Análise e Intervenção na Gestão do Fluxo de Informações de Uma Cadeia de Suprimentos Hospitalares, <i>Sistema & Gestão</i> , 8(4), 416-430.
4	BASE - Revista De Administração E Contabilidade Da UNISINOS	Andrade, M.C.F., Paiva, E.L., (2012), Green supply chain management na agroindústria canvieira: o caso Jalles Machado. <i>BASE - Revista de Administração e Contabilidade da UNISINOS</i> , 9(1), 2-12.
5	Cadernos EBAPE.BR	Nakayama, R.M., Teixeira, R.M., (2012), Esquemas interpretativos de dirigentes e fornecedores com relação a estratégias e ações de responsabilidade social: o caso da empresa O Boticário, <i>Cadernos EBAPE.BR</i> , 10(1), 82-107.
6	Gestão & Regionalidade	Araújo, G.C., Bueno, M.P., Bueno, V.P., Sproesser, R.L., Souza, I.F., (2008), Cadeia Produtiva Da Avicultura De Corte: Avaliação Da Apropriação De Valor Bruto Nas Transações Econômicas Dos Agentes Envolvidos, <i>Gestão & Regionalidade</i> , 24(72), 6-16.

7	Gestão & Regionalidade	Santos, S.M.B., Ferrari, C.E., Filho, G.G., (2008), Responsabilidade Socioambiental Na Cadeia De Suprimentos Do Tabaco No Brasil, <i>Gestão & Regionalidade</i> , 24(72), 17-26.
8	Gestão & Regionalidade	Torres Jr., A.S., Ratão, B.P., (2011), Relacionamento Na Cadeia De Abastecimento - Estudo De Caso Em Uma Pequena Empresa Distribuidora, <i>Gestão & Regionalidade</i> , 27(79), 4-21.
9	Gestão & Regionalidade	Demajorovic, J., Migliano, J.E.B., (2013), Política Nacional De Resíduos Sólidos E Suas Implicações Na Cadeia Da Logística Reversa De Microcomputadores No Brasil, <i>Gestão & Regionalidade</i> , 29(87), 64-80.
10	Revista Gestão & Tecnologia	Patto, A.R., Afonso, B.P.D., (2009), A Cadeia De Suprimentos: A Nova Fronteira Para A Competitividade De Um Atacadista Distribuidor, <i>Revista Gestão & Tecnologia</i> , 9(2), 1-20.
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