

Systematic Mapping Analysis on Sustainable Supply Chain Management

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Abstract

Sustainable Supply Chain Management (SSCM) concerned with integration approach an organization's social, environmental and economic. The purpose of this paper is to contribute to a systematic mapping on SSCM. Our research presented relations of papers published in the Web of Science core collection and Scopus database. The analysis of literature covers an innovative approach as ABC XYZ based on Pareto principle for ABC and coefficient of variation for XYZ. This paper applied a research methodology in three has contributed to replicability of this research. The data collection is described as search performed in database. In analysis, covered relevant papers categorized into four topics as governance dimensions, literature review, performance measurement and sustainability dimensions. The current analysis supports the view that research activity focused on SSCM continues to expand. Based on 129 articles, the main findings present rich insights toward the further advancement of the SSCM literature and contributed to the exploration of some scientific gaps. Implications for theory and practice: The approach proposed contribute to guide new studies about SSCM.

Keywords

Supply chain management, Sustainability, Systematic mapping.

1. Introduction

Sustainable Supply Chain Management (SSCM) has gained relevance and attention from the academic and practitioner communities over the past decade. SSCM is known by the integration approach an organization's social, environmental and economic. Some aspects influence the adoption of SSCM as greening supply chains, characteristics of suppliers, managerial approaches, barriers and benefits (Bask et al. 2018; Movahedipour, 2017; Jaegler, 2016; Ageron et al. 2012). SSCM practices leads to improved environmental and economic performance which positively impact on operational and organizational performance (Dos Santos et al. 2018; Green Jr et al. 2012).

In the existing literature some important aspects on SSCM should be managed as information system to translate uncertainties into information (Busse et al. 2017a), SSCM performance measures and metrics (Jakhar, 2015; Ahi and Searcy, 2015), circular economy (Genovese et al. 2017), managerial commitment to SSCM projects (Gattiker et al. 2014),

Systematic review helps to analyze data logically, and to reveal patterns and conclusions that may not be immediately obvious. The research includes an overview of publications which show a close relationship to the study. In scientific articles, generally considered key characteristics are a significant contributor to current knowledge and expansion of the scientific frontier (Ricker, 2017).

The development of this research was highlighted by innovative analysis on systematic review of literature using ABC XYZ approach. ABC is about the use of Pareto's Law (80/20 rule) items are grouped based on their level of importance. XYZ is about the use of Coefficient of Variation (CV) it measures the variability of a series of numbers independently of the unit of measurement used for these numbers.

The aim of this paper is to contribute to a systematic mapping analysis of SSCM literature. This paper is organized as follows: Theoretical background presents the significant research activities on SSCM literature. Research methodology describe the steps on systematic mapping analysis. Data collection presents the search details of publications on SSCM. Data analysis considers the ABC XYZ approach on SSCM. Conclusion is dedicated to summarize the contributions of this research to SSCM literature.

2. Literature Review

SSCM an area of significant research activity given the importance of addressing a host of environmental and social issues (Pagell and Shevchenko, 2014). SSCM research has been the subject of multiple reviews, such as Roy et al. (2018) highlighted of the literature in order to explicate the principal facets of SSCM development. Carter and Washispack (2018) mapped the path forward for SSCM by means of systematic literature review. Nakamba et al. (2017) examined how social sustainability is considered in the study of supply chain management, on key areas for future researchers to develop. Dubey et al. (2017) identified differences between definitions and methodologies in SSCM literature and argued for world class. Alexander et al. (2014) developed a systematic literature review by means of decision theory concepts in SSCM. Touboulic and Walker (2015) investigated theoretical perspectives and the adoption of original methodologies in structured review of SSCM literature. Panigrahi et al. (2018) investigated the theoretical perspectives in review of SSCM literature and future potentials of research. Yun et al. (2019) evaluated the interactions of research between environmental and social performance in SSCM framework review. Meixell and Luoma (2015) analysed the stakeholder pressure in systematic SSCM literature review.

3. Methods

A systematic mapping analysis on SSCM can best be described in a few steps, data collection, data analysis and conclusion (Tramarico et al. 2018). In data collection, it searched for publications whose title matches “Supply Chain Management” or “Supply Chain”, and “Sustainability”. It used the Web of Science Core Collection and Scopus databases to retrieve the relevant literature in a systematic manner. Other database, such as Google Scholar could be included to enlarge the study. In data analysis, ABC XYZ approach, ABC with the Pareto principle and XYZ with coefficient of variation (CV). In conclusion, the contributions to SSCM literature were identified.

4. Data Collection

The search considered publications in English and the type of paper. Conference papers and handbooks were omitted from the search to focus on high-quality, peer-reviewed academic papers. The research resulted of 129 papers with 2416 references cited in the main categories of the Web of Science and Scopus (Web of Science, 2019; Scopus, 2019). The number of times a publication is cited in a single text reveals how important that publication is to the author. Citation relations may also be used in a forward rather than a backward direction in time. The number of citations (has increased significantly in recent years.

The main sources identified in the search were Decision Sciences, European Journal of Operational Research, European Management Journal, Industrial Marketing Management, International Journal of Logistics Management, International Journal of Operations and Production Management, International Journal of Physical Distribution and Logistics Management, Journal of Business Logistics, Journal of Purchasing and Supply Management, Journal of Supply Chain Management, Omega International Journal of Management Science.

5. Data Analysis

The data analysis considered the ABC XYZ approach. The Pareto principle, also known as the 80/20 rule, is a theory maintaining that 80 percent of the output from a given situation or system is determined by 20 percent of the input resulting A = 80%, B = 15% and C = 5%. XYZ analysis is a statistical approach to understanding the magnitude of variability. To assess the statistic to provide a reliable guide to the evaluation, it is necessary to sensible to relate the CV. Values of CV less than 1.0 (100%) indicate relatively more manageable historical variability. A large CV value (greater than one) indicates relatively high variability. If $CV = 0$ to $.5$ then X constant, if $CV = .5$ to 1 then Y variable and if $CV > 1$ then Z sporadic (Figure 1). Table 1 presents the results of CV calculation on SSCM citations.

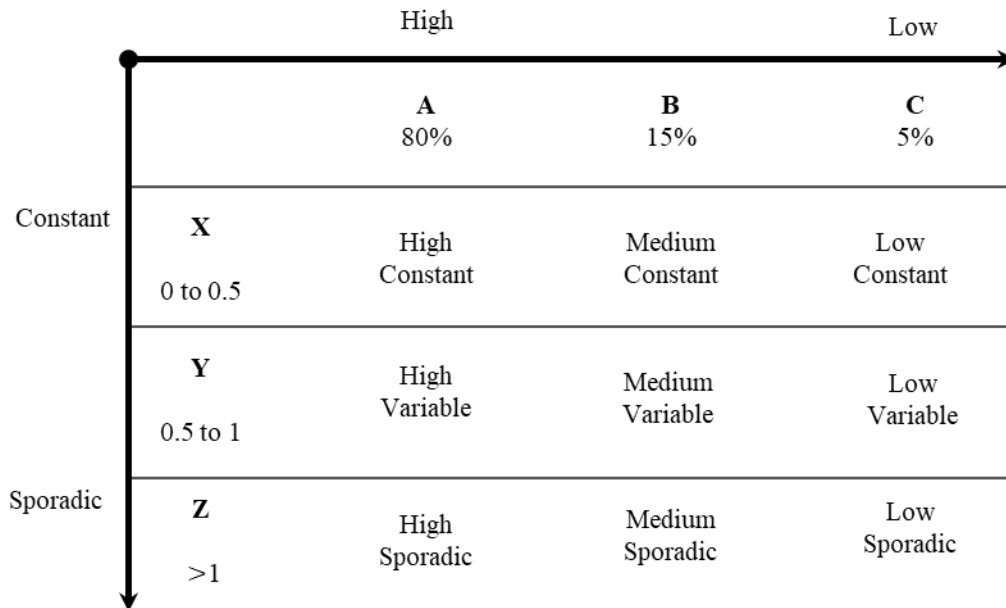


Figure 1. ABC XYZ approach

Table 1. Coefficient of variation on SSCM citations

<i>N</i> = 20	<i>N</i> = 40	<i>N</i> = 60	<i>N</i> = 80	<i>N</i> = 100
.5336	.8844	1.3159	1.7721	2.2361
.5933	.9244	1.3567	1.8066	2.2361
.6547	.9396	1.3641	1.8066	2.2361
.6683	1.0000	1.3693	1.8783	2.2361
.6778	1.0103	1.3693	2.2361	2.2361
.7144	1.0360	1.3693	2.2361	2.2361
.7295	1.0742	1.3752	2.2361	2.2361
.7308	1.0804	1.4006	2.2361	2.2361
.7424	1.0826	1.4142	2.2361	2.2361
.7443	1.0833	1.4325	2.2361	2.2361
.7635	1.0865	1.4551	2.2361	2.2361
.7912	1.1215	1.4907	2.2361	2.2361
.7947	1.1215	1.4907	2.2361	2.2361
.8221	1.1227	1.4907	2.2361	2.2361
.8305	1.1354	1.5288	2.2361	2.2361
.8327	1.2183	1.5524	2.2361	2.2361
.8355	1.2187	1.5721	2.2361	2.2361
.8557	1.2389	1.6298	2.2361	2.2361
.8608	1.2717	1.7095	2.2361	2.2361
.8732	1.3123	1.7321	2.2361	2.2361

The analysis (Table 2) constituting a reasonable range of ABC and XYZ citations on SSCM. In Table 2, there is no **X** as constant, **A** represents a total of 1923 citations, the analysis of CV is **Y** = 1500 and **Z** = 423, **B** represents a total of 371 citations, the analysis of CV is **Y** = 103 and **Z** = 268, **C** represents a total of 122 citations, the analysis of CV is **Z** = 122.

Table 2. ABC XYZ analysis

		A (80%)	B (15%)	C (5%)	Total
X	articles	0	0	0	0
Constant	citations	0	0	0	0
Y	articles	20	5	0	25
Variable	citations	1500	103	0	1603
Z	articles	12	19	73	104
Sporadic	citations	423	268	122	813
Total	articles	32	24	73	129
	citations	1923	371	122	2416

In Table 2, comparing the clusters (**AY**, **AZ**, **BY**, **BZ** and **CZ**), **AY** represents the high number of citations with CV variable, **AZ** represents high number of citations with CV sporadic, **BY** represents medium number of citations with CV variable, **BZ** represents medium number of citations with CV sporadic, **CZ** represents low number of citations with CV sporadic. Based on clusters comparing **AY** is the potential category of the exploratory, is measured on twenty articles with 1500 citations. In Table 3 the twenty cited articles details are presented.

Table 3. Data on twenty cited articles on SSCM

#	Title	Authors	Journal	ABC XYZ	Year
1	Aligning the sustainable supply chain to green marketing needs: A case study	Brindley, C.; Oxborrow, L.	Industrial Marketing Management	AY	2014
2	Customer pressure and innovativeness: Their role in sustainable supply chain management	Gualandris, J.; Kalchschmidt, M.	Journal of Purchasing and Supply Management	AY	2014
3	Designing a sustainable closed-loop supply chain network based on triple bottom line approach: A comparison of metaheuristics hybridization techniques	Devika, K.; Jafarian, A.; Nourbakhsh, V.	European Journal of Operational Research	AY	2014
4	Driving sustainable supply chain management in the public sector The importance of public procurement in the European Union	Amann, M.; Roehrich, J. K.; Essig, M.; Harland, C.	Supply Chain Management An International Journal	AY	2014
5	Framing sustainability performance of supply chains with multidimensional indicators	Varsei, M.; Soosay, C.; Fahimnia, B.; Sarkis, J.	Supply Chain Management An International Journal	AY	2014
6	Governance of sustainable supply chains in the fast fashion industry	Li, Y.; Zhao, X.; Shi, D.; Li, X.	European Management Journal	AY	2014
7	Managing Imbalanced Supply Chain Relationships for Sustainability: A Power Perspective	Touboulic, A.; Chicksand, D.; Walker, H.	Decision Sciences	AY	2014
8	Measuring and managing sustainability performance of supply chains Review and sustainability supply chain management framework	Schaltegger, S.; Burritt, R.	Supply Chain Management An International Journal	AY	2014
9	Putting sustainability into supply chain management	Beske, P.; Seuring, S.	Supply Chain Management An International Journal	AY	2014
10	Quantitative models for sustainable supply chain management: Developments and directions	Brandenburg, M.; Govindan, K.; Sarkis, J.; Seuring, S.	European Journal of Operational Research	AY	2014

Table 3. Data on twenty cited articles on SSCM (cont.)

#	Title	Authors	Journal	ABC XYZ	Year
11	Reputational risks and sustainable supply chain management Decision making under bounded rationality	Roehrich, J. K.; Grosvold, J.; Hoejmose, S.U.	International Journal of Operations & Production Management	AY	2014
12	Squaring the circle Management, measurement and performance of sustainability in supply chains	Grosvold, J.; Hoejmose, S. U.; Roehrich, J.K.	Supply Chain Management An International Journal	AY	2014
13	Supply chain collaboration and sustainability: a profile deviation analysis	Blome, C.; Paulraj, A.; Schuetz, K.	International Journal of Operations & Production Management	AY	2014
14	Sustainable supply chain and company performance A global examination	Ortas, E.; Moneva, J. M.; Alvarez, I.	Supply Chain Management An International Journal	AY	2014
15	Sustainable supply chain management in the fast fashion industry: An analysis of corporate reports	Turker, D.; Altuntas, C.	European Management Journal	AY	2014
16	The relationship between legitimacy, reputation, sustainability and branding for companies and their supply chains	Czinkota, M.; Kaufmann, H. R.; Basile, G.	Industrial Marketing Management	AY	2014
17	Why research in sustainable supply chain management should have no future	Pagell, M.; Shevchenko, A.	Jounal of Supply Chain Management	AY	2014
18	Stakeholder pressure in sustainable supply chain management A systematic review	Meixell, M.J.; Luoma, P.	International Journal of Physical Distribution & Logistics Management	AY	2015
19	Theories in sustainable supply chain management: a structured literature review	Touboulic, A.; Walker, H.	International Journal of Physical Distribution & Logistics Management	AY	2015
20	Sustainable supply chain management and the transition towards a circular economy: Evidence and some applications	Genovese, A.; Acquaye, A.A.; Figueroa, A.; Koh, S.C.L.	Omega International Journal of Management Science	AY	2017

5.1 Sustainable Supply Chain Management Classification

SSCM covered by relevant papers categorized into four topics discussed in this section, governance dimensions, literature review, performance measurement and sustainability dimensions (Figure 2).

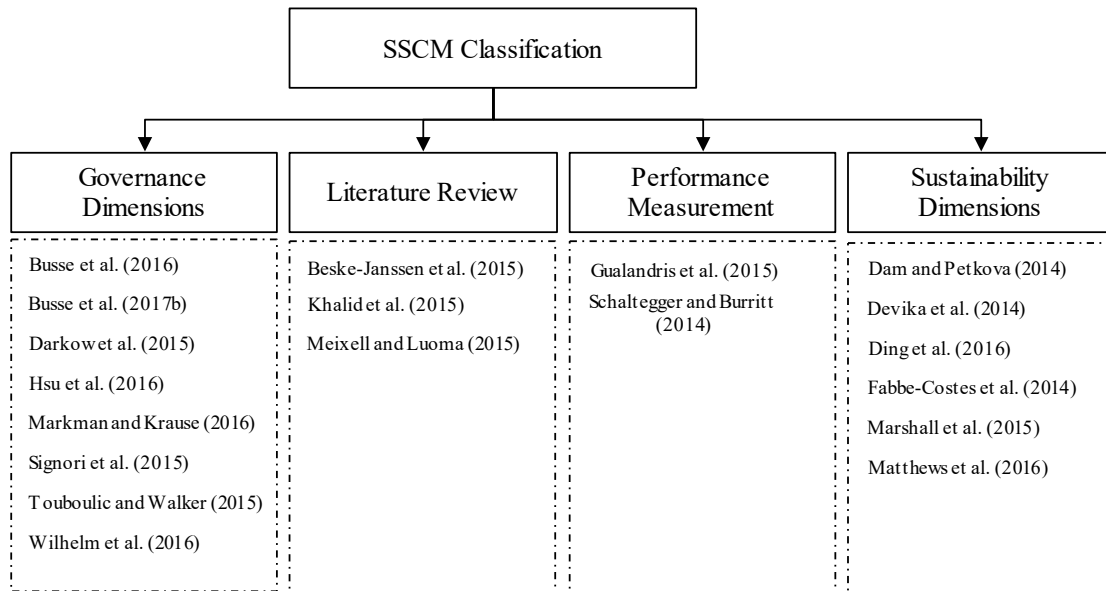


Figure 2. SSCM classification

Papers focused on governance dimensions developed a research to investigate the theoretical perspectives and contribute to understanding the current state of research in this field (Touboullic and Walker 2015). Darkow et al. (2015) examined the management of food supply chains in complex and volatile business environments. Signori et al. (2015) suggested pathways between executive profiles toward sustainable supply chain orientation. Markman and Krause (2016) assessed SSCM using theory building to know an exploring where to go. Busse et al. (2016) explored the barriers to supplier development for SSCM and managerial remedies to mitigate such barriers. Wilhelm et al. (2016) studied the conditions under which suppliers comply with their agency roles in the quest for a transparent supply chain. Hsu et al. (2016) developed a theoretical model to predict first, how SSCM initiatives might influence reverse logistics outcomes. Busse et al. (2017b) investigated how buying firms facing low supply chain visibility can utilize their stakeholder network to identify salient SSCM risks.

Papers focused on literature review conducted on stakeholder pressure and influence on SSCM (Meixell and Luoma 2015), reviewed the academic SSCM literature on performance measurement (Beske-Janssen et al. 2015). Khalid et al. (2015) presents a structured SSCM literature review and analysed the arguments were addressed in the base of the pyramid.

Paper focused on performance measurement presented a methodology to evaluate, select, and monitor SSCM performance measurement. Schaltegger and Burritt (2014) developed an analytical framework for the assessment of approaches for the measurement and management of sustainability performance of supply chains. Gualandris et al. (2015) evidenced a sustainable evaluation and verification in supply chains to align to stakeholders.

Papers focused on sustainability dimensions presented an analysis to compare three pillars of sustainability in the network design. Devika et al. (2014) presented a mixed integer programming model of environmental SSCM practices. Dam and Petkova (2014) presented on environmental supply chain programs on shareholder wealth. Fabbe-Costes et al. (2014) tested a conceptual a framework for environmental scanning practices. Marshall et al. (2015) examined the certain factors drive the adoption of environmental sustainability practices but few focuses on social supply chain practices, delineate which practices are adopted or what drives their adoption. Ding et al. (2016) analysed the economic performance of SSCM from the perspectives of supply chain firms and the government. Matthews et al. (2016) analysed the sustainability levels between the different types of theory being produced in response to the challenges of sustainability.

5.2 Results and Discussion

As a result of the analysis of the articles, some scientific gaps were identified in order to promote and guide new studies about SSCM.

Brindley and Oxborrow (2014) proposed a model for alignment SSCM to green marketing based on lean and resource efficient the authors suggest, as future research, upstream in the supply chain and from the perspective of the supplier as well as the buyer. Gualandris and Kalchschmidt (2014) Investigated how SSCM develops within a company and evolves from internal to external practices. Therefore, the authors propose a further investigation to explore the role of innovativeness in the context of SSCM. Devika et al. (2014) designed a SSCM network based on triple bottom line. The authors propose a further research to assess the performance in other optimization problems as cross-docking operations and vehicle routing practices. Amann et al. (2014) provided evidence of connections between sustainability policy goals included in public procurement tenders. The authors suggest that future studies might also include an economic measurement to investigate the link between green public procurement and socially responsible public procurement. Varsei et al. (2014) provided a framework which can assist focal companies in the development of SSCM. In this way, the author proposes that additional works to develop a comparative analysis with other tools would be beneficial to identify further the strengths and weaknesses on SSCM framework. Li et al. (2014) examined the impact of corporate social responsibility behaviour on the sustainability performance of focal companies. Therefore, the authors propose a further research can be conducted on the survey of the effectiveness of operating a fast fashion supply chain using sustainable supply chain governance principles. Touboulie et al. (2014) investigated SSCM relationships and specifically uses resource dependence theory. They also suggest that studies should be develop resource dependence theory combining with stakeholder theory. Schaltegger and Burritt (2014) measured and managed sustainability performance of supply chains. The authors propose a further research development systematic relevant nominal, ordinal, interval and ratio scales. Beske and Seuring (2014) providing a framework of SSCM and related practices that are required to fulfil the demands of sustainability and performance. The authors suggest that future studies might also include the framework might be used in evaluating whether issues are addressed that offer improvements toward sustainability. Brandenburg et al. (2014) developed an application of operations research methods and related models on SSCM. The authors propose a further research enlarge more modelling-based research to be completed and integrate SSCM into business. Roehrich et al. (2014) applied the logic of bounded rationality to corporate reputation management and explores how constraints posed by bounded rationality impact on firms' implementation of SSCM. Therefore, the authors propose a further research should investigate the use of supplier selection as a way to reduce reputational risk. Grosvold et al. (2014) evaluated the relationships between management, measurement and performance of SSCM. The authors propose a further research should also consider the focal firms' own rating in terms of sustainability performance as well as how their SC partners. Blome et al. (2014) analysed the deviation from an optimal profile of supply chain collaboration and its detrimental effect on sustainability performance. Therefore, the authors propose a further research might either want to include multiple respondents per firm or complement survey data with publicly available performance data. Ortas et al. (2014) investigated the link between a SSCM and companies' financial performance and provided empirical evidence about the relationship between these two constructs. The authors propose a further research should also extend to obtain the equations' coefficients implementing models and measure the social dimension to gain with the companies' economic success. Turker and Altuntas (2014) analysed the current situation of SSCM in the fast fashion industry from 9 companies that use the same reporting guidelines. The authors propose a further research should study based on real data about suppliers or measurements of actual sustainability performance. Czinkota et al. (2014) filled a gap in the scientific literature as to legitimacy, reputation and sustainability and their interrelationship to corporate and supply chain branding. The authors propose a further research might therefore evaluate how perception within the reference contexts is affected by corporate legitimacy.

6. Conclusion

The current research has focused on systematic mapping on SSCM. The use of research methodology has contributed to replicability of this research. In data collection, the author described the details of search performed in Web of Sciences and Scopus database and presented the number of articles identified in the search, the number of cited references. In analysis, the author was carried out in three approach as ABC XYZ and identification of scientific gaps. In ABC XYZ approach, an innovative analysis was used by the author. ABC from Pareto principle and XYZ from CV. The idea behind CV and especially the data decomposition techniques applied is to cluster the citation. From ABC XYZ analysis it was possible to identify the data on the twenty most cited articles on SSCM. Covered relevant papers categorized into four topics on SSCM as governance dimensions from ten authors identified, literature review from three authors, performance measurement from two authors and sustainability dimensions with six authors

identified. In identification of scientific gaps as a result of research, object of this study, has contributed to the exploration of some scientific gaps to promote and guide new studies about SSCM.

The current analysis supports the view that research activity focused on SSCM continues to expand. Based on 129 articles, this review presents rich insights toward the further advancement of the SSCM literature.

Our proposal for further studies is to perform both a qualitative and quantitative analysis including the impact factor of publications

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Biography

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