

Green and Sustainable Supply Chain Management: A Comparative Literature Review

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Abstract

The purpose of this literature review is to compare the difference between the concept of green supply chain management (GSCM) and sustainable supply chain management (SSCM) in relation to the factors of sustainable development and supply chain management in the literature. In order to achieve this objective, we proposed three factors of sustainable development and five factors of supply chain management. Based on these factors, the analysis of 20 definitions of GSCM and SSCM identified is performed. The results showed that the differences between the two concepts are that GSCM definitions are generally based on environmental factors. While the SSCM definitions are based on the three levers of Sustainable Development (SD) (environmental, economic and social) at the same time. However, the flow and the stakeholder factors present the similarities between the two approaches. Consequently, studying two approaches mutually can provide the companies the possibility to choose the implementation of GSCM or SSCM approach, which can help manufacturing practitioners in their decisions to increase their sustainable development goals.

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Keywords: Green; supply chain management; Sustainable; development; the flow; the stakeholder.

1. Introduction

The integration of the environmental approach in the industries became more essential in the last years. For this reason, several researches have examined this subject. According to [1]- [6], expectations for supply chain management have moved beyond basic economic concerns to include topics such as fair working conditions and sustainable ecological growth. This overlaps with sustainable development, which is generally considered to have economic, environmental, and social dimensions and is defined as "progress that meets the needs of the present without compromising the ability of future generations to meet their own needs" [7], [8]. The manufacturing and distribution of the product from the initial supplier to the final customer is controlled by supply chain management, which is defined as "the management of the value chain that includes both the movements and tasks of physical and information flows" [9], [1] [10], [11]. The literature has covered the idea of sustainability in the context of supply chain management (SCM) using a variety of terminologies. Green supply chain management (GSCM) and sustainable supply chain management (SSCM) are the two terms most frequently used to describe the relationship between sustainability and SCM [10]. Over the past ten years, a number of articles have been written on the subject of assessing green supply chain management and/or sustainable supply chain management

methodologies. The goal of [11] is to identify and evaluate the metrics published in the Green Supply Chain Management (GSCM) and Sustainable Supply Chain (SSCM) Management Literature. These authors provided the basis for the creation of an original conceptual model for the assessment of performance in green and sustainable supply chains. The research [12] examines the literature on Green Supply Chain Management (GSCM) and offers a thorough analysis of systemic relationships between the GSCM elements, which are Drivers, indicators of practice, and measures of performance. Authors' analysis is followed by content analysis of the 39 papers most cited Identified six underlying research sources, namely (a) conceptual growth and sense-making, (b) performance effect of GSCM, (c) integration of green and sustainable supply chain operations, (d) green supplier creation, (e) implementation drivers of GSCM, and (f) analysis and future direction of study. This has contributed to the introduction and direction of a systematic conceptual structure with logically grouped variables relationships between Groups. The goal of [13] is to classify influential SSCM enablers by using Interpretive Structural Modeling (ISM) from 13 recommended enablers in five Indian textile units in southern India. The findings of the ISM show that the industry's activities are dominated by five enablers, including the implementation of safety requirements, the adoption of green practices, Community economic wellbeing, health and safety problems and job stability. The outcome of this study indicates that when

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compared with other SSCM adoption enablers, security perspective enablers provide additional incentive. The aim of the study presented in [10] is to systematically investigate the supply chain management discipline (SCM) within the sustainability framework. The literature review shows that the environmental aspect is substantially better described at all stages of the supply chain by different processes. The social dimension is recognized, but it receives less attention than expected, given the focus of SCM on engagement, relationships and communication. With little insight into how to combine them, these two dimensions are viewed separately in the literature and current SCM and sustainability research offers very limited practical results. The objective of [19] is to identify and examine existing definitions of green supply chain management (GSCM) and sustainable supply chain management (SSCM) between the two proposed core feature sets. The main objective of the [14] was to suggest a conceptual structure for the GSCM / SSCM that contributes to knowledge-based view theory and system theory (ST) and to include an exhaustive list of further directions for study. There are two important reasons for this study; first, despite the fact that several researches [11], [19] and [14] analyze the GSCM and SSCM approaches, there are few articles that study the definitions and factors of GSCM and SSCM or that compare them. Second, the studies [12], [13] and [10] have studied the GSCM or SSCM concept, and examined them separately, but they have not identified the similarities and differences between the two approaches. Therefore, they could not be beneficial for developing the companies' sustainable performance. In this context, our contribution is to answer all the previous limitations, by analyzing the definitions of both GSCM and SSCM against the three (economic, environmental and social) SD factors and the five (flow, Coordination, Stakeholder, Relationship and Value) SCM factors. As well as comparing the relationships between GSCM and SSCM definitions on each SD and SCM factors, which can help manufacturing practitioners to make good decisions for increasing their sustainable performance goals. The structure of this article is as follows: The generality of supply chain management and sustainable development, as well as the components of the two factors, are presented in section 2 of this article. The methodology utilized in the research is presented in Section 3. By addressing our study questions, Section 4 outlines our key results and discussion, then addresses the limitations, and lastly suggests areas for further investigation. In Section 5, the paper finishes by summarizing key findings.

2. Background

2.1. Supply chain management

2.1.1. General overview

Supply Chain Management (SCM) is a word that has been used to describe logistics activities, information transfers, materials planning and control both internally within a business and externally among firms since it was first coined in the early 1980s [14]. The focus of SCM research has widened over time, and the term supply chain now refers to the management of the value chain, which

coordinates all activities related to physical and information flows and allows for the control of product manufacturing and distribution from the first manufacturer to the last consumer [15] [16].

The SCM methodology strives to maximize profitability through efficiency, achieve customer happiness, and add value in order to optimize the global logistics network [17]. The forward and reverse flow of materials, resources, finances, and information are made possible by SCM, which manages partnerships [15] between interconnected organizations and business units inside a corporation as well as between commonality and suppliers of goods, manufacturing facilities, logistics, marketing, and related systems [18], [17].

2.1.2. Supply chain management factors

Based on an analysis of the SCM factors presented in several articles, the key factors of SCM are summarized as follows:

1. flow factor according to [16] and [19]: managing flows of materials, services, and information: managing and controlling the movement of physical flows (transport, packaging, storage, etc.) and the flow of information from supplier to customers.
2. Coordination factor as set out in [17] and [21]: coordination within and between firms, the traditional systemic, strategic coordination of business functions and tactics in all of these functions within and across a given company supply chain companies for the purposes of improving the long-term output of the individual enterprises, and the entire supply chain. Also, according to [18], [21], its response to coordination within or between organisations, examples include the organized supply chain, collaboration, etc..
3. Stakeholder factor according to [14]: Firstly, it relies on establishing close relationships with partners through customer process development, just-in-time delivery to the point of use, sharing planning and manufacturing information and inventory management with the supplier. Secondly, the establishment and management of SC networks, based on the following three elements: quality standardization, performance and communication. Replacing contractual relationships with trust relationships and establishing balanced relationships, which enable companies to achieve a common goal and avoid a return to individual and short-term interests.
4. Relationship factor according to [16]: relationship management on both the inside and outside.
5. Value factor as explained in [16] and [23]: create value, improve efficiency, and improve overall performance in the supply chain.

2.2. Sustainable development

2.2.1. General overview

The definition of sustainable development (SD) is "growth that satisfies the demands of the present without jeopardizing the needs of future generations" [19]-[22]. Using natural resources sustainably is just one aspect of environmental sustainability, according to the United Nations Global Compact [26]. Instead, adopting, upholding, and putting into practice a set of core values in

the fields of human rights, labor standards, and anti-corruption is what sustainable development entails within the realm of firm influence. By doing this, businesses, a driving force behind globalization, will contribute to ensuring that markets, trade, technology, and finance advance in ways that benefit economies and communities worldwide [20] and [27].

2.2.2. Sustainable development factors

The SD is based on three aspects: The environmental factor, according to [21], [22] energy demand and CO₂ emissions are among the characteristics frequently of this factor. The economic factor, which reflects the total cost or net income as indicators [7] and [31], and the social factor which involves health, safety standards as well as employment rights, [24], [28], [29]. This factor has generally been recognized as the weakest "pillar" of sustainable development [23].

3. Research method

3.1. Research questions

A systematic literature review is the process of identifying, evaluating and analyzing all available literature related to a particular research question, topic or phenomenon of interest [25], [26]. It is appropriate for summarizing existing research, recognizing gaps in the existing literature, and providing the basis for a new research position.

In this article, we present the results of the literature systematic review on definitions and factors of GSCM and SSCM. The analysis is organized around the literature on

supply chain management and sustainability. As part of this analysis, we investigate the following research questions:

- RQ1: From 2000 to 2020, how are the terms GSCM and SSCM defined in the scientific literature?
- RQ2: What are the resemblances and distinctions between the GSCM and SSCM factors?

Although there are numerous thoughts and viewpoints about the definitions and elements that affect the performance of GSCM and SSCM concepts that might be utilized as research questions, we believe that these two questions best capture our emphasis and that addressing them would allow us to accomplish our goals.

3.2. Research Process of The systematic literature review

Our research process started with the collection of primary studies, which first used keyword dependent database in two phases Searches to find sources potentially important, and then Select search result manually. In this stage, several major databases were used, Scopus and WOS, notably Elsevier, springer, Emerald, and Taylor & Francis. The majority of articles on this topic are in English except four that are in French. Our research is based on articles that were released between 2000 and 2020 throughout the last 20 years.

Figure 1 depicts the four stages of the research process. Each stage was divided into two parts, the first of which involved manually filtering the search results after finding viable sources using keyword-based database searches. The manual filtering process was carried out.

The four stages of the research process are shown in Figure 1.

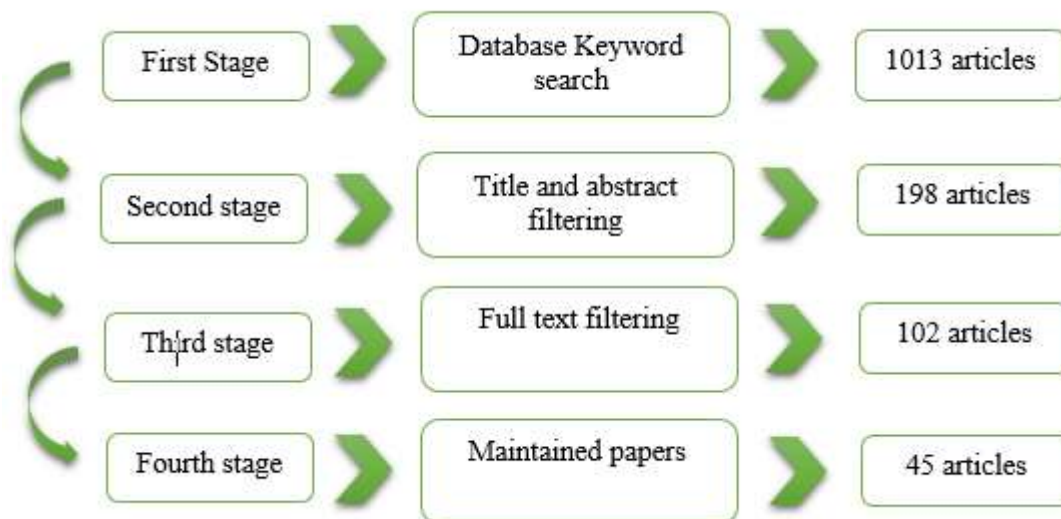


Figure 1. The systematic literature review protocole.

1. First stage: database keyword search

Before moving on with the identification of the primary studies, numerous initial searches were carried out. The purpose of initial research was to generate and evaluate different search strings. Additionally, we defined a group of relevant publications using the Searches, within which the real search should fit. To find possibly relevant sources, we first used keyword-based as general as feasible searches, including English and French terms (see table I). On the basis of these preliminary searches, 1013 papers were picked. The list of likely initial studies was based on the results of a search of the online databases mentioned in (table II), which were chosen because they were relevant to the theme. This collection served as a "mind check" for us when we were creating the package.

Table 1. Keywords used in english and french

Keywords use in English	Keywords use in French
Green supply chain management definition	Définitions de la gestion de la chaîne d'approvisionnement verte.
Sustainable supply chain management definition	Définitions de la gestion de la chaîne d'approvisionnement durable.
Green and sustainable supply chain management	gestion de la chaîne d'approvisionnement verte et durable.
The similarities and differences between GSCM and SSCM	les similitudes et les différences entre les facteurs GSCM et SSCM.
Supply chain management factors	Facteurs de la chaîne d'approvisionnement.
Sustainable development factors	Facteurs du développement durable.
Supply chain management and sustainable development success factors	facteurs de la chaîne d'approvisionnement et le développement durable.

Table 2. Publisher included in search and number of matched articles.

Publisher indexed in Scopus	Numbers of matched
Elsevier	102
Springer	31
Emerald	15
Taylor & Francis	8
Others	72
228	
Publisher indexed in WOS	Numbers of matched
Elsevier	50
Springer	16
Emerald	5
Taylor & Francis	6
Others	14
91	
Publisher indexed in Scopus and WOS	Numbers of matched
Elsevier	458
Springer	61
Emerald	50
Taylor & Francis	21
Others	104
694	

2. Second stage : Title and abstract filtering

The 1013 papers founded in the previous step were filtered based on title and abstract in the second stage. The names and abstracts of these works were divided into three categories by the two authors: include, exclude, and uncertain. In light of the "GSCM and SSCM definitions

and factors" questions, 815 exclusions and 54 inclusions were reached agreement on. The inclusion decisions for the 144 abstracts with ambiguity or disagreement were settled through discussion. In this phase, 198 papers were chosen.

3. Third stage : full text filtering

Full text filtering was carried out by comparing the texts of each of the 198 articles to our study questions on the GSCM and SSCM definitions and factors. Articles were only omitted at this point if the full text filtering was ambiguous or if both researchers thought the article was manifestly unimportant. 102 papers were chosen for full text analysis as a result.

4. Forth stage : Maintained papers

Only 45 publications that are helpful for the treatment of our subject were kept after we examined all 102 complete filtering papers.

3.3. Overview of the full papers analysis primary studies

In this section, we present some data from the 45 researches founded, namely the years of publication, the databases used, the country of research and the papers analysis research issues.

3.3.1. Publication years of papers analysis

the studied articles were published in the last 20 years between 2000 and 2020. Fig 2 shows the distribution of these articles by year, we note that the largest number of research articles (ten) was published in 2011 followed by seven papers in 2012 followed by four papers in 2013 and 2016, while the rest of the papers were published between one and three papers per year.

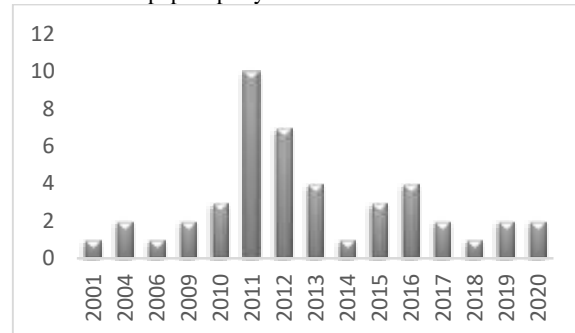


Figure 2. The number of papers analysis per year.

3.3.2. Number and percentage of papers analysed by Publisher

The publishers used in the analyzed papers are classified based on tree type's publishers indexed: "Scopus", "WOS" and "Scopus & WOS" (see figure 3). It can be noted that the higher percentage is 69 percent by the publisher indexed in Scopus & WOS, pursued by 21 percent of the Scopus-indexed publisher, then 8 percent of the WOS-indexed publisher. According to Figure 4, we mentioned that Elsevier is the most widely used publisher in the analyzed papers, with eighteen articles of publishers indexed in Scopus & WOS, and two articles in each publisher indexed "WOS" and "Scopus". Preceded by the springer publisher with six articles in Scopus & WOS indexed publisher and tree in Scopus indexed publisher.

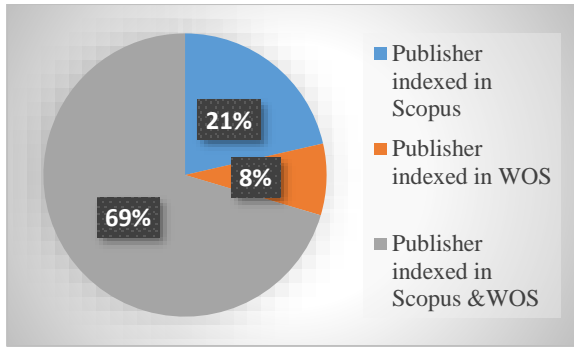


Figure 3. Percentage of Papers analysis publishers indexed Scopus /WOS/Scopus & WOS

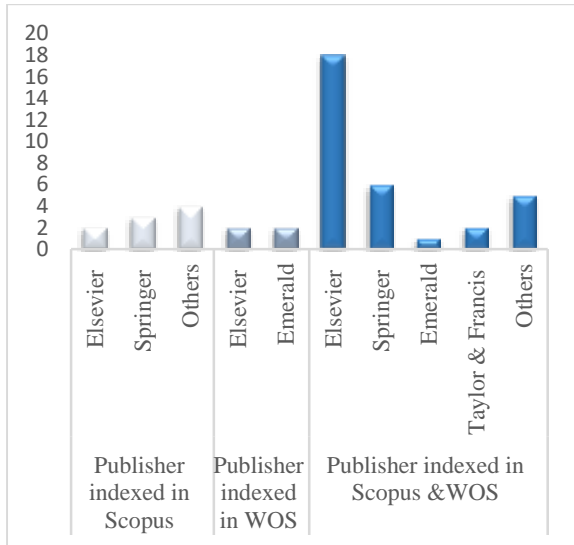


Figure 4. Articles number by publisher indexed Scopus /WOS/Scopus & WOS

3.3.3. Countries research of publication analysis

Fig 5 shows the number of papers examined by country, we note that 'Germany, Morocco and the United States represent the highest number of papers (six), followed by the United Kingdom with five papers, pursued by Canada and Malaysia with three articles, the other countries represented by two or one papers.

3.3.4. Percentages of papers analysed by by Issues

Fig 6 shows the percentage of paper analyzed by Issues. We can see that the larger portion studied GSCM performance, practice, orientation and application by twenty-seven percent. Seventeen percent studied SCM

literature modeling and simulation, also other diverse topics. Twelve percent studied SSCM definition literature modeling. Finally twenty-seven percent of papers still covering other topics shown in Figure 6. The topics of definition / modeling and performance of GSCM and SSCM that our subject belong was addressed by only seven percent.

4. Results and Discussion

In this section, we will first answer to our research questions then we discuss the limitations ultimately, we present a research vision for future study.

4.1. Answers to research questions

4.1.1. As an answer to RQ1 From 2000 to 2020, how are the terms GSCM and SSCM defined in the scientific literature?

Ten definitions for each of the two concepts GSCM and SSCM were found after reviewing 45 filtered papers between 2009 and 2020. The SD and SCM factors covered by the GSCM and SSCM definitions are then shown in two tables [II and III].

4.1.1.1. Green supply chain management definitions and factors

The search turned up 10 distinct definitions for GSCM between (2009 and 2020). A description of the definitions and the SD and SCM elements they cover showed in Table II. The definitions' source is listed in the first column, followed by a synopsis in the second, then the SD and SCM factors that are covered by the GSCM definitions in the final two columns. Based on the findings from Table II, Figure 6 illustrates the proportions of SD and SCM that are addressed by GSCM definitions.

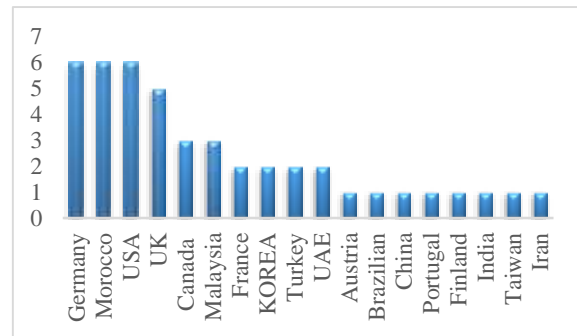


Figure 5. Number of Papers analysis per country.

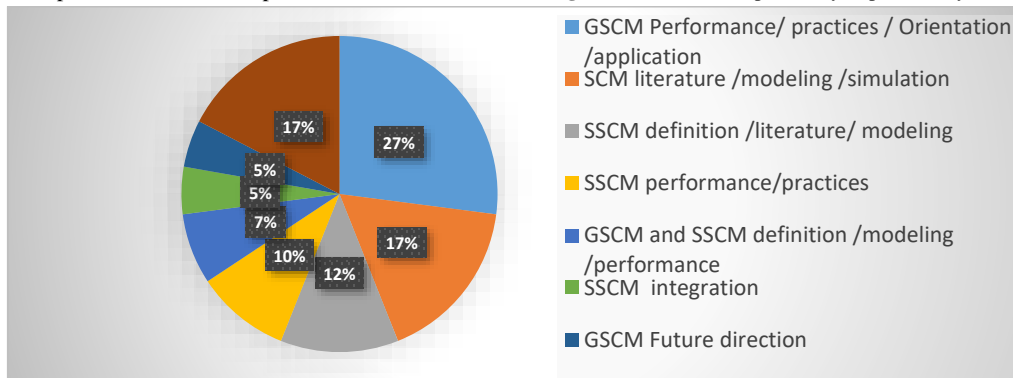


Figure 6. Percentage of papers analysis Issues.

Table 3. GSCM Definitions and Factors

Definition sources	Definition	Factors							
		Environmental	Economic	social	Flow	Coordination	Stakeholder	Relationship	Value
[27]	Integration of environmental factors into supply chain management, including product design, procurement and sourcing of products, production processes, final product distribution to customers, and end-of-life	X			X	X		X	
[28]	A set of practices for implementing, controlling and promoting environmental performance by allocating possible human resources and redefining organizational responsibilities and procedures	X			X	X	X		X
[29]	A way for companies to achieve profit and market share goals by reducing environmental impacts and increasing green efficiency.	X	X						X
[30]	Minimizing and potentially reducing the detrimental environmental effects of the supply chain.	X			X				X
[31]	The environmental sustainability dimension within the sense of a supply chain. An approach that seeks to incorporate environmental issues into the SC management process beginning with product design and going through the sourcing and selection of products, manufacturing processes, final product distribution and end of life management.	X			X		X		
[32]	This is the ideology that incorporates environmental issues, including reverse logistics, into SCM's inter-organizational activities.	X			X	X	X		
[33]	Extending conventional supply chains to incorporate practices aimed at reducing the environmental effect of a product over its entire life cycle, such as green design, resource conservation, elimination of hazardous materials and recycling or reuse of the product.	X			X		X		
[33]	The aim of the Green Supply Chain concept is to minimize or mitigate resource waste (energy and materials) and negative environmental impacts (air, water and land pollution) at all stages of the life cycle of a product, from the development of raw materials to the customer's use of the product and its disposal at the end of the life cycle of the product.	X			X	X	X	X	X
[34]	Green supply chain management is defined as the totality of green procurement, green manufacturing and materials management, green distribution and marketing, and ultimately reverse logistics.	X			X		X		
[35]	Green Supply Chain Management (GSCM) is seen as an environmental breakthrough that incorporates environmental thinking into supply chain management (SCM). The goal is to minimize or eliminate waste in the supply chain, including hazardous chemicals, emissions, energy and solid waste, such as product design, resourcing and procurement of materials, production processes, final product distribution, and end-of-life management of the product.	X			X				X

4.1.1.1.1. Sustainable development factors addressed by GSCM definitions

In the published definitions for GSCM, all definitions deal with the environmental factor (100%), given the nature of the word "GSCM", which specifically focuses on this aspect of sustainability, this focus on this dimension was to be anticipated. This factor was deduced in the analysis by the definition containing terminology referring to the environmental component of sustainability. Only one definition [29] (10%) addressed the Economic factor, using terminology that pertains to sustainability's economic component, this factor was interpreted. Basing on the definitions using words that refer to sustainability's social component; the social factor was not explicitly mentioned in any of the published definitions of GSCM. After this analysis we can conclude that the GSCM definitions focus mainly on environmental factors and rarely on economic factors.

4.1.1.1.2. Supply chain management factors addressed by GSCM definitions

The investigation showed that the SCM attribute that was mentioned the most in the GSCM specifications was

the flow focus. In nine out of ten (90%) definitions, the flow factors were mentioned, the strong emphasis on these traits reflects their significance for SCM as a whole and the requirement for them to be reflected in any concept extensions, such as GSCM. The definitions of GSCM also covered all of the other SCM factors. 60% of GSCM definitions included a stakeholder aspect, indicating that this factor is strategic in both the SCM and the GSCM. Five definitions, or 50% of the total, addressed the value focus, by taking into account profit, market share, and the conversion of resources into usable products. Coordination factors specifically addressed 40% of definitions. Finally, just 3 (30%) of the definitions addressed the relationship aspects. The publications addressed these factors by making mention of collaborative practices, supplier relationship management, and interaction between vendors. Consequently, the findings indicate that the definitions offered for GSCM adequately covered the SCM components, even though different writers undoubtedly highlighted different parts.

Table 4. SSCM Definitions and Factors

Definition sources	Definition	Factors							
		Environmental	Economic	social	Flow	Coordination	Stakeholder	Relationship	Value
[36]	Reflecting the ability of the company to prepare, manage, track, respond and recover from possible global risks. Risks that include significant marketing and supply chain considerations include product creation, channel selection, business decisions, procurement, difficulty in manufacturing, transport, government and industry regulation, availability of capital, Talent management, forums on renewable energies, and health.	X	X		X		X		
[24]	By incorporating environmental and social / ethical elements to the conventional definition of supply chain management.	X		X	X				
[16]	Creation of integrated supply chains by integrating economic, environmental and social factors with key inter-organizational business processes designed to efficiently and effectively manage the inventory, information and capital flows associated with the purchase, manufacture and distribution of products or services. In order to satisfy the requirements of stakeholders and boost the organizational profitability, competitiveness and resilience over the short and long term.	X	X	X	X		X	X	X
[7]	Sustainable SCM is the management of information, expertise and capital flows, as well as cooperation between firms along the supply chain, while at the same time integrating sustainable growth goals from all three dimensions, i.e. economic, environmental and social, derived from the needs of customers and stakeholders.	X	X	X	X	X	X		
[8]	To make the supply chain operational and achieve sustainable efficiency, SSCM aims for more collaboration between partnering firms. In this new context, it is important to incorporate environmental and social standards into performance goals for individual firms, but also for the management of the entire supply chain.	X		X	X	X	X	X	X
[24]	Strategic accomplishment and convergence of the organization's social, environmental and economic priorities by consistently coordinating key inter-organizational business processes in order to maximize the long-term economic success of the individual company and its value network.	X	X	X			X		X
[37]	In the procurement and supply process, we describe sustainable SCM as following the goals of sustainability, integrating social, economic and environmental elements.	X	X	X	X				
[38]	The combination of sustainable development and supply chain management is understood as SSCM, which also describes sustainable development as having three dimensions: combining environmental, social and economic problems for human development.	X	X	X	X		X		
[38]	In order to optimize the long-term economic performance of the individual company and its supply chain, SSCM is the strategic, consistent alignment and achievement of an organization's social, environmental, and economic goals through the systematic management of key inter-organizational business processes.	X	X	X	X	X	X	X	X
[39]	Three sustainability elements related to the degree to which the focal entity has developed skills and strategies to strengthen social and environmental conditions in the upstream value chain have been used to measure SSCM.	X	X	X					X

4.1.1.2. Sustainable supply chain management definitions and factors

The search turned up 10 distinct definitions of SSCM between (2009 and 2020). The definitions and the SD and SCM components that are covered by these definitions are described in Table III. The definitions' source is listed in the first column, followed by a synopsis in the second, then the SD and SCM factors that are covered by the SSCM definitions in the final two columns. Based on the findings from Table III, Figure 7 illustrates the proportions of SD and SCM that are addressed by GSCM definitions.

4.1.1.2.1. Sustainable development factors addressed by SSCM definitions

In the SSCM issued definitions. The three components of sustainable development were specifically mentioned in the majority of definitions: Environmental factor by 100% (see Fig 6), this factor was deduced in the analysis by the definition contains terminology referring to the environmental component of sustainability. The social factor by 90% (see Fig 6), basing on the definitions uses words that refer to sustainability's social component. The

economic factor by 80% (see Fig 6), using terminology that pertains to sustainability's economic component. In the other hand six definitions ([16], [7], [24], [37], [38], and [39]) specifically mentioned the triple bottom line's. Only one article [36] focused on combinations of the environmental aspect with a focus on renewable energy and economic factors with a focus on product development, channel choice, management decisions, purchasing, production challenges, transportation, government and industry regulation, access to finance, and management consulting. The [24] and [8] concentrated on a grouping of the environmental factor and social factor with a focus on ethical elements.

4.1.1.2.2. Supply chain management factors addressed by SSCM definitions

The analysis showed that the SCM characteristic that was mentioned the most in the SSCM definitions was the flow emphasis. The flow factors were mentioned in 8 out of 10 definitions (80%), which is indicative of their importance for SCM as a whole and the necessity for them to be included in any concept extensions, such SSCM. All of the other SCM factors were covered in the SSCM definitions. 70% of SSCM definitions included a

stakeholder aspect, indicating that this factor is strategic in both the SCM and the SSCM. By considering profit, market share, and the conversion of resources into useable products, five (50%) definitions of the total, addressed the value focus. 30% of SSCM definitions mentioned coordination and relationship factors. Thus, despite the fact that different authors certainly emphasized various SCM components, the results show that the definitions provided for SSCM adequately encompassed the SCM components.



Figure 7. Percentages of SD and SCM factors addressed by GSCM definitions.

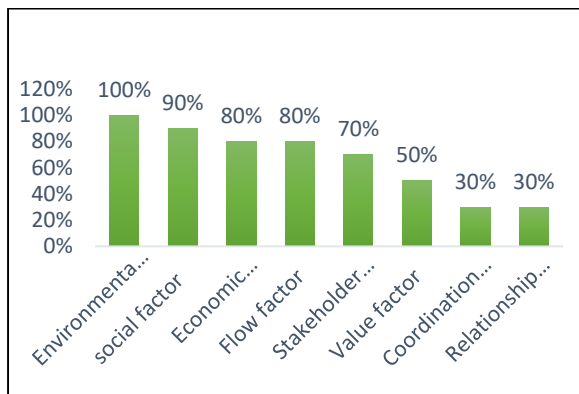


Figure 8. Pourcentages of SD and SCM factors addressed by SSCM definitions.

4.1.2. As an answer to RQ2 :What are the resemblances and distinctions between the GSCM and SSCM factors?

A comparative analysis of GSCM and SSCM is realised in order to determined the response to this question.

4.1.2.1. The comparison of the GSCM and SSCM definition addressed by the SD factors

A contrast between the GSCM and the SSCM definitions discussed by the SD factors has been presented in the Table III. The first column includes the SD factors which is (Environmental, Economic and Social factors), the ten after columns contains the GSCM definitions addressed by the SD factors and the last ten columns involve the SSCM definitions addressed by the SD factors.

After the comparison, we are showing that the environmental factor explicitly addressed the highest percentages of GSCM and SSCM definitions equally by 100%. In contrary, the definitions of GSCM and SSCM discussed by the economic factor demonstrate a significant gap between the percentages of each other that is 80% in SSCM definitions and 10% in GSCM definitions. Finally,

the percentage of SSCM definitions addressed by the social factor is 90%, but they have hardly any GSCM definitions addressing the social factor. The percentages of SD factors covered by the GSCM and SSCM definitions are shown in Fig. 8, which is based on Table IV data.

All of these analyses allowed us to arrive at the following conclusions:

- The environmental factor is consistently included in all GSCM and SSCM definitions, indicating that the GSCM and SSCM are fundamentally intended to improve the environmental dimension.
- It is necessary to highlight that the SSCM's economic factor is more significant than the GSCM's economic weight.
- The GSCM must be a strategic approach that focuses on enhancing the environmental aspect of sustainability as well as producing value at the economic level in light of these findings.
- It must be observed that there is not much of a difference between the first three percentages. The three aspects of sustainability (social, environmental, and economic) are consistently and simultaneously described as SSCMs.
- The social pillar serves as the distinction element between GSCM and SSCM.
- The SSCM, which is an extension of the GSCM, addresses all aspects of SD.

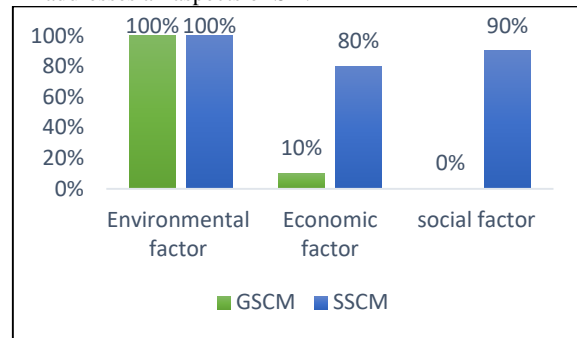


Figure 9. Percentages of SD factors addressed by GSCM and SSCM definitions.

4.1.2.2. The comparison of the GSCM and SSCM definition addressed by the SCM factors

A Distinction between the GSCM and the SSCM definitions explored by the SCM factors has been illustrated in the Table V. The first column includes the SCM factors that is (Flow, Stakeholder, Value, Coordination and Relationship), the ten after columns contains the GSCM definitions discussed by the SCM factors and the last ten columns accommodate the SSCM definitions discussed by the SD factors.

After the comparative analysis, we indicate that the maximum percentages of GSCM and SSCM definitions have been addressed simultaneously by the flow factor, which is 90% of GSCM and 80% of SSCM definitions, There's no big distinction between the two percentage concepts. Then, the definitions of GSCM and SSCM discussed by the stockholder factor demonstrate also no gap between the percentages of each other that is 70% in SSCM definitions and 60% in GSCM definitions. The value factor has been presented similarly by 50% in the GSCM and SSCM definitions. The same thing in GSCM

and SSCM definitions addressed by the coordination factor the two percentage are close of each other even if the percentages are feeble, 40% of GSCM definitions and 30% of SSCM definitions. Finally, the percentage of SSCM definitions addressed by the relationship factor is 30%, and it is 20% in GSCM definitions. Therefore, these two percentages are also near of each other and are the lowest. Fig 9 based on table V results illustrate percentages of SCM factors addressed by GSCM and SSCM definitions.

The outcome of this comparative study indicates that all the percentages of GSCM and SSCM definitions that tackle SCM factors are identical to each other, therefore flow and stakeholder factors are the highest percentage of both GSCM and SSCM definitions.

4.1.3. Summary

The primary goals of GSCM are to decrease harmful materials and collect all trash inside the industrial system itself. Academic communities and businesses have investigated or adopted a number of GSCM projects, such as green purchasing, sustainable production and green transportation. Additionally, according to [40] and [41], supply chain management is where you can easily get the GSCM statement. The "green" component of supply chain management also talks about the value of and connections between supply chains and the environment. The analyses in the preceding sentence make it clear that SSCM is an expansion of GSCM in that it adds social and economic considerations to the environmental ones [42]. Although almost all of GSCM's definitions place a strong emphasis on integrating environmental consideration into SCM processes, SSCM definitions incorporate the three pillars of sustainable development environmental, economic, and social into SCM practices. The study [32] offers a reflection on the components of SCM, specifically SCM as an economic reaction from SUSCM, GSCM as an environmental response, and social supply chain management as a social response, and according to [43] GSCM is included as a pillar which contributed in large part to the evolution of sustainable SCM.

Both GSCM and SSCM had several definitions that addressed supply chain management factors. The

consequence of this empirical study shows that all the percentages of GSCM and SSCM definitions addressing SCM factors are near each other. As a result, the majority of GSCM and SSCM definitions addressed the flow factor and the stakeholder factor. The value factor was presented by the same percentage of GSCM and SSCM definitions. The GSCM definitions showed more definitions emphasizing the coordination factor than the SSCM definitions. The relationship factor was more present in the SSCM definitions than in the GSCM definitions. According to the syntheses formed by the analysis of definitions, we can therefore place the two terms GSCM and SSCM in the universal illustration of SD as shown in Figure 11.

The comparative analysis conducted in this research can help manufacturing firm's managers in the choice of the appropriate SC practices in order to achieve sustainable performance goals. Implementing the GSCM practices in companies will first improve environmental performance and then economic performance, but it may not have a positive effect on social performance. On the other hand, organizations that adopt SSCM practices are much more likely to have a beneficial influence on the three dimensions of sustainable performance.

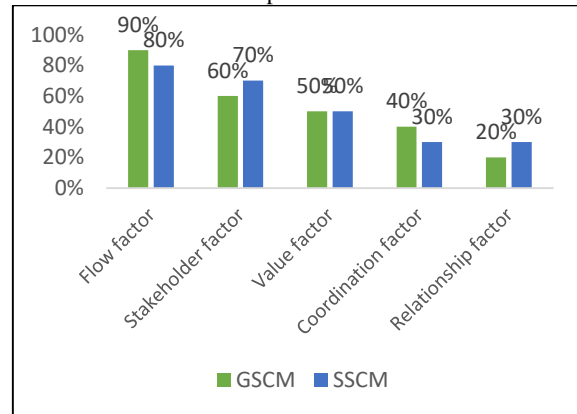


Figure 10. Percentages of SCM factors addressed by GSCM and SSCM definitions

Table 5. GSCM/ SSCM definitions and SD factors

Ref. paper	GSCM Definitions										SSCM Definitions									
	[21]	[9]	[22]	[23]	[24]	[10]	[25]	[25]	[26]	[27]	[28]	[29]	[5]	[1]	[2]	[7]	[30]	[11]	[11]	[31]
Environmental factor	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Economic factor			X								X		X	X		X	X	X	X	X
social factor												X	X	X	X	X	X	X	X	X

Table 6. GSCM/SSCM definitions and SCM FACTORS

Ref. paper	GSCM Definitions										SSCM Definitions									
	[21]	[9]	[22]	[23]	[24]	[10]	[25]	[25]	[26]	[27]	[28]	[29]	[5]	[1]	[2]	[7]	[30]	[11]	[11]	[31]
Flow factor	X	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	
Stakeholder factor		X			X	X	X	X	X		X		X	X	X	X		X	X	
Value factor		X	X	X				X		X			X		X	X			X	X
Coordination factor	X	X				X		X						X	X				X	
Relationship factor	X							X					X		X				X	

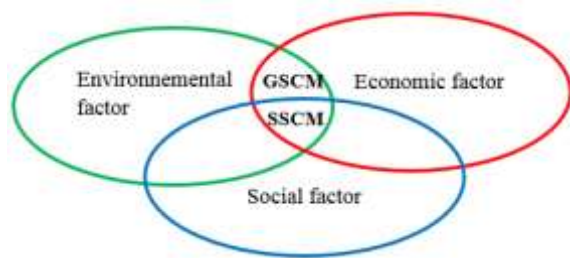


Figure 11. The proposed illustration of GSCM and SSCM in relation to SD

4.2. The limitations

- The majority of the review papers were located through searches in the Scopus database. A few pertinent related studies on SSCM and GSCM definitions and criteria may not have been included in the analysis because not all peer-reviewed publications are included in the collection of Scopus, a big database of management and scientific journals.
- Only English publications were searched, except for four
- Papers in French, which might miss some related articles published in journals not in other languages.
- The analysis focuses on only 10 GSCM definitions and 10 SSCM definitions, while they have influenced both SD and SCM factors, a few more definitions may have not been included.

4.3. The future research

Over the last two decades, GSCM research has focused on the overall impact of GSCM practices mainly on environmental and economic performance [11]. According to our review of 45 papers Figure 6, we find that 27% of the articles studied GSCM performance, practice, orientation and application, 17% educated SCM literature modeling and simulation, 12% learned SSCM definition literature modeling, 27% of articles, which is still spread over other topics shown in figure 6. After this database analysis, we may infer that the research focuses on the GSCM, SSCM or SCM performance practice literature, modeling, simulation separately. However, the works that have examined the GSCM and the SSCM associated are limited on 7%, see figure 6. As [44] indicates that a substantial selection of reviews of the literature explore the numerous topics that they solely on With SSCM. For this reason, we propose focusing our current and future research on areas that tie the GSCM and the SSCM together. We began this effort by defining GSCM and SSCM, identifying their contributing elements, and then noting their parallels and differences. Throughout Morocco, like our country, we may also focus on the similarities and differences between GSCM and SSCM practices against sustainable performance. However, there are other topics that can be addressed as the success factors of GSCM and SSCM in the world, such as a comparison of the GSCM and SSCM challenge and strategy, as well as the success criteria for both. We also observed in the assessment of literature that the manufacturing industries had the highest ranking overall, while only a small number

of Works examined Green and Sustainable SCM issues in the service sectors. However, future research might examine how supply chain management is implementing sustainable development.

5. Conclusion

The GSCM and SSCM definitions, sustainable development and SCM factors, as well as its presentations on GSCM and SSCM definitions, are the main topics of this research. In this work, the published definitions of GSCM and SSCM between 2000 and 2020 were identified by a review of the literature. The study's findings revealed that 20 different definitions of GSCM and SSCM have been published. The comparison analysis revealed that the two concepts shared and differed from each other in a number of ways. Economic, environmental, and social sustainability development elements were highlighted, together with the five SCM factors of flow, coordination, stakeholder, relationship, and value. The comparative analysis shows that definitions of GSCM focus on environmental, flow and stakeholder factors. However, the definitions of SSCM represent a focus on environmental, economic, social, flow and stakeholder factors. The results have shown that the differences between the two concepts is that GSCM definitions are generally based on the environment factors. Although SSCM definitions are based on the three levers of Sustainable Development (SD) (environmental, economic, social) at the same time. However, the flow and the stakeholder factors present the similarities between the two approaches. To conclude, the comparative analysis conducted in this research can help manufacturing firm's managers in the choice of the appropriate SC practices in order to achieve sustainable performance goals. Implementing the GSCM practices in companies will first improve environmental performance and then economic performance, but it may not have a positive effect on social performance. On the other hand, organizations that adopt SSCM practices are much more likely to have a beneficial influence on the three dimensions of sustainable performance. The identified definitions addressed the totality of the proposed sustainable development and SCM factors.

References

- [1] Vanalle, R. M., Ganga, G. M. D., Godinho Filho, M., & Lucato, W. C., «Green supply chain management: An investigation of pressures, practices, and performance within the Brazilian automotive supply chain.» *Journal of Cleaner Production*, vol. 151, p. 250-259, 2017.
- [2] Y. F. S. B. Fouad Jawab, «Hospital logistics activities.» *Proceedings of the International Conference on Industrial Engineering and Operations Management*, pp. 3228-3237, 2018.
- [3] Seuring, S, "A review of modeling approaches for sustainable supply chain management," *Decision Support Systems*, vol. 54, no. 4, p. 1513-1520, 2013.
- [4] F. J. Imane Tronnebati, «The similarities and differences between the green and sustainable supply chain management definitions and factors: A literature review.» *2020 IEEE 13th International Colloquium of Logistics and Supply Chain Management (LOGISTIQUA)*, pp. 1-6, 2020.

- [5] Ageron, B., Gunasekaran, A., & Spalanzani, A., "Sustainable supply management: An empirical study," *International Journal of Production Economics*, vol. 140, no. 1, p. 168–182, 2012.
- [6] A. A. F. J. I Ibn el Farouk, «Chaîne logistique hospitalière: définition, état de l'art et pistes d'amélioration», *CIGIMS 2012*, 2012.
- [7] Ibn El Farouk, I., Talbi, A., & Jawab, F., "Modeling and simulation of hospital supply chain: State of the art and research perspectives," in *4th International Conference on Logistics*, 2011.
- [8] F. J. Imane MOUFAD, «The Determinants of the performance of the urban freight transport-An empirical Analysis», *2018 International Colloquium on Logistics and Supply Chain Management (LOGISTIQUA)*, pp. 99-104, 2018.
- [9] F. J. Imane Moufad, «Conception and validation of a decision support model for Urban Freight Transport», *2017 International Colloquium on Logistics and Supply Chain Management (LOGISTIQUA)*, pp. 94-99, 2017.
- [10] Ashby, A., Leat, M., Hudson-Smith, M., "Making connections: a review of supply chain management and sustainability literature.," *Supply Chain Management: An International Journal*, vol. 17, no. 5, pp. 497-516, 2012.
- [11] Maditati, D. R., Munim, Z. H., Schramm, H.-J., & Kummer, S., "A review of green supply chain management: From bibliometric analysis to a conceptual framework and future research directions," *Resources, Conservation and Recycling*, vol. 139, p. 150–162, 2018.
- [12] Diabat, A., Kannan, D., & Mathiyazhagan, K., "Analysis of enablers for implementation of sustainable supply chain management – A textile case," *Journal of Cleaner Production*, vol. 83, p. 391, 2014.
- [13] Stock, J.R., Boyer, S.L., Harmon, T., «Research opportunities in supply chain management.,» *Journal of the Academy of Marketing Science*, vol. 38, n° 11, p. 32e41, 2010.
- [14] Fouad Jawab, Driss Bouami, "La démarche "supply chain management" enjeux et stratégies, cas du commerce électronique et de la grande distribution," *La Revue des Sciences de Gestion Direction et Gestion*, 2004.
- [15] M. e. Y. a. F. J. Imane Tronnebati, «A Review of Green Supplier Evaluation and Selection Issues Using MCDM, MP and AI Models», *Sustainability*, vol. 14, n° 124, 2022.
- [16] F. J. a. J. A. Imane Tronnebati, «Decision-Making Models for solving Green Supplier Evaluation and Selection problems», *2022 14th International Colloquium of Logistics and Supply Chain Management (LOGISTIQUA)*, 2022.
- [17] I. T. a. F. JAWAB, «The similarities and differences between the green and sustainable supply chain management definitions and factors: A literature review», *2020 IEEE 13th International Colloquium of Logistics and Supply Chain Management (LOGISTIQUA)*, 2020.
- [18] ArifKhaoula Azzouz, J., Mouzouna, Y., Jawab, F., «Design on Improvement of Traceability Process in the Outsourcing of Logistics' Activities Using the Internet of Things (IoT) Applications», *International Journal of Advanced Science and Technology*, vol. 29, n° 11, p. 1093_1108, 2020.
- [19] Y. F. J. Fouad, «Modeling the impact of hospital logistics on quality of care and patient satisfaction: Results of a survey in three public healthcare facilities in Fez, Morocco», *Journal of Industrial Engineering and Management*, vol. 13, n° 12, pp. 296-320, 2020.
- [20] F. J. Jabir Arif, «Outsourcing of logistics' activities: Impact analysis on logistics service performance», *2018 International Colloquium on Logistics and Supply Chain Management (LOGISTIQUA)*, pp. 88-92, 2018.
- [21] Ahi, P., & Searcy, C., "A comparative literature analysis of definitions for green and sustainable supply chain management," *Journal of Cleaner Production*, vol. 52, p. 329–341, 2013.
- [22] W. L. Boxue Zhong, «Modeling and Analysis of Relationship Between Flow Characteristics and Efficiency of Reciprocating Porous Medium Burner», *Jordan Journal of Mechanical and Industrial Engineering*, vol. 16, no. 11, pp. 1 - 9, 2022.
- [23] Jawab, f., Bouami, D., Tahon, C., «La Gestion Partagée des Approvisionnements, outil déterminant pour l'optimisation de la supply chain.,» *Conception et production intégrées*, 2001.
- [24] M. R. S. E. M. R. N. a. M. A. R. Irfan ur Rahman, «Proposing Multi-item Replenishment model for an Inventory Management System of Malaysia's SMEs», *Jordan Journal of Mechanical and Industrial Engineering*, vol. 16, no. 13, pp. 395-401, 2022.
- [25] Ahi, P., Searcy, C., & Jaber, M. Y., «Energy-related performance measures employed in sustainable supply chains: A bibliometric analysis.,» *Sustainable Production and Consumption*, vol. 7, p. 1–15, 2016.
- [26] F. J. Youssef E. L. Mokaddem, «Researches and applications of Intelligent Transportations Systems in urban area: Systematic literature review», *ARPN Journal of Engineering and Applied Sciences*, vol. 14, n°13, 2019.
- [27] M. J. F. S. L. B. a. T. G. Luai Jraisata, «No Actor is an Island: The Role of Partnerships in Sustainable Value Chains», *Jordan Journal of Mechanical and Industrial Engineering*, vol. 16, no. 12, pp. 163-174, 2022.
- [28] J. A. Fouad Jawab, «Risk matrix model applied to the outsourcing of logistics' activities», *Journal of Industrial Engineering and Management (JIEM)*, vol. 8, n° 14, pp. 1179-1194, 2015.
- [29] S. L. a. H. L. Dandan Liu, «Experimental Study on Formaldehyde Emission from Environmental Protection and Energy-Saving Alcohol Fuel for Vehicles», *Jordan Journal of Mechanical and Industrial Engineering*, vol. 15, no. 11, pp. 1 - 6, 2021.
- [30] Julia, W., «Sustainable Supply Chain Management Integration: A Qualitative Analysis of the German Manufacturing Industry», *Journal of Business Ethics*, vol. 102, n° 12, pp. 221-235, 2011.
- [31] H. A. Q. F. H. A. Q. a. O. H. Nader Al Theeb, «Utilizing AHP-TOPSIS as Multi-Criteria Decision Approaches to Select the Best Alternative for Waste to Energy Technology», *Jordan Journal of Mechanical and Industrial Engineering*, vol. 16, no. 14, p. 601 – 613, 2022.
- [32] S. Cholette, K. Venkat., «The energy and carbon intensity of wine distribution: A study of logistical options for delivering wine to consumers», *Journal of Cleaner Production*, vol. 17, n° 116, p. 1–13, 2009.
- [33] J.B. Edwards, A.C. McKinnon, S.L. Cullinane., «Comparative analysis of the carbon footprints of conventional and online retailing: a "last mile" perspective», *International Journal of Physical Distribution and Logistics Management*, vol. 40, n° 11–2), p. 103–123, 2010.
- [34] M. J. A. A. S. M. P. A. M. a. M. E. H. A. Ehsan Abbasi Teshnizia, «Comprehensive Energy-Econo-Enviro (3E) Analysis of GridConnected Household Scale Wind Turbines in Qatar», *Jordan Journal of Mechanical and Industrial Engineering*, vol. 15, no. 12, pp. 215 - 231, 2021.
- [35] White, L., & Lee, G. J., «Operational research and sustainable development: Tackling the social dimension.,» *European Journal of Operational Research*, vol. 193, n° 13, p. 683–692, 2009.
- [36] Wittstruck, D., & Teuteberg, F., «Understanding the Success Factors of Sustainable Supply Chain Management: Empirical Evidence from the Electric and Electronics Industry.,» *Corporate Social Responsibility and Environmental Management*, vol. 19, n° 13, p. 141_158, 2011.
- [37] F. J. Imane Moufad, «A study framework for assessing the performance of the urban freight transport based on PLS

- approach.» *Archives of Transport*, vol. 49, 2019.
- [38] F. J. Imane Moufad, «A study framework for assessing the performance of the urban freight transport based on PLS approach.» *Archives of Transport*, p. 49, 2019.
- [39] El Mokaddem, Y., Jawab, F., «Researches and applications of intelligent transportation systems in urban area: systematic literature review.» *ARPN Journal of Engineering and Applied Sciences*, 2019.
- [40] Barbara, K., «2004. Procedures for performing systematic reviews.» *Keele, UK, Keele University*, vol. 33, pp. 1-26, 2004.
- [41] Wee, H.-M., Lee, M.-C., Yu, J.C.P., Wang, C.E., «Optimal replenishment policy for a deteriorating green product: life cycle costing analysis.» *International Journal of Production Economics*, vol. 133, n° %12, p. 608e611, 2011.
- [42] Kim, J.H., Youn, S., Roh, J.J., «Green supply chain management orientation and firm performance: evidence from South Korea.» *International Journal of Services and Operations Management*, vol. 8, n° %13, p. 283e304, 2011.
- [43] Buyukozkan, G., Cidci, G., «A novel hybrid MCDM approach based on fuzzy DEMATEL, fuzzy ANP and fuzzy TOPSIS to evaluate green suppliers.» *Expert Systems with Applications*, vol. 39, n° %13, p. 3000e3011., 2012.
- [44] Andic, E., Yurt, O., Baltacioglu, T., «Green supply chains: efforts and potential applications for the Turkish market.» *Resources, Conservation and Recycling*, vol. 58, p. 50e68., 2012.
- [45] Wu, Z., Pagell, M., «Balancing priorities: decision-making in sustainable supply chain management.» *Journal of Operations Management*, vol. 29, n° %16, p. 577e590, 2011.
- [46] M. Joëlle, «Le Sustainable Supply Chain Management : Une première étape de modélisation.» *8èmes Rencontres Internationales de la Recherche en Logistique*, 2010.
- [47] Diabat, A., Khodaverdi, R., & Olfat, L., «An exploration of green supply chain practices and performances in an automotive industry.» *The International Journal of Advanced Manufacturing Technology*, vol. 68, n° %1(1-4), p. 949–961, 2013.
- [48] Olugu, E. U., Wong, K. Y., & Shaharoun, A. M., «Development of key performance measures for the automobile green supply chain.» *Resources, Conservation and Recycling*, vol. 55, n° %16, p. 567–579, 2011.
- [49] Chin, T. A., Tat, H. H., & Sulaiman, Z. , «Green Supply Chain Management, Environmental Collaboration and Sustainability Performance.» *Procedia CIRP*, vol. 26, p. 695–699, 2015.
- [50] Closs, D.J., Speier, C., Meacham, N., «Sustainability to support end-to-end value chains: the role of supply chain management.» *Journal of the Academy of Marketing Science*, vol. 39, n° %11, p. 101e116, 2011.
- [51] Walker, H., & Jones, N., «Sustainable supply chain management across the UK private sector.» *Supply Chain Management: An International Journal*, vol. 17, n° %11, p. 15–28, 2012.
- [52] Zailani, S., Jeyaraman, K., Vengadasan, G., & Premkumar, R., «Sustainable supply chain management (SSCM) in Malaysia: A survey.» *International Journal of Production Economics*, vol. 140, n° %11, p. 330–340, 2012.
- [53] Wolf, J., «The Relationship Between Sustainable Supply Chain Management, Stakeholder Pressure and Corporate Sustainability Performance.» *Journal of Business Ethics*, vol. 119, n° %13, p. 317–328, 2013.
- [54] Li, J., Fang, H., & Song, W., «Sustainable supplier selection based on SSCM practices: A rough cloud TOPSIS approach.» *Journal of Cleaner Production*, 2019.
- [55] Kim, J., & Rhee, J., «An empirical study on the impact of critical success factors on the balanced scorecard performance in Korean green supply chain management enterprises.» *International Journal of Production Research*, vol. 50, n° %19, p. 2465–2483, 2012.
- [56] Carter, R.C., Easton, P.L., «Sustainable supply chain management: evolution and future directions.» *International Journal of Physical Distribution & Logistics Management*, vol. 41, n° %11, p. 46e62, 2011.
- [57] Mardani, A., Kannan, D., Hooker, R. E., Ozkul, S., Alrasheedi, M., & Tirkolaee, E. B., «Evaluating of Green and Sustainable Supply Chain Management Using Application of Structural Equation Modelling: A systematic review of the state of the art literature and recommendations for future research.» *Journal of cleaner production*, pp. 119-383, 2019.
- [58] Rajeev, A., Pati, R. K., Padhi, S. S., & Govindan, K., «Evolution of sustainability in supply chain management: A literature review.» *Journal of Cleaner Production*, vol. 162, p. 299–314, 2017.
- [59] Couto, J., Tiago, T., Gil, A., Tiago, F., & Faria, S., «It's hard to be green: Reverse green value chain.» *Environmental Research*, vol. 149, p. 302 313, 2016.
- [60] Laari, S., Töyli, J., Solakivi, T., & Ojala, L., «Firm performance and customer-driven green supply chain management.» *Journal of Cleaner Production*, vol. 112, p. 1960, 2016.
- [61] Paulraj, A., Chen, I. J., & Blome, C., «Motives and Performance Outcomes of Sustainable Supply Chain Management Practices: A Multi-theoretical Perspective. , (2),» *Journal of Business Ethics*, vol. 145, p. 239–258, 2015.
- [62] Khaksar, E., Abbasnejad, T., Esmaili, A., Tamošaitienė, J., «The effect of green supply chain management practices on environmental performance and competitive advantage: a case study of the cement industry.» *Technological and Economic Development of Economy*, vol. 22, pp. 293-308, 2016.
- [63] Ahi, P., & Searcy, C., "An analysis of metrics used An analysis of metrics used to measure performance in green and sustainable supply chains," *Journal of Cleaner Production*, vol. 86, p. 360, 2015.
- [64] Dubey, R., Gunasekaran, A., & Papadopoulos, T., "Green supply chain management: theoretical framework and further research directions," *Benchmarking: An International Journal*, vol. 24, no. 1, p. 184–218, 2017.
- [65] Jawab, F., Talbi, A. & Bouami, D., «Le réapprovisionnement continu dans les réseaux industriels, vers une meilleure gestion des interfaces de la « supply chain ».» *La Revue des Sciences de Gestion*, vol. 218, n° %12, pp. 123-137, 2006.
- [66] J. F. Zehmed Karim, «Measuring urban public transport performance on route level: A literature review.» *MATEC Web of Conferences*, vol. 200, p. 00021, 2018.