The Study of Implementing Green Supply Chain Concept in Business Perspective A Systematic Study Review and Future Challenges

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Abstract. Examining and pursuing the Green Supply Chain (GSC) field of research provides an idea in understanding in relation to seeing the extent of the use of chain management of green supply chains used both academics and practitioners. Scientific publications related to green supply chain research are still limited, therefore requires review research to describe the extent to which the concept of green supply chain is applied in business organizations. This study use a literature study with an analysis model review. Emerald Insight Platform (www.emrald.com) was chosen to get scientific journals with the theme of Green Supply Chain. This platform was chosen because: has a depth in explaining the purpose of the articles it published, the language that easily understood, and the use of terms that is easily understood. The research showed, research in the field of green supply chain divided into 5 main themes of writing: framework development, case study literacy, investigating the success of GSC, GSC to Support Business Performance, and Technology and IT Literation. The density index value provides clarification that the use of the concept of green supply chian focused on the field of framework development. The future study in the GSC field refers to the relative density index value by focusing on the realm (1) Modeling Framework, (2) Using Journal Approach, (3) Failure Model and Effect Analysis (FMEA), (4) Boost Value Chain With Process Flow, and (5) Internet of Thing (IoT) Approach.

Keywords: Green Supply Chain, Systematic Literature Review, Density Index, and Density Index Relatives

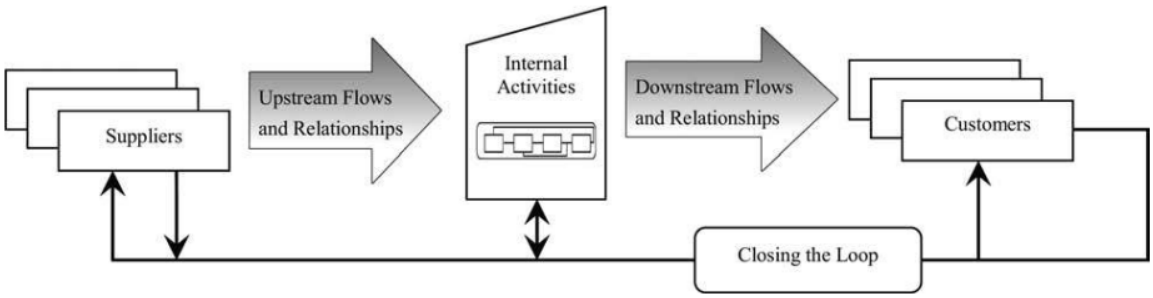
1. Introduction

The development and interest in the field of supply chain has received attention both for academics and practitioners. During its development this field has touched not only in the field of manufacturing, but also in the field of services [1]. The development of the field of science from time to time has given a real evolution in the field of supply chain which in this field touches on the field of environment which in the business process of implementing pays attention to the impact and impact on the environment, which is currently known as the concept of the Green Supply Chain (GSC) concept (GSC). The application of the Supply Chain concept in the fields of industry and manufacturing because there is a business intervention in it better known as the concept of Green Supply Chain Management (GSCM) [2]. GSCM is part of the form of sustainability in the field of supply chain, the definition is defined by Oleg [3] as "Strategic Integration, Transparent and Achievement of Social, Environmental and Economics of the Organization in Coordination Each company and supply chain ", therefore in the implementation of the GSCM concept requires a planned plan and supply chain control in a closed and complete cycle end-to-end [1]. The GSCM concept is substantially driven by the urgency of the importance of paying attention to the production process that is more environmentally friendly and does not have a spatial impact on the environment such as environmental pollution that accompanies industrial development [2], reduced sources of raw materials, overflowing waste locations and increased pollution levels [4]. At the same time, government regulations, changes in consumer demand, and the development of international certification standards [5] have undergone changes which support the greener environmental concepts, so this is the second consideration for manufacturing company management to change towards a greener direction. However, the integration of logistics flow in the green supply chain remains an important issue in GSCM [2].

The GSCM concept is basically a derivative of the SCM concept which in this concept teaches the activities of upstream, downstream and internal organizations. In Figure 1 shows how the three interactions are intertwined in business organizations, keep in mind in the SCM concept involving up-stream and down-stream processes.

ICBAE 2022, August 10-11, Purwokerto, Indonesia

DOI 10.4108/eai.10-8-2022.2320870



Source: adopted from [6]

Fig. 1. Basic Concepts of Supply Chain Management (SCM)

Based on Figure 1, the activity contained in "Upstream Flows and Relationship" is an upstream activity where this activity is more related to the external parties of the organization such as related to stakeholders and suppliers. Included in this section are activities (1) outsourcing, (2) audit vendors, (3) management and selection of management, (4) collaboration with suppliers, and (5) building relationships with suppliers [7]. Generally for some business organizations in "Upstream Flows and Relationship" using the long approaches and ways in conducting external relations with stakeholders and suppliers [8]. In this section also the occurrence of material transport as well as material movement and transfer, henceforth in this section also considered how the strategic relationship between business organizations and intertwined suppliers. In the realm and its relationship with the GSCM concept, in this section requires strategic considerations which components can be made more "green" [9].

Activities in "Internal Activities" describe how business organizations carry out their daily activities in conducting production activities and operational activities. In this section the main challenge that must be faced by the organization is how to regulate the plot, relationship, and resources in order to work together and in tune. Included in this section is the activity (1) research and design, (2) regulation of quality standards, (3) inventory, (4) materials and internal raw materials, and (5) Internal technology is able to reflect and influence the environment Internal organization [7]. Activities in "Internal Activities" can occur within the organizational environment of manufacturing and services [9].

Continuing on the activity "Downstream Flows and Relationship" which is the opposite of Upstream Flows and Relationship. Is a downstream activity where this activity is more related to the external parties of the organization such as related to customers, distributors, transportation, and warehousing. Included in this section is the activity (1) regulating customer service, (2) distributor network, (3) Mapping of effective transportation paths, and (4) warehousing management [7]. In this activity the business organization depends on environmental changes that harmonize business organizations to be able to respond as well as possible [6]. Continuing in the last activity namely "Closing of the Supply Chain Loop" where this is an activity that accommodates the "Reverse Supply Chain" which emphasizes the reciprocal relationship between upstream to downstream and downstream to upstream. This relationship will result in a closed cycle so that it allows the same relationship to be repeated so that it brings financial benefits for business organizations [6]. Included in this section are activities (1) Remanufacturing, (2) reclamation, and (3) reverse logistics [7]. In closing in the cycle, this has the implications of dominating, where many studies in this field have shown results and benefits both in economics and business [10].

This research is a research based on systematic literature that tries to reveal how scientific studies that discuss related to the concept of green supply chain (GSCM) are applied by practitioners and academics. Until now the number of studies that take the theme of GSCM is still limited, so it requires a review of the study that discusses the urgency and importance of this GSCM concept for business organizations. It is hoped that in the future there will be more studies in the field of GSCM which ultimately have positive implications for the development of manufacturing organizations and services. Therefore a number of major research questions are asked as the direction of discussion and implications of this article.

1. What and what are the trends of scientific studies in the field of Green Supply Chain (GSCM)?
2. What is the theme in the field of Green Supply Chain (GSCM) which is still not or less explored in literature as a reference for future research?

As a manifest of the systematic literature design, in the first part of this study explains the background and research objectives which then lead to research questions. The second part explains the systematic review methodology, which will describe (1) literature sources, (2) tabulation methods, (3) analytical methods which are then completed with the research framework. The third part and the last part, describe the results of the literature study and discussion intended to answer research questions [11].

2. Method

Research Design

This study uses literature -based study design. [12] Explaining the existence of a literature study design makes it possible to develop other research models that are relevant to existing research trends, so that this allows research to find research gaps so as to be able to formulate research results that have renewal and benefits for business organizations. Furthermore [13] Describe that the key element of literature study research is the process of research synthesis, this process allows summarizing several scientific studies that are sourced from various literature to be put together, simplified, and most importantly is found a gap between one scientific study and another. The purpose of the synthesis of this study is to explain the analysis of findings obtained from various scientific studies, which are then drawn conclusions so that they can be used in determining the steps in the future of the use of the concept of green supply chain management (GSCM).

Literature Review Process and Analysis

As a scientific research method, a literature review plays an important role in gathering and disseminating its main knowledge in the field of management and for business organizations [14]. Literature study methodology requires good methodological and accuracy options, this is because this use allows researchers to examine various kinds of articles and article documents whose numbers are not small [15]. Furthermore [14] highlights the use of literature studies for mapping, socialization and evaluation in certain fields of research. This literature -based review approach follows a systematic and explicit design, which is designed to maximize replication while possible for transparency and minimizing researchers' bias in each step of the research process [15].

Some previous researchers [16] [17] gave a review of the use of literature -based analysis as one of the representative methods in the study of supply chain management and their derivatives to get the research gap. Furthermore [18] added to assess the qualitative aspects in literature studies to be more systematic and able to have a scientific impact that can be accounted for. The following are steps and approaches developed by [18] as a form of literature study that is more representative and is able to prioritize qualitative aspects that can be accounted for.

1. Material Collection

In the study of literaturestudies the first thing that is important is how to find scientific articles stored in hundreds to thousands of journal publishers. Therefore, the keyword is the main identity in imposing relevant scientific articles, so that researchers study literature studies must be mapped and reduced the scope of the keyword referred to [14]. This keyword can represent the theme of the article which is then searched in the repository of articles publishers such as Emerald, Proquest, Wiley, and EBSCO Host [19].

Furthermore, material collection requires each article to be reviewed manually, following a two -step approach to determine its relevance. First, abstract articles are reviewed to determine whether the article research design is really the subject of the theme sought. Second, the complete text review is carried out to assess whether the article meets the requirements for the final sample. As a condition for being included in the sample, the article manuscript has fulfilled the criteria desired by researchers who are not significantly in the inclusion criteria.

2. Descriptive analysis

It is a stage where scientific articles to be chosen are confirmed to be free from the specified inclusion criteria at the first stage. Descriptive assessment can use insight from researchers who are the main justification of scientific articles deserved to be included in the sample to further study the content of the article [19].

3. Category Selection

This stage prioritizes the overview of the contents of the selected article. Sometimes researchers find research titles and themes that are not included in the inclusion criteria, but the content of the article in question is not feasible or not appropriate to be used as a literature study material, this occurs in manuscripts that are legally still not published by the publisher journal [19].4. Evaluation material.

4. Evaluation material

This stage puts forward what the researchers want or demonstrated from the literature study [6]. Researchers have freedom in determining what they want to display as well as how the direction and form of analysis of the literature study. The most important thing that needs to be considered is able to answer research questions, besides that the study must be representative and comprehensive so that the level of depth and renewal highlighted by researchers can be accounted for [19].

As a form of manifest of the Literature Study Management in this study using the Protocol View approach [20] which is divided into several practical steps, among others:

1. Use a scientific journal database option that allows researchers to have enough options to choose articles that are in accordance with their research [13]. Researchers can use more than one journal database, but researchers are also allowed to choose a journal database, which is based on rational reasons and does not violate scientific research rules.
2. The combination of keywords used in the journal database must be carefully selected [13]. The right keyword selection will make it easier for the next step.

3. Scientific articles obtained from the journal database must aim to guarantee the quality of research, selection of appropriate academic journal groups [21]
4. Resignation Search is the process of reviewing a paper quoted in the article taken through keyword search, and a progress search is the process of reviewing famous papers quoting articles taken [20] (see Figure 2).

Based on search results in the journal database, found approximately 12,170 scientific articles that support the overall supply chain management theme. Scientific articles that are classified as non-peer-review and written in the language of the English language will be removed from the list of potential analysis articles [22]. Further access in the journal database used is to use guest actions (guest login) then there are a number of limitations in the search process namely (1) unable to access scientific articles published in 2022 and (2) The number of articles that can be accessed is the first 1,000 articles. Further-more inclusion criteria are added to potential articles before making potential articles on analysis, namely

1. Articles that discuss manufacturing, without accompanied by elements of the concept of supply chain management.
2. Articles that discuss the concept of supply chain management without accompanied by elements of green supply chain or green manufacturing.
3. Articles that discuss about the concept of Supply Chain Management concept
4. Articles that discuss manufacturing performance.

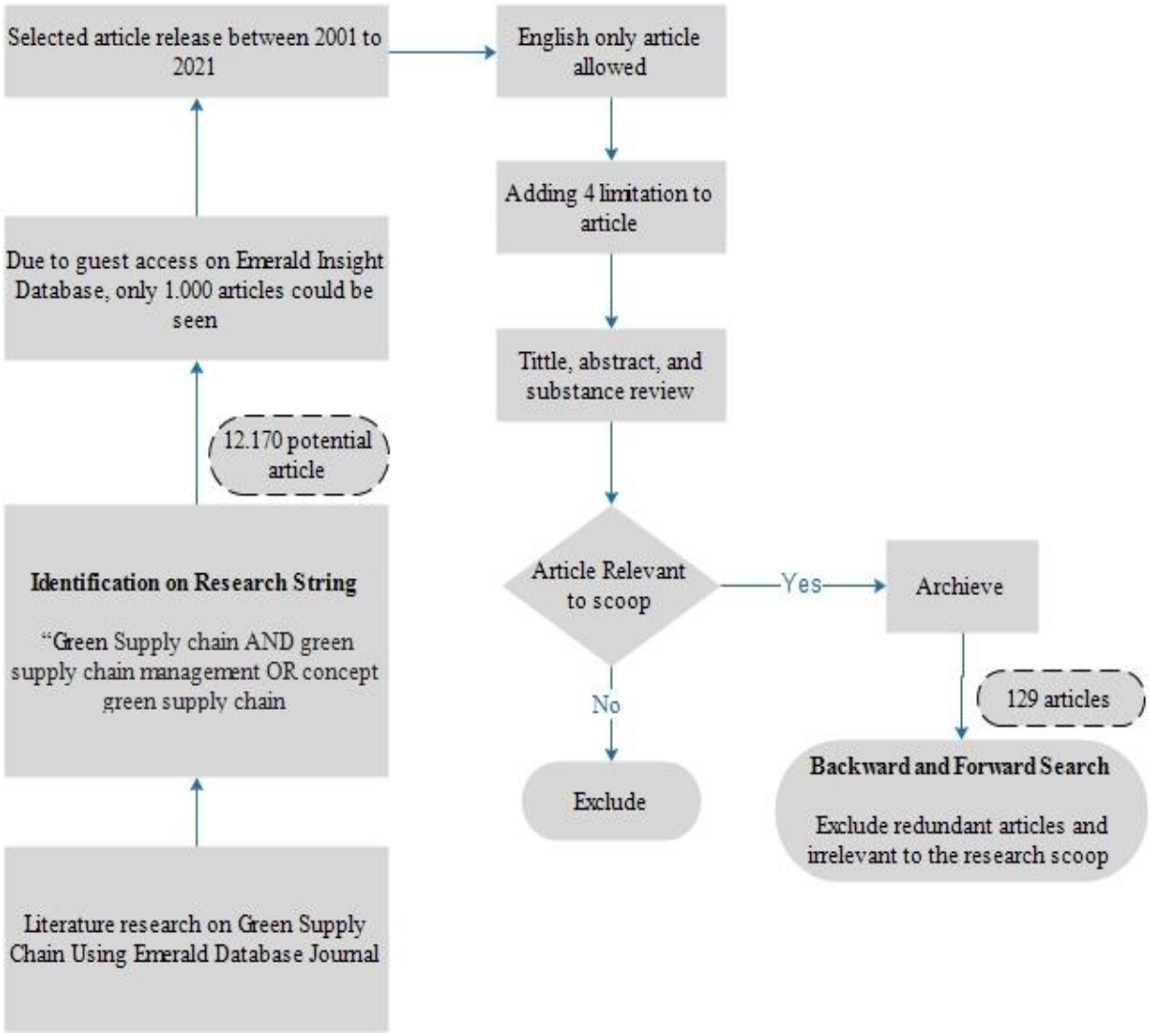
3. Results And Discussion

Data frequency distribution

The distribution of data frequencies based on the year of the publishing scientific article is 129 articles, which all these articles are in accordance with the criteria for further analysis (see Figure 3). This picture describes the trend of scientific articles in the field of GSCM began in 2005, where in that year emphasized the attention of academics related to the existence of new derivatives in SCM inspired by environmental factors. This is directly as a sign of a paradigm shift from the perpetrators in the manufacturing industry who maintain and improve the main supply chain performance in the realm of "greening" the production process. The article was written by the author from 26 countries (indicating the affiliate state from the first author).

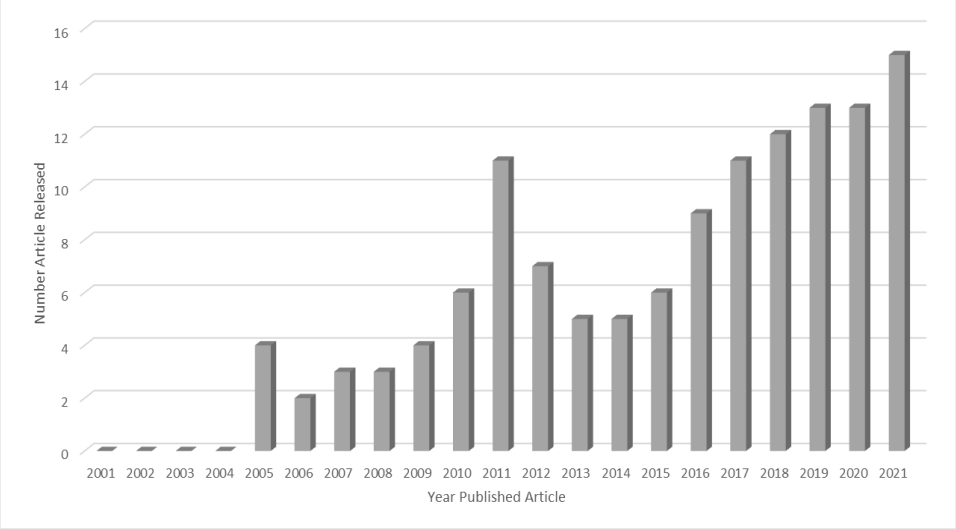
The geographical distribution of articles is shown in Figure 4, and India (35 scientific article manuscripts) are countries that have the highest number of article writers among other countries as well as a marker of great attention from the country to the GSCM concept. Followed by the USA state (28 scientific article manuscripts). The scenery here is the lack of writers from Indonesia who raised this GSCM concept into the international research scene. Therefor this scientific study is hoped to be able to provide a scientific picture of the importance of the concept of GSCM for scientific writers both contract and practitioners, so that in the future the GSCM concept is more familiar to scientific writers in Indonesia.

The limit in this study is the text of the article reviewed is using a single platform of the journal database namely Emerald, while the use of other platforms that can be used to enrich relevant journals such as (1) Scopus (www.scopus.com), (2) Elsevier (www. sciencedirect.com), (3) Taylor & Francis (http://www.taylorandfrancis.com), (4) Springer (https://www.springer.com/gp) (5) IEEE (https://IEEEXPLORE .ieee.org/) and (6) Google Scholar is not used [23].



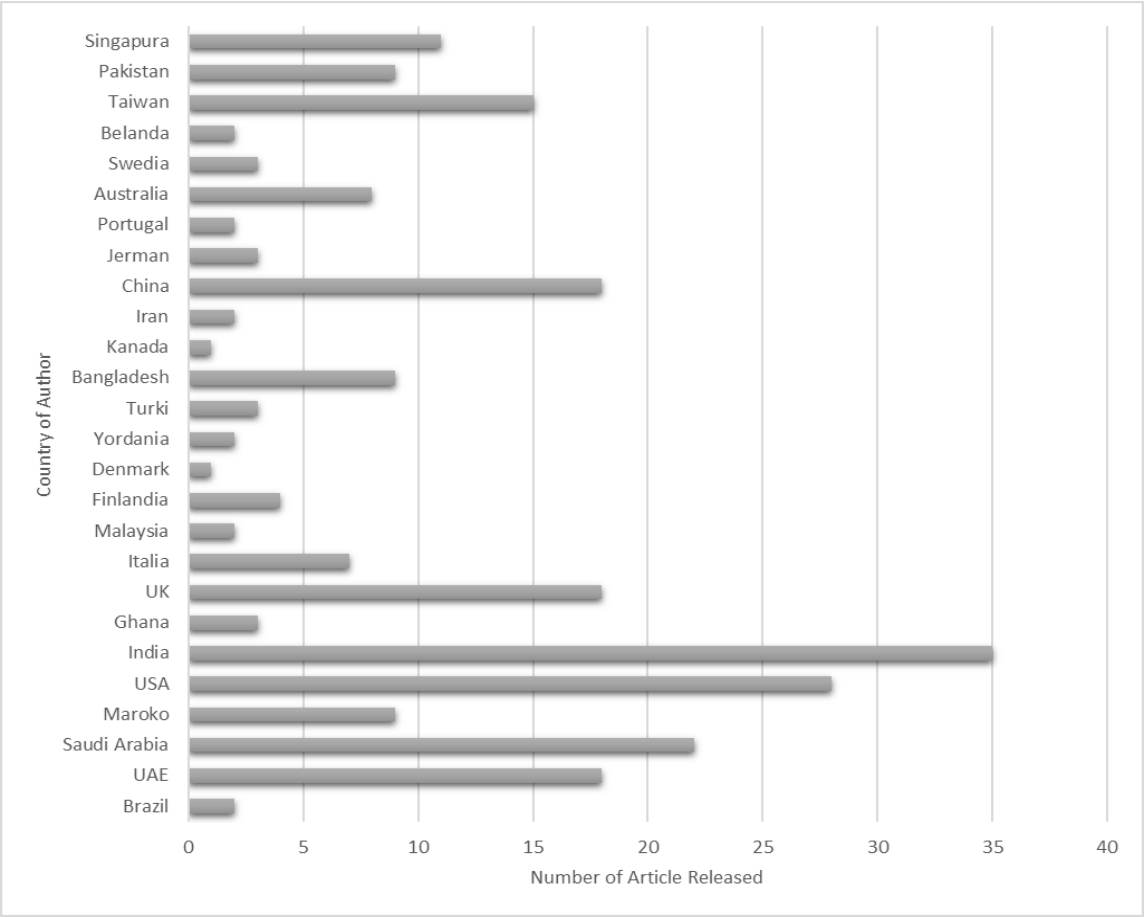
Source: Adopted from [22]

Fig. 2. Research Framework



Source: Research Data Processing Results, 2021

Fig. 3. Distribution by Year of Scientific Articles in the Field of Green Supply Chain



Source: Research Data Processing Results, 2021

Fig. 4. State Publisher Scientific Articles in the Field of Green Supply Chain

The Emerald Journal Database Platform was chosen from various other journal database platforms because of several reasons including the first, the Emerald Journal Database has a depth in the explanation and pronunciation of the sentences and the purpose of the article published in it. This also concerns the harmony between the title of the article, purpose, results, discussion, and drawing conclusions so that it becomes a unity of manuscripts that are easier to understand the purpose of writing the article. Second, the Emerald Journal Database has grammar and use of vocabulary that is not too scientific, so the purpose of writing articles published by this database is able to provide more understanding than other journal databases. Table 1 describes the distribution of publisher journals incorporated in the Emerald Journal Database which is the study material in this study. Journal of Supply Chain Management Publisher: An International Journal is a publisher journal whose article manuscripts publish the most discussion of studies related to GSCM (18 articles). Followed by the Journal of Industrial Management & Data Systems Publisher is a publisher journal whose article is the second most in publishing the discussion of studies related to GSCM (17 articles). Variated the name of the Journal of the Publisher of Articles that discusses the study related to GSCM shows the attention of scientific researchers both from academics and practitioners to introduce the GSCM concept as part of the integrated SCM concept in order to benefit from the use of this GSCM concept for business organizations and for the development of scientific studies going forward.

Tabel 1. Sebaran Publisher Penerbit Jurnal Ilmiah

No	Nama Jurnal Penerbit	Jumlah		No	Nama Jurnal Penerbit	Jumlah
1	Supply Chain Management: An International Journal	18		10	World Journal of Science, Technology and Sustainable Development	7
2.	European Business Review	6		11	International Journal of Physical Distribution & Logistics Management	7

3	International Journal of Contemporary Hospitality Management	6		12	*Journal of Asia Business Studies*	7
4	Industrial Management & Data Systems	17		13	Journal of Manufacturing Technology Management	7
5	International Journal of Operations & Production Management	6		14	Kybernetes	6
6	Competitiveness Review: An International Business Journal	6		15	Journal of Modelling in Management	4
7	Management Research Review	7		16	The International Journal of Logistics Management	6
8	Benchmarking: An International Journal	9		17	Asia Pacific Journal of Marketing and Logistics	3
9	Management of Environmental Quality: An International Journal	7				

Source: Research Data Processing Results, 2021

Research Trend Research Green Supply Chain Management (GSCM)

The trend shows the future potential for the GSCM research field. This field of research began to be promoted in 2005 and received a lot of attention from academics of scientific writers to develop in 2016-2021. However, this trend experienced stagnant after 2011 and began to be examined again in 2016. This shows that there is a condition The scientific gap for 3 years, several articles revealed the existence of this stagnant due to the condition of GSCM that were not met. Although some experts have recognized the importance of GSCM and have discussed its implications for the performance, conceptualization and operationalization of GSCM is still ambiguous and inconsistent; Empirical evidence of how GSCM affects performance is still rare. To advance an understanding of this GSCM approach, this study provides insight for scientific researchers in the field of academics and practitioners by providing a trend of the area and how relevance will be in the future. Furthermore, with the Density Index (DI) value and the Relatively Density Index (D-R) value will disburse the scientific picture of the extent of GSCM, both applied significantly in manufacturing or analogizing using certain approaches to see GSCM performance and effectiveness.

The GSCM research trend examined in this study includes 2 trends, namely (1) methodological trend, (2) data level trend [22]. Methodological trends show a methodological approach used by scientific researchers from 2001 - 2021 who pursue the GSCM field. By knowing this trend, it can be concluded the extent of the implementation of GSCM in business organizations and how the study was carried out by these scientific researchers (see Figure 5). In this study there are 5 methodological approaches used including (1) Descriptive Research, (2) Fundamental Research, (3) Applied Research, (4) Conceptual Research, and (5) Qualitative Research [24]. Descriptive Research is a research methodology that prioritizes the exploration of existing phenomena without adding further treatment or analysis of the phenomenon and concluding based on the existing phenomena. Fundamental Research is a research methodology that prioritizes gathering opinions from experts or practitioners in their fields which are then triangulated to get the validity of the research to be conducted. Applied Research is a research methodology that prioritizes finding solutions on the basis of certain phenomena, the results of this method are strategic suggestions that can be used by business organizations in making decisions. Conceptual Research is a research methodology that prioritizes the use of ideas from previous researchers or practitioners which is then used as a basis for building a basis for logical thinking so as to make this method full of influence from previous research. Finally, Qualitative Research is a research methodology that prioritizes investigations of the findings or real problems that exist in the object of research, the results of research with this method will be enriched with an approach that is able to support the investigation carried out [25].

Based on the presentation in Figure 5 the distribution of the use of methodology in the last 21 years in the field of GSCM is varied. At the beginning of the dominant year of research methodology used was descriptive research, conceptual research, and fundamental research (dominant use in the range of 2005-2013). Most types of articles that discuss the research methodology above are related to the study of literature studies, GSCM exploration in the realm of business organizations, as well as reviewing problems in manufacturing that are trying to be resolved with the concept of GSCM [26] [16] [17]. Further research with the use of this methodology produces several research frameworks that are used as a forerunner to further researchers so as to enrich the understanding and implementation of GSCM in the scientific domain [6]. Furthermore, in 2013 the variant of research methodology began to develop such as the use of applied research and qualitative research. The

implication of the use of this research methodology is likely GSCM to be applied in business organizations at a strategic level such as Firm Performance and Practice, Supply Chain Resilience, and Drivers Performance [27] [28] [29].

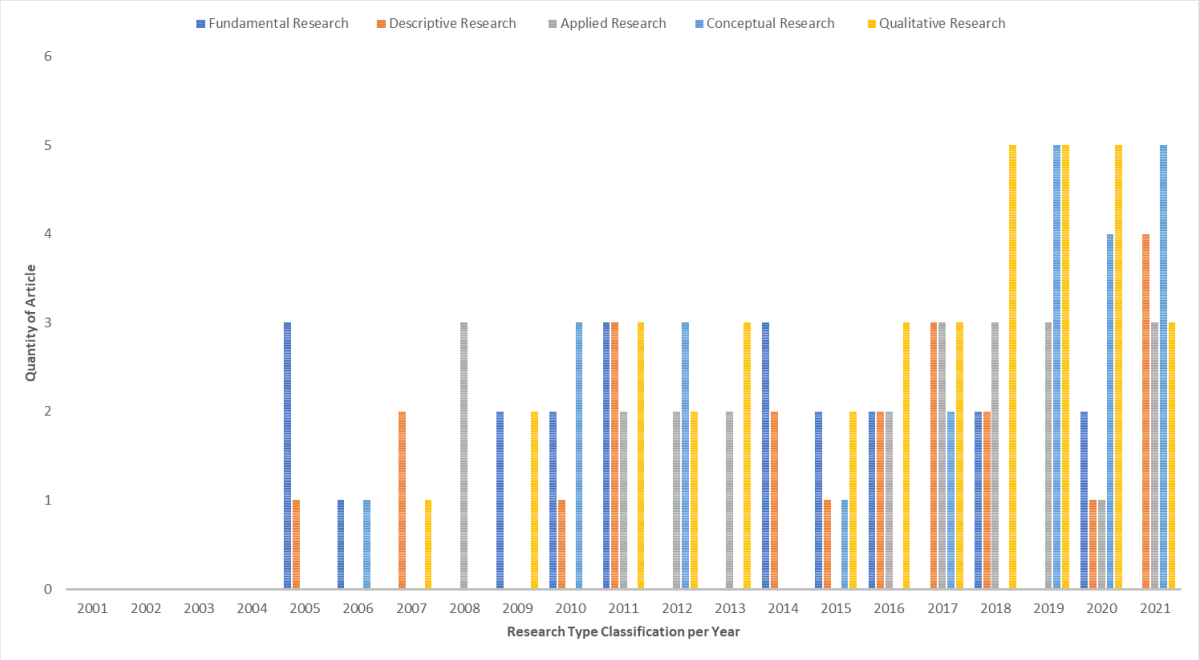
Data level trends indicate the extent to which data distribution and data level are used by scientific researchers in explaining the GSCM phenomenon in each article discussed (see Figure 6). In its distribution data trends are divided into 3 strata namely (1) single data level, (2) double data level, and (3) multiple data levels [22]. Single Data Level shows data distribution data used is sourced from one type (single data use), therefore the depth of analysis and conclusions drawn from the use of this data level is to be at a surface level with a focus on seeing how much GSCM concept is described in scientific articles. Double data level shows the use of two different types of data, for example literature data is combined with field data. The case study approach is the most tangible form of the use of double data level, in this approach the researcher will combine the findings of the two data which will then create a double triangulation between the two. The result of the use of this level data is the results of research conducted able to provide a picture of comparative what happens in the field with standard standard of literature, so that researchers will use the best possibilities in drawing conclusions. Furthermore, the use of this level data will provide strategic benefits for business organizations and for the development of scientific studies going forward [22]. Finally, multiple data levels that emphasize the use of more than 2 entities as research objects, such as using comparisons in business organizations A and business organizations B. Data obtained from business organizations A and B will have significant differences, but remain connected to the research theme , so that if the GSCM concept is used using this level data it will provide a broader picture related to the use of GSCM in business organizations A and B and be able to learn tips and tricks will compensate for the GSCM concept in these two business organizations [22].

Based on data in Figure 6 shows the use of single data level dominating research in the GSCM field in the range of 2001 - 2021. The use of single data shows limitations in the application of the GSCM concept so that researchers choose to study within surface boundaries. Basically there are not many applications in the field of business organizations both manufacturing and service that use the GSCM concept as part of their business processes, they still doubt and question how the integration between the GSCM concept with their current business processes. [30] [31]. As many as 69% of research distribution uses single data, so that in the future researchers still have the opportunity to explore in double data levels and multiple data levels to develop the GSCM concept more comprehensive. Furthermore, the use of double data level dominates the two studies in the field of GSCM in the range of 2001 - 2021. The use of double data shows that there is little possible GSCM concept applied in business organizations as evidenced by the use of case studies [32] [33]. As many as 20% of the use of this data level indicated the need for case study research to explain the phenomenon of the GSCM concept more in the future in the future.

The distribution of research themes in the Green Supply Chain Management (GSCM) field

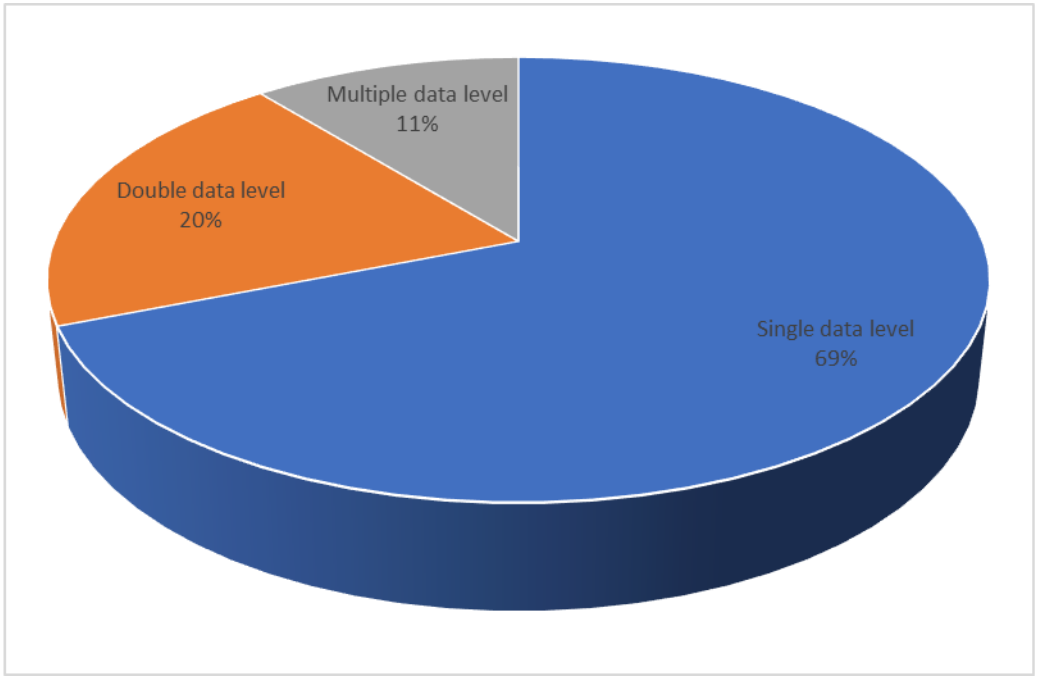
Further analysis in this study is the study of the distribution of GSCM research themes. Analysis of the distribution of this theme will help complete the analysis of the distribution of methodology and analysis of the distribution of data levels previously discussed. Analysis The distribution of themes aims to group research themes in the field of GSCM into groups based on the similarity of the theme which will then be burdened in a number and concluded how this theme gives an influence on business organizations [11]. Based on the distribution of the year which is the limit of this study collected 129 articles that took the main theme of GSCM, which was then based on further study grouped into grouping that reflect the theme of each of these articles [11]. The division of the main themes of GSCM research is divided into 5 sub themes, including:

1. Modeling Framework Theme;
2. Case Study Literation theme;
3. The theme of Integrating The Success of GSCM;
4. GSCM theme to Support Business Performance;
5. Themes of Technology and IT Literacy



Source: Research Data Processing Results, 2021

Fig. 5. Distribution of Research Methodology Trends in the Green Supply Chain Field 2001 – 2021



Source: Research Data Processing Results, 2021

Fig. 6. Distribution of Article Level Data

Modeling framework describes a journal that specifically discusses how supply chain concepts must be applied in manufacturing organizations by developing, finding, and synthesizing the framework. Case Study Literaction explains the journal that specifically discusses the phenomenon in the GSCM field which is then analyzed and studied to succeed the Supply Chain concept. Integrating The Success of GSCM explains the use of additional methods or approaches that can help ensure the implementation of GSCM concepts can be possible. GSCM to Support Business Performance explains how the concept of supporting Supply Chain Management (SCM) can synergize well with the GSCM concept, such as the integration of the SCM concept into the concept (1) Green Supplier, (2) Green Production, (3) Green Logistics, (4) Green Procurement, (5) Green Manufacturing,

(6) Green Lean Concept, and (7) Green Value Chain. Technology and IT Literation explains how the latest IT technology is able to support the application of GSCM in business organizations. Table 2 will show the distribution of the trend of the theme of this research illustrated in the Density Index (DI) and Density Index Relative (DI-R).

Table 2. The distribution of the theme of the Green Supply Chain Management (GSCM) research theme is indicated based on the value of DI and DI-R

Research Themes	Number of Papers	DI Score (Main)	DI Score (Relative)
Framework Development	64	10,67	
Framework Modelling	20		3,33
Framework Building	13		2,17
Using Mathematics to Build Framework	5		0,83
Survey Study	15		2,50
Interview Study	5		0,83
Equation Modelling	6		1,01
Case Study Literation	33	11,00	
Using Journal Approach	21		7,00
Using Expert Approach	5		1,67
Placing at Remote Company	7		2,33
Investigating the Success of Green Supply Chain	11	2,75	
Inventory Redundancy	2		0,50
Subject	2		0,50
LCA Approach	2		0,50
MICMAC Approach	5		1,25
FMEA Approach			
Green Supply Chain to Support Business Performance	19	3,80	
Supply Chain Sustainability	8		1,60
Balancing Production Process	2		0,40
Boost Value Chain Within Process Flow	4		0,95
Build Internal & External Communication	2		0,40
Role of 3PL	3		0,60
Technology & IT Literation	2	2,00	2,00
Internet of Thing (IoT) Approach	2		

Adopted from [11]

Source: Research Data Processing Results, 2021

Table 2 illustrates the density index description stated by DI, referring to the average number of certain topics discussed in a particular theme. Scores are calculated by the number of articles divided by a number of topics [11]. For example, in "Framework Development" is 10.67 (out of 64 articles divided by 6 topics). That is, the average number of discussions with the theme "Framework Development" is about ten times. The higher it leads to more topics "specific" that has been done, as a result this implies discussion about certain themes must focus on exploring problems deeper rather than adding new variations to other themes. The value of density index relative (DI-R), shows the closeness between the type of theme and the main theme. This value will indicate how varied articles derived from the main theme. This means that this value will show the relative level of research themes in the GSCM concept with its main theme. For example the derivative of the theme "Modeling Framework" which is part of the theme category "Framework Development" has a value of DI-R 3,33. This value shows that GSCM researchers who use this theme derivatives as their research references are 3.33 times more

than other theme derivatives in the same main theme category. With this value, it will enrich understanding for future writers in GSCM to develop scientific research in this field.

Basically the values of DI and DI-R are as a pointer to the spread of research themes in the field of GSCM. With this spread, it can be used as a guide and direction of research with GSCM that is comprehensive and has renewal.

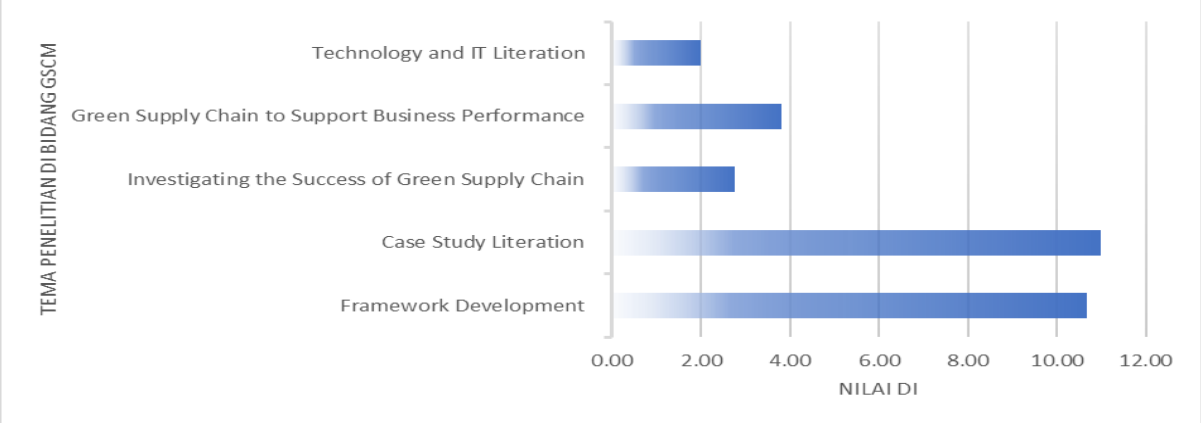
Opportunities and direction of research going forward in the field of Green Supply Chain Management (GSCM)

The development and direction of research in the field of GSCM is still possible to be open and directed better in the future. Figure 7 shows the distribution of research themes in the GSCM field collected in the last 21 years. Based on the picture, information was obtained that the GSCM theme research with sub themes in the field of "Framework Development" ranked highest compared to other GSCM research themes. This shows that Framework Development is a study with a supervise theme, meaning to reveal how the possibility of implementing GSCM in business organizations. Limits and constraints in the application of the GSCM concept are undeniable that they will be faced by business organizations, but this is a challenge that with the framework can make it easier to apply the GSCM concept.

Furthermore, the development of the future direction of the GSCM concept will reflect on the value of R (see Table 2) where the value of R on each theme will represent the opportunities and direction of the research going forward. On the theme "Framework Development" the highest R value is held by "Modeling Framework". On the theme "Case Study Literacy" the highest R value is held by "Using Journal Approach". On the theme "Investigating The Success of Green Supply Chain" The highest value of R is held by "FMEA Approach" FMEA is short for the Failure Model and Effect Analysis. On the theme "Green Supply Chain to Support Business Performance" the highest value of R is held by "Supply Chain Sustainability". Finally on the theme "Technology and IT Literation" The highest value of R is held by "Internet of Thing (IoT) Approach".

In Framework Development the highest value is held by the Modeling Framework. The term framework is a very popular term used, and thus does not have a clear definition. The conceptual framework is defined as "visual or written product, which" explains, either graphically or in narrative form, the main things that will be learned and key factors, concepts, or variables and the alleged relationship between them "[34] Furthermore, the researchers have developed the LSC framework to meet the requirements of the manufacturing industry The efficiency of supply chains, suppliers, and improvement of quality management practices.

Referring to Table 2, in the Case Study Literation the highest value is held by the Using Journal Approach. Case study is a qualitative research approach used to understand an issue or problem using cases [36]. Research Methods The right case study if the form of research questions is "how" because it allows the gathering of better knowledge and in -depth understanding of complex problems because it considers social processes and knowledge about managerial complexity as happened in practice. [36]. Generally research with the theme of case studies will combine 2 things, namely literature and location selection that will be used as a data collection and analysis location. This model will produce triangulation that is close to real (adjusted to the location where the data is collected and analyzed), considering that the data taken is real data in the conditions at that location. The theme of this study will further describe the location where the data is collected, so the results will be difficult to generalize, but the concepts and ideas of thought can be used to help develop other research.



Source: Research Data Processing Results, 2021

Fig. 7. The Density Index (DI) Values in the Green Supply Chain Management (GSCM) research field

4. Conclusion

Conclusions that can be drawn based on the results and analysis of research are combined with the formulation of the problem and research objectives, then the following are:

1. Research in the Green Supply Chain Domain is divided into 5 main themes of writing (1) Framework Development, (2) Case Study Literacy, (3) Investigating The Success of Green Supply Chain, (4) Green Supply Chain to Support Business Performance, and (5) Technology and IT Literacy
2. Density Index Value Focusing the theme of Green Supply Chain Research in the future is in the field of Literas Case Study with the highest value between others.
3. In the future the research in the field of GSCM is directed at the field of study (1) Modeling Framework, (2) Using Journal Approach, (3) FMEA Approach, (4) Supply Chain Sustainability, and (5) Internet of Thing (IoT) Approach

In the end this research applied a base on literature studies that have variants and renewal changes faster in seconds. Therefore the results of the review of this study are the deepening of a particular journal database and requires a combination of other journal databases so as to get a more complex and representative picture.

Acknowledgement

This study uses support from the Laboratory of the Management Study Program of the Faculty of Economics and Business, University of Muhammadiyah Gresik as a database and data running.

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