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A Green Supply Chain-Oriented Research Mapping for the Green Marketing: A Bibliometric Analysis

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ABSTRACT
The purpose of this research is to undertake a bibliometric analysis of both the published literature on the green supply chain in the context of green marketing that was produced between 2013 and 2023. This study utilizes scientific mapping and analysis of publication performance to characterize the structure of green marketing publications as well as the patterns that have emerged within the field. The purpose of this research is to determine the contributions made by authors, journals, topic areas, the incidence of keywords, and trends in papers that have been published. The findings indicate that considerable growth occurred in the 2010s, despite the fact that the initial year of publishing did not see a significant amount of expansion. The findings of this investigation on the pattern of publications relating to environmentally responsible marketing reveal an average annual rise of 23 new publications in this field. Seven hundred and nine papers utilize the term "sustainability," making it the most popular choice. The interconnections between keywords provide information about the connections that often exist between terms that are used in a particular investigation. The visualization of research trends is offered in order to provide up-to-date reference information for academics. This reveals crucial research gaps as well as possible research pathways that may be pursued in the future in order to progress the consolidation of disciplines.

INTRODUCTION

The advent of green supply chains in the execution of supply chain operations is a result of shifts in the industrial revolution period that necessitate the involvement of industry in safeguarding the environment by decreasing waste and pollution. In order to develop competitive tactics, GSCM necessitates industrial operations that combine marketing effectiveness with environmental concerns that give rise to new concerns like energy consumption reduction and pollution reduction. In order to reduce waste and streamline operations, including the shipment of goods and services, businesses must upgrade their network or supply chain. Premised on this, the goal of a green supply chain seems to be to take into account the environmental impact of all commodities, processes, and products, including those generated from raw resources to finished products, and indeed the recycling of waste of these items.

Per the Claim Dheeraj (Nimawat Dheeraj and Namdev Vishal, 2012), green supply chain management (GSCM) is an invention in the functionality of supply chain strategies based on an environmental context that includes activities such as reducing waste, recycling waste, reusing waste, and substituting materials. Toke (L. K. Toke, R. C. Gupta, 2010) explained that the GSCM concept is an integration of ecological perspectives into one of supply chain management. This provides product architecture, selection of sources for raw materials manufacturing operations, delivery of finished directly to customers, and product management after it has reached the end of its useful life. It is possible to draw the conclusion that the idea of global supply chain management (GSCM) is founded on an environmental viewpoint, specifically the question of how to lessen the amount of waste produced and the negative effects on the environment that are brought about by the operations of industrial businesses in their supply chains. This is a significant non-financial long-term factor associated with the environment that the business has to take into consideration in order to preserve good connections for the sake of sustainability among its supply chain operations in the future.

Toke (2010) and Ninlawan (Ninlawan et al., 2010) the GSCM is comprised of a number of operational roles and activities, some of which are as follows: The term "green procurement" refers to the status of the buying environment, which includes participation in activities that reduce the amount of money spent on purchases, as well as the reuse and recycling of materials obtained via the purchasing process. Green procurement, often known as the notion of procuring a selection of goods and services that have a minimal effect on the environment, is one option that environmentally conscious and fiscally responsible firms may use. Among the actions that comprise green procurement are:

(1) The choosing of suppliers, In the green marketing system, the suppliers from which materials are purchased can also only start coming from "green partners" who meet the required standards of environmental quality and successfully complete the auditing process. Additionally, the green procurement system gives preference to suppliers who earn ISO certification as well as certificates that are related to the successful completion of green-related goals. In order to raise awareness about the environment and cut down on the use of products that are damaging to it, activities that promote recycling should be encouraged.

(2) Green manufacturing seems to be a production method that employs inputs with a minimal effect on the environment, is highly efficient, and creates little to no residue or pollution. Green manufacturing is sometimes referred to as eco-friendly manufacturing. The use of environmentally friendly manufacturing practices may have a number of beneficial effects, including lower prices for raw materials, increased production efficiency, and an improvement in the company's public image. The following are examples of activities that fall within the category of green manufacturing: a) The management against the use of potentially hazardous products, the protection of the quality of the water supply, and the regulation of the quality of the inputs to the treatment process. b) Technological advancements in energy efficiency, that is, by reducing the consumption power in the product, increasing the service life of the product to improve efficiency and productivity, increasing the capacity of the machine, and improvements in energy conservation brought about by new technology. c) Increasing environmental awareness, reducing the use of items that are causing climate change, and promoting reuse and recycling are all important steps to take.

(3) Green Distribution, Flow Actions are taken in the distribution of environmentally friendly goods, namely green packaging and green logistics. The use of environmentally friendly materials, collaboration with suppliers to achieve uniformity in packaging, the reduction of the amount of time and resources required for disassembly, and the promotion of recycling programs are all components of "eco-friendly" packaging. Green logistics encompasses a wide range of practices, such as product distribution in batches, direct delivery to end users at specific locations, and the use of vehicles that run on alternative fuels.

(4) Logistics in the Reverse Direction, the act of purchasing goods from final consumers with the intention of reselling them at a higher price or disposing of them in an environmentally responsible manner is an example of reverse logistics. Collecting, jointly inspecting, selecting, or sorting, recovering, redistributing, and disposing of items are some of the activities involved in reverse logistics.

The question "what are green supply chain strategies and what is the first phase in creating a more sustainable strategy?" is a key question that is often asked by businesses that are concerned about the environment. The principle of sustainability is incorporated into more conventional methods of supply chain management via the use of green supply chain strategies. The objective is to assist the sector in cutting carbon emissions and minimizing waste while simultaneously increasing revenues. Every stage of the distribution process, from production and procurement through distribution, storage, and transportation, offers opportunities for more environmentally responsible practices.

Customers have an essential and productive role to play in the creation of a green supply chain. In point of fact, businesses located in developing nations are under a great deal of pressure to implement environmentally friendly procedures within their supply chain activities in order to satisfy the expectations of their target market and remain competitive. When it comes to gaining productive advantages from environmentally responsible supply chain management, collaboration with consumers becomes highly important. Equally as vital as greening your own operations is engaging in environmentally responsible procurement, which entails searching for suppliers that provide

environmentally responsible goods and services. After all, the remainder of business supply chain is dependent on you acquiring your resources in a manner that is environmentally responsible. Finding materials that have been recycled or remanufactured might be the best option for some companies. Others have a responsibility to get raw materials that are obtained in a sustainable manner, such as lumber from vendors that take measures to safeguard animal habitat.

The advantages of implementing a green marketing strategy for supply chains, the implementation of important measures for environmentally responsible development is brought to the forefront via green supply chains. It demonstrates how green practices may be adopted into enterprises to prevent environmental deterioration and enhance the firm's operational and financial performance, while at the same time providing a basic model for a green supply chain. (Siswanto et al., 2019). The following is an explanation of the notion of sustainable GSCM: The goal of green marketing is to increase sales of goods and services by highlighting the positive impact they have on the surrounding environment. It is characterized by the acceptance of environmentally responsible business practices, the production of eco - friendly products, this same utilization of eco - friendly packaging, as well as the dissemination of information concerning the ecological benefits of various products, among other characteristics. Even though the cost may be expensive, businesses stand to get effective marketing as a result of participating in such programs..

RESEARCH METHODS

An analysis of the records that match to these findings was carried out utilizing bibliometric analysis. According to Noyons et al. (Noyons et al., 1999), The subjects of performance analysis and research mapping are the two primary components that compose bibliometrics. The bibliometric performance analysis makes use of a variety of methods, such as the study of word frequency and citations, as well as the counting of publications categorized according to the nation, authors, research group, or university. (Thelwall, 2008). Three steps were taken, as illustrated in Figure 1: source identification, data extraction, and data analysis. Here is a brief explanation of these steps.

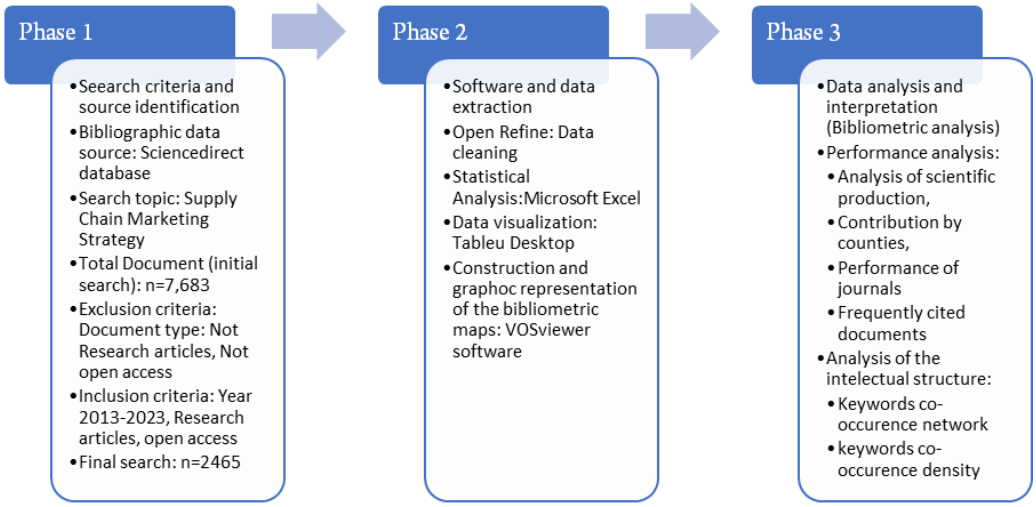

Figure 1. Methodology Stage: Bibliometric Analysis Design

Source of Data

Bibliometric analysis is useful for researchers who wish to study publishing patterns since it can be used to the evaluation of research results in almost any field (Alryalat et al., 2019). As a consequence of this, finding the proper database sources to filter articles for each topic is becoming an increasingly crucial endeavor (Aghaei Chadegani et al., 2013). During our hunt for information on this specific research, we consulted the ScienceDirect database. ScienceDirect, a multidisciplinary bibliographic database, was selected because it provides information that is perhaps the most complete citation and abstract database of peer-reviewed scientific papers. The information that ScienceDirect contains may be found here (Kulkarni et al., 2009). Using ScienceDirect is beneficial for a number of

reasons, including the fact that it is simple to do so and that its database includes more (Wiyono et al., 2021). Studies that focus on bibliometrics commonly make use of the ScienceDirect database.

Defining Keywords

According to Zupic and Čater (Zupic & Čater, 2015), it is essential to pick acceptable and relevant keywords in order to get the highest possible degree of precision in the results. Additionally, the selection of keywords has direct effects on the results of bibliometric study (Chabowski et al., 2013). When doing a search, the keywords that are selected will be utilized to narrow down the results. The research that determined sports nutrition to be an integral component of athlete recovery served as the basis for the development of the keyword criteria that were employed in this study.

When doing a search for bibliographic records in the ScienceDirect database, the green supply chain strategy marketing literature that was just discussed is used as keywords. In this approach, the following terms are searched using a single query by combining the usage of the Boolean operators (OR and AND), as well as the quote mark and asterisk commands: green supply chain marketing strategy and green supply chain marketing and green marketing strategy. Through the ScienceDirect database, searches are performed using the following keywords: (TITLE-ABS-KEY (" green supply chain marketing strateg* ") AND TITLE-ABS-KEY (" green supply chain market *" OR " green marketing strateg *") AND TITLE-ABS-KEY (" green marketing *" OR " green marketing strateg *")).

Inclusion and Exclusion Criteria

During the literature search process, a number of precautions are taken to minimize the likelihood of finding contradictory information to ensure that the results obtained are as accurate as possible. Analysis of published research on green supply chain marketing strategies. Researchers have published research journals in the last 10 years. Restrictions on publication from 2013 to 2023, and limited to article types: Research articles, and journal articles that are Open access and Open archive. Articles, reviews, and conference papers are the only types of writing that were considered for inclusion in the study. As a result, it is essential to review all relevant literature and topic areas, and the use of a foreign language should not be seen as a barrier. Nevertheless, while writing the concluding piece, all of the relevant material has to be incorporated.

Data Analysis

In this research, the information for the articles was obtained directly from the ScienceDirect (https://www.sciencedirect.com) database on December 17, 2022, and it was saved in the form of CSV files (comma-separated values). The findings were analyzed with Microsoft Excel 2019 and the VOSViewer software (https://www.vosviewer.com/). Following the completion of the cleaning process using OpenRefine (https://openrefine.org/), the data was then included into the analysis. In order to get findings that can be relied upon, it is essential to clean the data. Even if the majority of the bibliometric data is accurate, it is possible that the references that were used included several versions of the same publication (Zupic & Čater, 2015). The outcomes of the study are given in the form of graphs, tables, and maps that are intended to visualize networks. A bibliometric analysis is conducted based on the number of publications that are compiled by nation, journal, author, and the articles that are most often referenced. In addition, a keyword network analysis and a density analysis were carried out in order to identify which research areas and topics were the most important and prevalent respectively. An investigation of the connections that exist between the article's key terms was carried out with the help of VOSViewer. The results are presented in the form of a network graph, which consists of nodes (also known as keywords) and network lines that link those nodes to one another. The size of a node will increase according to the number of times a term appears in the search results. The close link that exists between keywords is shown visually by a line that indicates a common keyword quotation, and the density of the network shows the closeness of the relationships that exist between keywords. It is possible to be in near proximity to the nodes at any moment because the closeness or distance between nodes determines how often they are connected. This means that it is always feasible to be in close proximity to the nodes. The color of the nodes that surround a node that has a high connection density will change to indicate that the node has a high relationship density (clusters). After that, a density analysis was carried out between the several principal research domains that had been determined. It enables the researchers to locate the study issues that are currently trending within the research area.

RESULTS AND DISCUSSION

Following the completion of the preceding phases in the procedure, the records were subjected to a bibliometric examination. Bjork et al. (Bjork et al., 2014) highlighted that the benefit of bibliometric analysis comes in the capacity to gain an overall picture of a particular area of research. This ability is what makes bibliometric analysis so valuable. Bibliometrics is the study of the use of a variety of methodologies to determine qualitative and quantitative shifts in the topic of scientific research, the creation of a publishing profile for a particular subject, and the identification of structural and trend characteristics within a field (Huertas-Valdivia et al., 2020). Performance analysis and scientific chart mapping, which is often referred to as bibliometric mapping, are the two components that make up the bibliometric approach. The first step in the approach is to conduct an analysis of performance (Noyons et al., 1999).

Type of Documents and Publication Trends

Prior to the discovery of the criteria for inclusion and exclusion, a total of 1,252 papers were used and examined. By category, the published articles and review articles (see Table 1).

Tabel 1. Type Articles limitation

Type of Articles	Frequency	Proportion
Article	2,043	82.87
Review	422	17.13
Total	2,465	100

As seen in Figure 2, there are more then 10 studies on green supply chain marketing strategies have seen significant improvements. The last ten years of publication saw slight growth, with only sixteen occurrences of connections of keywords about green marketing. Although there has been an increased trend in the number of publications, the statistics reveal inconsistent results. The number of articles that were published grew substantially in 2017. Thus according Chen et al. (Chen et al., 2006), there is a favorable effect on firms that result from investments in environmentally friendly product innovation and environmentally sustainable process innovation (Hasan & Ali, 2015). This discussion aims to map the trend of network keyword occurrences of study.

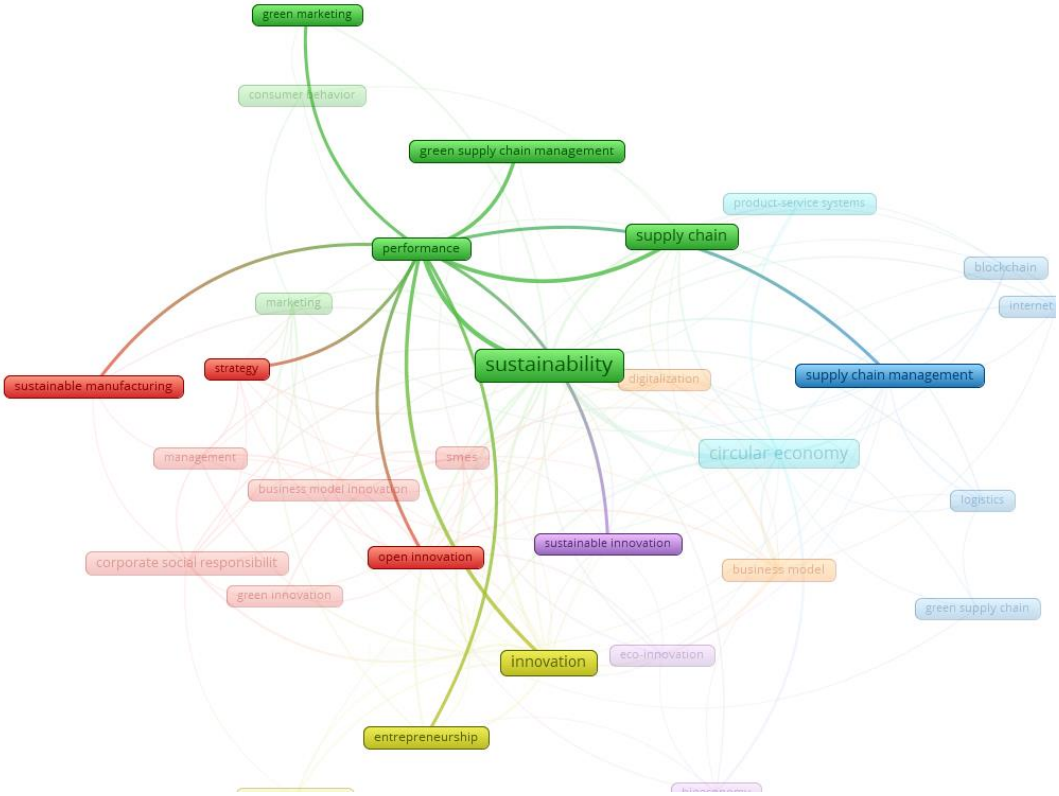

Figure 2 Network Visualization of Keywords related to Green Marketing & GSCM

Publication Trends and Subject Area

The trend of increasing research is described in figure 3, the first wave in 2015 which published 291 articles and and the upward trend again in 2022 which amounted to 643 articles, the increase in discussion about green marketing in the supply chain field is very significant.

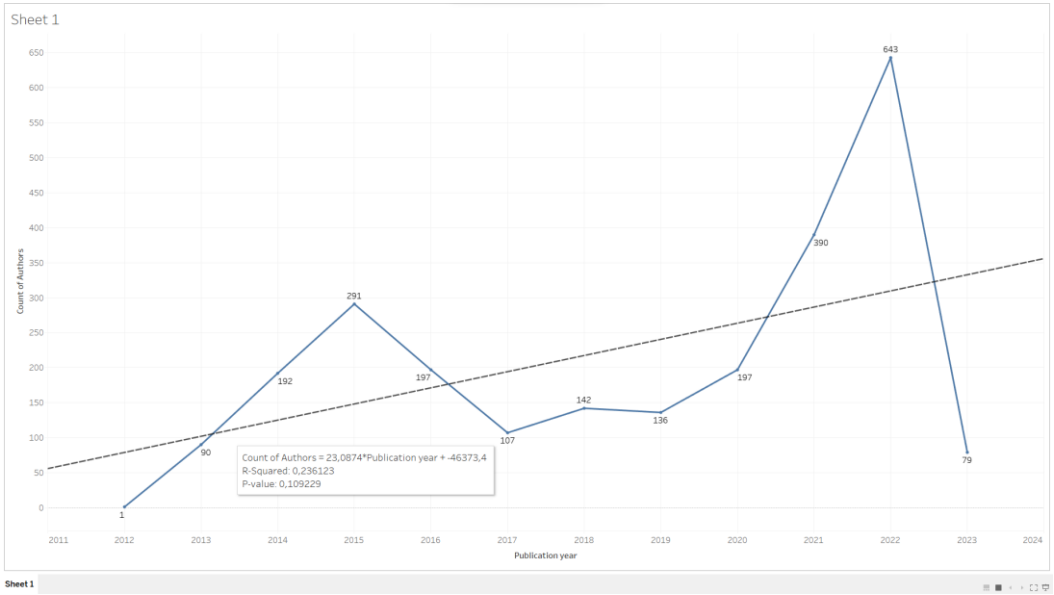

Figure 3 Scientific Publication Trends

Based on figure 4, it shows that there are 8 fields of study that have the highest number of document publications. The subject area of Social Sciences is the most popular field of study by authors, at 21.9 percent (540 out of 2,465).

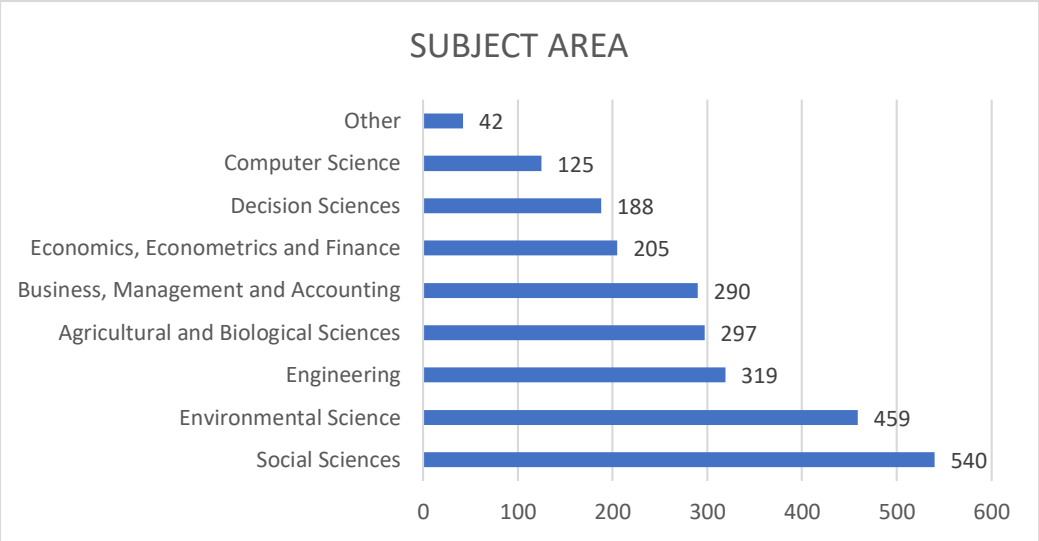

Figure 4 Subject area study

The trend of increasing research is described in figure 3, the first wave in 2015 which published 291 articles and and the upward trend again in 2022 which amounted to 643 articles, the increase in discussion about green marketing in the supply chain field is very significant.

The Most Common Search keywords

In this part of the analysis, we will examine the content by looking at how the keywords are distributed. There will be a presentation of an interactive co-occurrence map and density visualization map the top keyword is sustainability (709). Additional help for scientific research may be obtained via the use of co-occurrence keywords, which can effectively indicate research clusters in a certain subject area. As shown in figure 5 and figure 6.

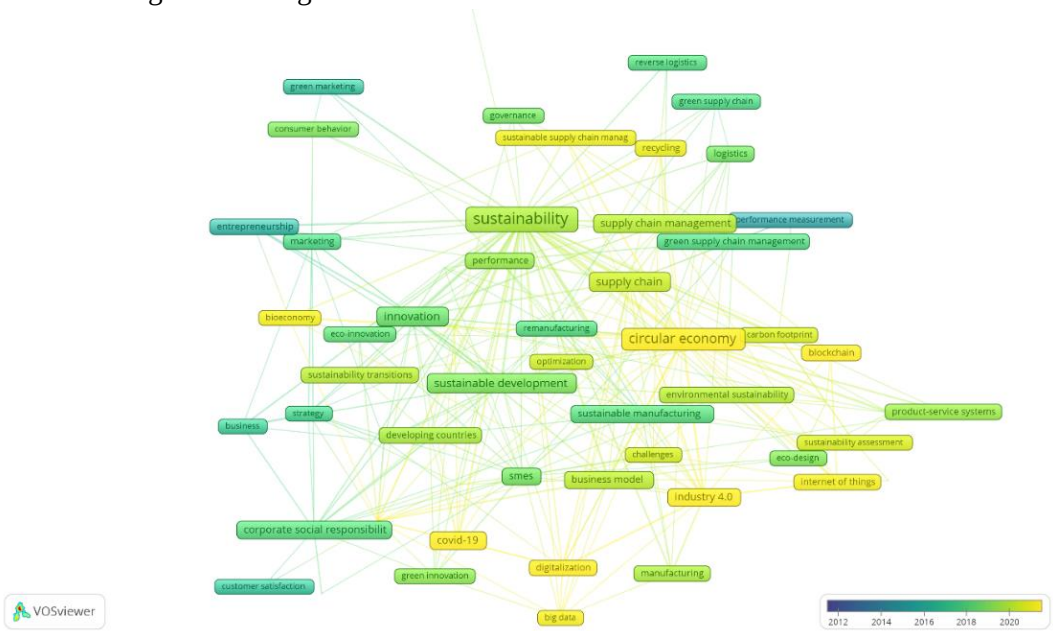

Figure 5 Co-occurrence Map

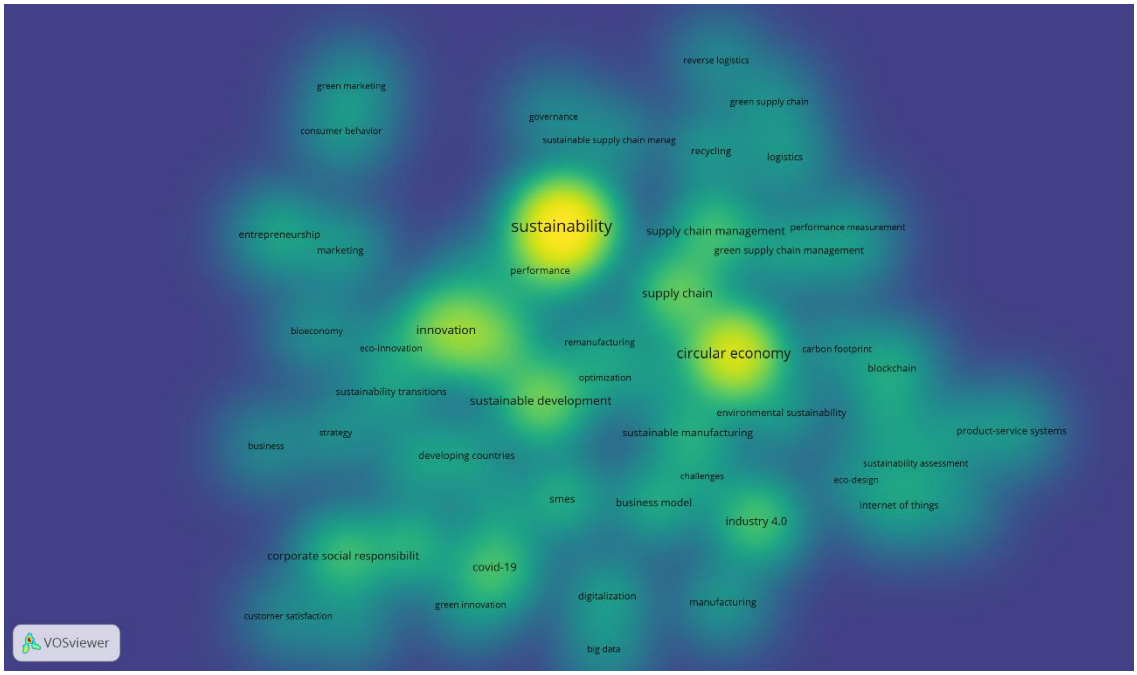

Figure 6 Density visualization map

CONCLUSION

Bibliometric analysis of green supply chain marketing reveals that global research trends have increased over the past 10 years. In this analysis, keywords were used to mining the articles from the ScienceDirect database that were the most relevant. There were a total of 2465 papers collected that were pertinent to this subject of discussion. The increase in research on green supply chain marketing has led to keyword sustainability, which is very closely related to the sustainability of environmentally friendly development in the last ten years. At 21.9 percent, the topic of study that writers find themselves most interested in is that of the Social Sciences. According to the results of the analysis, it shows that the average increase in publications over the past 10 years discussing this study is 23 publications per year, this can explain that human understanding of environmental issues is increasing and increasingly needed, for the sustainability and balance of nature.

This study is restricted in a variety of ways. First, the ScienceDirect archive is the only place where we can find material that is pertinent to our investigation. Even if ScienceDirect is one of the databases with the largest coverage, there is still a possibility that some of the research in this topic will only be indexed in other databases or not at all. As a consequence of this, an additional database is necessary in order to bolster and broaden the study literature. Second, the demands of the author are taken into account when calculating the threshold in the VOSViewer analysis; nevertheless, this tool merely organizes the author's requirements; it does not completely reflect those requirements. Third, the process of data cleansing puts all of its faith on the application and presumes that everything is in order..

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