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Research Article



## BIBLIOMETRIC ANALYSIS OF ARTICLES PUBLISHED ON THE WEB OF SCIENCE (WoS) DATABASE ON SUSTAINABLE TRADE AND GREEN LOGISTICS

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### Abstract

#### Article Info

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The purpose of this study is to examine articles regarding sustainable trade and green logistics and to provide insight into the state and development of academic research in the relevant fields using the bibliometric analysis method. The data were obtained from the WoS database to observe the publication trends between 2007 and 2022. A total of 528 articles were reviewed within the scope of this study. The visualization of the data was carried out using MAXQDA Analytics Pro. The results indicated that the number of publications in the relevant fields have increased significantly since 2015. The highest numbers of publications in the relevant fields were released and published by Asian institutions, which were followed by European institutions. The highest numbers of publications in the relevant fields were released and supported by the Elsevier and MDPI publishing companies. The highest numbers of publications in the relevant fields were published in Sustainability and the Journal of Cleaner Production. Researchers in Europe have already started to pay attention to and investigate trade and logistics in the context of sustainability since 2010. Academicians have mostly preferred to utilize quantitative methods.

**Keywords:** Bibliometrics, Green Logistics, MAXQDA, Sustainable Trade, WoS

**Jel Codes:** F10, M10, Q56



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## **1. Introduction**

International trade and sustainability have been considered separate fields in the economics literature (Dupuy & Agarwala, 2014: 399). However, especially once the United Nations (UN) adopted the Sustainable Development Goals (SDGs), researchers have started to intensively investigate the relationship between international trade and sustainable development. In 2015, the UN established the 17 SDGs to assist in the achievement of global sustainable development through economic development, environmental protection, and social inclusion (UN, 2017). According to international institutions such as the World Trade Organization (WTO) and the World Bank (WB), international trade has extensively affected sustainable development (Chandia et al., 2018; Belloumi & Alshehry, 2020). Accordingly, the role of international trade in economic growth, social welfare, and the effective utilization of natural resources is becoming more and more important (Steen-Olsen et al., 2012; Xu et al., 2020).

Besides the impact of international trade on sustainable development, logistics also plays a significant role in reducing the negative effects of transportation on economy and the environment. After growing awareness of the environment and other aspects of social inclusion, sustainable logistics, sometimes referred to as green logistics, has become quite popular among businesses (Ren et al., 2020: 1-2). Neto et al. (2008) emphasized that a logistics network is divided into two approaches: maximizing profit (or minimizing costs) and minimizing the environmental impact. In parallel with this, especially over the last decades, sustainable logistics has been investigated in various fields. These fields include emission control (Mattila & Antikainen, 2011), reverse logistics (Ramos et al., 2014), outsourcing in reverse logistics (Agrawal et al., 2016), reducing pollutant emissions (Bask & Rajahonka, 2017), packages and containerized goods (Lee et al., 2019), and green logistics performance in service trade (Yingfei et al., 2022).

In previous research, relevant topics have been examined by numerous scholars from different perspectives. Tian et al. (2018) pointed out trends and features of embodied flows associated with international trade based on the bibliometric analysis method. Bartolini et al. (2019) provided a comprehensive overview and classification of the existing research on green warehousing. Ren et al. (2020) conducted a comprehensive review of global green and sustainable logistics using bibliometric analyses. Jiménez-Almazán et al. (2020) reviewed the scientific literature that focuses on terms related to international trade and sustainability. Çavdar (2021) examined the current status of the literature with bibliometric analyses for the field of green logistics. Morales and Belmonte-Urena (2021) explored the systematic structure of

interactions between sustainability and circular economy. Naeem et al. (2022) revealed the current state and future directions of green and sustainable finance through bibliometric analyses. Since research on sustainable trade and green logistics has increased in recent years, this study draws on bibliometric analysis to visualize academic publication trends. Despite the considerable body of literature on sustainable trade and green logistics, there is still lack of a study which systematically addresses both topics at the same time.

To the best of our knowledge, this is the first comprehensive study to assess trends in the relevant field with a bibliometric approach. In this study, the qualitative method was utilized to fill this gap in knowledge. Accordingly, the purpose of this study is to examine articles regarding sustainable trade and green logistics and provide insight for the state and development of academic research in the relevant fields by the help of bibliometrics. The data were obtained from the WoS database to observe publication trends from 2007 to 2022. A total of 528 articles were reviewed within the scope of this study. For the purpose of the study, the following research questions were designed:

- (1) What is the distribution of articles by years?
- (2) What is the frequency of keywords repeated in studies in relevant fields?
- (3) Which institutions and countries published the highest numbers of articles on relevant fields?
- (4) What are the publishers and journals that published the highest numbers of articles in relevant fields?
- (5) What is the most preferred research method in relevant fields?
- (6) What are the 5 most-cited articles in relevant fields?

The remainder of the paper is structured as follows: After a brief introduction, the first section of the paper includes a literature review on bibliometric analysis. Afterwards, the research methodology is described in section 2. Section 3 outlines the results and discussion of the bibliometric analysis. The last section concludes the paper and describes recommendations for future work.

## **2. Research Methodology**

### **2.1. Data Collection**

The data were collected from the WoS database. The most prestigious and influential journals from a wide range of fields are represented in the WoS database. According to previous studies, this database provides comprehensive and standardized information in a wide range of scientific literature for bibliometric analysis (Jacso, 2005; Rey-Martí et al., 2016; Gong et al.,

2019; Sarkar et al., 2022; Yalçıntaş et al., 2023). Table (1) demonstrates the main steps of the systematic literature review (SLR).

Table 1

*Flow Diagram (SLR)*

<b>Selection of Database:</b>	
<i>WoS Core Collection</i>	
<b>The proposed two-level keywords:</b>	
<i>(Green Trade) or (Sustainable Trade)</i> <i>n = 451</i>	<i>(Green Logistics) or (Sustainable Logistics)</i> <i>n = 476</i>
<b>Refine search: Articles only</b>	
<i>n = 640</i>	
<b>Specify publications year: 2007-2022</b>	
<i>n = 528</i>	
<b>Total: 528</b>	

**Source:** Author

The search for publications was conducted at the end of December 2022. Initially, the two-level keyword structure comprising “*green trade/sustainable trade*” and “*green logistics/sustainable logistics*” was formed. Then, publications in the relevant fields were listed for the period of 2007 to 2022. Following this, the publications were limited to articles only. Within the scope of this study, only articles in English with open access were selected. Furthermore, the Social Science Citation Index (SSCI), the Science Citation Index Expanded (SCI-EXPANDED), and the Emerging Source Citation Index (ESCI) were used for the bibliometric analyses. After applying the aforementioned set of parameters, a total of 528 articles were obtained for analysis.

The bibliographic indicators that were used in this study were as follows: distribution of articles by years, frequency of keywords, distribution of institutions and countries, distribution of publishers and journals, most preferred research methods, and most-cited articles.

## **2.2. Methodology**

Bibliometric methods have been used for providing quantitative analyses of written publications. Bibliometric methods have benefited from computerized data analyses, and in recent years, there has been a substantial increase in the number of publications within the field. This is partly due to computerized methods, but it is also related to the fact that a bibliometric method must include a certain volume of data in order to be statistically reliable (Ellegaard & Wallin, 2015: 1810). The bibliometric methodology encapsulates the application of quantitative

techniques (i.e., bibliometric analysis—e.g., citation analysis) on bibliometric data (e.g., units of publication and citation). Specifically, publications using bibliometric methods have grown over the years, with an average of 1021 publications in the last decade, which can be attributed to the overall growth of scientific research. The emergence of scientific databases such as Scopus and WoS has made acquiring large volumes of bibliometric data relatively easy (Donthu et al., 2021: 286).

Bibliometric methods are quantitative by nature, but they are employed to make interpretations regarding qualitative features. In fact, the main purpose of all sorts of bibliometric studies is to transform something intangible (scientific quality) into a tangible entity. Bibliometrics has given researchers a tool that can be easily scaled from micro (institute) to macro (world) levels (Wallin, 2005: 261). Correspondingly, to date, various programs have been developed to analyze academic publications. For instance, the VOSviewer, Gephi, CiteSpace, ATLAS.ti and MAXQDA programs have been used extensively in bibliometric research (Fahimnia et al., 2015; Cui et al., 2018; Yu et al., 2020; Bianchet et al., 2020; Özekenci, 2022).

In this study, the “*MAXQDA Analytics Pro 2022*” software was utilized to refine and visualize the data. MAXQDA is a program for the analysis of qualitative data. A variety of qualitative data such as text, audio recordings, video recordings, surveys, spreadsheets, photographs, bibliographic data, and web pages can be analyzed using MAXQDA. The program can analyze all data commonly collected in the context of empirical social research. It is particularly well-suited to conducting literature reviews, which is a standard practice in all scientific disciplines. MAXQDA can also be used to systematically index and automatically code large volumes of text. Additionally, it contains several useful tools for visualizations, such as MAXMaps, Code Matrix, and Code Relations (Kuckartz & Rädiker, 2019).

### **3. Results and Discussion**

This section visualizes and summarizes the 528 articles published on sustainable trade and green logistics between 2007 and 2022 using the bibliometric analysis method.

#### **3.1. Code Clouds**

To visualize frequently used terms in the examined articles, code clouds were generated. The minimum frequency of the codes to be included was determined as five. In other words, codes that were repeated in the examined articles for more than five times were included in this study. Therefore, the codes that were repeated fewer than five times are coded as “others”. This way, trends and developments in the relevant fields are presented more clearly.



Figure 2.

*Code Cloud of the Most Common Terms in Articles on Green Logistics*

Figure (2) demonstrates the code cloud of green logistics. Terms such as “Sustainability,” “Quantitative”, “China”, “Elsevier”, “2022”, “Sustainability (journal), and “Others” were the most frequently encountered words, as in the previous code cloud. A total of 2008 different words were mentioned in the context of green logistics.

**3.2. Trends in Publication Years**

Figure (3) illustrates the distribution of publications on sustainable trade. In the graph below, one can see that the academic interest in this field of research started to increase exponentially over the last decade (2015-2022). However, the development of the relevant field was slow between 2007 and 2014 with a maximum of nine articles published per year. Since 2015, there has been remarkable growth in academic research in the relevant field. In particular, publications reached the highest numbers during the 2020, 2021, and 2022 periods with 32, 36, and 61 publications, respectively.

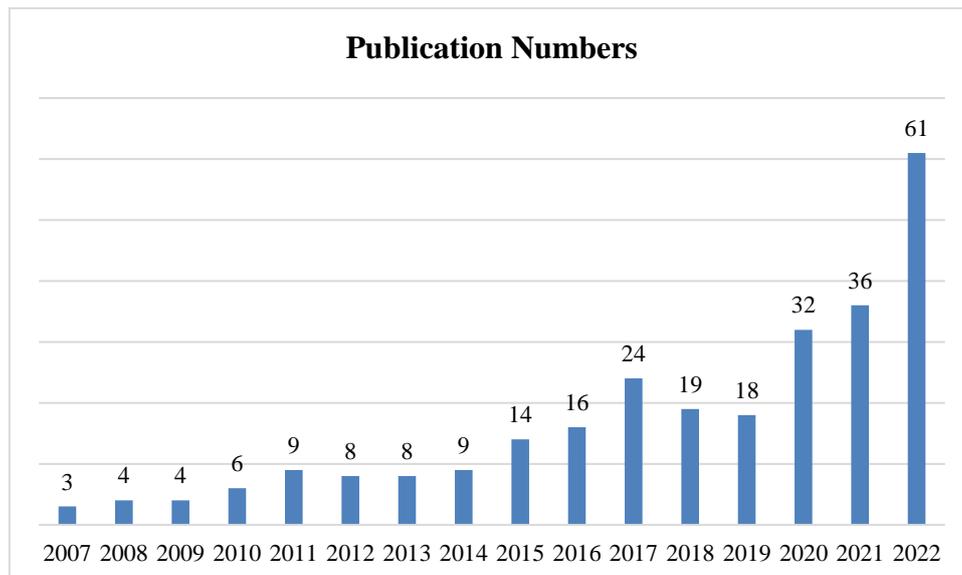


Figure 3.

*Number of Publications per Year, Sustainable Trade*

Figure (4) illustrates the distribution of publications on green logistics. As seen in the graph, the academic interest in this field of research started to increase significantly in the last decade (2013-2022). However, the development of this field was slow between 2007 and 2011 with a maximum of 5 articles published per year. Surprisingly, no academic research appeared in 2008. In 2010 and 2014, there were fluctuations in academic research. Since 2016, there has been noteworthy growth in academic research in the relevant field. In particular, publications

reached the highest numbers during the 2019 and 2022 periods with more than thirty publications per year.

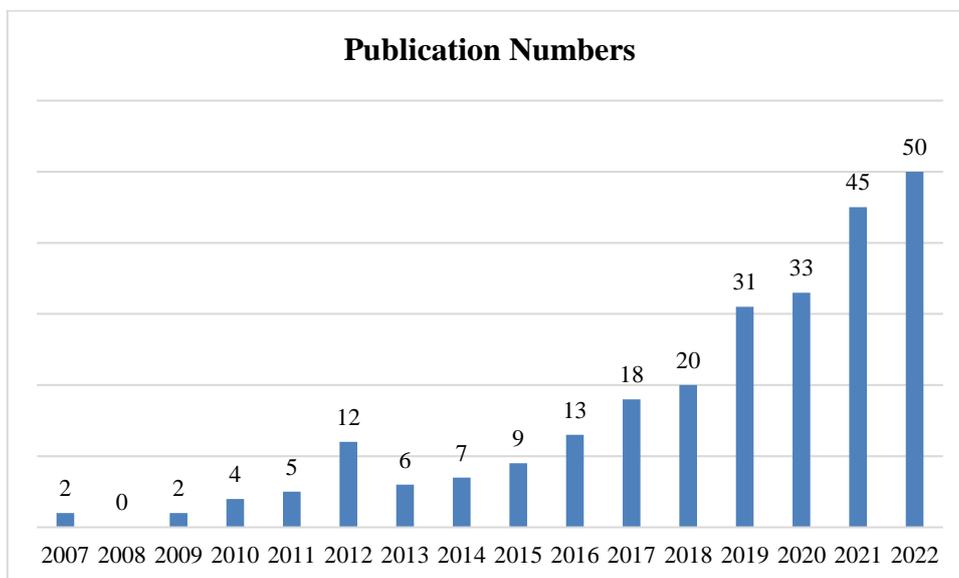


Figure 4.

*Number of Publications per Year, Green Logistics*

These results suggest that researchers are becoming more interested in the relevant fields and are publishing their articles on the WoS database. This trend also supports the idea that the number of articles on sustainability in the context of international trade and logistics will increase in the following years.

### **3.3. Contribution of Countries to Publications**

Figures (5) and (6) show the most productive countries in the relevant fields according to their numbers of publications. As seen in Figures (5) and (6), the countries are listed in ascending order. To make interpretation clearer, countries with 10 or more publications were included in this analysis.

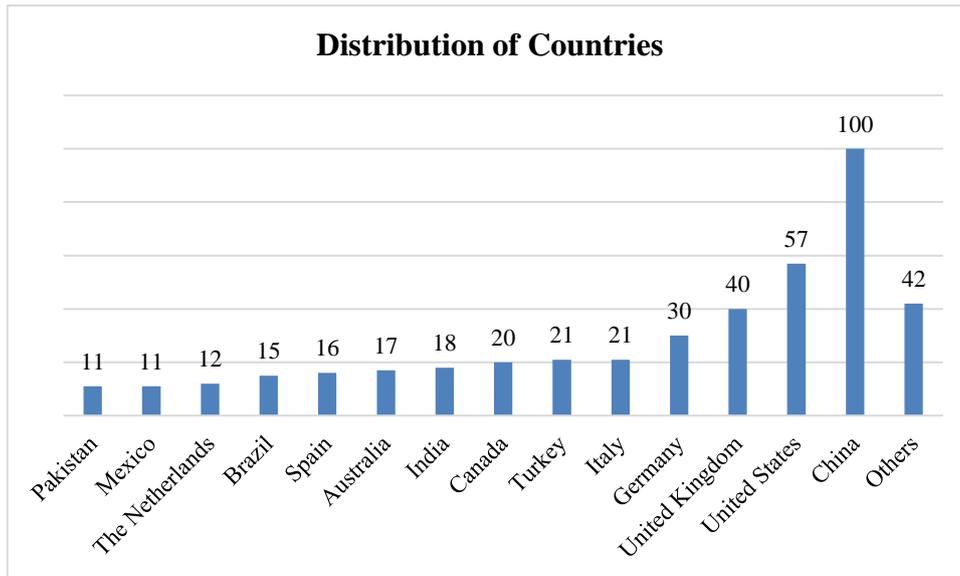


Figure 5.

*Countries with the Highest Numbers of Publications on Sustainable Trade*

Based on the result of the bibliometric analysis, the most influential countries that contributed to the field of sustainable trade were China with one hundred publications, the United States with fifty-seven publications, the United Kingdom with forty publications, and Germany with thirty publications. Most countries in the top five are developed economies, except for China.

The regional distribution of influential countries included five countries from Europe, four from Asia, two from North America, one from South America, one from Central America, and Australia as both a country and a continent. Overall, Asia had a significant contribution to this field with 150 publications (34.80%). It was observed that Turkey was one of the influential countries with more than twenty publications.

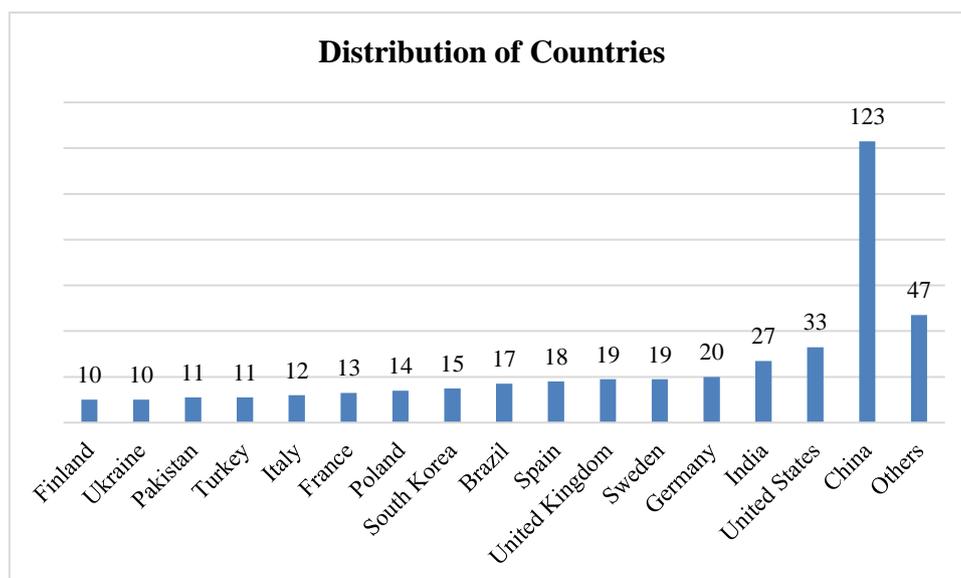


Figure 6.

*Countries with the Highest Numbers of Publications on Green Logistics*

The most influential countries with publications on green logistics were China with 123 publications, the United States with thirty-three publications, India with twenty-seven publications, and Germany with twenty publications. China was the most influential country with the highest number of publications (29.30%) in the relevant field. The regional distribution of influential countries included nine countries from Europe, five from Asia, one from North America, and one from South America. Overall, Asia had a significant contribution to this field with 187 publications (44.63%). It was observed that the number of publications on green logistics in Turkey was only eleven (0.0262%).

These results demonstrate the position of academicians in emerging economies in researching and discussing sustainability in the context of trade and logistics. In particular, Chinese researchers are gaining a more prominent position in the growth of publications in the relevant fields. Following China, the United States ranked first among developed economies in terms of publication productivity.

**3.4. Distribution of Keywords**

The major sub-fields or most popular research areas in a main field can be investigated by analyzing keywords. Figures (7) and (8) present the distribution of keywords that were utilized more than five times in the relevant fields. As seen in Figure (7), the term “sustainability” dominated the network of keywords in publications on sustainable trade. “Sustainability” had the highest frequency ( $n = 147$ ), followed by “trade-off” ( $n = 33$ ) and “carbon emissions” ( $n = 27$ ). Other frequently used keywords were “international trade” ( $n = 20$ ), “green trade” ( $n = 11$ ), “renewable energy” ( $n = 11$ ), “multi-criteria decision making

methods” ( $n = 6$ ), “climate change” ( $n = 6$ ), “trade policy” ( $n = 5$ ), “exports” ( $n = 5$ ), and “foreign direct investment” ( $n = 5$ ).

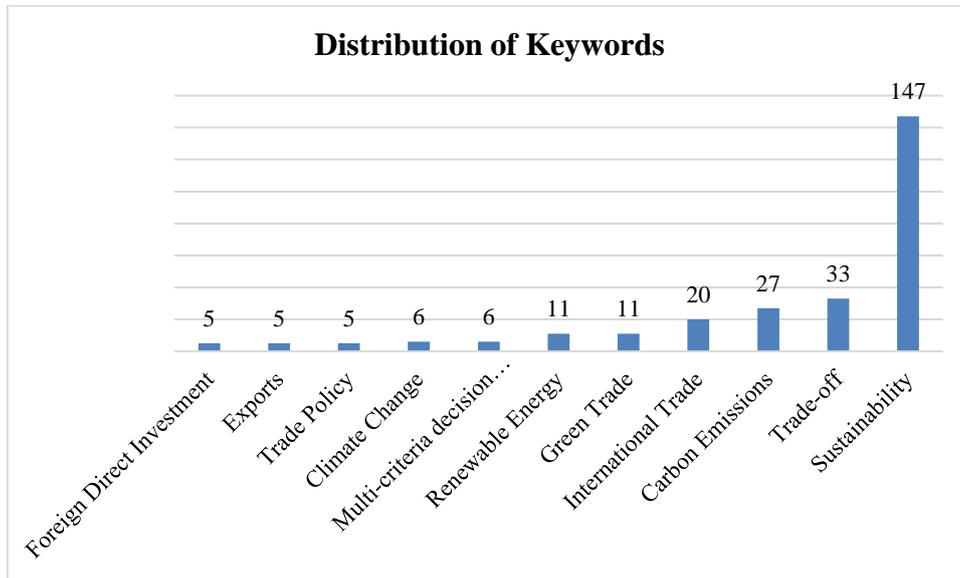


Figure 7.

*Most Frequently Used Keywords on Sustainable Trade*

Figure (8) illustrates the distribution of keywords in publications on green logistics. As seen in Figure (8), “sustainability” was the most frequently used keyword, appearing 141 times. The second most frequently used keyword was “green logistics”, which was used 100 times. The term “logistics” has the third place, and it was mentioned 45 times. Other frequently used keywords were “multi-criteria decision methods” ( $n = 29$ ), “reverse logistics” ( $n = 19$ ), “transportation” ( $n = 16$ ), “logistics service provider” ( $n = 15$ ), “green supply chain” ( $n = 14$ ), “logistics performance” ( $n = 13$ ), “environmental impacts” ( $n = 11$ ), “carbon emissions” ( $n = 8$ ), and “humanitarian logistics” ( $n = 5$ ).

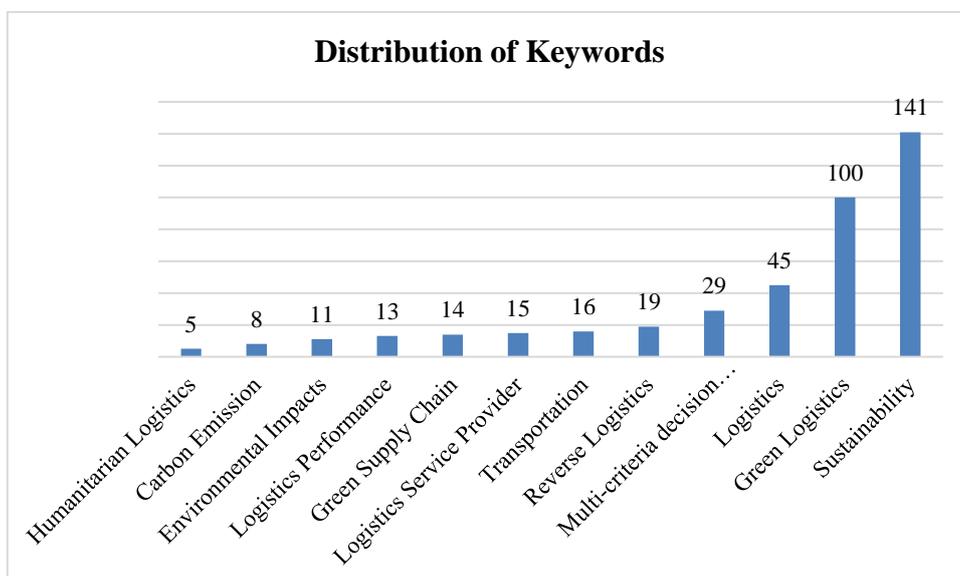


Figure 8.

*Most Frequently Used Keywords on Green Logistics*

These results suggest that academicians have widely used different terms regarding environmental issues, such as sustainability, green logistics, carbon emissions, green trade, reverse logistics, green supply chain, and renewable energy, to fill gaps in the literature. Additionally, such keywords reveal that awareness regarding environmental issues has been increasing each day.

**3.5. Trends in Research Methods**

Figures (9) and (10) illustrate the distribution of research methods in the relevant fields. It is seen that the most prevalently used research methods in the examined publications were quantitative methods, followed by document review and qualitative methods. More than two-thirds of the publications that were examined in this study (66.78%) were conducted with quantitative methods. Interestingly, no publication using a mixed research method was found in the field of sustainable trade.

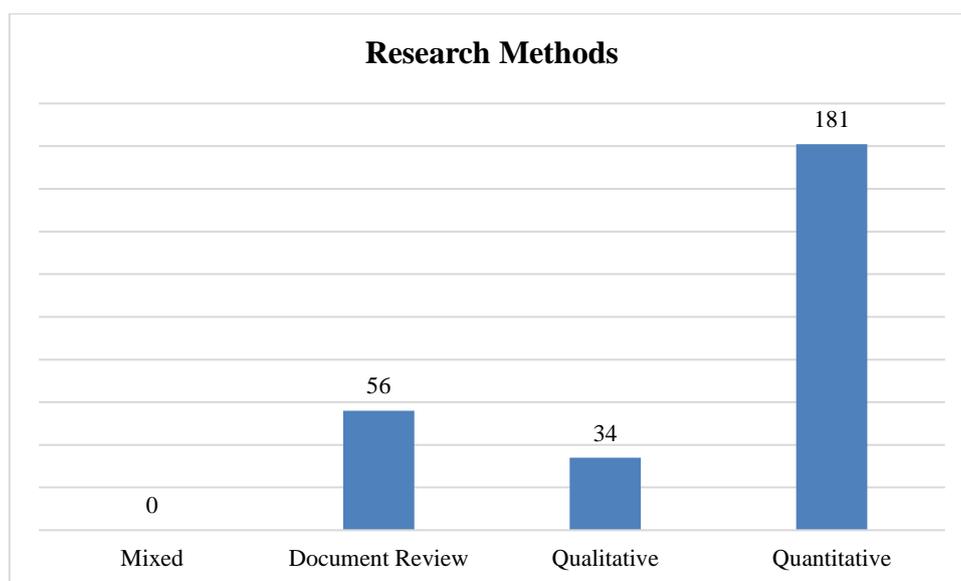


Figure 9.

*Most Preferred Research Methods on Sustainable Trade*

Figure (10) shows the trends in research methods in publications on green logistics. It is seen that the most prevalently used research methods in the publications were quantitative methods, followed by qualitative methods, document review, and mixed approaches. More than two-thirds of the examined publications (67.31%) were carried out with quantitative methods. Unlike the publications on sustainable trade, some publications in the field of green logistics involved mixed research methods.

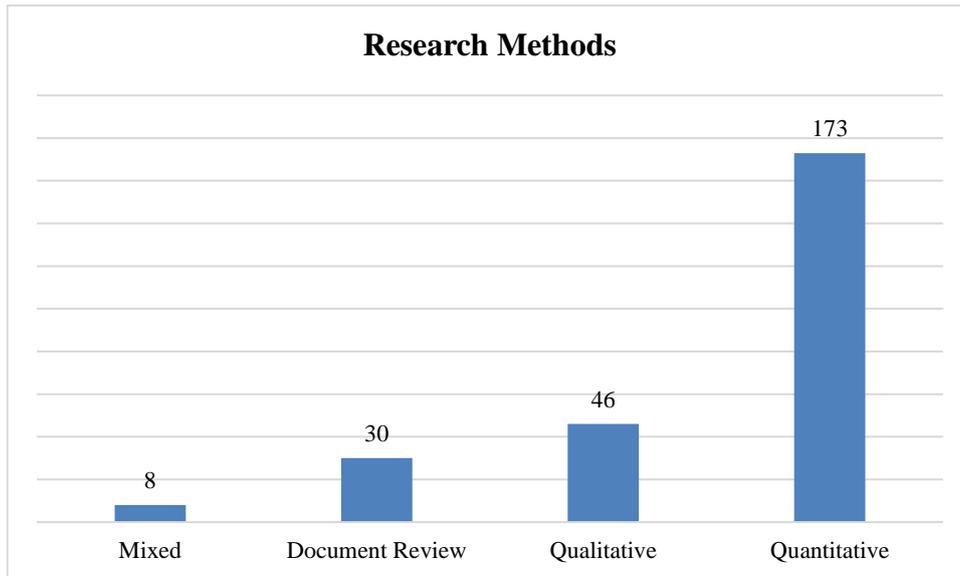


Figure 10.

*Most Preferred Research Methods on Green Logistics*

These results demonstrate that academicians have mostly preferred to utilize quantitative methods in their scientific research. According to the data shown in Figures (9) and (10), it is clear that the numbers of publications using qualitative and document review methods were almost equal. Qualitative methods were used eighty times, and the document review method was used eighty-six times in both research fields. In comparison to other research methods, only a few publications utilized mixed methods.

**3.6. Affiliations of Institutions**

Figures (11) and (12) show the performance of institutions based on the affiliations of the authors of the examined publications. In the entire sample, the authors were found to be affiliated with more than five hundred institutions, but the number of publications from each institution was quite variable. To avoid confusion, institutions with more than five publications each were chosen for reporting. As shown in Figure (11), the “University of California” and the “Chinese Academy of Sciences” ranked first and published the highest numbers of articles (14 in total) in the field of sustainable trade. The “Cyprus International University” and the “University of International Business and Economics” published 12 articles, ranking second, followed then by the “BETA Academy” (5 articles), “Shanghai Jiao Tong University” (5 articles), “Beijing Normal University” (5 articles), and “Wageningen University” (5 articles) among the most active institutions based on their volumes of publication.

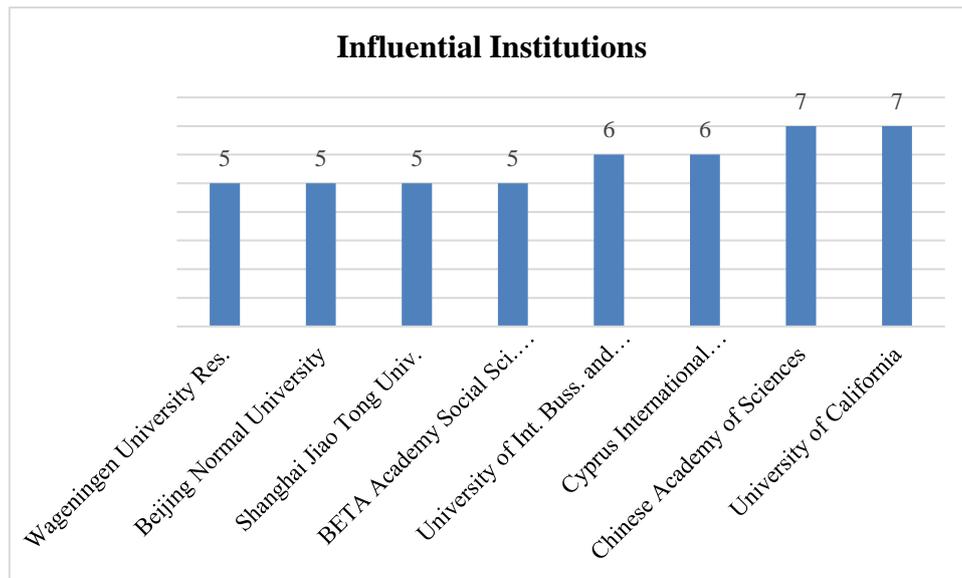


Figure 11.

*Productive Institutions, Sustainable Trade*

Figure (12) shows the institutions that had the greatest contribution to the field of green logistics. As seen in Figure (12), the “Dalian Maritime University” and “Jilin University” ranked first and published the highest numbers of articles (16 in total) in this field. “Hong Kong Polytechnic University” published 7 articles, ranking second, which was then followed by “FOM University of Applied Sciences for Economics and Management” (6 articles), “Linkoping University” (6 articles), “University of Hong Kong” (5 articles), and “University of Maribor” (5 articles) among the most active institutions based on their publication volumes.

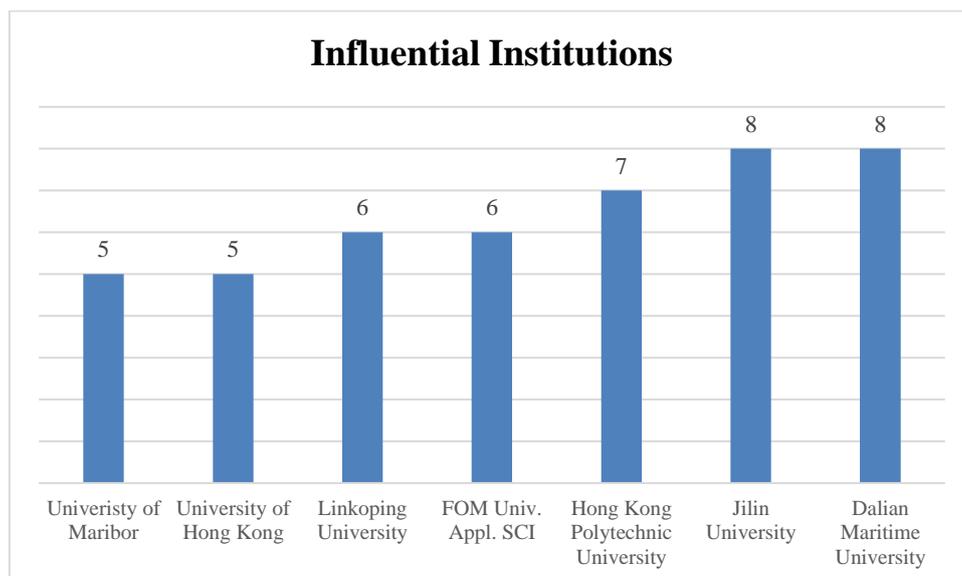


Figure 12.

*Productive Institutions, Green Logistics*

These results show that the highest numbers of publications on sustainable trade and green logistics were produced and published by Asian institutions, which were followed by European institutions. This could be evidence that Asian and European institutions are more interested in publishing articles on sustainability in the context of trade and logistics. Overall, scientific research on the relevant fields have been dominated by institutions from Asia and the Far East region, constituting 10 of the top fifteen institutions.

### **3.7. Most Active Publishers**

Figures (13) and (14) show the numbers of articles published by international publishing companies. Publishers that published more than five articles each are reported in this section, and the remaining publishers are indicated as “others.” Based on the data in Figure (13), approximately 30% of the articles on sustainable trade were published by “Elsevier”. Following this, 17% and 13% of the articles in the relevant field were published by “MDPI” and “Springer”, respectively.

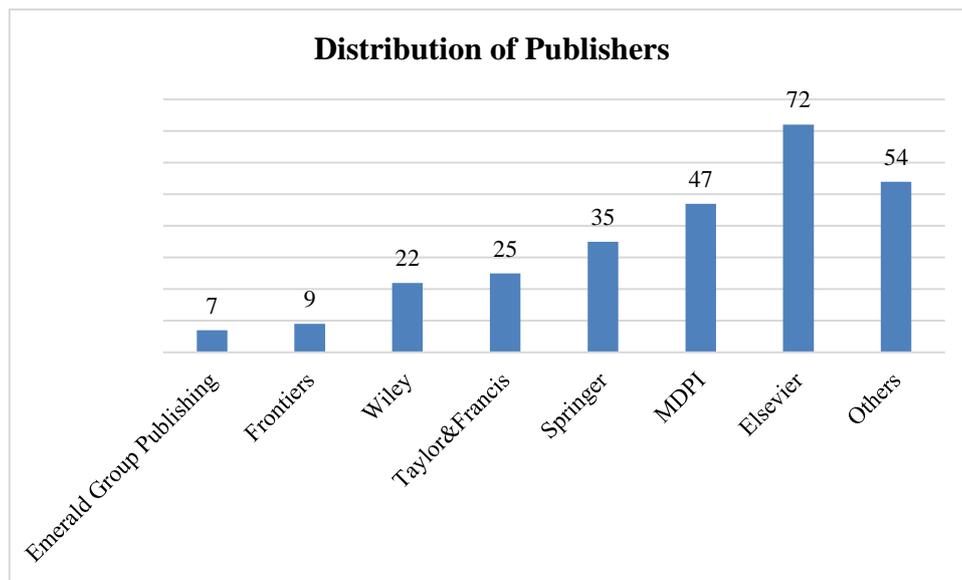


Figure 13.

#### *Publisher Performance, Sustainable Trade*

Figure (14) illustrates the performance of publishing companies in terms of their publications on green logistics. As seen in Figure (14), the publishers with the greatest numbers of publications were “Elsevier” and “MDPI,” followed by “Emerald Group Publishing”. Approximately half of the publications (41.63%) were made by “Elsevier” and “MDPI”. Following these two companies, “Emerald Group Publishing” contributed to the relevant literature with 45 publications (17.50%).

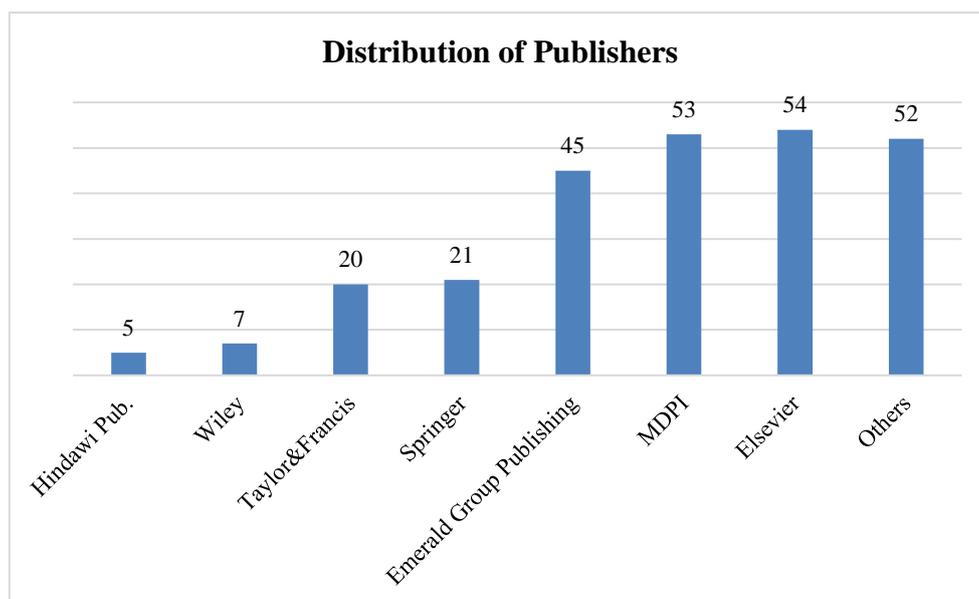


Figure 14.

*Publisher Performance, Green Logistics*

These results reveal that the highest numbers of publications on sustainable trade and green logistics were released and supported by the Elsevier and MDPI publishing companies, which were followed by Springer, Emerald Group Publishing, and Taylor & Francis. As another important point, all the publishers such as Elsevier (Netherlands), MDPI (Switzerland), Emerald Group Publishing (United Kingdom), Springer (Germany), and Taylor & Francis (United Kingdom) were launched in Europe. This could indicate that European publishing companies are becoming more and more important platforms in the development of the relevant literature.

**3.8. Most Active Journals**

Figures (15) and (16) show the most influential journals based on their numbers of publications. Journals that published more than five articles are reported in this section. It is seen in Figure (15) that “Sustainability” ranked first with the highest number of publications (36 articles) on sustainable trade. It was followed by the “Journal of Cleaner Production” with 12 articles and “Environmental Science and Pollution Research” with 10 articles.

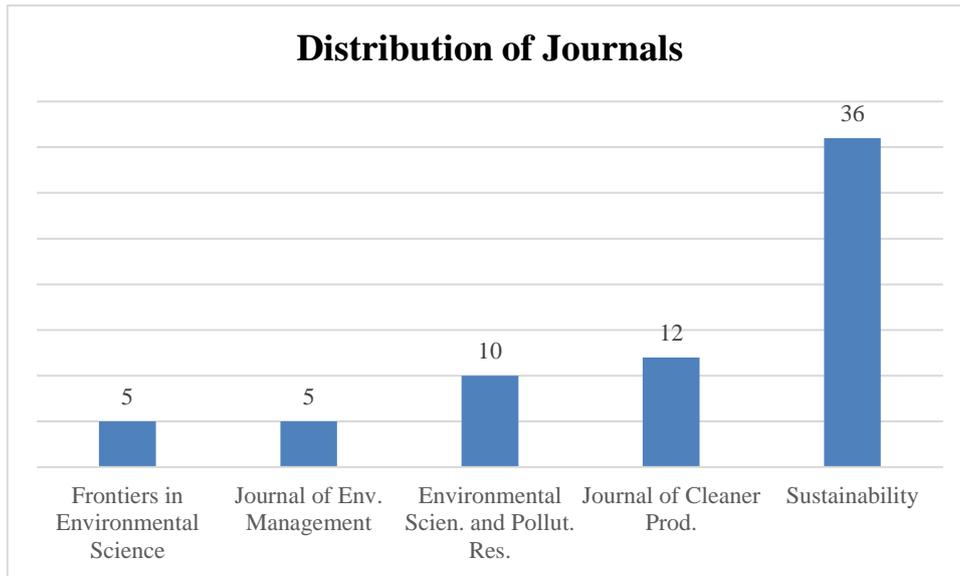


Figure 15

*Journal Performance, Sustainable Trade*

Figure (16) illustrates the performance of journals on green logistics. It is seen here that the most productive journals in the field of green logistics were “Sustainability” and the “Journal of Cleaner Production”, followed by the “International Journal of Logistics Research and Applications” with 40, 14 and 12 articles, respectively.

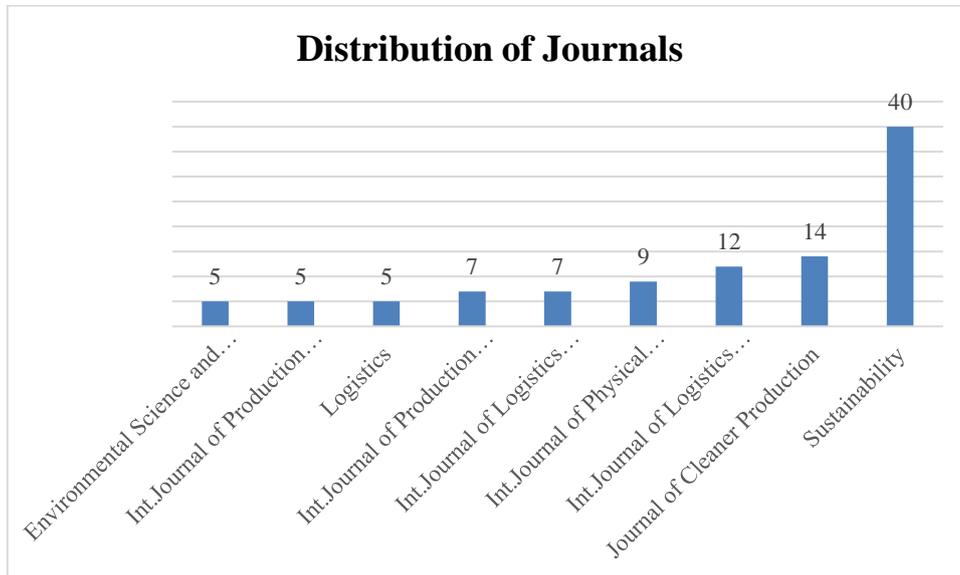


Figure 16.

*Journal Performance, Green Logistics*

It is seen that the highest numbers of publications on sustainable trade and green logistics were published in “Sustainability” and the “Journal of Cleaner Production”, which were then followed by the “International Journal of Logistics Research and Applications” and

“Environmental Science and Pollution Research”. These results also indicate that “Sustainability” and the “Journal of Cleaner Production” were far from other journals that were the most influential journals in this research field. In other words, the aforementioned journals were substantially more prevalently preferred compared to other journals. As another important point, all the journals such as “Sustainability (Switzerland)”, the “Journal of Cleaner Production (Netherlands)”, the “International Journal of Logistics Research and Applications (United Kingdom)”, and “Environmental Science and Pollution Research (Germany)” are located in Europe. This could be evidence that European scientists are more interested in such topics, and thus, they contributed more to these topics.

### 3.9. Overview of Influential Articles

Table (2) exhibits the details of the top five most cited articles by publication year, title, journal name, total citations, country, and references. According to Zhang et al. (2019), when a publication receives more than 100 citations, it is considered a highly cited article. Therefore, articles with more than 100 citations were chosen to be reported. As shown in Table (2), the most cited articles were published between 2010 and 2012. The highest number of citations belonged to the article by Dekker et al. published in the European Journal of Operational Research in 2012. The articles with the second and third highest numbers of citations (623 citations in total) were published by researchers from France, the Netherlands, and the United Kingdom consortium in 2010.

Table 2

*Top 5 Most Cited Articles*

Rank	Year	Title	Journal	Total Citations	Country	References
1	2012	Operations research for green logistics-an overview of aspects, issues, contributions, and challenges	European Journal of Operational Research	497	Netherlands Greece	(Dekker et al. 2012)
2	2010	Trade-offs in corporate sustainability: You can't have your cake and eat it	Business Strategy and the Environment	364	France Netherlands United Kingdom	(Hahn et al. 2010)
3	2010	Combinatorial optimization and green logistics	Annals of Operations Research	259	France United Kingdom	(Sbihi & Eglese, 2010)
4	2012	Green logistics management and performance: Some empirical evidence from Chinese manufacturing exporters	Omega	258	China	(Lai & Wong, 2012)
5	2011	Sustainability of pasture-based livestock farming systems in the European	Livestock Science	236	Spain	(Bernués et al. 2011)

These results clearly suggest that researchers in Europe have already started to pay attention to and investigate trade and logistics in the context of sustainability since 2010. They also show that Chinese researchers were pioneers in the exploration of these issues.

### 3.10. Hierarchical Code-Subcode Model

The hierarchical structures of the codes in publications in the relevant fields were visualized in MAXMaps, as shown in Figures (17) and (18).

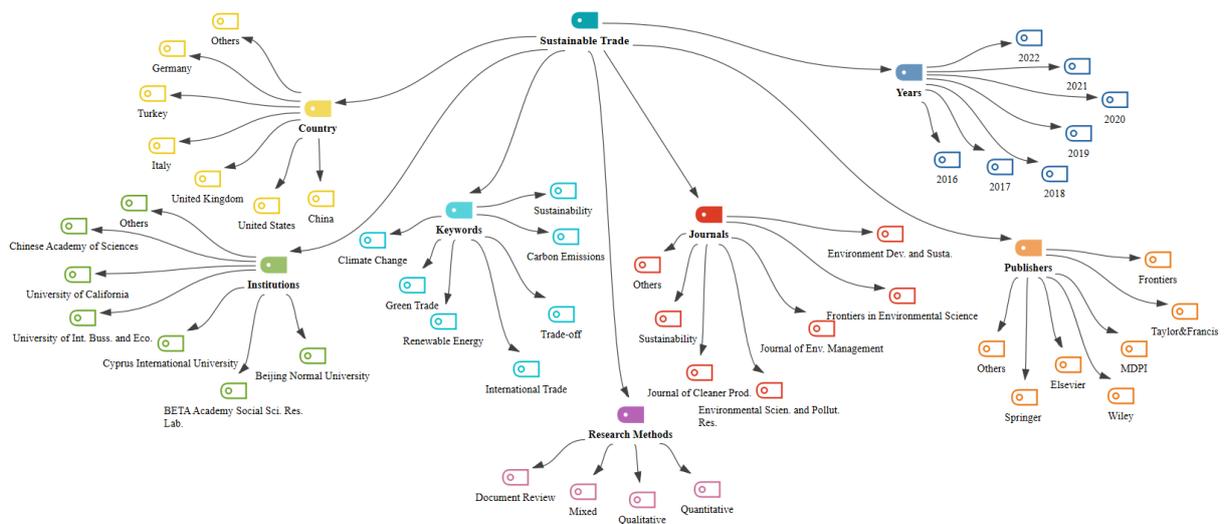


Figure 17.

*Hierarchical Code-Subcode Model of Publications on Sustainable Trade*

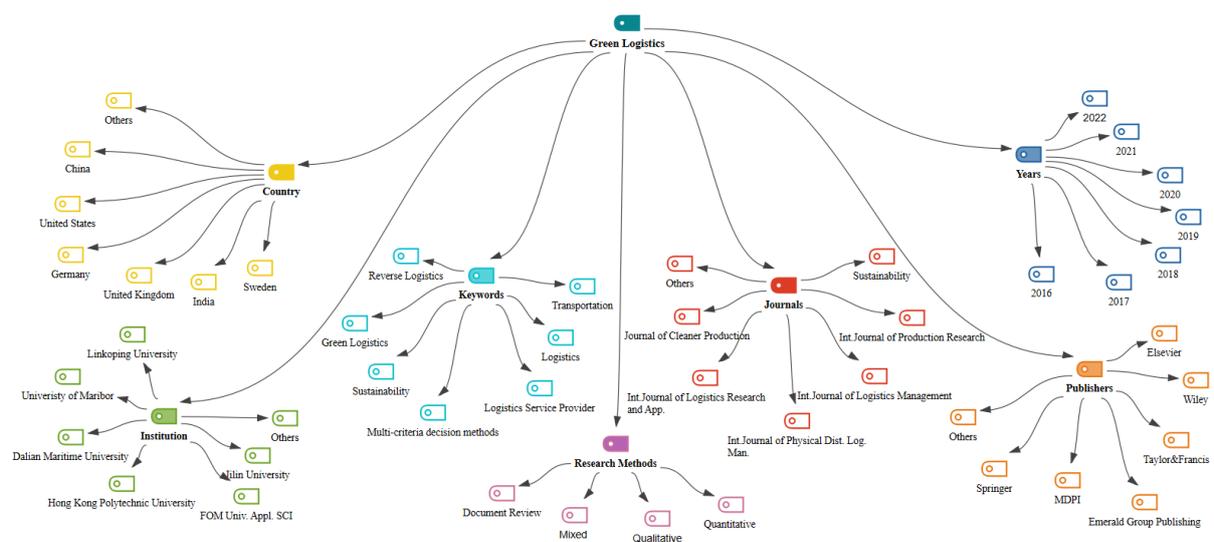


Figure 18.

*Hierarchical Code-Subcode Model of Publications on Green Logistics*

By applying a hierarchical code-subcode model, a selected code and its subcodes are displayed on a map. This way, in this study, the hierarchical structures of the subcodes were visualized in the form of multiple “levels”. This method is also utilized to explore statements on specific topics. Overall, the code-subcode model is useful for illustrating the hierarchical structure of a code and its subcodes in combination with code frequencies (Kuckartz & Rädiker, 2019).

#### **4. Conclusion**

This study examined articles published on sustainable trade and green logistics from 2007 to 2022. The bibliometric analysis method was used to identify the distributions of countries, institutions, research methods, publication years, keywords, most cited publications, journals, and publishers in the relevant fields. The data to be used in this study were gathered from the WoS database, and a total of 528 articles were found to have been published within 15 years. The visualization of the data was carried out using MAXQDA Analytics Pro.

The results revealed that the number of publications in the relevant fields increased significantly since 2015. In particular, relevant publications reached the highest number in the last two years. Accordingly, it can be stated that there is a relationship between the announcement of the SDGs by the UN and the growth of academic publications in these fields. In recent years, the awareness of researchers regarding the examined topics has increased. In the comparisons of countries in terms of publication productivity, China, the United States, the United Kingdom, Germany, and India were found as the most influential countries in the fields in the context of which publications were analyzed in this study. The findings showed that China and India had significant contributions to these fields with more than 250 publications. The findings also revealed that the United States, the United Kingdom, and Germany were the most productive countries among developed economies in terms of publication numbers.

Based on the results of the keyword analyses, sustainability, green logistics, carbon emissions, green trade, reverse logistics, green supply chain, and renewable energy were the most frequently used terms in the relevant literature. The results on the most preferred research methods demonstrated that the highest numbers of studies were carried out with quantitative methods. They also indicated that there were limited numbers of publications with mixed methods. The findings on the affiliations of institutions showed that the countries of origin of the most influential institutions were in Asia, followed by Europe. For instance, while the Chinese Academy of Science, Dalian Maritime University, and Jilin University were the most

active institutions in Asia, FOM University of App., Linkoping University, and University of Wageningen were the most active institutions in Europe.

According to results of the distribution of publishers, Elsevier and MDPI were the most active publishing companies in the relevant fields, followed by Springer, Emerald Group Publishing, and Taylor & Francis. This also showed that European publishing companies had substantial contributions to the development of the relevant literature. The results on the most influential journals indicated that Sustainability and the Journal of Cleaner Production were more preferred journals compared to others. The findings pointed out that the most cited articles were published by mostly European researchers between 2010 and 2012. It can be argued that in the specified period, researchers in Asian countries were not as active as they are today.

In this regard, this study can help scholars who are planning to pursue research in the fields of sustainable trade and green logistics quickly grasp the overall picture of current trends and developments in the global literature. However, some limitations of this study need to be acknowledged. For instance, only articles from the WoS database were included in this study, and articles published exclusively in other databases were not included. Therefore, further research can be conducted based on other prestigious databases such as Scopus. Additionally, a future study could examine more document types such as proceedings and book chapters.

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**Peer-review:** Externally peer-reviewed.

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## REFERENCES

- Agrawal, S., Singh, R. K., & Murtaza, Q. (2016). Outsourcing decisions in reverse logistics: Sustainable balanced scorecard and graph theoretic approach. *Resources, Conservation and Recycling, 108*, 41-53. <https://doi.org/10.1016/j.resconrec.2016.01.004>
- Bartolini, M., Bottani, E. & Grosse, E. H. (2019). Green Warehousing: Systematic Literature Review and Bibliometric Analysis. *Journal of Cleaner Production, (226)*, 242- 258. <https://doi.org/10.1016/j.jclepro.2019.04.055>
- Bask, A., & Rajahonka, M. (2017). The role of environmental sustainability in the freight transport mode choice: A systematic literature review with focus on the EU. *International Journal of Physical Distribution & Logistics Management*. <https://doi.org/10.1108/IJPDLM-03-2017-0127>
- Belloumi, M., & Alshehry, A. (2020). The impact of international trade on sustainable development in Saudi Arabia. *Sustainability, 12*(13), 5421. <https://doi.org/10.3390/su12135421>
- Bernués, A., Ruiz, R., Olaizola, A., Villalba, D., & Casasús, I. (2011). Sustainability of pasture-based livestock farming systems in the European Mediterranean context: Synergies and trade-offs. *Livestock Science, 139*(1-2), 44-57. <https://doi.org/10.1016/j.livsci.2011.03.018>
- Bianchet, R. T., Cubas, A. L. V., Machado, M. M., & Moecke, E. H. S. (2020). Applicability of bacterial cellulose in cosmetics—bibliometric review. *Biotechnology Reports, 27*, e00502. <https://doi.org/10.1016/j.btre.2020.e00502>
- Çavdar, E. (2021). Green Logistic: a Bibliometric Analysis Based on WoS Data (2000-2021). *Econder International Academic Journal, 5*(2), 359-374. <https://doi.org/10.35342/econder.1006218>
- Chandia, K. E., Gul, I., Aziz, S., Sarwar, B., & Zulfiqar, S. (2018). An analysis of the association among carbon dioxide emissions, energy consumption and economic performance: an econometric model. *Carbon Management, 9*(3), 227-241. <https://doi.org/10.1080/17583004.2018.1457930>
- Cui, Y., Liu, Y., & Mou, J. (2018). Bibliometric analysis of organisational culture using CiteSpace. *South African Journal of Economic and Management Sciences, 21*(1), 1-12. <https://doi.org/10.4102/sajems.v21i1.2030>
- Dekker, R., Bloemhof, J., & Mallidis, I. (2012). Operations Research for green logistics—An overview of aspects, issues, contributions and challenges. *European Journal of Operational Research, 219*(3), 671-679. <https://doi.org/10.1016/j.ejor.2011.11.010>
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research, 133*, 285-296. <https://doi.org/10.1016/j.jbusres.2021.04.070>
- Dupuy, L., & Agarwala, M. (2014). International trade and sustainable development. In *Handbook of Sustainable Development*. Edward Elgar Publishing.
- Ellegaard, O., & Wallin, J. A. (2015). The bibliometric analysis of scholarly production: How great is the impact? *Scientometrics, 105*(3), 1809-1831. <https://doi.org/10.1007/s11192-015-1645-z>
- Fahimnia, B., Sarkis, J., & Davarzani, H. (2015). Green supply chain management: A review and bibliometric analysis. *International Journal of Production Economics, 162*, 101-114. <https://doi.org/10.1016/j.ijpe.2015.01.003>
- Gong, R., Xue, J., Zhao, L., Zolotova, O., Ji, X., & Xu, Y. (2019). A bibliometric analysis of green supply chain management based on the Web of Science (WOS) platform. *Sustainability, 11*(12), 3459. <https://doi.org/10.3390/su11123459>
- Hahn, T., Figge, F., Pinkse, J., & Preuss, L. (2010). Trade-offs in corporate sustainability: You can't have your cake and eat it. *Business Strategy and the Environment, 19*(4), 217-229. <https://doi.org/10.1002/bse.674>

- Jacso, P. (2005). As we may search—comparison of major features of the Web of Science, Scopus, and Google Scholar citation-based and citation-enhanced databases. *Current science*, 89(9), 1537-1547.
- Jiménez-Almazán, M, Uribe-Toril, J & Ruiz-Real, JL. (2020). International Trade and Sustainability: Bibliometric and Cluster Analysis. *Sustainability*, 12(17): 6816. <https://doi.org/10.3390/su12176816>
- Kuckartz, U., & Rädiker, S. (2019). *Analyzing qualitative data with MAXQDA*. Basel, Switzerland: Springer International Publishing. <https://doi.org/10.1007/978-3-030-15671-8>
- Lai, K. H., & Wong, C. W. (2012). Green logistics management and performance: Some empirical evidence from Chinese manufacturing exporters. *Omega*, 40(3), 267-282. <https://doi.org/10.1016/j.omega.2011.07.002>
- Lee, P. T. W., Kwon, O. K., & Ruan, X. (2019). Sustainability challenges in maritime transport and logistics industry and its way ahead. *Sustainability*, 11(5), 1331. <https://doi.org/10.3390/su11051331>
- M. E. Morales & L. J. Belmonte-Ureña. (2021). "Theoretical research on circular economy and sustainability trade-offs and synergies: A bibliometric analysis," *2021 IEEE International Conference on Technology and Entrepreneurship (ICTE)*, 1-6.
- Mattila, T., & Antikainen, R. (2011). Backcasting sustainable freight transport systems for Europe in 2050. *Energy Policy*, 39(3), 1241-1248. <https://doi.org/10.1016/j.enpol.2010.11.051>
- Naeem, M. A., Karim, S., Rabbani, M. R., Bashar, A., & Kumar, S. (2022). Current state and future directions of green and sustainable finance: A bibliometric analysis. *Qualitative Research in Financial Markets*. <https://doi.org/10.1108/QRFM-10-2021-0174>
- Neto, J. Q. F., Bloemhof-Ruwaard, J. M., van Nunen, J. A., & van Heck, E. (2008). Designing and evaluating sustainable logistics networks. *International Journal of Production Economics*, 111(2), 195-208. <https://doi.org/10.1016/j.ijpe.2006.10.014>
- Özekenci, E. K. (2022). A Content Analysis of Theses Written in The Field of International Trade and Green Logistics: National Thesis Center Sample. *Dokuz Eylul University the Journal of Graduate School of Social Science (Special Issue)*, 238-266. <https://doi.org/10.16953/deusosbil.1189619>
- Ramos, T. R. P., Gomes, M. I., & Barbosa-Póvoa, A. P. (2014). Planning a sustainable reverse logistics system: Balancing costs with environmental and social concerns. *Omega*, 48, 60-74. <https://doi.org/10.1016/j.omega.2013.11.006>
- Ren, R., Hu, W., Dong, J., Sun, B., Chen, Y., & Chen, Z. (2020). A systematic literature review of green and sustainable logistics: bibliometric analysis, research trend and knowledge taxonomy. *International Journal of Environmental Research and Public Health*, 17(1), 1-25. <https://doi.org/10.3390/ijerph17010261>
- Rey-Martí, A., Ribeiro-Soriano, D., & Palacios-Marqués, D. (2016). A bibliometric analysis of social entrepreneurship. *Journal of Business Research*, 69(5), 1651-1655. <https://doi.org/10.1016/j.jbusres.2015.10.033>
- Sarkar, A., Wang, H., Rahman, A., Memon, W. H., & Qian, L. (2022). A bibliometric analysis of sustainable agriculture: based on the Web of Science (WOS) platform. *Environmental Science and Pollution Research*, 1-22. <https://doi.org/10.1007/s11356-022-19632-x>
- Sbihi, A., & Eglese, R. W. (2010). Combinatorial optimization and green logistics. *Annals of Operations Research*, 175(1), 159-175. <https://doi.org/10.1007/s10479-009-0651-z>
- Steen-Olsen, K., Weinzettel, J., Cranston, G., Ercin, A. E., & Hertwich, E. G. (2012). Carbon, land, and water footprint accounts for the European Union: consumption, production, and displacements through international trade. *Environmental Science & Technology*, 46(20), 10883-10891. <https://doi.org/10.1021/es301949t>
- Tian, X., Geng, Y., Sarkis, J., & Zhong, S. (2018). Trends and features of embodied flows associated with international trade based on bibliometric analysis. *Resources, Conservation and Recycling*, 131(4), 148-157. <https://doi.org/10.1016/j.resconrec.2018.01.002>

United Nations, (2017). The Sustainable Development Goals Report. Retrieved from <https://sdgs.un.org/goals> (05.01.2023).

Wallin, J. A. (2005). Bibliometric methods: pitfalls and possibilities. *Basic & Clinical Pharmacology & Toxicology*, 97(5), 261-275. [https://doi.org/10.1111/j.1742-7843.2005.pto\\_139.x](https://doi.org/10.1111/j.1742-7843.2005.pto_139.x)

Xu, Z., Li, Y., Chau, S. N., Dietz, T., Li, C., Wan, L., ... & Liu, J. (2020). Impacts of international trade on global sustainable development. *Nature Sustainability*, 3(11), 964-971. <https://doi.org/10.1038/s41893-020-0572-z>

Yalçıntaş, D, Oğuz, S, Özeltürkay, E.Y, Gülmez, M. (2023). Bibliometric Analysis of Studies on Sustainable Waste Management. *Sustainability*, 15(2):1414. <https://doi.org/10.3390/su15021414>

Yingfei, Y., Mengze, Z., Zeyu, L., Ki-Hyung, B., Avotra, A. A. R. N., & Nawaz, A. (2022). Green logistics performance and infrastructure on service trade and environment-measuring firm's performance and service quality. *Journal of King Saud University-Science*, 34(1), 101683. <https://doi.org/10.1016/j.jksus.2021.101683>

Yu, Y., Li, Y., Zhang, Z., Gu, Z., Zhong, H., Zha, Q., ... & Chen, E. (2020). A bibliometric analysis using VOSviewer of publications on COVID-19. *Annals of Translational Medicine*, 8(13). <https://doi.org/10.21037/atm-20-4235>

Zhang, X., Estoque, R. C., Xie, H., Murayama, Y., & Ranagalage, M. (2019). Bibliometric analysis of highly cited articles on ecosystem services. *PloS One*, 14(2), e0210707. <https://doi.org/10.1371/journal.pone.0210707>