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Green Logistics: A Bibliometric Analysis of the Concept Scanned in Web of Science in the Period 1980-2024

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KEYWORDS

Green Logistics,
Bibliometric Analysis,
Transportation

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ABSTRACT

The aim of this research is to analyze the content of the articles written in the field of "Green Logistics" in Web of Science between 1980 and 2024 and to identify the countries and institutions that conduct research in this field, the authors who wrote the most articles, their citations, keywords, and which university has the most research in the field of green logistics. Articles published on green logistics in SSCI and SCI-EXPANDED Journals were scanned on the Web of Science and viewed in the VOS viewer program, and bibliometric analysis was performed. In this study, 230 articles from the Web of Science were included. As a result of the research, it was seen that there were only articles in English, and these articles started to be written since 2000. China has done more research on green logistics than other countries and received many citations, and Chinese researchers have written articles in cooperation with other countries. It was observed that Turkish researchers wrote three articles on green logistics published in the Social Sciences Citation Index (SSCI) and Science Citation Index Expanded (SCI-EXPANDED) journals scanned in Web of Science.

Introduction

Global climate change, which negatively affects human life due to geographical and human reasons, has raised concerns about the future of the world with risks such as overheating and overcooling. The issues of how to evaluate the increasing waste after the industrial revolution and technological developments, how to cope with changes in weather and climate dynamics, how to ensure access to food in the future, and what precautions can be taken against extraordinary events due to climate

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change have been frequently discussed by scientists. Global climate changes, the increase in evaporation and rainfall causes torrential rains; as the glaciers melt, the sea water level increases, corals turn white, and forest fires increase due to the effect of warming and temperature. While many living things are becoming extinct, there is an increase in greenhouse gas emissions due to human reasons, and temperature increases and excessive cooling negatively affect vegetation.

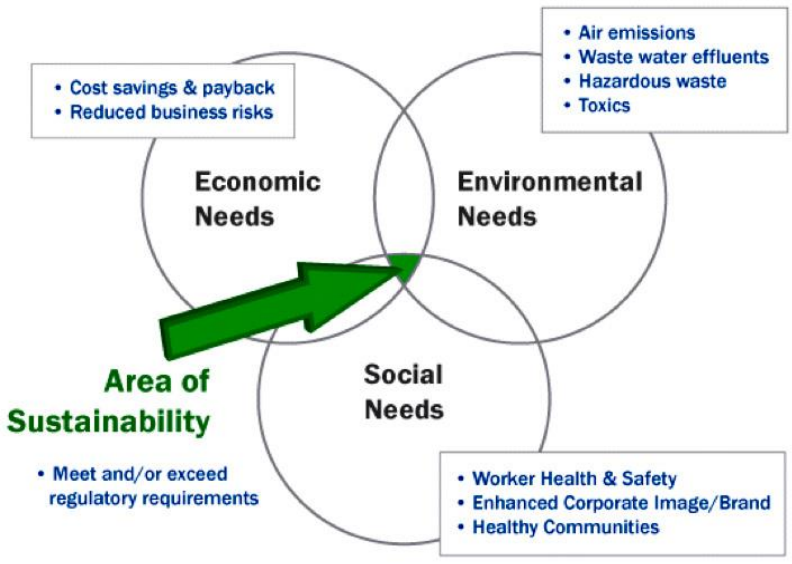
As the number of electronic devices increases, electricity consumption also increases. As of the beginning of 2024, 8 billion 73 million 859 thousand 407 people live in the world (https://www.dw.com, 2024, Accessed Date 12.05.2024). In research conducted by Istanbul University Faculty of Transportation and Logistics and the Communication Tools and Information Technologies Businessmen Association in Turkey, the "Mobile Communication Sector Report" was prepared. According to this report, 77 percent of the population in Turkey uses smartphones. The number of mobile phone users in the world is over 5 billion. Statistics show people will use mobile phones 5.9 billion in 2025. The increased number of tablets and mobile phones increases energy consumption, resulting in the need for energy to recycle electronics. Pritchard, in 1969, proposed a bibliometric system and was the first to analyze communications set up in systematic modules (Dilek, 2020). The European Green Deal covers the measures to be taken regarding the EU's concerns in the next century. The European Commission prioritizes global warming measures in solving political issues and aims for zero emissions by 2050. The EU, which adopted the first EU Climate Law in 2021, has set a target of 55% less emissions by 2030 compared to 1990. The EU aims to reduce emissions by 90% by 2040 and supports workers and regions for a green economy with the Just Transition Fund. The Social Climate Fund, financed by the EU, supports EU member states with investments in energy efficiency, heating with renewable energy, and renovation of buildings through the Emission Trading System. It created new job opportunities by providing a Just Transition Fund with 354 million Euros and directing 11,000 workers and job seekers to green jobs. The EU Solidarity Fund against disasters caused by climate change was established and has provided 2.1 billion Euros of assistance to 13 member states following climate disasters since 2019. The EU Civil Protection Mechanism has supported national projects for EU member states in need of assistance. The EU's €75 billion Next Generation EU and REPower EU fund climate-related investments have been developed. The Emergency Response Coordination Center provides training, humanitarian aid, and satellite mapping support to members on climate change. Greece and Slovenia receive 330 million Euros of support from EU farmers. Fifty million Euros of support was sent to these farmers. The EU Emissions Trading System has been modernized. Social support against climate change was provided through the Innovation Fund, Modernization Fund and Social Climate Fund. Due to the Russia-Ukraine war, the EU Commission requested an end to fossil fuel imports from Russia. The increasing share of renewable energy in the electricity mix and the decrease in overall energy demand contributed to the decline of energy prices to pre-war levels. The reform implemented in the electricity market will further contribute to keeping the green industry competitive and preventing carbon leakage. The World Trade Organization, which introduced carbon limitation in the world, supports green production (https://ec.europa.eu, Access Date, 10.05.2024). DTO, EU, and OECD members have set strategic goals against the problems that humanity may face due to the damage caused by global climate change. One of these goals is

sustainable green logistics. Logistics is an important part of international trade. It is aimed to carry out transportation without harming the environment in all transportation modes, to reduce carbon emissions, to prevent energy waste, and to carry out effective and efficient logistics activities. In this research, it was seen that green logistics was scanned in 6142 articles in 195 fields in the Web of Science. Green logistics is a multidisciplinary concept that is widely discussed in the literature in many branches of science and social sciences. Since our field is logistics, when we narrowed the research framework to logistics and transportation, 230 articles were found on the specified dates. This broad framework has shown us that green logistics is a dramatically developing concept that is frequently emphasized due to global climate change. The limitation of the research is the reliance on the bibliometric analysis results of many studies, which provide insight into collaborative research trends rather than the analysis results of a particular study. When we searched the English language documents in the Web of Science database, 730 articles were found. When we expanded the fields, it was determined that 6142 articles were scanned in 19 languages. Only 230 articles written in English were identified in the field of logistics. The research includes English documents in the Web of Science database. For future research, research in different areas can be included. Qualitative research conducted with bibliometric analysis guides researchers with their keywords, and the fact that universities conducting academic studies in this field, including the field of green logistics, in a broad context shows that the institutions have global values and fulfill their social responsibilities.

Logistics management includes all packaging, labeling, and handling processes, transportation, inventory, storage, and order processing. Research in recent years has increasingly addressed green logistics. Renewable energy, material transportation, waste management, finding solutions to climate change, focusing on environmentally friendly practices, and environmentally protective practices at an international level are the subject of logistics. Green logistics is environmentally friendly logistics that aims to minimize the damage caused by logistics processes to the environment. Logistics activities include handling, packaging, storage inventory, warehousing, and order processing. Green Logistics is the execution of logistics activities in an environmentally friendly manner, taking into account the green agreement. With green logistics, damage to the environment is minimized. It covers all actions that try to reduce the carbon footprint that humans emit on the environment. Supply chain management is important for the future of promoters, producers, and customers. Green purchasing is the purchase of recyclable, usable materials (Min & Galle, 2001; Sarkis, 2003). Green production processes that do not pollute the world can be recycled and protected (Shamdasani, 1993). Inputs that cause minimal damage to the environment have high efficiency. A green distribution process, a marketing action that adds value to the supply chain, causes the least harm to the environment (Jain & Kaur, 2004). An environmentally friendly marketing distribution network is planned. Global climate change is the biggest problem facing the world (Anonymous, 2010, p. 17). Rodrigue et al. (2001) define green logistics as supply chain management strategies that cause minimal damage to the environment during transportation. Sbihi and Eglese (2007), while defining green logistics, stated that the products considered within sustainable development are produced and distributed sustainably, taking into account environmental and social factors. Climate Change is a multidimensional social and economic

environmental problem. It can be defined as environmentally friendly logistics activities that re-design materials (waste material, cans, bottles, paper, etc.) to increase environmental efficiency and manage the flow of products or parts for the efficient use of resources (Carter & Ellram, 1998). The focus of the traditional supply chain is on cost, quality, time, and flexibility. While creating a green supply chain, the performance of the elements that make up the chain management, green image, ecological efficiency, green design, green product, and sustainability components (Chan & Qi, 2003, p. 214). Green distribution means measurement systems, transportation, distribution and control in all processes of the supply chain in a way that causes minimal damage to the environment. It covers the determination process. Covering all processes of the supply chain fuel consumed by transportation vehicles, transportation frequency, distribution points, and distances traveled. It is designed by taking environmental factors into consideration (Sarkis, 2003, p. 399). Green Logistics is an ecological management activity that adds value to the transaction. The purpose of logistics is to manage logistics processes correctly and minimize damage to the natural environment (Seroka et al., 2019, p. 473). Sustainability is possible by solving environmental, social and economic problems. According to the OECD, sustainability is possible by meeting the needs necessary for development (OECD, 2001). Figure 1 shows the area of sustainability.

Figure 1.
Sustainability and Its Components



Source: Camlica and Akar (2014).

After logistics 4.0, monitoring and documentation operations are carried out in the virtual environment with IoT applications. With IoT, labor loss, environmental pollution, and paper waste are prevented. Simulation studies in logistics activities increase efficiency as they prevent losses due to incorrect planning. Thanks to simulations, the optimum scenario can be realized without loss of cost, resources, and time (Demirci et al., 2022). Green is a concept used in multidisciplinary

studies in many areas, meaning cleanliness, sustainability, fair trade, recycling, welfare, the transformation of products into final products, retailers, transportation companies, warehouses, seller distribution centers being environmentally sensitive. International organizations such as the EU, UN, OECD, and WTO consider issues such as sustainability and green logistics among the development goals of the millennium and attach importance to research on these issues.

Literature research

Global climate change requires focusing on environmentally friendly studies in all branches of science. While logistics activities focus on customer needs, they can harm the environment. Logistics are carried out by businesses to deliver value to customers. Operations can also cause various environmental problems. 27% of the greenhouse gas emissions of countries in the world originate from logistics. Eurostat stated that in 2019, 25.8% of the greenhouse gases released in Europe originated from the logistics sector. Since logistics is one of the main causes of global climate change, green logistics is seen as an area that will reduce these negative effects and is considered among the basic components of the logistics field. Grosse (2019) examined 38 articles related to green storage, which they found in three different databases: Google Scholar and Scopus.

Ren et al. (2020) researched the theme of green logistics based on WoS and Scopus (they studied 306 articles published from 1999 to 2019). Zhang and Zhao (2021) conducted a bibliometric analysis of the YTZY literature in the platform economy. The study examined 1404 articles in the WoS database published between 2003 and 2020 (Çavdar, 2021). In the research conducted by Çavdar (2021), a bibliometric analysis of the studies conducted in the field of green logistics was made by compiling 77 articles in the Web of Science database between 2000 and 2021, various analyses were made, and a search was made to identify studies containing the green logistics in their keywords and titles.

Duran and Çelikkaya (2019) examined 529 postgraduate theses in the National Thesis Center database on green logistics in the 2000-2019 period with the bibliometric analysis method. Graduate theses are reported according to criteria such as publication language, keywords, research type, and number of pages.

Korkmaz and Çetinkaya (2019) bibliographically included 525 graduate theses on logistics and supply chain added to the National Thesis Center database between 1993 and 2019. He analyzed the postgraduate theses and reported them according to criteria such as the city in which they were written, publication date, and keywords. Serdarasan et al. (2021) also reported on supply chain and/or logistics between 2000 and 2022. Articles published in the DergiPark database were examined, and as a result of the research, criteria such as the most cited journal, the most frequently used keyword, and the department with the most publications in this field were reported. About sustainable logistics practices When bibliometric studies were examined, Çavdar (2021) examined articles on green logistics based on Web of Science (WOS) data has been seen to examine articles on reverse logistics based on Product Acquisition, Collection of Products, Inspection and Classification of Products, Recycling, Raw Material Production, Distributors, Intermediaries, Consumers, Reproduction, Reuse, Repair, Disposal, Disposal (Waste) Advanced Logistics, Reverse Logistics, again based on WOS data (Kılıç & Yaprak, 2022). In the research conducted by Tian et

al. (2018) using the bibliometric analysis method, trends in international trade were discussed. Grosse et al. (2019), green research in storage was classified in the research conducted by. Ren et al. (2020) examined global green sustainable logistics in their bibliometric analysis. Jiménez-Almazán et al. (2020) conducted a literature review on international trade and sustainability. In Morales et al (2021), the systematic structure of sustainability and circular economy is discussed and in Naeem et al. (2022), the present and future of green, sustainable finance were investigated in their bibliometric analysis. Green logistics sustainable trade has been addressed as the subject of bibliometric analyses in recent studies to visualize academic publication trends (Özekenci, 2023). According to Rodrigue et al. (2001), supply chain management with green logistics reduces environmental damage in transportation. According to Sbihi and Eglese (2007), green logistics' environmental and social effects on sustainable development have become a matter of debate. They stated that production and distribution should be carried out in a sustainable manner. Xiu and Chen (2012) defined green logistics as using resources in the most effective way and keeping the damage to the environment at a minimum level throughout the logistics processes.

Method

In this research, data were accessed from 230 articles in the Social Sciences Citation Index (SSCI) and Science Citation Index Expanded (SCI-EXPANDED) indexed journals, which included technologies in the field of green logistics, citing the original study. The Vos viewer program provided data visualization of articles published in Web of Science. There is an increase in the number of articles written on green logistics published in 2000-2024. Articles covering the years 29 May 2000 to 29 May 2024 were included in the research.

In the bibliometric analysis, VOSviewer was used to process and visualize the data obtained from the Web of Science, and it was combined with the bibliometric software VOSviewer. The Web of Science data was filtered with the keyword green logistics. The articles scanned in this research were reviewed from a broad perspective. It was examined with bibliometric analysis, one of the qualitative research methods. The research sought answers to the following questions:

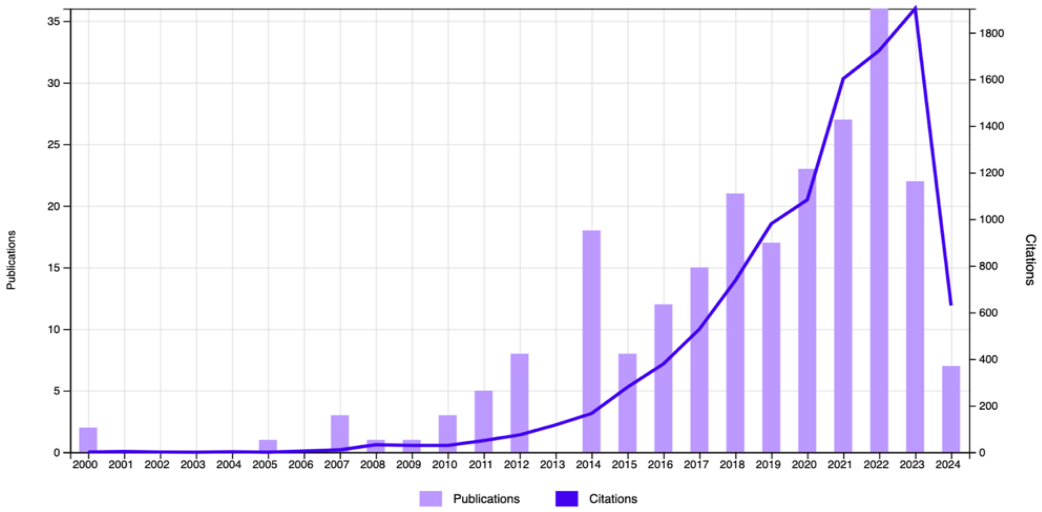
1. How many studies have been conducted in the field of green logistics in the international literature in the period 1980-2024 in the journals indexed with the Social Sciences Citation Index (SSCI) and Science Citation Index Expanded (SCI-EXPANDED) indexed in Web of Science. Which country and which university did the most research?
2. Written articles in the field of green logistics in journals
3. Which universities contribute the most to green logistics literature, and which journals publish articles in the field of green logistics?
4. How have the keywords of articles written in the field of green logistics changed over the years?
5. Which are the most cited studies and authors in the national literature in the field of Green Logistics?
6. How are the articles published in the national literature in the field of Green Logistics distributed according to the research method, research model, sample volume, data collection method, and data analysis technique used?
7. Questions such as who the influential author who wrote articles on the specified dates, which

journal published the most articles in this field, which article received the most quotes, and which country contributed the most constitute the hypotheses of this research. This research differs from other studies on green logistics in that it only includes articles published in specified indexed journals. This research is important because of its contribution to the academic research on green logistics.

In the international literature, 230 articles were written in the field of green logistics in SSCI and SCI-EXPANDED indexed journals scanned in the Web of Science between 2000-2024. Written articles on green logistics in journals indexed with SSCI and SCI-EXPANDED scanned in Web of Science The period 1980-2024 was included in the research, but it was found that there were no studies in 1980 among the indexed articles scanned in the Web of Science within the scope of the research. It has been observed that there are studies covering the years 2000-2024. The distribution of articles by year is given in the figure 2. When we examine the graph, we see that the article was written between 2000-2024 period.

Figure 2.

The number of articles was written between the 2000-2024 period.



Written articles on green logistics in journals indexed with SSCI and SCI-EXPANDED scanned in Web of Science. The distribution of articles by year is given in Figure 2. When we examine the graph, we see that the article was written between 2000-2024 period. This article on green logistics was published in 2000. The number of articles citations has increased in the last decade.

The third question of the research is How do the keywords of articles written in the field of green logistics change over the years? When we examine the articles scanned on the Web of Science in Vos Viewer. It has been determined that the following keywords are used. When we examined the frequently used keywords in 230 articles in the research, it was seen that the words in Table 1 gained priority.

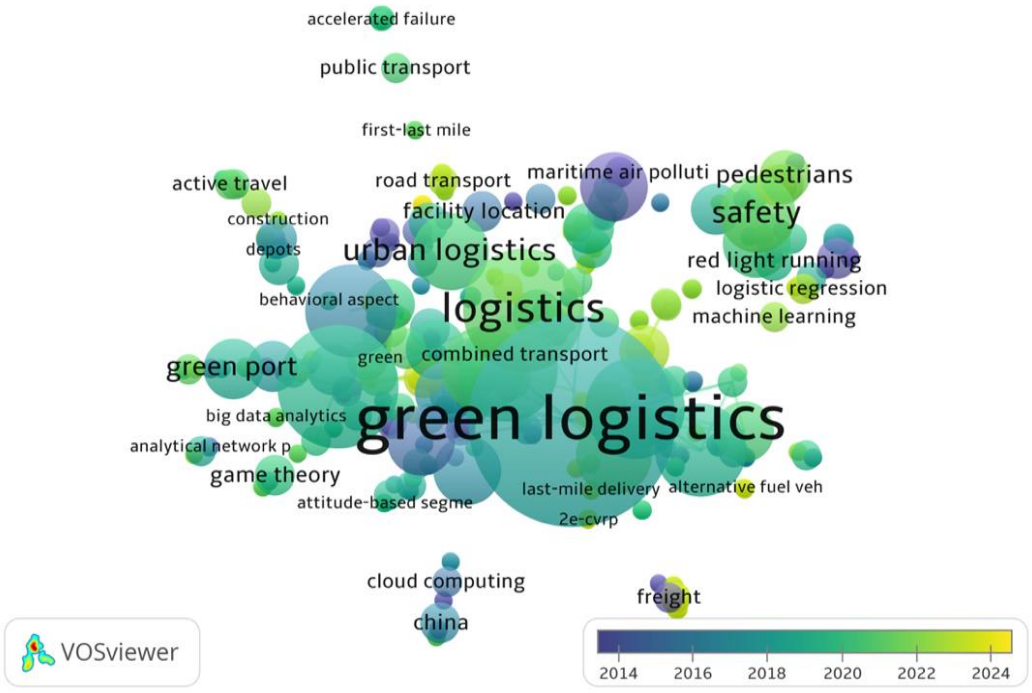
Table 1.

The number of articles between the 2000 -2024 period

Publication Years	Record Count	% of 230
2024	7	3.043
2023	22	9.565
2022	36	15.652
2021	27	11.739
2020	23	10.000
2019	17	7.391
2018	21	9.130
2017	15	6.522
2016	12	5.217
2015	8	3.478
2014	18	7.826
2012	8	3.478
2011	5	2.174
2010	3	1.304
2009	1	0.435
2008	1	0.435
2007	3	1.304
2005	1	0.435
2000	2	0.870

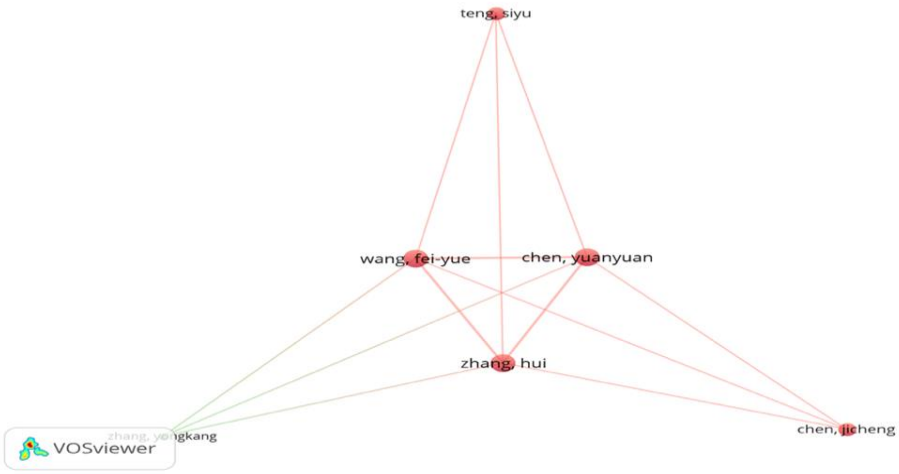
Figure 3.

Frequently used keywords in the articles



According to Figure 3, frequently used keywords are as follows: Green port big data analytics, urban logistics, safety, maritime, combined transport, logistics, cloud computing, road transport accelerated failure, maritime air pollution, machine learning, logistics regression, and pedestrians. Freight maritime air pollution was used in 2014. Logistics, urban logistics, and pedestrians green port words were used in 2022. Figure 4 shows the authors with whom the most cited authors collaborated.

Figure 4.
The most cited authors collaborated



According to Figure 4 Zhang Hui, Wang Fei and Chen Yuanyuan, Chen Hengs are the researchers who conducted joint research.

Table 2.
The most cited authors and the number of documents

Author	Document	Citation
Albanandam Ramesh	1	53
Kumar Aalok	1	53
Chen Yuanyuan	3	37
Wang Fei Yue	3	37
Zhang Hui	3	37
Chen Jicheng	2	23
Teng Siyu	2	23
Zhang Yongkang	1	20
Catay Bülent	1	16
Guo xiaolong	1	15
Lai Kee hung	1	12
Jabbour Charbel Jose Chiappetta	1	11
Jabbour ana Beiatrriiz Lopes de Sousa	1	11
Huang Gianzhi	1	10

According to Table 2, the most cited author is Albanandam Ramesh (53), Kumar Aalck (53), Chen Yuanvuan (37), Wang Fei Yue (37), Zhang Hui (37), Chen Jicheng (23), Teng Siyu (23), Zhang Yongkang (20).

Figure 5.
The names of organizations

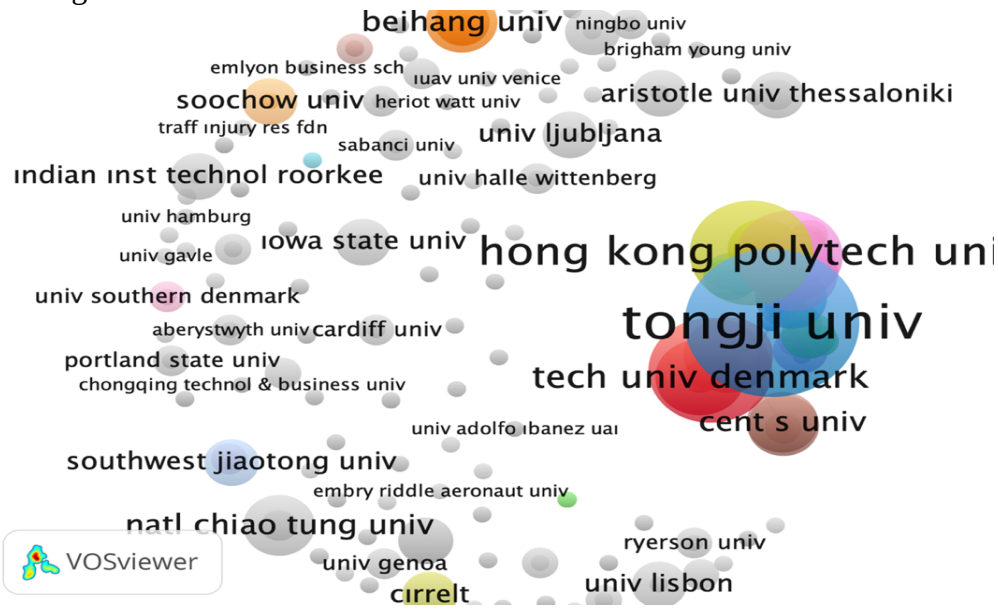
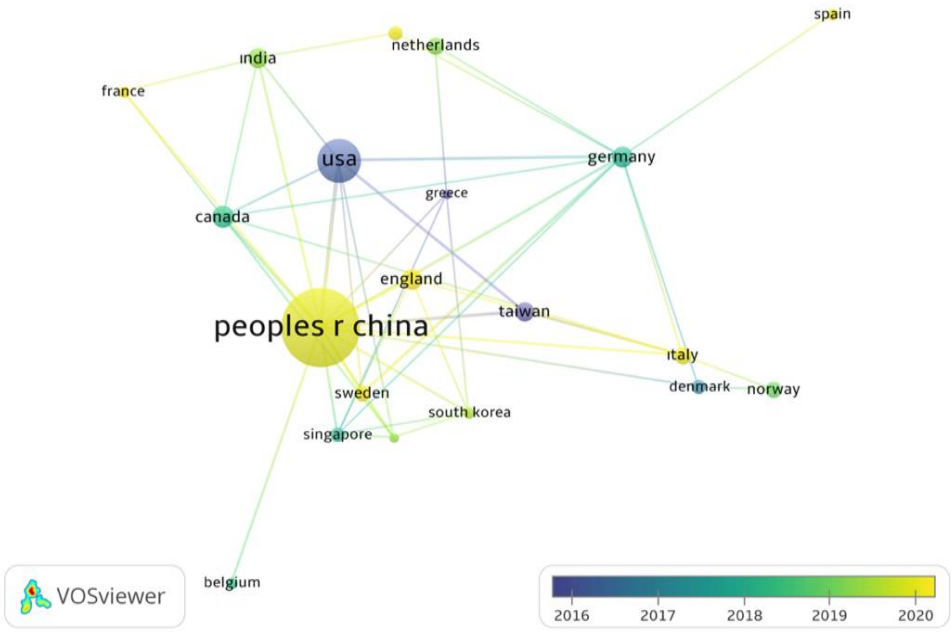


Figure 6.
Countries collaborating in writing articles



According to Figure 5, Tongji University is the university that writes the most articles on green logistics. It is followed by Beijing Jiaotong University, Hong Kong Polytechnic University, Central South University, Nanyang Technological University, State University System of Florida, Chang An University, Indian Institute of Technology System Iıt Syste, Technical University of Denmark University of Montreal, University of Central Florida, Beihang University, Central South University of Forestry Technology, Chinese Academy of Science, Molde University College University of Washington, University of Washington, Seattle Zhejiang University, Aristotle University of Thessaloniki. The details are shown in Table 3. According to Figure 6, China has the most collaboration in writing articles on green logistics. It is shown that China, America, Japan, Italy, France, Turkey, Hungary, and Germany wrote co-authored articles with each other.

Table 3.

The institutions on green logistics articles

Affiliations	Record Count	% of 230
Tongjı Unıversıty	10	4.348
Beıjıng Jıaotong University	7	3.043
Hong Kong Polytechnıc University	7	3.043
Central South University	6	2.609
Nanyang Technological University	6	2.609
State University System of Florida	6	2.609
Chang An University	5	2.174
Indian Institute of Technology System Iıt System	5	2.174
Technıcal University of Denmark	5	2.174
Universites De Montreal	5	2.174
University Of Central Florida	5	2.174
Beıhang University	4	1.739
Central South University of Forestry Technology	4	1.739
Chinese Academy of Sciences	4	1.739
Molde University College	4	1.739
University Of Washıngton	4	1.739
University Of Washıngton Seattle	4	1.739
Zhejıang University	4	1.739
Arıstotle University of Thessalonıkı	3	1.304
Chalmers University of Technology	3	1.304
Eındhoven University of Technology	3	1.304
Hasselt University	3	1.304
Indian Institute of Technology Iıt Roorkee	3	1.304
Institute Of Automation Cas	3	1.304
Institute Of Transport Economıcs	3	1.304
Iowa State University	3	1.304
Macau University of Science Technology	3	1.304
Martın Luther University Halle Wıttenberg	3	1.304
Natıonal Institute of Technology Nıt System	3	1.304
Polytechnıc Unıversıty of Turın	3	1.304
Polytechnıque Montreal	3	1.304

Shanghaı University	3	1.304
Southwest Jıaotong University	3	1.304
Unıversıdade De Lısboa	3	1.304
University Of Ljubljana	3	1.304
University Of Sheffıeld	3	1.304
Volvo	3	1.304
Australıan Marıtıme College	2	0.870
Cardıff Unıversıty	2	0.870
Chongqıng Jıaotong University	2	0.870
Chongqıng University	2	0.870
Chung Ang Unıversıty	2	0.870
Dalıan Marıtıme University	2	0.870
Erasmus University Rotterdam	2	0.870
Erasmus University Rotterdam Excl Erasmus Mc	2	0.870
Eth Zurıch	2	0.870
Harbın Institute of Technology	2	0.870
Hong Kong Baptist University	2	0.870
Indian Institute of Management Iım System	2	0.870
Iran University Scıence Technology	2	0.870
Isfahan University of Technology	2	0.870
Iuav University Venıce	2	0.870
Korea Marıtıme Ocean University	2	0.870
Lınkopıng University	2	0.870
Mıchıgan State University	2	0.870
Natıonal Cheng Kung University	2	0.870
Natıonal Kaohsıung University of Scıence Technology	2	0.870
Natıonal Taıwan University	2	0.870
Natıonal Yang Mıng Chıao Tung University	2	0.870
Natl Chıao Tung University	2	0.870
Portland State University	2	0.870
Qatar University	2	0.870
Roma Tre University	2	0.870
Rwth Aachen University	2	0.870
Shanghaı Jıao Tong University	2	0.870
Shıjıazhuang Tıedao University	2	0.870
Soochow University Chına	2	0.870
South China University of Technology	2	0.870
Southeast University Chına	2	0.870
Swiss Federal Institutes of Technology Domaın	2	0.870

A few publications that published the most works and received the most citations among 368 institutions and universities are given in the table. A total of 46 countries in which universities and organizations wrote joint articles are shown in Table 4.

Table 4.

The countries of authored journals on green logistics

Countries/Regions	Record Count	% of 230
Peoples Republic China	82	35.652
USA	37	16.087
Canada	15	6.522
England	15	6.522
Germany.	14	6.087
India	13	5.652
Taiwan	12	5.217
Italy	11	4.783
Netherlands	11	4.783
Norway	10	4.348
Sweden	10	4.348
Denmark	8	3.478
Iran	8	3.478
Singapore	8	3.478
Belgium	6	2.609
France	6	2.609
South Korea	6	2.609
Spain	6	2.609
Australia	5	2.174
Greece	5	2.174
Chile	4	1.739
Malaysia	4	1.739
Portugal	4	1.739
Finland	3	1.304
Indonesia	3	1.304
Slovenia	3	1.304
Turkey	3	1.304
Wales	3	1.304
Brazil	2	0.870
Qatar	2	0.870
Switzerland	2	0.870
Austria	1	0.435
Colombia	1	0.435
Croatia	1	0.435
Egypt	1	0.435
Ireland	1	0.435

The following results were reached when we researched how many authors from Turkey wrote articles on green logistics that were scanned in the Web of Science between 1980-2024. Three articles on green logistics were published in English by researchers from Turkey in Web of Science.

The names of the authors are given in Table 5. The number of articles co-written by authors from Turkey who wrote articles in the field of Green Logistics is 7, and the names of the authors are as follows.

Table 5.
The names of the Turkish authors

Name of Author	The Number of Articles	Citation
Seyfi, M; Alinaghian, M Sabbagh, M,	1	16
Durmusoglu, Yalcin, Aksoy S	1	15
Erdem, Mehmet	1	4

Three articles were written by six authors in the field of green logistics in Turkey, published in the journals Transportation and Transportation Technology Science, and scanned on the Web of Science. The articles written by Turkish authors were published in 2020, 2022, 2023. The topics of these articles are given in Table 7. These articles were written in the fields of transportation and transportation technology science and are listed on the Web of Science. Six authors wrote and published one of these three articles in 2020, 2022, and 2023. Articles by Turkish authors were published in Taylor & Francis magazine (two articles) and Elsevier magazine (1 article). The universities of these authors are Isfahan University of Technology, Istanbul Technical University, Istanbul Technical University, Ondokuz Mayıs University, and Sabancı University.

Table 6.
Citations of 230 articles by years

Years and Citations					
2020	2021	2022	2023	2024	2020-2023 period
1,083	1,602	1,723	629	414,.44	Total 10,361 Citations

Articles were cited the most in 2022 and 2021. The number of total cited is 10,361. According to this research, 230 articles have taken 10,361 citations. The citations in each year are shown in the Table 6.

The cited fields are Transportation, Transportation Science Technology, Engineering Civil, Economics, Operations, Research Management Science, Environmental Studies, Management, Public Environmental Occupational Health, Engineering Electrical Electronic, Ergonomics, Social Sciences Interdisciplinary, Business Geography, Psychology Applied Computer Science, Artificial Intelligence. Table 7 shows the cited fields of articles.

Table 7.

The areas of citations of 230 articles in journals indexed on the Web of Science

Web of Science Categories	Record Count	% of 230
Transportation	185	80.435
Transportation Science Technology	161	70.000
Engineering Civil	90	39.130
Economics	78	33.913
Operations Research Management Science	63	27.391
Environmental Studies	33	14.348
Management	18	7.826
Public Environmental Occupational Health	16	6.957
Engineering Electrical Electronic	15	6.522
Ergonomics	11	4.783
Social Sciences Interdisciplinary	11	4.783
Business	10	4.348
Geography	5	2.174
Psychology Applied	4	1.739
Computer Science Artificial Intelligence	3	1.304
Computer Science Interdisciplinary Applications	1	0.435
Construction Building Technology	1	0.435
Green Sustainable Science Technology	1	0.435
Telecommunications	1	0.435

According to Table 8, Scanned in Web of Science articles, the most common goals are sustainable cities and communities, responsible consumption and production, climate action, industry innovation and infrastructure, affordable and clean energy, good health and well-being, decent work, and economic growth.

Table 8.

The article's written goals

Sustainable Development Goals	Record Count	% of 230
Sustainable Cities and Communities	249	64.508
Responsible Consumption and Production	68	17.617
Climate Action	21	5.440
Industry Innovation and Infrastructure	11	2.850
Affordable and Clean Energy	3	0.777
Good Health and Well Being	2	0.518
Decent Work and Economic Growth	2	0.518

According to Table 9, Sheu Chen Kumar A YY JB, Kontovas CA, Li SY, Yan XD, Zhang DZ, Zhang H, Abdel-aty M, Basso R, Kulcsár B, Lai K. H., Lam JSL, Li X, Psaraftis HN, Sanchez-diaz I, Wang FY Wang Y, Yuan JH, Beskovnik B, Brijs K, Brijs T, Bruzzone F, Chen JC, Chen L, Cheng C. are authors the most written articles on green logistics. In this research, a few of the articles on green logistics and the research method of these articles are as follows: The article written by Talha Khana, Amanat Alia, Muhammad Sajid Khattakb, Muhammad Irfanullah Arfeenc,

Muhammad Azam Chaudharyd, and Aleena Syedaalahor. In the research, a model was developed to analyze the association between five gscM practices and three measures of sustainable OP provided the five gscM practices (eco-design, green purchasing, green production, cooperation with customers, and green logistics) were taken as independent variables, whereas the three measures OP (economic, social, and environmental performance) were treated as dependent of sustainable variables.

Table 9.

The most written authors on green logistics

Authors	Record Count	% of 230
Sheu JB	5	2.174
Kontovas CA	4	1.739
Li SY	4	1.739
Yan XD	4	1.739
Zhang DZ	4	1.739
Zhang H	4	1.739
Abdel-aty M	3	1.304
Basso R	3	1.304
Chen YY	3	1.304
Kumar A	3	1.304
Kulcsár B	3	1.304
Lai K. H.	3	1.304
Lam JSL	3	1.304
Li X	3	1.304
Psaraftis HN	3	1.304
Sanchez-diaz I	3	1.304
Wang FY	3	1.304
Wang Y	3	1.304
Yuan JH	3	1.304
Beskovnik B	2	0.870
Brijs K	2	0.870
Brijs T	2	0.870
Bruzzone F	2	0.870
Chen JC	2	0.870
Chen L	2	0.870
Cheng C	2	0.870
Total	The Number of Authors 1057	

The research model proposes that the five gscM practices are positively associated with the three measures of sustainable OP in Pakistan's construction organizations. The study empirically analyzed the association between five gscM practices and three measures of sustainable OP using the Pls-seM-based approach. The other article by Henrik Gillström and Maria Björklund (2024) presented vastly different results regarding the environmental and social benefits when UCCs are implemented. This study aims to provide an overview of research on the sustainability assessment of UCCs, to describe dominant themes, and to identify why assessments differ. A systematic

literature review approach employing a content analysis was used to create the overview and identify the dominant themes in the quantification of the sustainability benefits of UCCs. As a complement, a cross-case analysis was applied to compare the results and to identify underlying differences between the studies. Research attempting to estimate the sustainability benefits of UCCs is fragmented and transdisciplinary, and the benefits put forward point in different directions. An SLR contributes to the research area by providing a structured and comprehensible way of identifying relevant publications, summarizing themes, and highlighting important gaps. The article, written by Aming et al. (2024), selects a sample of manufacturing businesses from a Sub-Saharan African context (Kenya) for the above arguments. This study aims to investigate the influence of CLSMs on the resilience and sustainability of SCs for manufacturing businesses in a Sub-Saharan African context with a bias to Kenya. This study adopted an explanatory research paradigm that was quantitative in nature and utilized the survey methodology. This approach was critical to get views from supply chain stakeholders informed by extant literature.

Conclusion

This research determined that there were 230 articles scanned in the Web of Science with indexed green logistics content in the period 1980-2024. It was seen that 230 articles were written in English by 1057 authors. Three articles were written by six authors in the field of green logistics in Turkey, published in the journals Transportation and Transportation Technology Science, and scanned on the Web of Science. The articles written by Turkish authors were published in 2020, 2022, 2023. These articles were written in the fields of transportation and transportation technology science and are listed on the Web of Science. One of these three articles was written and published by 6 Authors in 2020, 2022, and 2023. Articles by Turkish authors were published in Taylor & Francis magazine (two articles) and Elsevier magazine (1 article). The universities of these authors are Isfahan University of Technology, Istanbul Technical University, Istanbul Technical University, Ondokuz Mayas University, and Sabancı University. Only articles were included in the research. Articles written within the framework of the research started to be written since 2000. Although the research was started in 1980, the journals scanned in the Web of Science were written since 2000. In the research, it was seen that China wrote many cited articles on green logistics and cooperated with other countries. It covers only articles published in SSI and indexes in the fields of transportation and transportation technology in the Web of Science between 1980-2024. Global climate change has forced international organizations such as the EU, OECD, WTO, WHO, UN, etc., to make agreements and research on green logistics, supply chains, and sustainability. Research articles written to minimize the environmental damage caused by all modes of transportation attract much attention today. Bibliometric analyses of the articles written for this purpose by which researchers in which countries are the most, which universities and organizations the researchers represent, which articles are cited the most, and which keywords are used frequently are guiding for both researchers and readers. Carrying out these activities in an environmentally friendly manner, in accordance with the EU's green agreement, is covered by the Green Logistics. Green logistics is logistics actions that minimize the industry's damage to the environment. It covers all actions that try to reduce the carbon footprint that humans emit on the environment. Therefore, supply chain

management is important for the future of promoters, producers, and customers. The third question of the research is: How do the keywords of articles written in the field of green logistics change over the years? When we examine the articles scanned on the Web of Science in Vos viewer. It has been determined that the following keywords are used. Frequently used keywords are as follows: green port big data analytics, urban logistics, safety, maritime, combined transport, logistics, cloud computing, road transport accelerated failure, maritime air pollution, machine learning, logistics regression, and pedestrians. Freight and maritime air pollution was used in 2014. Logistics, urban logistics, and pedestrians green port words were used in 2022.

According to Figure 5, Tongji University is the university that writes the most articles on green logistics. It is followed by Beijing Jiaotong University, Hong Kong Polytechnic University, Central South University, Nanyang Technological University, State University System Of Florida, Chang An University, Indian Institute Of Technology System Iıt Syste, Technical University Of Denmark University of Montreal, University Of Central, Florida Beihang University, Central South University Of Forestry Technology, Chinese Academy Of Science, Molde University College, University Of Washington, University Of Washington, Seattle Zhejiang University, Aristotle University of Thessaloniki. There were three articles published in English by researchers from Turkey on green logistics in Web of Science. The number of articles authors. Sheu Chen Kumar A YY JB, Kontovas CA, Li SY, Yan XD, Zhang DZ, Zhang H, Abdel-aty M, Basso R, Kulcsár B, Lai K. H., Lam JSL, Li X, Psaraftis HN, Sanchez-diaz I, Wang FY Wang Y, Yuan JH, Beskovnik B, Brijs K, Brijs T, Bruzzone F, Chen JC, Chen L, Cheng C. are authors the most written articles on green logistics in this research, a few of the articles on green logistics and the research method of these articles are as follows: according to the results of the research, researchers in Turkey do not do enough research on green logistics, which is a subject often emphasized in developed countries such as China, The United States, and Japan. China has conducted a lot of research on green logistics. Research is published in transportation journals, but the sufficient number of research articles has increased since 2000.

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Conflict of Interests
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