

# Bibliometric Analysis and Visualization of Research in the Field of Green Economy (1993-2023)

## Yeşil Ekonomi Alanındaki Çalışmaların Bibliyometrik Analizi ve Görselleştirilmesi (1993-2023)

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### ABSTRACT

Based on the data of articles indexed in the Web of Science Core Collection database between 1993 and 2023, this research intends to add to the body of literature by gaining an understanding of the development trend of popular scientific studies on the green economy. The bibliometric analysis method VOS Viewer is used to statistically assess the keywords and highly cited countries in this topic for this purpose. The study's analysis includes two map-based visualizations, one of which shows the most often cited countries and the other depicts the trending keywords over time.

**Keywords:** Green economy, Sustainable development, Macro economy, Environment, VOS Viewer

**Jel Code:** F41, O11, O40

### ÖZ

Bu çalışma, 1993-2023 yılları arasında yeşil ekonomi üzerine Web of Science Core Collection veritabanında indekslenen popüler bilimsel çalışmaların gelişimini inceleyerek, literatüre katkı sağlamayı amaçlamaktadır. Bu amaçla, bu konudaki anahtar kelimeleri ve en çok alıntı yapılan ülkeleri istatistiksel olarak değerlendirmek için VOS Viewer aracılığıyla bibliyometrik analiz yapılmıştır. Çalışmanın analizi, biri en sık alıntı yapılan ülkeleri, diğeri ise zaman içinde trend olan anahtar kelimeleri gösteren iki harita tabanlı görselleştirme içermektedir.

**Anahtar Kelimeler:** Yeşil ekonomi, Sürdürülebilir kalkınma, Makro ekonomi, Çevre, VOS Viewer

**Jel Kodları:** F41, O11, O40



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## 1. Introduction

The perception that natural resources would renew themselves and hence wouldn't run out has long been a contributing factor in the traditional economic view's ignoring of resource consumption and environmental issues. In this context, dealing with ecological issues while developing a sustainable growth strategy has proven challenging.

Unprecedented economic, social, and environmental challenges are being faced by the world today. Although the current challenges vary in different countries and regions, the deterioration of the global environment affects all parts of the world. Environmental degradation has evolved into an economic phenomenon with significant effects on the wellbeing of the global population as a result of unsustainable lifestyles, production, and consumption patterns (Eaton & Zhou, 2019).

The concept of a green economy has grown in acceptance ever since the Rio+20 Conference in 2012, which highlighted the relevance of the green economy for sustainable development, the elimination of poverty, and the design of sustainable development policies. Consequently, the green economy is considered an essential component of sustainable development. These concepts have been proposed as a means of escaping the current global economic, social, and environmental problems and preserving a safer way of life. Furthermore, rather than competing, these concepts complement one another.

A green economy also emphasizes putting people first and improving the quality of life, which is closely related to objective 13 of the Sustainable Development Goals, which aims to prevent climate change (United Nations, 2022). Therefore, scholars, governments, and policymakers have focused increased attention in recent years to sustaining and supporting a green economy and combating climate change. This growing interest has led to a rise in the literature's discussion of the green economy.

Following the Rio+20 Conference, studies based on comprehensive qualitative analysis were carried out in an effort to clarify the significance and consequences of "greening" for sustainable development. With this motivation, Bina (2013) investigated the relationship and effect between both the global financial and economic crises and the growth of greening as a component of the answer. Whereas Brand (2012) stated that in order for green economy policies to be successful in decreasing environmental deterioration and reducing poverty, cultural, economic, and political restrictions must be considered. In order to operationalize the green economy, Loiseau et al. (2016) attempted to contribute to the definitions and linkages of the many different notions that make up the green economy, some of which are not necessarily clearly linked to sustainability.

More recent research focuses on empirically examining how sustainable green growth might be achieved. With this goal, Odugbesan Rjoub, Ifediora, and Iloka (2021) used time series data ranging from 1996 to 2019 to study the effects of financial regulations on the sustainability of the green economy in Turkey. They found that the following factors had a short-term causal effect on carbon productivity: economic freedom, government effectiveness, inflation, the quality of regulation, and the rule of law. Using empirical methodologies, the research by Bai, Wang, Tran, Sadiq, Trung and Khudoykulov (2022) investigated the sustainability of China's green economic recovery and energy environment. According to the study's empirical findings by Ghanem and Amari (2023), the integration of the environmental, economic, and social facets of sustainable development becomes possible through the green economy's stable transition.

Though various theoretic and empirical studies have been conducted recently, to the best of the writer's knowledge, the bibliometric analysis of the green economy has remained little studied. Bibliometric studies, as is well known, have received a great deal of interest in the scientific world recently. In particular, bibliometric studies offer valuable insight into topics like identifying the most productive researchers, comparing nations and institutions, and how scientific communication is conducted within various disciplines. Using the Scopus database for the years 1990 through 2020, Alsmadi and Alzoubi (2022) employed a bibliometric analytic technique to study the green economy. Additionally, a subsequent bibliometric analysis by Purnomo and Maulana (2022) uses the Scopus database for the years 2000 to 2020.

This study mainly covers the fundamental components of the term, "green economy", in this framework, aiming to fill this gap in the literature. The goal of this study is to define the term "green economy", conduct a bibliometric analysis of the green economy using a different database, namely, the Web of Science (WoS) database, from the first publication year of 1993 to the most recent study conducted in 2023, and then visualize the map using the VOS Viewer tool.

The rest of the paper is organized as follows: Following the introduction, Section 2 provides a conceptual definition of the phrase "green economy." After conducting a bibliometric analysis, which is described in Section 3 along with the study's methodology, Section 4 presents the analysis's findings. A summary of the study's findings is provided in the final section.

## **2. Green Economy: Conceptual Framework**

The existing macroeconomic accounting framework, which uses "Gross Domestic Product" as its primary accounting indicator, entirely disregards the natural resource

depletion and the deterioration of environmental quality brought on by human economic and social activity and does not adhere to the principles of green development (Wang, Z.Wang, & R.Wang 2023).

Around the world, there is a growing interest in the green economy. The existing body of literature emphasizes the broad acceptance of the green economy as it relates to energy conservation, attaining sustainable development, generating new employment opportunities, increasing market demand, and eventually poverty eradication (Lee, Wang, & Ho, 2022; Al-Taai, 2021).

The fundamental notion underlying the green economy is a rising perception that the existing ways of conducting economic development and economic activity are incompatible with protecting the natural environment despite the numerous definitions and perceptions of how it might be defined and what it entails (Gibbs, 2020). The Sustainable Development Goals and the Paris Agreement, according to Georgeson, Maslini and Poessinouw (2017), may undermine the potential of these green economic concepts in rising discourses on sustainable development.

UNEP (2012) identifies the green economy as “one that results in improved human well-being and social equity while significantly reducing environmental risks and ecological scarcities”. Furthermore, according to UNCTAD (2011) “green economy encompasses some of the most important challenges we face today: eradicating poverty, improving our relationship with the environment, addressing the potential negative impacts of global climate change, and creating a new path for sustainable development”. The green economy is “the mechanism that results in mainly improving and developing human well-being, reducing environmental risks” (Al-Taai, 2021). A green economy, according to Söderholm (2020), is an additional advantage for growth and development that can increase the well-being of both social and environmental groups, in addition to advancing economic development and quality of life.

These definitions together demonstrate that the term “green economy” refers to a broad notion that contains various implications for development and well-being as well as sustainability and risk mitigation with regard to the utilization of natural resources (Loiseau et al., 2016). In addition, Ferguson (2014) claims that the green economy is split into three categories, such as weak, transformational, and strong, in contrast to the other definitions. Ferguson’s typology is shown in Table 1 below.

**Table 1: Ferguson's Green Economy Typology**

	<b>Weak Form of green economy</b>	<b>Transformational Form of green economy</b>	<b>Strong form of green economy</b>
Economic growth path	Green growth	A-growth or selective growth	Growth constraints or post-growth
Determinants of the economy, society, and environment	Gross Domestic Product (Unmodified)	Gross Domestic Product (Modified)	Includes welfare indicators
The sustainability of Western consumption levels	Sustainable and green consumerism in the West	Green consumerism/ Institutional adjustments are required.	Non-sustainable Western consumerism / Further institutional system adjustments are required.
Focus of security discourse	State-wide security	Economic and environmental security are both restricted	The large-scale security of the economy and environment

Source: Adopted from (Ferguson, 2014).

One of the most recent studies on the subject is the level of the green economy. In this regard, the green economy has been divided into micro and macro levels (Mohammad (No Date) as cited in Al-Taai, 2021).

- **Micro-Green Economy:** The institution's economy, which takes into account and evaluates the institution's connection with the environment, the quality of its surroundings, and the effects of environmental legislation on the institution, is at the center of the micro-green economy (Al-Taai, 2021).

- **Macro-Green Economy:** At the level of economic activity in general, macro-green economies address environmental challenges and their management. The macro-green economy attempts to improve welfare standards while also protecting higher standards of environmental quality. Additionally, it addresses how policy is implemented to enhance sustainability in both the private and public sectors' activities (Al-Taai, 2021).

The benefits of the green economy, which are highlighted from both micro and macro viewpoints, can be summarized as follows; (i) it aims to provide long-term societal advantages to short-term environmental risk-mitigation actions (UNCTAD, 2011); (ii) it helps to lower the risk and vulnerability of the environment (Ikram, 2022; Abid, Ikram, Wu, & Ferasso, 2021); (iii) pollution is decreased, which benefits the climate; and (iv) it helps to create employment possibilities and investment opportunities that eliminate socioeconomic inequalities, poverty, and destitution. This, in turn, contributes to protecting resources in a manner that benefits succeeding generations and secures their future (Verma & Kandpal, 2021; Al-Taai, 2021).

### 3. Data and Methodology

The goal of this research is to conduct a thorough evaluation of the scientific literature relevant to the "green economy" using the VOS Viewer tool developed by Eck and Waltman

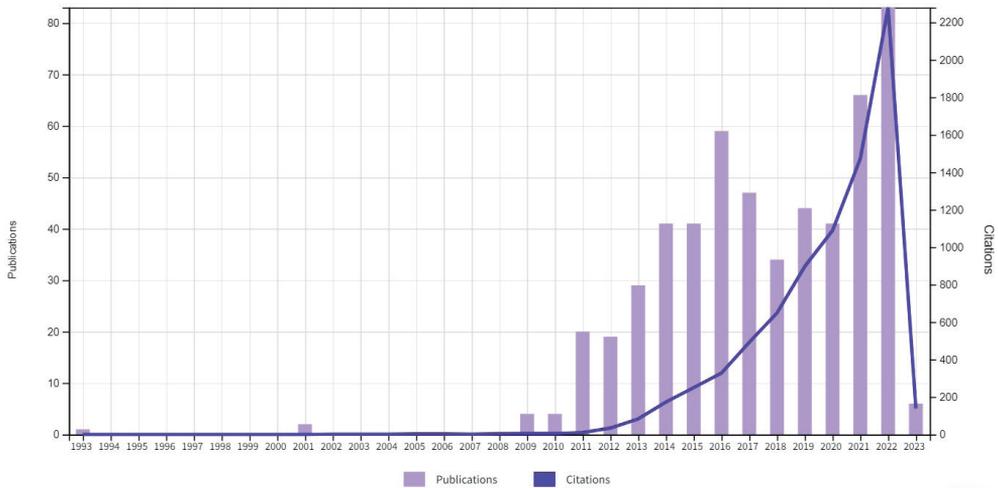
(2021). An incredibly popular software program called VOS Viewer creates data-based maps and then visualizes those maps employing sample publications as input (Yıldız & Tosun, 2021; Huang, Cheng, Yang, & Chen, 2022). By employing the VOS Viewer, bibliometric analysis is a method that enhances the frequency analysis that shows the occurrence of keywords and also citations of countries presented in the literature.

Below is a description of the methodology used to collect the data for this study, which led to the bibliometric analysis (Torun, 2002). *The term “green economy” in the title of studies in the Web of Science (WoS) database was first searched for on February 13, 2023.* Using this keyword, 868 papers of various publication types were reported in the WoS database between 1993 and 2023. The publication type for the second phase was only an article. To put it another way, after eliminating book chapters, early access articles, and proceeding papers from the bibliometric analysis, only 541 publications, comprising all articles linked to the research subject of “green economy,” were left. The most frequently used keywords with “green economy” and citations of the countries in the study area were visualized and displayed with maps through the analysis of the data collected with the help of VOS Viewer.

According to the evidence, this research is one of the few bibliometric analyses to have ever reported linked research in the “green economy”.

#### **4. Result**

The process of analysis began with a summary of the research field’s studies and the number of citations in the literature by year. A total of 541 publications were studied for the purposes of the bibliometric analysis in this section by using the VOS Viewer tool on just one form of publication, an article, in the WoS database related to the green economy. Since the first study was conducted in 1993, the study’s time period spans from 1993 to 2023.

**Graph 1. Citations & Publications from the Years 1993 through 2023**

The fact that very little research has been published since the first publication in 1993 is evident in Graph 1. The study's issue received little attention from academics between 1993 (1 publication) and 2001 (2 publications), as was the case between 2002 and 2009. The study's topic attracted the interest of academics in 2009 and 2010, which both had 4 and 5 publications and citations, respectively.

The concept of a "green economy" has become more prevalent recently in a discussion about sustainability, according to Brand (2012), particularly in light of the Rio+20 Conference (United Nations Conference on Sustainable Development) in 2012. The growing popularity of the green economy was brought on by politicians emphasizing it as a solution to the continuing economic crisis.

The key subjects of the Rio+20 Conference included the significance of the green economy for sustainable development, the elimination of poverty, and the policy structure of sustainable development. Thus, it should come as no surprise that the Rio+20 Conference increased the number of articles, which was 20 in 2011 and received 10 citations, and 19 in 2012 and received 34 citations.

Here's another reason why the green economy is such a hot topic in the literature: in recent years, the world's reliance on and consumption of nonrenewable energy, as well as its rising price in response to increased demand, have had an unequalled influence on the global economy. As a result, global concern over sustainable development has increased. Several studies within the context of sustainable development and the green economy have focused on the quest for alternative energy sources that can be economical, renewable, and ecologically friendly. In comparison to 19 publications and 34 citations in 2012, there were

29 articles and 83 citations in 2013, reflecting the growing significance of the green economy in the scientific literature with regard to economic growth. While the number of papers published and citations varied between 2013 and 2022, 2022 had the most productive year in terms of publications and citations, with 87 articles and 2,330 citations. As of right now, in the second month of 2023, the WoS database has already gathered 143 citations and six publications. As a consequence, the topic is still crucial, and this year's publications and citations will likely be higher than last year's.

The evaluation of the top five most-cited papers comes next in the second section of this research paper after analyzing the citation data and article graph.

The article with the most citations, "Green economy and related concepts: An overview," by Loiseau et al. (2016), received 248 citations and focused on defining the term "green economy" and other related terms, as well as examining how these terms relate to sustainable development. Three ways in which this study contributes to the body of literature include (i) numerous theories about a "green economy," which are defined and explained, ranging from environmental and ecological economics to a circular economy and cost-benefit analysis; (ii) a framework for illustrating the concepts and the points of view of the green economy has been constructed to support the transition to sustainability; and (iii) the study focuses heavily on how sustainability is affected by the green economy and how economic and environmental gains might be substituted for one another (by evaluating it both in terms of strength and weakness).

"Modeling the role of environmental regulations in regional green economy efficiency of China: Empirical evidence from super efficiency DEA-Tobit model", by Shuai and Fan (2020), is the study that has received the second-highest number of citations, with 164 citations. The study's objective is to evaluate the effectiveness of China's green economy from 2007 to 2018 using the DEA and Tobit models. The following is an overview of their study's outcome: (i) The efficiency of the green economy in terms of geographical diversity basically indicates that it is highest in the east and least efficient in the west; (ii) At both the national and eastern levels, environmental regulation displays similar characteristics for the effectiveness of the green economy, and both have the U-shaped curve property. In contrast, the central and western regions show a difference. (iii) On a national and regional scale, control variables exhibit significant variation.

The third most-cited article, "The green economy and sustainable development: an uneasy balance?" authored by Bina (2013), has 163 citations. The aim of the paper is to investigate the relationship between the double crisis and the rise in "greening". In order to determine the significance and implications of "greening" in three areas, a methodical

qualitative analysis is conducted in this study. The following are these: (i) practically business as usual; (ii) greening; and (iii) all change. As an outcome of the research, a conflict between the fixing or altering of dominant socioeconomic concepts that drive its conceptualizing is disclosed, allowing it to appreciate the implications of going green for sustainable economic development.

“Green economy: the next oxymoron? No lessons learned from failures of implementing sustainable development” by Brand (2012), receiving 159 citations, now ranks as the fourth most cited article. In his research, the effectiveness of green economy initiatives is questioned, with the conclusion that in order to continue their aims of halting environmental deterioration and lowering poverty, economic, cultural and political restrictions need to be taken into account.

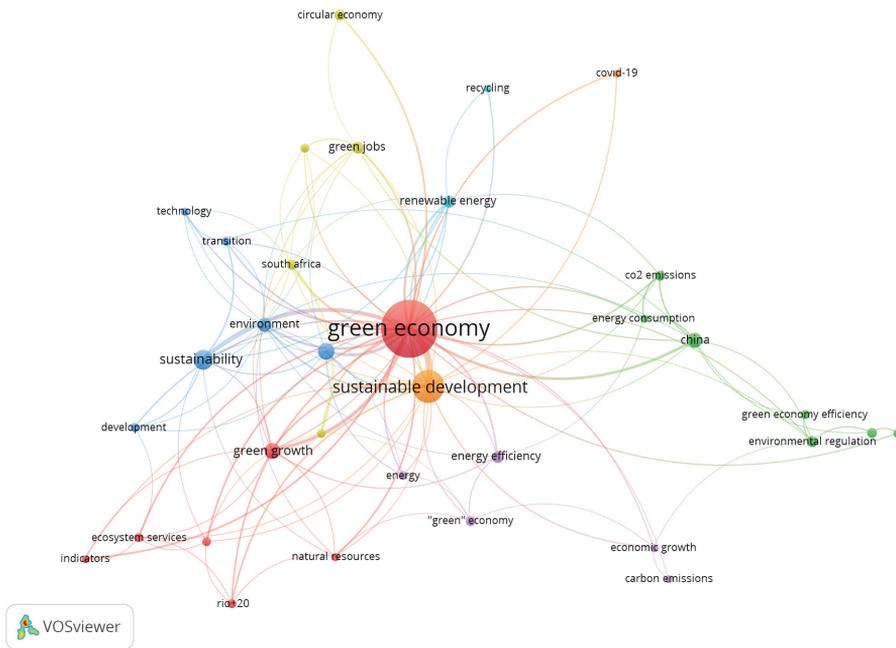
On the list of papers with the most citations, the 2019 study by He et al. titled “Green credit, renewable energy investment and green economy development: Empirical analysis based on 150 listed companies of China” comes in fifth place with 158 citations. Their research’s goal is to model the non-linear link between investments in renewable energy and the index of the development of the green economy. The results of their research suggest that (i) investment in renewable energy has a twofold impact on the index of green economy development. This impact is separated into three phases: encouraging, restricting, and encouraging sequentially; (ii) the effect of investing in renewable energy on the index measuring the growth of the green economy involves twofold impacts from green financing for micro-sized, small-sized, and medium-sized firms, whereas there is one threshold effect for larger firms; (iii) by raising funding for the prevention of environmental pollution and altering the industrial structure, the index reflecting the growth of the green economy can be enhanced.

#### **4.1. Keywords Co-Occurrence Analysis**

A review of the citations and publications of the papers that were considered for the evaluation was performed before starting the bibliometric analysis step. In this process, the VOS Viewer tool was used to investigate the keyword distribution of publications about the green economy that were published between 1993 and 2023. The frequency with which certain keyphrases co-occur in various publications is indicated by their co-occurrence (McAllister, Lennertz, & Atencio Mojica, 2021). In other words, the co-occurrence is the frequency with which one term occurs next to another. Furthermore, the keyword co-occurrence analysis will also help the researcher discover topics that still need to be investigated. In this context, research hotspots can be successfully engaged using a study area’s keyword co-occurrence analysis, providing guidance for academic study (Li, An, Wang, Huang, & Gao, 2016; Oladinrin, Arif, Rana, & Gyoh, 2022).

In the analysis of keywords co-occurrence, VOS Viewer divided the data set into different clusters of articles that were associated with the term “green economy”. Each cluster is represented by a new color. The clustering of the terms indicates that they are most frequently used in conjunction with one another. Therefore, just because a term is a member of a certain cluster does not automatically exclude it from being used with other terms (Glinska & Tomaszewska, 2017).

**Figure 1: The Network Visualization’s Co-Occurrence Map for the Keywords**



By displaying clusters within a specific color, Figure 1’s network visualization map demonstrates how frequently certain keywords occur together. Every keyword is given a node color in this map, and each color indicates its cluster. And also, the related color reveals their relation to one another. The sizes of the nodes and terms reflect the nodes’ weights. Node and term sizes and weights are inversely linked. The frequency with which a keyword appears in publications as well as the quality of the links affect a node’s size (McAllister et al., 2021; Oladinrin et al., 2022; Torun, 2022).

As seen in Figure 1, The VOS Viewer software tool separated the data obtained into seven clusters by including a total of 34 words, 120 linkages, and 356 total link strengths in the analysis. The connection or relationship between two keywords is represented by a link, which suggests they have appeared together. The distance between two nodes, which is

quantified by a positive numerical number, reflects how closely related (or linked) they are to one another. This means that the stronger the connection, the greater the numerical value of the link (Eck & Waltman 2021a; Eck & Waltman 2021b; Oladinrin et al., 2022). In addition, “the total link strength refers to the total number of co-occurrences of the node with other nodes (including repeated co-occurrences)” (Huang et al., 2022). These categorized clusters and items (listed in decreasing order of frequency) are as follows:

**(i) The first cluster** (represented in red) consists of seven words. These are green economy (249), green growth (20), ecosystem services (7), natural capital (6), rio+20 (6), indicators (5) and natural resources (5).

**(ii) The second cluster** (in green) includes seven words. These consist of China (17), environmental regulation (9), CO2 emissions (8), green economic efficiency (8), green economy efficiency (7), threshold effect (6), and energy consumption (5).

**(iii) The third cluster** (in dark blue color) has six words, consisting of sustainability (30), climate change (22), environment (16), development (6), transition (6) and technology (5).

**(iv) The fourth cluster** (in yellow) includes five words. These are green jobs (11), circular economy (9), South Africa (8), system Dynamics (7), and employment (6).

**(v) The fifth cluster** (in purple) consists of five keywords. These are “green” economy (8), energy efficiency (12), energy (7), carbon emissions (5) and economic growth (5).

**(vi) The sixth cluster** (in blue) has two keywords. These are renewable energy (12) and recycling (5).

**(vii) The last cluster** (in orange) has two items. These are sustainable development (80) and covid-19 (5).

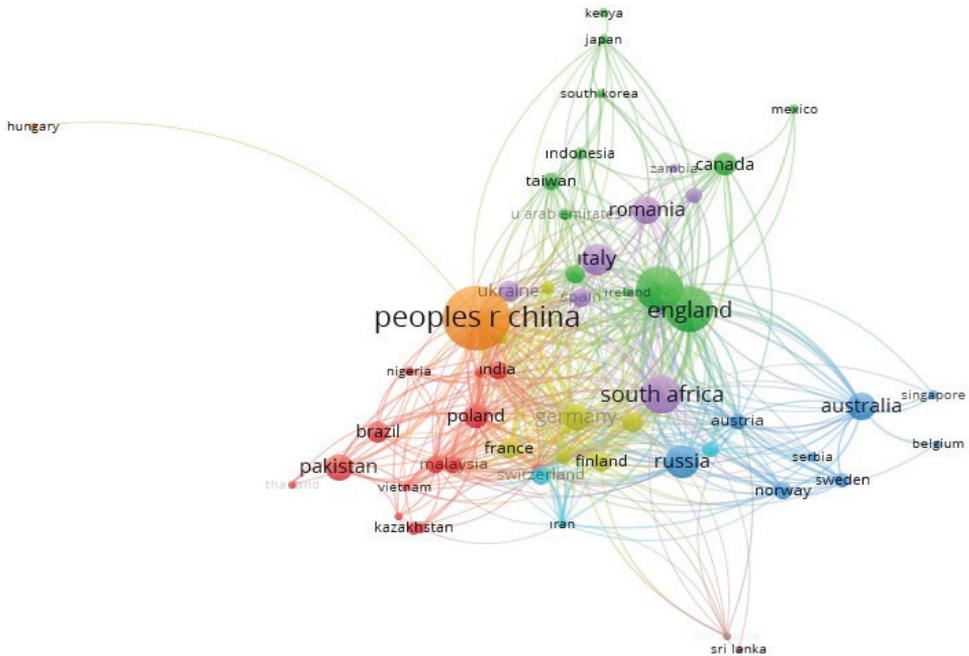
The keyword “green economy,” which is the most popular term with 217 total link strength, 30 linkages, and 249 occurrences in cluster 1, has the largest node, as can be seen in Figure 1. As the size of the nodes indicates how frequently the terms occur and the keywords’ co-occurrence is shown by the connecting lines (Huang et al., 2022), it can be considered that this keyword is the most frequently used term in the figure. Following the term “green economy,” “sustainable development” is the second most often used keyword and is found in 80 repeats and 24 connections (links). The word “sustainability” is used 30 times with 12 links, ranking it third most frequently. The keyword “climate change” ranks fourth, with 22 repetitions and 8 links. With 20 repetitions and 11 links, the keyword “green growth” comes in at number five.

In a nutshell, by considering the most commonly used keywords, the increasing importance of the green economy and its relation to the terms of sustainable development, climate change, and green growth is shed light on in this analysis. However, these findings of the study are not surprising and can be considered as the consequences of earlier research, such as: (i) In the report of UNEP in 2011, the green economy was extensively employed to manage the economic crisis and climate change challenges, and it is a vital aspect of meeting the Paris conference's improved climate aim of lowering emissions (Loiseau et al., 2016); (ii) In the paper of EEA in 2014, the term "green growth" is frequently used in place of, or in regards to, "green economy" (Loiseau et al., 2016).

#### **4.2. Citation Analysis of the Countries**

The VOS Viewer tool was initially used to determine the minimum requirements for the countries' citation analysis. Only 59 of the 86 countries reach the required number of documents and citations when the minimums for each nation are both set to 2. The total link strengths of each of the 59 nations are added up in the next stage, and the countries with the highest total link strengths are selected. This determines the number of countries to be chosen. Only 57 countries were related when using the VOS Viewer tool, which splits the 59 countries into 8 distinct clusters, each of which is represented by a different color. Considering that the nations are grouped together, it is likely that this is how they are referenced the most.

The second network visualization map in this study, Figure 2, provides a thorough analysis of the citations for the various countries. The distance between two countries can be demonstrated to decrease as the academic relationship between them increases. In contrast to the keyword occurrence analysis, the nodes in the country's citation analysis reveal how many times the articles have been cited in each country. As a result, as the number of citations grows, so does the size of the nodes. Therefore, the size of the nodes increases as the number of citations increases. To categorize the scientific communities in this analysis, nodes of the same color were utilized (Guo et al., 2019).

**Figure 2: The Network Visualization Map of the Citations of the Countries**

On the network visualization map of the countries' citations, China has the largest node, with 120 publications and 292 total links in Cluster 7 (orange color), resulting in the country with the most citations. Therefore, it may be stated that China made the most outstanding contribution to this important field. The second-most referred country, displayed in green (Cluster 2), is England, with 62 documents and a total of 194 links. The next most cited country is the USA, which is in the same cluster as England and has 59 papers and 195 total links. With 44 papers and 144 total links, South Africa is the nation in Cluster 5 with the fourth-highest number of references. It is depicted in purple. With 33 articles and 89 total links, Russia is the fifth-most cited nation and can be noticed in Cluster 3 in dark blue.

## 5. Conclusion

The goal of this research is to add to the body of literature by offering popular scientific studies on the green economy. This goal is accomplished by the use of VOS Viewer software, a bibliometric analysis method. As a result, two techniques- keyword occurrence analysis and country citations- were employed in the analysis.

The Web of Science database was utilized to extract data on articles pertaining to the research field between 1993 and 2023. An overview of the studies in the research field and the number of citations in the literature divided by year were offered as the starting point for

the analysis process. The time frame of the study is from 1993 to 2023 since the initial study was carried out in 1993. Between 1993 (1 publication) and 2001 (2 publications), as well as between 2002 and 2009, scholars paid little attention to the study's topic. Academics were interested in the study's subject in 2009 and 2010, as evidenced by the study's 4 and 5 publications and citations, respectively.

Since the Rio+20 Conference in 2012, which emphasized the significance of the green economy for sustainable development, the eradication of poverty, and the structuring of sustainable development policies, the concept of a green economy has gained more popularity.

As a result, it shouldn't be surprising that the Rio+20 Conference improved the number of articles, which was 20 in 2011 and had 10 citations, to 19 in 2012 and received 34 citations. Nonrenewable energy use and consumption, along with its rising cost in response to increasing demand, have had an uneven impact on the world economy. As a consequence, concern over sustainable development and the green economy has grown on a global scale. Despite varying fluctuations in the quantity of papers published and citations throughout 2013 and 2022, 2022 was the most fruitful year in terms of articles and citations, with 87 articles and 2,330 citations.

After reviewing the publication and citation data, the most cited publications were evaluated to highlight the topics associated with the "green economy". And the most-cited five studies generally focused on the following issues: (i) a broadly defined "green economy" in terms of the environmental, ecological, and circular economies; (ii) the effectiveness of China's green economy; (iii) the relationship between "green economy" and sustainable development; and (iv) modeling the non-linear link between investments in renewable energy and the index of the development of the green economy.

In the analysis of keyword co-occurrence, VOS Viewer divided the data set into different clusters of articles that were associated with the term "green economy". In addition, the network visualization's co-occurrence map for the keywords was generated in order to demonstrate how frequently specific keywords appear together. The keyword co-occurrence analysis provided a thorough and in-depth assessment of the important terms and assisted the researcher in identifying areas that require more research. The following are the top five topics that were identified through this analysis: (i) green economy; (ii) sustainable development; (iii) sustainability; (iv) climate change; and (v) green growth.

For the citation analysis of the nations, the VOS Viewer tool splits the 59 countries into 8 different clusters, each of which is depicted by a different color, and only the interconnected ones (57 countries) were included in the analysis. The fact that the nations come closer in the

visualization map indicates that this is how they are most frequently cited together. This section of the analysis also served to demonstrate which nations contribute the most significantly to the literature in this area. According to this analysis, these nations are listed below in citation order: (i) China; (ii) England; (iii) the United States; (iv) South Africa; and (v) Russia.

In conclusion, this study provides a thorough review of the most recent developments in the “green economy,” and by providing a list of the most popular and frequently cited papers and countries for researchers, it contributes to serving as a guide for understanding the key ideas behind the term and outlining prospective guidance for further research. Additionally, it may be recommended to expand the analysis’s time frame for future studies, and analyses in the future may use data gathered from a variety of sources, including Scopus and Google Scholar, while taking care to prevent duplication if an academic study is included in numerous databases.

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