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Bibliometric Analysis of Studies in the Field of Green Accounting Based on the Web of Science (WOS) Database (1992–2024)

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ABSTRACT

This study was conducted to perform a bibliometric analysis of research in the field of green accounting. In this context, publications indexed in the Web of Science (WoS) database were examined. As of March 30, 2024, a search was conducted in the WoS database using the keyword "green accounting", with all WoS Core Collection criteria selected. The search results revealed no studies related to green accounting prior to 1992, while 250 studies were identified between 1992 and 2024. The highest number of publications was recorded in 2013. Among the analyzed studies, economics was found to be the most prominent research field, encompassing 118 publications. In terms of country-based contributions, the United States led the field with 61 studies. The World Bank was identified as the institution contributing the most to green accounting research. Additionally, Nicholas Z. Muller and Robert Mendelsohn were determined to be the most highly cited authors in the field. Furthermore, the study conducted co-authorship, institutional collaboration, and country collaboration network analyses, along with keyword mapping, bibliographic coupling of texts, and co-citation analysis of authors. Based on these analyses, visual mappings were created, and the discussion and conclusions were presented.

Keywords: Green Accounting, Bibliometric Analysis, Thematic Clusters

Web Of Science (WOS) Veri Tabanına Göre Yeşil Muhasebe Alanında Yapılan Çalışmaların Bibliyometrik Analizi (1992-2024)

ÖZ

Bu çalışma yeşil muhasebe alanında yapılmış olan çalışmaların bibliyometrik analizi amacı ile yapılmıştır. Bu kapsamda Web of Science (WOS) veri tabanında taranan yayınlar 30.03.2024 tarihi itibari ile WoS veri tabanının arama kısmına "green accounting" anahtar kelimesi yazılmış ve bütün WoSCore Collection kriterleri seçilerek arama yapılmıştır. Arama sonucunda 1992 yılı öncesi yeşil muhasebe alanına ilişkin bir çalışmaya rastlanılmamış, 1992-2024 yılları arasında 250 adet çalışmaya ulaşılmıştır. En fazla yayının 2013 yılında yapıldığı görülmektedir. İncelenen çalışmaların 118 çalışma ile en fazla ekonomi alanında yer aldığı, yayın bazında değerlendirildiğinde ise ABD'nin 61 çalışma ile alana en fazla katkı sağlayan ülke olduğu belirlenmiştir. Yeşil muhasebe alanına en fazla katkı sağlayan kurumun The World Bank olduğu, en fazla atıf alan yazarların Nicholas Z. Muller, Robert Mendelsohn olduğu tespit edilmiştir. Son olarak çalışmada, ortak yazar, ortak kurum ağları, ortak ülke ağları, anahtar kelime, metinlerin bibliyografik eşleşme ve yazarların ortak atıf analizleri yapılarak haritalamalar yapılmış, tartışma ve sonuç ortaya konulmuştur.

Anahtar Kelimeler: Yeşil Muhasebe, Bibliyometrik Analiz, Tematik Kümeler

1. Introduction

Global environmental issues have led to an increasing interest in sustainability among businesses (Kurnaz & Kurnaz, 2022, p.76). In today's corporate landscape, environmental performance has become as crucial as financial success. This shift necessitates the accurate measurement and reporting of the financial implications of environmental damage caused by businesses. Green accounting contributes to sustainable management by integrating environmental costs into financial processes (Moorthy & Yacob,

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2013, p. 4). Green accounting practices not only ensure the transparent presentation of environmental impacts in financial reporting but also help businesses fulfill their environmental responsibilities and gain a competitive advantage (Altınbay & Durak, 2022, p. 140).

The widespread adoption of green accounting practices on an international scale has led to the development of significant standards in sustainability reporting. Regulations such as the Global Reporting Initiative (GRI) and the Corporate Sustainability Reporting Directive (CSRD) encourage businesses to transparently report their environmental impacts (European Commission, 2022). In Turkey, the Turkish Sustainability Reporting Standards (TSRS) have been implemented to align sustainability reporting with local regulations (Kamu Gözetimi, Muhasebe ve Denetim Standartları Kurumu, 2023).

A growing body of academic literature focuses on green accounting; however, most research has been conducted in developed countries, while studies on its implementation in developing economies remain limited (Dilber, 2020, p. 1). This gap highlights the need for research on how green accounting practices can be adopted in developing countries and the challenges that must be addressed. This study aims to fill this gap by analyzing academic trends in green accounting and providing insights for future research.

The primary objective of this research is to conduct a comprehensive bibliometric analysis of academic publications on green accounting from 1992 to 2024, identifying trends and gaps in the literature. By examining publications indexed in the Web of Science (WoS) database, this study explores the geographical and thematic distribution of scientific output in this field. The key research questions addressed in this study are:

- What is the distribution of academic research on green accounting over the years?
- Which countries and scholars have contributed the most to this field?
- What are the key emerging topics and keywords in green accounting research?
- What gaps exist in the literature, and which areas should future studies focus on?

By analyzing trends in green accounting, this study aims to provide valuable insights for businesses, academics, and policymakers. Additionally, based on the research findings, recommendations are provided to promote the widespread adoption of green accounting practices and improve existing implementations.

2. Literature Review

Green accounting has established a significant presence in the literature as an accounting discipline that helps businesses integrate environmental costs into their financial processes to achieve sustainability goals. This concept not only enables businesses to assess their financial performance but also considers their environmental and social impacts, guiding sustainability-oriented decision-making processes (Moorthy & Yacob, 2013, p. 4). Academic studies in the field of green accounting are structured around various themes, including environmental reporting, carbon accounting and sustainable finance.

2.1. Sectoral Impact of Green Accounting

Establishing green accounting practices in businesses is crucial for community concern and environmental sustainability (Nofita et al., 2024, p. 62) The applicability of green accounting varies across sectors, depending on how businesses manage their environmental impacts. In the energy and industrial sectors, carbon footprint calculations and waste management accounting are prioritized, whereas in the service sector, sustainability reporting is more widely adopted (Rounaghi, 2019, p. 505). Large-scale enterprises in the manufacturing sector actively implement green accounting practices to reduce environmental costs, while small and medium-sized enterprises (SMEs) face challenges in adopting these practices (Bezirci, Özpeynirci & Duman, 2011, p.64). In developing countries, the limited financial and technical capacity of SMEs further restricts the implementation of green accounting practices (Rounaghi, 2019, p. 511).

Studies on the healthcare sector indicate that green accounting has not been sufficiently adopted. Çil Koçyiğit et al. (2023, 9. p.1641) highlighted the low awareness among healthcare service providers regarding the measurement and reporting of environmental costs, emphasizing the need for policy support in this area. In contrast, in the financial sector, green accounting has been gaining increasing importance as part of sustainable finance policies (Fleischman & Schuele, 2006, p. 44).

2.2. International Regulatory Framework and Applications

The increasing environmental awareness in society has created an expectation for businesses to produce more environmentally friendly products. Accordingly, many governments have made green production mandatory for businesses within the scope of their economic policies (Çetin & Doğan, 2023, p. 165). International regulations developed to enhance the applicability of green accounting play a critical role in ensuring businesses comply with environmental sustainability principles. Reporting standards such as the Global Reporting Initiative (GRI), Corporate Sustainability Reporting Directive (CSRD), and IFRS S1-S2 mandate transparent reporting of environmental impacts (European Commission, 2022). These standards enable businesses to integrate environmental costs into their financial reporting systems.

In Turkey, regulations on green accounting are implemented through the Turkish Sustainability Reporting Standards (TSRS). The standards, published by the Public Oversight, Accounting, and Auditing Standards Authority (2023), provide guidance to businesses on sustainability reporting. However, challenges persist in the implementation of these standards. The literature indicates that Turkish businesses face awareness deficiencies in transitioning to green accounting, which complicates the integration process with international reporting standards (Yelgen, 2022, p. 107-108).

When comparing different countries' approaches to green accounting, around the world, many countries require businesses to implement green accounting practices and disclose environmental information. Countries such as Japan, Denmark, the Netherlands, Taiwan, and Vietnam support this process through various legal regulations and incentives, while the United States and Japan have imposed partial obligations on certain businesses. Multinational companies are also increasingly demanding green accounting information from their suppliers. This demonstrates that green accounting has become a global trend and highlights the importance of legal regulations. Although mandatory practices increase production costs for businesses, they also encourage the development of sustainable solutions such as green innovation and product redesign (Tu & Huang, 2015, p. 6265).

2.3. Recent Studies and Trends in Green Accounting

Recent bibliometric analyses show that academic publications in green accounting primarily focus on sustainable finance, environmental reporting, and corporate social responsibility (Karcıoğlu & Tosunoğlu, 2022). The number of academic studies on this topic has been increasing annually, aligning with economic and environmental developments. Among the most frequently used keywords in this field are sustainable development, environmental management, and environmental economics (Rizka et al., 2024). Furthermore, a study by Yalçın & Sümerli Sarıgül (2021) determined that green accounting research is predominantly concentrated in developed countries, with a particular emphasis on carbon accounting in the energy sector.

Future research is expected to focus on the integration of green accounting with digital accounting systems, blockchain-based reporting mechanisms, and AI-powered sustainability measurement tools, making sustainability assessments more transparent (Wider et al., 2023a). In this regard, the relationship between digital transformation and sustainability needs to be explored in greater detail. Moreover, studies suggest that research in green accounting is influenced by environmental concerns, policy changes, funding availability, and industry participation (Dwianika et al., 2024). Therefore, future research should adopt interdisciplinary approaches that consider these factors.

3. Methodology

Bibliometric research methodology, a scientific mapping technique, examines relationships among academic disciplines, research fields, scholars, and publications. This method has gained significant scientific attention due to its capacity to visually represent the structural composition of scientific domains by integrating classification and visualization techniques. Researchers can apply statistical and mathematical methods to bibliographic data to identify patterns, trends, and relationships within a specific field or discipline. The primary objective of employing a bibliometric approach is to gain a nuanced understanding of the characteristics, impact, and evolution of scientific publications, authors, journals, and research topics (Wider et al., 2023, p.3).

In this study, a bibliometric approach is adopted to provide a comprehensive examination of publications related to green accounting. Co-citation analysis and co-word analysis are two widely used bibliometric techniques that enhance the effectiveness of this method. By utilizing both co-citation and co-word analysis, researchers can obtain a comprehensive perspective on the historical development, current state, and potential future trajectories of a research area such as green accounting.

One of the most critical factors in bibliometric studies is the data source. The Web of Science (WoS) database is one of the most widely used sources for conducting scientific research and is recognized across disciplines for its authority, scientific quality, and objectivity. The WoS database indexes 21,973 high-quality scientific journals, books, and conference proceedings in leading fields of natural sciences, social sciences, arts, and humanities from 1990 to the present. It references approximately 2 billion cited references, making it a reliable data source for bibliometric analysis (Yang et al., 2023, p. 2). For this reason, the WoS database was chosen for bibliometric analysis in this study.

As part of the research, on March 30, 2024, the keyword "green accounting" was entered into the WoS database search section, with all WoS Core Collection criteria selected. The search results revealed no studies related to green accounting prior to 1992, with studies in this field emerging between 1992 and 2024. As a final result, 250 documents indexed in the WoS database were identified.

3.1. Data Analysis

The bibliometric analysis method was employed to evaluate the dataset obtained from the green accounting literature. Bibliometric analysis techniques can be classified into two main categories: performance analysis and scientific mapping. While performance analysis explains the contributions of research components, scientific mapping focuses on relationships among research components (Donthu et al., 2021, p. 287-288).

For processing raw data obtained in the study, VOSviewer 1.6.20 software was used to map bibliometric network data, as it provides reliable data, advanced analytical capabilities, user-friendliness, and functionality. Additionally, Excel software was used to conduct performance analysis of the data.

3.2. Limitations

As this study focuses solely on mapping data retrieved from the Web of Science database, data from other databases were not considered.

4. Results

This section presents the findings obtained from 250 studies, including 183 journal articles, 45 conference proceedings, and 44 book chapters. The results highlight the general descriptive characteristics of research conducted in the field (such as publication year, country, author, journal, research areas, and citation counts) as well as connections and clusters identified through scientific mapping (such as keywords, country networks, author collaborations, and institutional networks).

4.1. Overview of Publications

Figure 1 illustrates the distribution of publications in green accounting between 1992 and 2024. A review of Figure 1 indicates that the first indexed article in the WoS database on this topic appeared in 1992. In the initial years, an average of three publications per year were indexed; however, by 2005, a significant increase was observed, with the number of annual publications rising to 22. This surge coincides with the Kyoto Protocol, which came into effect in 2005, emphasizing climate change mitigation and leading to increased interest in environmental research, including green accounting.

Although a decline was observed in the following years, 2013 marked a resurgence of interest in the field, reaching its peak with 35 published studies in that year.

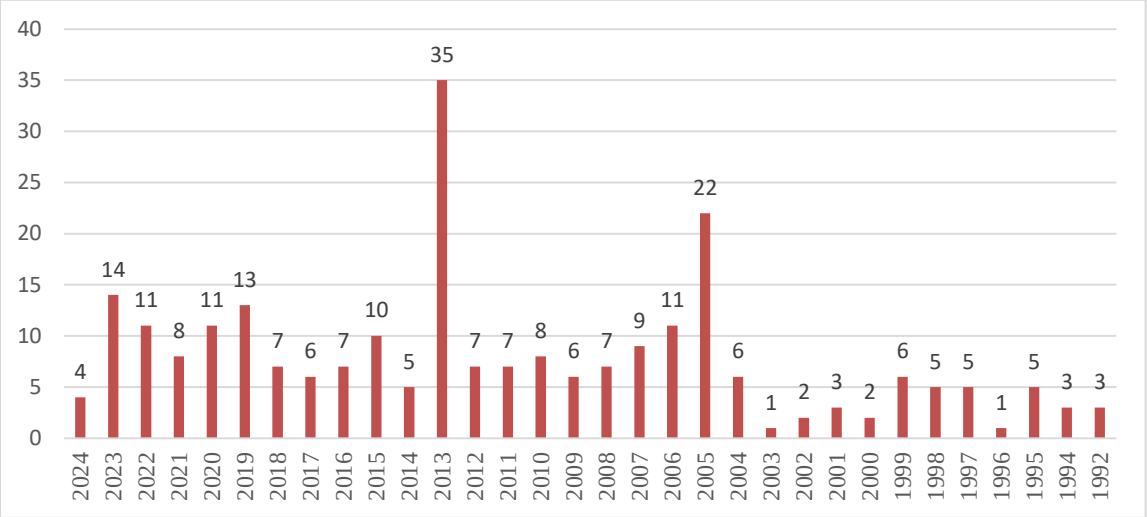

Figure 1. Distribution of Publications by Year (1992–2024)

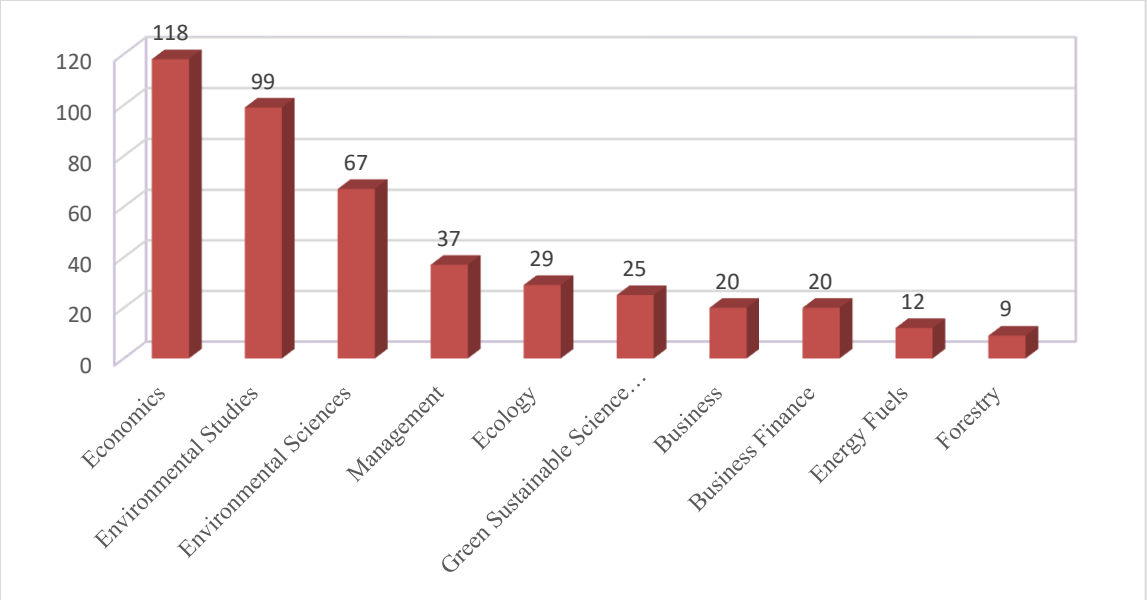

Figure 2. Distribution of Publications on Green Accounting Across Interdisciplinary Fields

Figure 2 illustrates the scientific disciplines in which green accounting research has been conducted. Among these, economics ranks first with 118 publications, followed by environmental studies with 99 publications and environmental sciences with 67 publications. In contrast, forestry (9 publications) and energy fuels (12 publications) are identified as the least researched fields in green accounting.

Figure 3 presents the indexing information of the 250 publications available in the WoS database. The findings reveal that the highest number of studies are indexed in SSCI (101 publications) and SCI-EXPANDED (89 publications) journals.

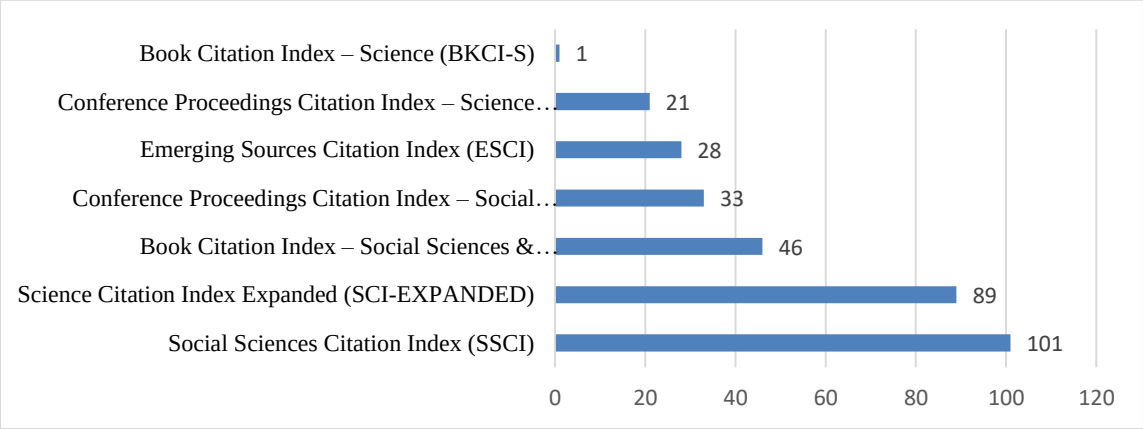

Figure 3. Indexing Information of Publications in WoS Figure 4. Top 10 Countries Contributing to the Green Accounting Literature

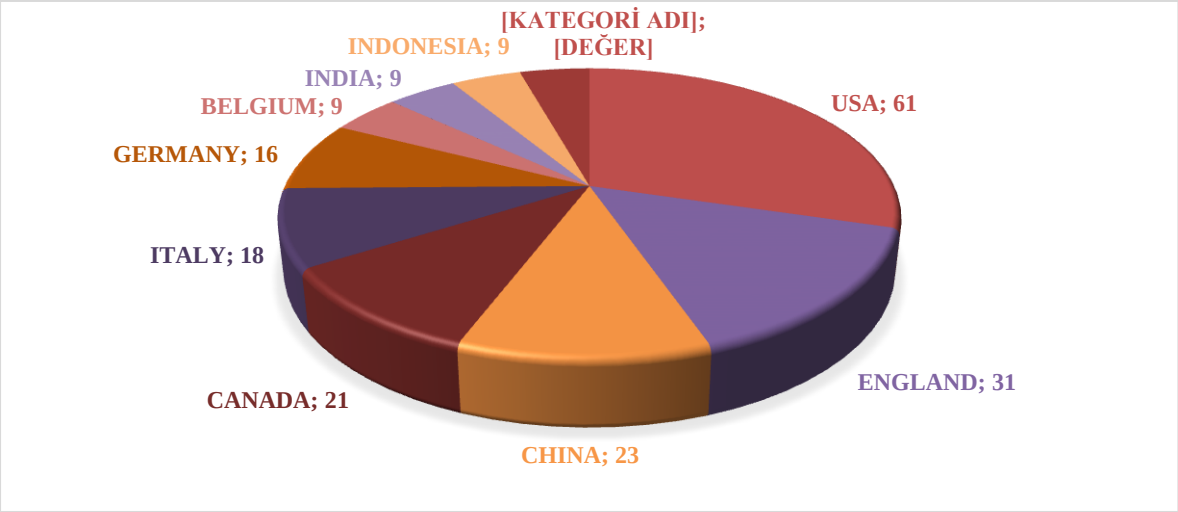

Figure 4. Top 10 Countries Contributing to the Green Accounting Literature

Figure 4 presents the top 10 countries that have contributed to the green accounting literature. The United States leads the field with 61 publications, making it the most significant contributor. The United Kingdom follows with 31 publications, while China (23 publications) and Canada (21 publications) rank third and fourth, respectively.

Table 1. Top 10 Institutions in the Field of Green Accounting

ORGANİZATİON	DOCUMENTS	FREKANS (%)
The World Bank	22	8,8
Mcgıll Unıversıty	15	6,0
Unıversıty Of Bath	10	4,0
Fondazıone Mattei	7	2,8
Yale Unıversıty	6	2,4
Commıss European Communıtıes	5	2,0
Unıversıty Of Readıng	5	2,0
Unıversıty Of Wuppertal	5	2,0
Vrıje Unıversıteıt Amsterdam	5	2,0
Italıan Energy Author	4	1,6

The top 10 institutions contributing to the field of green accounting are presented in Table 1. The World Bank ranks first with 8.8%, followed by McGill University with 6.0% and University of Bath with 4.0%.

Table 2. The 10 most influential researchers in the field of Green Accounting according to the number of publications

	Authors	Documents	Frekans (%)
1.	**Elserafy S.**	26	10,4
2.	**Cairns R.D.**	14	5,6
3.	**Bartelmus P.**	8	3,2
4.	**Markandya A.**	7	2,8
5.	**Tamborra M.**	7	2,8
6.	**Hunt A.**	6	2,4
7.	**Fenichel E.P.**	5	2,0
8.	**Watkiss P.**	5	2,0
9.	**Droste-franke B.**	4	1,6
10.	**Friedrich R.**	4	1,6

Table 2 shows the top 10 researchers with the most publications in the field of green accounting, together with their publication numbers and frequency percentages. Elserafy S., who is at the top of the list, is by far the most productive researcher with 26 publications, accounting for 10.4% of the total publications. Cairns R.D. is in second place with 14 publications and a rate of 5.6%, and it can be said that this author has also played an important role in shaping the field. This data reveals that publications in the field of green accounting are concentrated around certain researchers and that the literature base of the field is largely formed by a few productive academics.

Table 3. Top 10 Most Cited Studies in Green Accounting

Article Title	Authors	Journal Name	Year	Citation Count
Measuring The Damages Of Air Pollution In The United States	Muller & Mendelsohn	Journal Of Envıronmental Economıcs And Management	2007	254
Pıcabue - A Methodologıcal Framework For The Development Of Indıcators Of Sustaınable Development	Mitchell, et all.	The İnternational Journal Of Sustainable Development & World Ecology	1995	178
On The Evolution Of "Cleaner Production" As A Concept And A Practice.	Hens, et all.	Journal Of Cleaner Production	2018	163
Exploring Nitrogen İndicators Of Farm Performance Among Farm Types Across Several European Case Studies.	Quemada, et all.	Agricultural Systems	2020	103
National Accounting And The Valuation Of Ecosystem Assets And Their Services	Obst, et all.	Environmental And Resource Economics	2016	103
Farm Level Environmental İndicators; Are They Useful?: An Overview Of Green Accounting Systems For European Farms	Halberg, et all.	Agriculture, Ecosystems & Environment	2005	93
Linking Environmental Strategy To Environmental Performance: Mediation Role Of Environmental Management Accounting	Solovida & Latan	Sustainability Accounting, Management And Policy Journal	2017	92
Natural Capital: From Metaphor To Measurement.	Fenichel,&Abbott,	Journal Of The Association Of Environmental And Resource Economists	2014	82
One-Sided Sustainability Tests With Amenities, And Changes İn Technology, Trade And Population.	Pezzey, J. C.	Journal Of Environmental Economics And Management	2004	71
It Was 20 Years Ago Today Sgt Pepper, Accounting, Auditing & Accountability Journal, Green Accounting And The Blue Meanies	Gray & Laughlin,	Accountıng Audıtıng & Accountabılıty Journal	2012	70

Table 3 presents the top 10 most cited studies in the field of green accounting, which are considered to have significantly shaped the discipline. In citation analysis, the most frequently cited studies help clarify

the key concepts guiding a field, while the most cited authors provide insights into who has played a major role in shaping the discipline (Arslan & Mayatürk Akyol, 2023, p. 51). An examination of the most cited studies reveals that the highest-cited article is Muller and Mendelsohn's 2007 publication, titled "Measuring the Damages of Air Pollution in the United States," published in the Journal of Environmental Economics and Management, with 254 citations. This study focuses on the economic damage caused by air pollution emissions, particularly in relation to human health, forest health, and agricultural productivity. Furthermore, a review of the most frequently cited works indicates that the majority of them focus on agricultural production and related topics.

4.2. Co-authorship of Authors

Co-authorship analysis is a method used to measure the importance, impact, and citation count of an author's work. The quantitative aspect of this analysis helps assess the impact of a study, identify key scholarly contributions, and understand the extent of an author's influence both within and beyond their discipline (Çankaya Kurnaz, 2024, p. 198). In this context, data obtained from the WoS database related to the "green accounting" keyword were processed using VOSviewer software, and co-authorship analysis was conducted based on the criteria of at least one publication and one citation. The analysis identified 300 interconnected researchers, and the co-authorship network map is presented in Figure 5.

Figure 5 shows that each color represents a cluster, where nodes indicate authors and connection lines represent collaborative relationships. Authors working together are grouped within the same color cluster, and the thickness of the connecting lines indicates the strength of collaboration. The findings reveal that there are four main clusters, consisting of 17 researchers in total:

- Cluster 1 (Red): 6 researchers
- Cluster 2 (Green): 4 researchers
- Cluster 3 (Blue): 4 researchers
- Cluster 4 (Yellow): 3 researchers

The highest collaboration strength is observed in the red cluster, where the most highly connected researchers are:

- Hunt, Alistair (6 publications, 5 citations, total link strength: 28)
- Markandya, Anil (7 publications, 3 citations, total link strength: 26)
- Watkiss, Paul (5 publications, 2 citations, total link strength: 25)

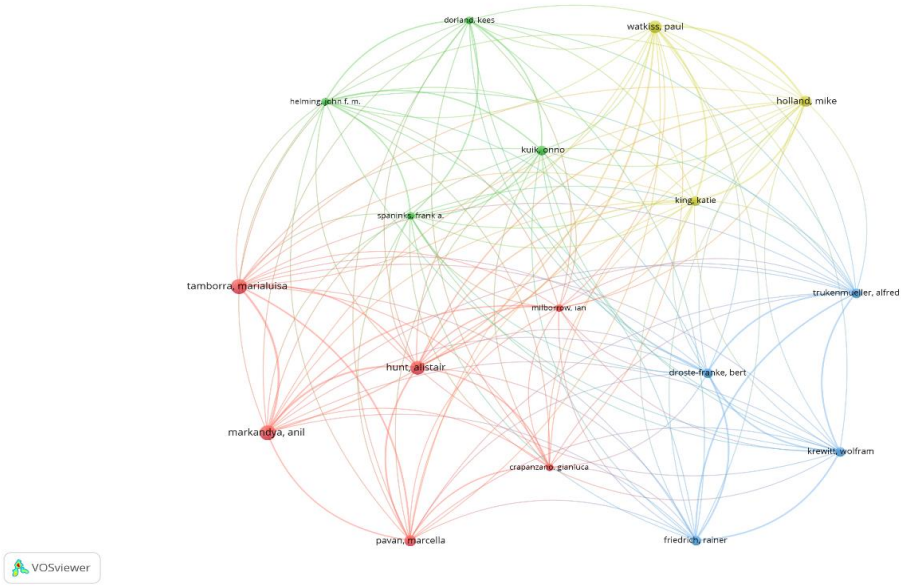

Figure 5. Co-authorship Network Map

4.3. Institutional Collaboration Networks

Institutional collaboration network mapping visualizes academic output and inter-organizational relationships, while also representing the flow of relevant information among research institutions (Qiu et al., 2023, p. 42). In this context, an analysis was conducted using VOSviewer software, applying the criterion of at least one citation per institution, which identified 200 institutions.

The most cited institutions are Yale University, with 3 studies receiving 265 citations, and Wageningen University, with 2 studies receiving 199 citations.

An examination of Figure 6, which presents the institutional collaboration network map, reveals that 14 institutions are grouped into five clusters:

- Cluster 1 (Red): 4 institutions
- Cluster 2 (Green): 3 institutions
- Cluster 3 (Blue): 3 institutions
- Cluster 4 (Yellow): 2 institutions
- Cluster 5 (Purple): 2 institutions

In terms of total link strength, Bath University ranks first, with 10 studies, 75 citations, and a total link strength of 22.

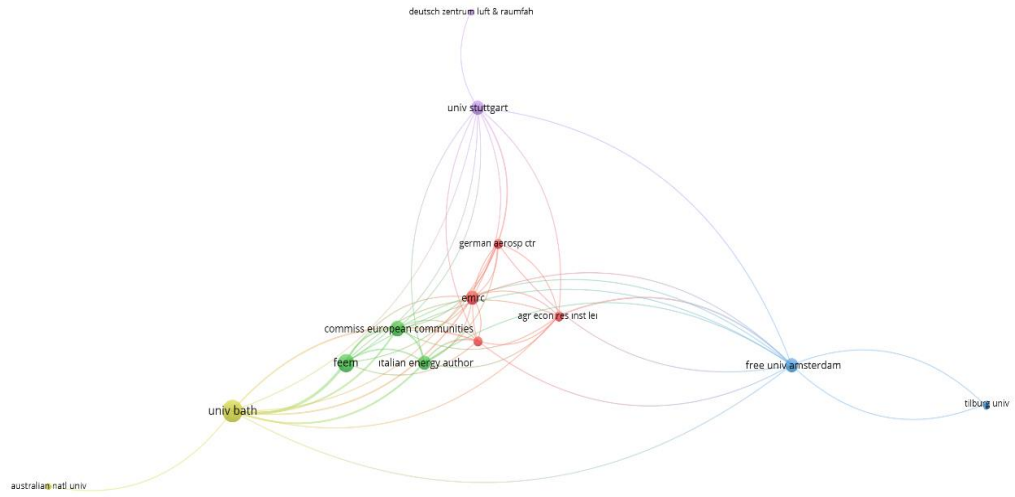

Figure 6. Institutional Collaboration Networks

4.4. Country Collaboration Networks

Citation analysis of countries contributes to bibliometric studies by serving as an accessible and widely used indicator of the impact and quality of research produced in a given country (Çankaya Kurnaz, 2024, p. 199). In this context, an analysis was conducted using VOSviewer software, applying the criteria of at least one country and one citation, which identified 42 countries.

The most cited countries are:

- United States, with 54 studies and 760 citations
- United Kingdom, with 28 studies and 597 citations
- Netherlands, with 9 studies and 351 citations

Figure 7 presents the country collaboration network map. In this figure, nodes represent the countries where researchers are affiliated. The size of each node is proportional to the number of publications produced by that country. The connecting lines between nodes indicate collaborative relationships, with thicker lines representing stronger collaboration levels.

A review of the collaboration network map shows that 31 countries are distributed across 9 interconnected clusters, with a total link strength of 103. In terms of total link strength, the United Kingdom, which belongs to the blue cluster, stands out with a total link strength of 34.

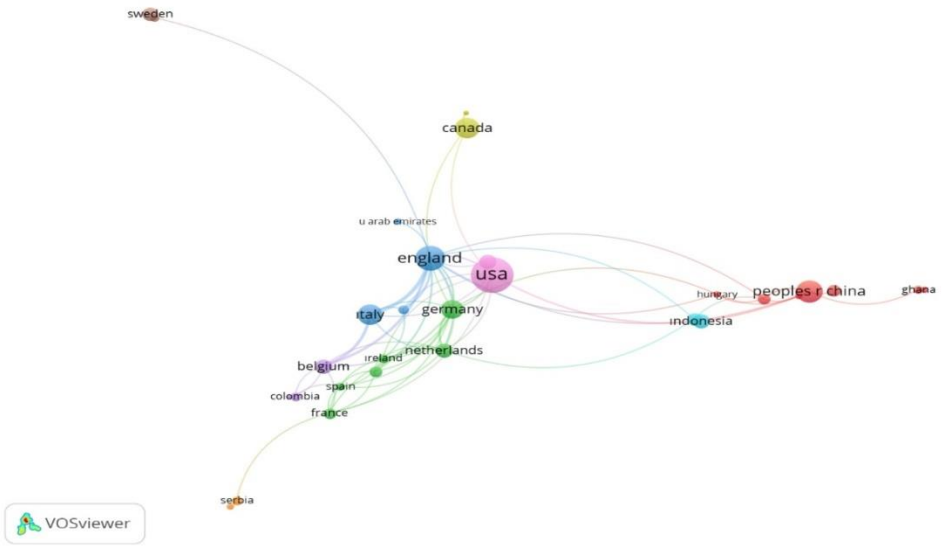

Figure 7. Country Collaboration Networks

4.5. Keyword Analysis

The main research topic and content of an article are typically reflected through its keywords. Keyword analysis, which identifies frequently used terms across multiple studies, provides insights into current topics and research trends in the literature (Yang et al., 2023, p. 5).

The network map of keywords used in green accounting studies indexed in the WoS database is presented in Figure 8. Using VOSviewer software, an analysis was conducted based on the criterion of at least one occurrence, identifying 552 keywords. The findings indicate the presence of 52 clusters, comprising 462 keywords, 1,817 connections, and a total link strength of 2,024.

The most frequently used keywords are:

- "Green accounting" (434 total link strength, 99 occurrences)
- "Sustainability" (141 total link strength, 34 occurrences)
- "Sustainable development" (83 total link strength, 19 occurrences)

Additional keywords identified in the gray cluster, where "green accounting" is positioned, include "green economy," "energy," "air quality," "forest," and "environmental protection."

In the pink cluster, where "sustainability" is found, related keywords include "environment," "public welfare," "net national income," and "sustainable development."

Meanwhile, the purple cluster, where "sustainable development" appears, includes terms such as "green economy," "environmental pollution," and "green gross domestic product (green GDP)."

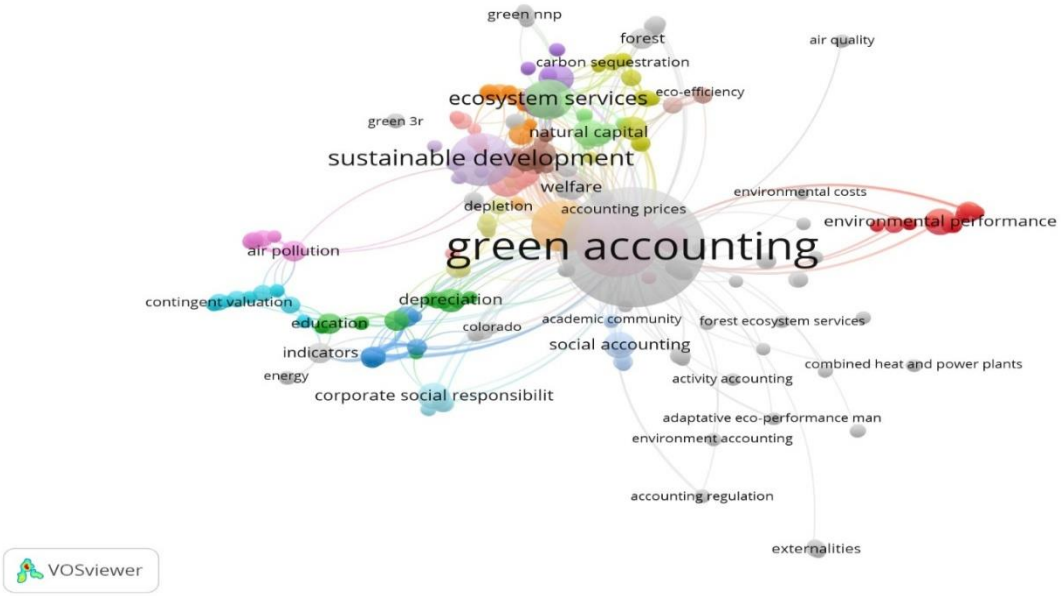

Figure 8. Keyword Network Map

Figure 9 presents the distribution of keywords over the years. This distribution illustrates how the popularity and frequency of certain keywords have changed over time. In the figure, each keyword is represented by a different color, making it easier to observe when specific terms were more commonly used or when their relevance declined. The darker the node color, the earlier the keyword emerged in the literature.

An analysis of Figure 9 reveals that between 2000 and 2010, keywords such as "air pollution," "health," "energy," and "social accounting" were widely used. However, during 2010–2020, terms such as "green accounting," "sustainable development," "environmental performance," and "environmental accounting" became more prominent.

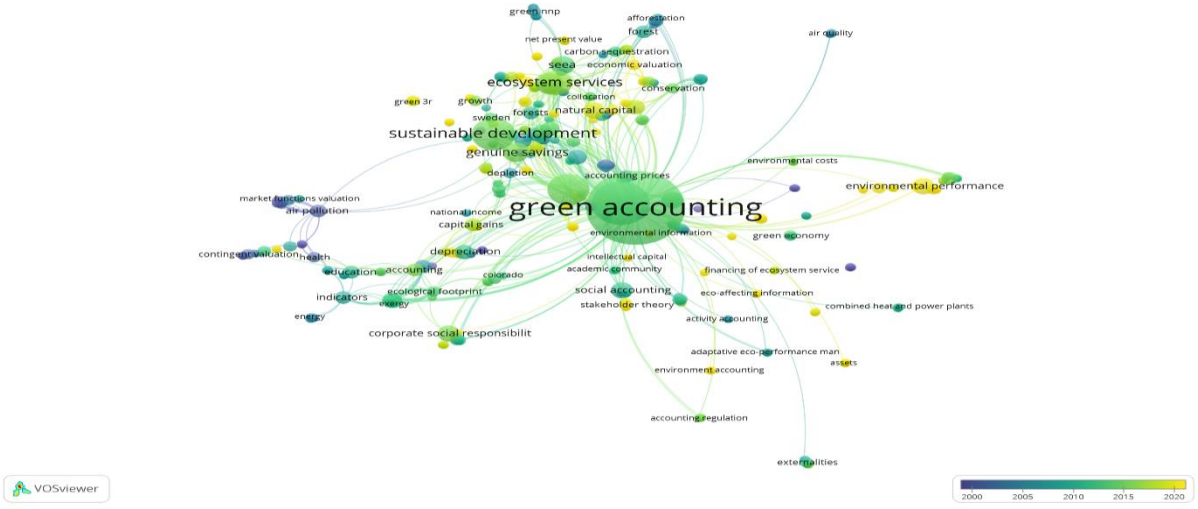

Figure 9. Distribution of Keywords Over Time

4.6. Bibliographic Coupling Analysis of Texts

In VOSviewer, a bibliographic coupling network map provides an analytical framework for identifying instances where two independent sources cite the same study, establishing a bibliographic connection. For example, if Source X and Source Y both cite Source Z, this indicates the presence of bibliographic coupling (Çankaya Kurnaz & Afşar, 2025, p. 626).

An analysis conducted in VOSviewer on 250 publications related to "green accounting" identified 127 studies that met the criterion of having at least one citation and were grouped into 11 interconnected clusters.

A review of Figure 10 reveals that the most frequently co-cited studies are:

- Müller (2007) with 254 citations,
- Mitchell (1995) with 178 citations,
- Hens (2018) with 163 citations.

In terms of total link strength, the authors with the strongest bibliographic coupling connections are:

- McGrath (2019) with 6 citations and a total link strength of 317,
- McGrath (2022) with 5 citations and a total link strength of 271,
- Ferreira (2011) with 18 citations and a total link strength of 243.

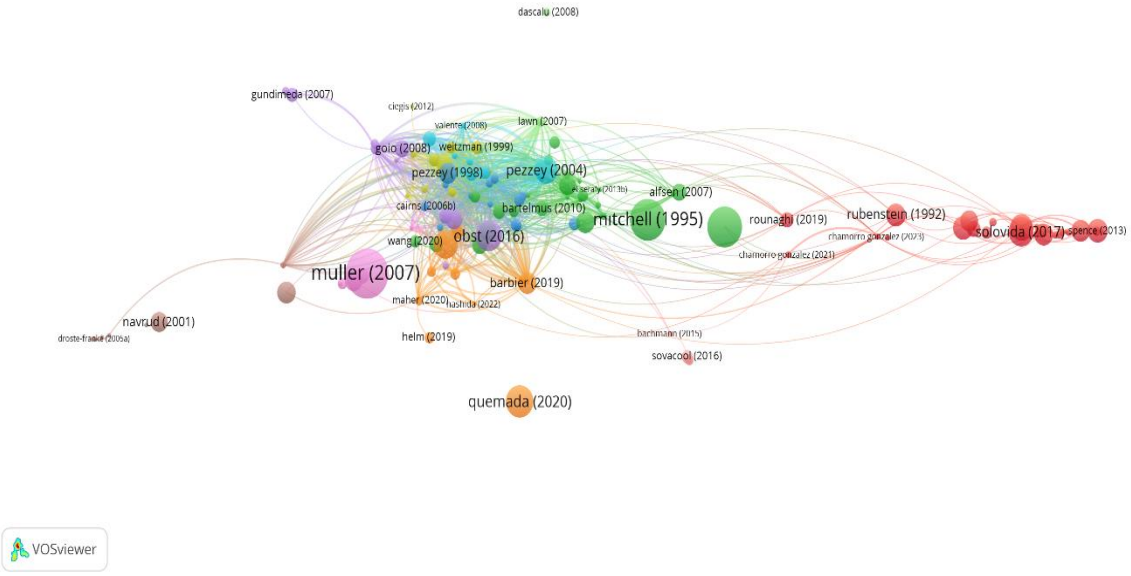

Figure 10. Bibliographic Coupling Network Map of Texts

4.7. Co-citation Analysis of Authors

Co-citation analysis is defined as the frequency with which two scientific publications are cited together in the same source (Small, 1973, p. 265).

In the VOSviewer analysis conducted on "Green Accounting," a total of 4,967 authors were identified. Applying the criterion of at least 10 citations, 68 interconnected authors were selected for further examination.

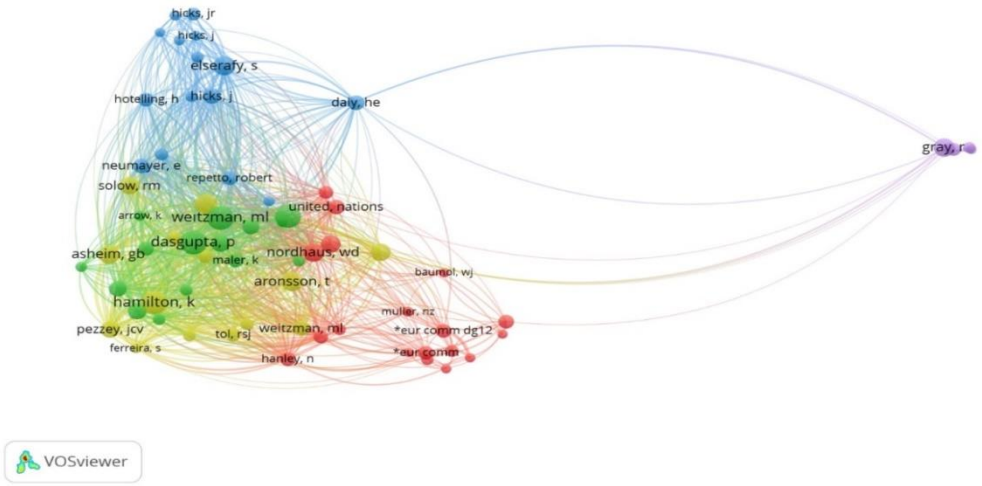

Figure 12. Co-citation Analysis of Authors

A detailed analysis identified 68 authors grouped into 5 clusters, with a total of 1,239 connections and a total link strength of 9,779. As shown in Figure 12, the green cluster contains the most frequently co-cited authors.

The top three co-cited authors in this cluster are:

- Dasgupta, P. with 60 citations and a total link strength of 950,
- Weitzman, M.L. with 57 citations and a total link strength of 811,
- Cairns, R.D. with 56 citations and a total link strength of 465.

5. Discussion

The bibliometric analysis conducted in this study indicates that academic research on green accounting has increased rapidly in recent years and has gained an interdisciplinary structure. The findings reveal that green accounting is no longer merely a financial reporting tool for businesses but has become an integral part of corporate sustainability strategies. The identified trends align with the bibliometric analysis conducted by Karcıoğlu and Tosunoğlu (2022), confirming that green accounting studies are increasingly focused on environmental reporting and sustainable finance.

It has been determined that green accounting practices are more widespread in developed countries. This finding is consistent with Rounaghi (2019), who emphasized that the lack of a regulatory framework, limited technical capacity, and insufficient financial incentives have hindered the adoption of green accounting practices in developing countries. In the case of Turkey, the Turkish Sustainability Reporting Standards (TSRS), published by the Public Oversight, Accounting, and Auditing Standards Authority (2023), provide important guidance for businesses. However, there are still gaps in knowledge and implementation.

According to the study's findings, the adoption of green accounting practices varies across different sectors. In particular, environmental cost accounting and carbon accounting are more prominent in the energy and manufacturing sectors. Moorthy and Yacob (2013) highlighted that large-scale manufacturing companies pay greater attention to environmental impacts, while small and medium-sized enterprises (SMEs) have limited awareness in this area. These findings suggest that green accounting provides financial advantages to large firms, whereas SMEs often lack the necessary resources and knowledge to fully integrate such practices.

The findings also reveal that green accounting increases investor confidence and reinforces corporate sustainability strategies. Research by Rounaghi (2021, p. 511) shows that sustainability reporting can enhance firms' financial performance, indicating that green accounting is not only an environmental

necessity but also a source of competitive advantage. The integration of environmental costs into accounting systems enables companies to make decisions that simultaneously enhance long-term profitability and improve environmental performance. By positioning themselves as part of the green industry in the capital market, firms can both increase shareholder wealth and contribute to the development of an environmental accounting system grounded in the principles of classical accounting evolution.

The results of this study highlight the need to increase the integration of green accounting into accounting education curricula. In particular, it is essential to expand the number of courses on environmental accounting at universities and to implement initiatives that raise awareness among businesses. In this context, the widespread adoption of sustainable accounting practices and the preparation of green accounting reports in compliance with international standards are necessary steps for future development.

6. Conclusion and Recommendations

This study examined academic developments in green accounting using bibliometric analysis and provided an overview of the current state of the field. The findings indicate that green accounting practices are becoming increasingly important, playing a critical role in strategic decision-making processes, particularly in the context of sustainability reporting. The main results highlight that green accounting is not only a tool for cost accounting but also a key instrument for ensuring social and environmental sustainability in businesses.

The findings suggest that regulatory and financial incentives should be increased to promote the adoption of green accounting practices in developing countries. Particularly in countries like Turkey, it is recommended that training and awareness programs be expanded to help businesses fully comply with national sustainability standards such as TSRS. At the international level, strengthening the global adoption of sustainability reporting standards, such as IFRS S1-S2, could enhance the competitiveness of businesses worldwide.

Future research should focus on sector-specific analyses of green accounting, identifying challenges faced by businesses and developing solutions to address these challenges. Conducting long-term studies on the relationship between green accounting and financial performance will provide a better understanding of the cost-benefit balance in implementation. Additionally, studies on the integration of digital accounting systems with green accounting will enable businesses to report environmental data more efficiently.

In conclusion, this study provides important insights into the place of green accounting in the existing literature and serves as a guide for future research. The widespread adoption of green accounting practices will become an integral part of businesses' long-term environmental and financial sustainability strategies.

Araştırmacıların Katkı Oran Beyanı / Contribution of Authors

Yazarların çalışmadaki katkı oranları Tevfik EREN %34/ Ali KURNAZ %33/ Semih BÜYÜKİPEKCİ %33 şeklindedir.

The authors' contribution rates in the study are Tevfik EREN %34/ Ali KURNAZ %33/ Semih BÜYÜKİPEKCİ %33 form.

Çıkar Çatışması Beyanı / Conflict of Interest

Çalışmada herhangi bir kurum veya kişi ile çıkar çatışması bulunmamaktadır.

There is no conflict of interest with any institution or person in the study.

İntihal Politikası Beyanı / Plagiarism Policy

Bu makale İntihal programlarında taranmış ve İntihal tespit edilmemiştir.

This article was scanned in Plagiarism programs and Plagiarism was not detected.

Bilimsel Araştırma ve Yayın Etiği Beyanı / Scientific Research and Publication Ethics Statement

Bu çalışmada Yükseköğretim Kurumları Bilimsel Araştırma ve Yayın Etiği Yönergesi kapsamında belirtilen kurallara uyulmuştur.

In this study, the rules specified within the scope of the Higher Education Institutions Scientific Research and Publication Ethics Directive were followed.

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