



Landscape of Sustainability Accounting: Past, Present, And Future Using Bibliometric Analysis 2009-2024

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ABSTRACT

The objective of this study is to explore significant developments, trends, and opportunities in the field of sustainability accounting through a comprehensive bibliometric analysis. Utilizing data from the Scopus database, this research examines 70 peer-reviewed articles published in English between 2009 and 2024. The analysis identifies influential publications, key authors, major thematic areas, and countries that have successfully implemented sustainability accounting practices and policies. Methodologically, the study employs network mapping to highlight scholarly collaborations and uncover relationships among the identified themes. The findings of this study not only shed light on current research trends but also identify critical gaps in the extant literature, thereby offering a solid foundation for future studies. Moreover, the results are expected to contribute to the refinement of business policies and practices, particularly in addressing environmental and social challenges in Indonesia. This research enhances understanding of sustainability accounting, supporting its integration into strategic decision-making and promoting sustainable business practices across diverse industries and regions.

Keywords: Sustainability accounting, Environmental accounting, Green accounting, Social accounting, Bibliometric analysis

INTRODUCTION

The notion of sustainable development is predicated on a multifaceted consideration of environmental and human needs, encompassing the recalibration of economic growth and the integration of social and environmental concerns (Ramcilovic-Suominen & Pülzl, 2018). This concept exerts a profound influence on economic development policies worldwide, impacting economic demand and supply as well as business activities (Castaneda *et al.*, 2015). Contemporary approaches to economic growth are progressively incorporating the concept of sustainable development, which considers economic, social, and environmental dimensions in a balanced manner. This approach encompasses the adoption of clean technologies, efficiency in resource utilization, and enhancements in social equity and access to fundamental services.

Sustainable economic growth hinges upon a robust monitoring and reporting system that functions as an indicator of sustainability. This system can be utilized as an ongoing evaluation tool to assess the impact of the economy on the environment and society. Sustainability

accounting is a measurement tool that centers on disclosing non-financial information regarding company results to external users (Adams & Larrinaga, 2019). Sustainability accounting is associated with activities that directly impact society, the environment, and the company's economic performance (Vysochan *et al.*, 2021).

Sustainability accounting is a process that involves the communication of the social and environmental effects of an organization's economic actions to specific interest groups in society and society in general (Hörisch *et al.*, 2020). Sustainability accounting involves the measurement, collection, and reporting of both qualitative and quantitative information that demonstrates the social, environmental, and economic performance of the organization (Burritt & Schaltegger, 2010).

A fundamental component of sustainability accounting pertains to the quantification and disclosure of greenhouse gas emissions emanating from corporate operations. This process entails the quantification of direct emissions, indirect emissions from energy acquisitions, and associated emissions emanating from corporate operations (Kasperzak *et al.*, 2023). By regularly monitoring and reporting these emissions, companies can comprehensively assess their contributions to climate change and proactively pursue strategies to minimize their carbon footprint (Burritt & Schaltegger, 2010).

In Indonesia, the OJK regulation No.51 of 2017 stipulates that every issuer and public company publishes a sustainability report. By 2023, the number of companies listed on the Indonesia Stock Exchange (IDX) had reached 900 (IDX, 2023). The 2023 Asia Sustainability Reporting Rating (ASSR) reveals that of these 900 companies, a mere 68 participated, and a mere 12 were awarded a platinum rating (Risty, 2023). The platinum category is indicative of a company's adherence to the prescribed guidelines for sustainability report publication. However, a closer look at the number of companies listed on the IDX reveals that only 7% of companies have fulfilled their obligation to publish sustainability reports in 2023 (Risty, 2023). This finding suggests a deficiency in the quality of sustainability reports, or a lack of awareness regarding the importance of reporting among the companies in question.

The development of research related to sustainability accounting using a comprehensive macro approach is still very limited. Conventional studies have predominantly adopted a micro approach, which entails the examination of specific relationships and influences within a more circumscribed context. These micro approaches typically examine aspects such as company performance, disclosure of environmental information, or the impact of specific policies on sustainability.

This study aims to contribute to the field of sustainability accounting by offering broader insights, leveraging a macro approach and employing bibliometric analysis. The population of this study includes articles that examine topics such as sustainability accounting, green accounting, environmental accounting, and social accounting from the Scopus database for the period 2009-2024. The selection of these topics was driven by their representation of the multifaceted nature of sustainability accounting, encompassing economic, environmental, and social dimensions within the context of accounting. Social accounting underscores corporate accountability to social stakeholders and the social impacts of business activities. It is consistent with the broader objective of sustainability accounting to ensure social responsibility and sustainability in business operations (Lamberton, 2005). Environmental accounting and green accounting are integral components of sustainability accounting, focusing on reporting and managing the environmental impacts of business activities. These components are essential to a company's sustainability strategy (Gray *et al.*, 2014).

Vysochan *et al.* (2021) conducted a study entitled "Sustainability accounting: A Systematic Literature Review and Bibliometric Analysis of Sustainability Accounting," which employed the keywords "sustainability accounting" in a review of the Scopus and Web of

Science databases. The study's findings, as reported by Vysochan et al revealed a total of 251 publications accepted by Scopus and 252 by Web of Science, the majority of which were classified as scientific articles. The findings suggest a substantial increase in the number of articles published in this area during the analysis period, indicating a growing interest in key circles and the relevance of this issue.

Hasanah (2023) conducted an analysis of environmental accounting and sustainable development in bibliometrics (2013-2023) by using data from Google Scholar. The results of the analysis demonstrate a decline and subsequent increase in research activity on Environmental Accounting and Sustainable Development in Google Scholar from 2013 to 2023.

Concurrently, Dwianika *et al.* (2024) undertook a study entitled "Bibliometrics Analysis of Green Accounting Research," which amassed data from the Scopus database. This research identifies global contributions to Green Accounting from developed and developing countries.

LITERATURE REVIEW

Stakeholder Theory

Stakeholder theory posits that companies, as social entities, are obligated to consider the interests of various stakeholders involved in decision-making processes. This theory encourages companies to report transparently about their business decisions that affect and utilize a variety of stakeholders, as well as to consider the long-term interests of these stakeholders (Schaltegger *et al.*, 2017).

To that end, companies must maintain relationships with stakeholders by accommodating their wants and needs. This is particularly crucial for stakeholders who wield significant influence over the availability of resources utilized for the company's operational activities, such as labor, customers, and owners (Hörisch *et al.*, 2020).

Sustainability Accounting

Sustainability accounting is defined as a communication process utilized by organizations to convey the social and environmental impacts of their economic activities to diverse stakeholders in society and the general public. This process entails the collection, measurement, and reporting of information, both qualitative and quantitative, that demonstrates the organization's performance in social, environmental, and economic domains (Laine *et al.*, 2021).

The role of sustainability accounting in supporting management in planning and managing the company's impact on the environment and society is well-documented (Laine *et al.*, 2021). The development of sustainable business models is facilitated by sustainability accounting, thereby enhancing a company's competitiveness and reputation in markets that are increasingly focused on sustainability issues (Gray *et al.*, 2014).

Bibliometric Analysis

Bibliometric analysis can be categorized into two distinct types: performance analysis and science mapping analysis. Performance analysis is concerned with determining the number of publications, the number of citations, and publication trends. Conversely, science mapping analysis can be facilitated through the utilization of VOSviewer, a software that enables the visualization of three distinct types: network visualization, overlay visualization, and density visualization (Donthu *et al.*, 2021). According to (Zakiyyah *et al.*, 2022), the following types of analysis are available:

- a. Co-authorship: This analysis examines the collaboration relationship between authors. VOSviewer will produce visualizations in the form of author names, author organizations, and author countries.
- b. Co-occurrence: displays the bibliometric network between keywords in visual form.
- c. Citation: displays the citation relationship between documents. This analysis serves to show the citation relationship between documents, and can be used to see an author's self-citation. The visuals displayed include observed documents, journals, authors, organizations, and countries.
- d. Bibliographic coupling: displays the closeness of studies between documents that are connected based on the same references used. The visualizations encompass documents, journals, authors, organizations, and countries.
- d. Co-citation: this visualization technique displays the references utilized by the observed or tested documents. References are linked if they are used in the same article. For instance, if references A and B are used by article X, then references 1 and 2 have a co-citation relationship.

Research Question

The present study employs the Donthu et al (2021) instrument to analyze bibliometrics. Two results of bibliometric analysis are as follows: first, analysis consisting of the number of publications per year, countries with the highest number of articles, countries with the highest number of citations, and countries producing journals; and second, science mapping consisting of network visualization, overlay visualization, and density visualization (Donthu *et al.*, 2021). Terdapat 2 hasil analisis bibliometrik, yaitu analisis yang terdiri atas jumlah publikasi tiap tahun, negara dengan jumlah artikel terbanyak, negara dengan jumlah sitasi terbanyak, negara penghasil jurnal; dan pemetaan sains yang terdiri atas *network visualization*, *overlay visualization* dan *density visualization* (Donthu *et al.*, 2021).

RQ 1: What are the topic trends in sustainability accounting during the period 2009-2024?

RQ 2: What are the publication trends in sustainability accounting during the period 2009-2024?

RQ 3: Which articles had the greatest influence in the field of sustainability accounting during the period 2009-2024?

RQ 4: Who are the leading authors in the field of sustainability accounting during the period 2009-2024?

RQ 5: Which countries were influential in the field of sustainability accounting during the period 2009-2024?

METHODOLOGY

This research employs a descriptive quantitative approach, utilizing bibliometric analysis. Quantitative approaches are defined as those that collect numerical data or data that can be measured quantitatively and then analyze the data using statistical techniques (Creswell & Creswell, 2018). Descriptive research, in contrast, is a study aimed at describing existing phenomena or events, which take place at this time or in the past (Purwanza *et al.*, 2022).

This study employs bibliographic coupling analysis to identify influential authors, countries, and articles in the domain of sustainability accounting. To identify trends in research topics, researchers employed co-occurrence analysis to reveal patterns of relationships between keywords in the scientific literature.

The population of this study consists of scientific articles from the Scopus database that examine the topics of sustainability accounting, green accounting, environmental accounting, and social accounting. The total number of articles used was 70 articles from 2009 to 2024. The articles were then divided into four distinct themes: 20 articles on the theme of environmental

accounting, 16 articles on the theme of green accounting, 24 articles on the theme of social accounting, and 10 articles on the theme of sustainability accounting. Subsequent to the aggregation of these themes, a bibliometric analysis was conducted.

Sustainability accounting, green accounting, environmental accounting, and social accounting are integrated to represent each aspect of the sustainability accounting field, which includes economic, environmental, and social aspects in an accounting context. Social accounting underscores corporate accountability to social stakeholders and the social impacts of business activities. This objective aligns with the overarching commitment to sustainability in business operations, as articulated by Lamberton (2005). Environmental accounting and green accounting are integral components of sustainability accounting, focusing on reporting and managing the environmental impacts of business activities. These components are essential to a company's sustainability strategy (Gray *et al.*, 2014).

The present study employed a purposive sampling method, a non-random sample selection technique, to obtain information according to specific criteria. The following criteria were used to select the articles for this study:

- a. Electronic articles with full text available in the Scopus database.
- b. Articles published from 2009 to 2024 in May.
- c. Articles are in English.
- d. Articles with subject areas in business, management, and accounting, and economics, econometrics, and finance.
- e. Articles with keywords: social accounting, corporate social responsibility, social accounting matrix, environmental accounting, green accounting, and sustainability accounting.
- f. Articles that examine the topic of sustainability accounting in the scope of business.
- g. Articles that examine the topic of green accounting in the scope of business.
- h. Articles that examine the topic of environmental accounting in the scope of business.
- i. Articles that examine the topic of social accounting in the scope of business.

The present study employed the Scopus database to collect data. During the data search process, researchers employed keywords including "sustainability accounting," "green accounting," "environmental accounting," and "social accounting." Within the specified subject area, researchers identified articles that exclusively addressed subjects related to business, management, and accounting, as well as economics, econometrics, and finance. The time period set for the study encompasses articles published from 2009 to 2024.

Following the identification of relevant articles by the Scopus database, a manual validation process was initiated. This entailed the thorough examination of the abstracts of each article, ensuring that the final selection aligned with the predetermined criteria. This validation process was implemented to ensure the articles aligned with the research objectives. The validation process is meticulously executed to ensure the exclusion of irrelevant articles, thereby ensuring the integrity and relevance of the final data set. The final data set will consist of 70 articles that are relevant and ready to be analyzed. Subsequently, a collection of 70 articles from the Scopus database will be downloaded, resulting in a Microsoft Excel file with a Comma Separated Values (CSV) format.

The data analysis technique employed in this research utilizes VOSviewer, Microsoft Excel, and Mendeley applications. Researchers employed Microsoft Excel to process and classify metadata stored in Comma Separated Values (CSV) format. The utilization of VOSviewer facilitates the presentation of cluster groupings and development maps, ensuring enhanced comprehensibility for readers from diverse cross-disciplinary backgrounds.

RESULTS AND DISCUSSION

Topics Trend

Co-occurrence analysis was employed with the threshold employed being the minimum number of times a word appears (Pauji *et al.*, 2023), which resulted in 34 keywords.

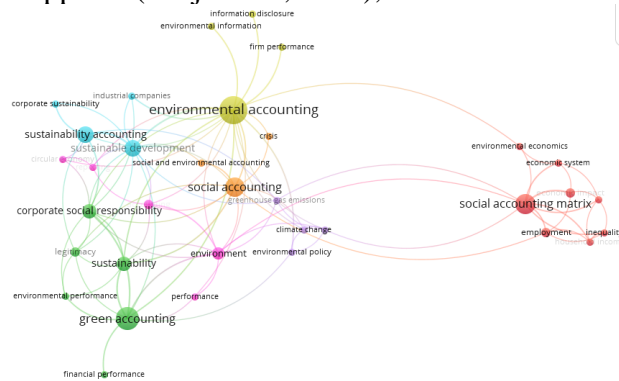


Figure 1. Network Visualization of Research Topics

The topic mapping was divided into seven clusters with different colors by the network visualization results from VOSviewer in Figure 1. Each cluster represented a different theme focus from other clusters. Topics that were gathered in the same cluster indicated that the topics often appeared together in research.

Cluster 1, designated by a red, encompasses eight items, including: *economic impact*, *economic system*, *employment*, *environmental economic*, *household income*, *inequality*, *social accounting matrix*, dan *tourism economics*. An examination of Cluster 1 reveals an in-depth perspective on the integration of economic and sustainability accounting dimensions, thereby offering a comprehensive understanding of the intricate relationship between economic growth, social justice, and environmental sustainability. The social accounting matrix is a recurring theme in Cluster 1, often discussed in conjunction with other subjects. Conversely, subjects such as economic impact, economic system, environmental economics, household income, inequality, and tourism economics exhibit minimal connectivity and sporadic lines. This observation indicates that these subjects are infrequently addressed and demonstrate a limited association with other themes. Consequently, these subjects can serve as a point of reference for future research, facilitating the establishment of connections with other, as yet unconnected, subjects.

Cluster 2, designated by a green hue, encompasses six items, including: corporate social responsibility, environmental performance, financial performance, green accounting, legitimacy, and sustainability. This cluster offers a more profound comprehension of the accounting aspects that can be applied to enhance environmental performance and ensure transparent reporting related to economic impacts on the environment. Within this cluster, green accounting and corporate social responsibility are frequently encountered and discussed in conjunction with other subjects. Conversely, subjects such as environmental performance and financial performance exhibit smaller circles and a paucity of dashes. This observation indicates a paucity of association between these subjects and other themes, suggesting a limited degree of interconnection. Consequently, these subjects can serve as a point of reference for future research, facilitating the establishment of connections with other, as yet unconnected, subjects.

Cluster 3, which is represented by the color pink, encompasses five items, including: "accounting," "circular economy," "environment," "performance," and "reporting". This cluster's focal point is the integration of accounting aspects and practices that support

sustainable development, particularly within the context of the circular economy and environmental management. The environment theme, frequently present yet often discussed in isolation, is of particular interest. The limited size of the circles and the connecting lines, particularly in the context of the circular economy and reporting topics, underscore the paucity of research on these subjects. This finding should be used as a reference in developing literature in the field of sustainability accounting in the future.

Cluster 4, represented by the color gold, encompasses four items, including: environmental accounting, environmental information, firm performance, and information disclosure. This cluster signifies an endeavor to enhance comprehension of how accounting practices can contribute to environmental sustainability and overall firm performance. Within this cluster, environmental accounting emerges as a recurrent theme, often discussed in conjunction with other subjects. Conversely, subjects such as environmental information, firm performance, and information disclosure exhibit less cohesion within their respective clusters, with only a marginal connection to the overarching theme of environmental accounting. This observation suggests that these subjects are infrequent and that research conducted on this topic is largely constrained to their relationship with environmental accounting subjects. Further exploration is necessary to ascertain the relationship between environmental information, firm performance, and information disclosure with other topics. Kluster 5 berwsrna ungu yang berisi 4 items, di antaranya yaitu: *climate change*, *environmental policy*, *greenhouse gas*, dan *greenhouse gas emissions*.

Cluster 5 indicates that research related to this cluster is centered on issues related to climate change, environmental regulation, and greenhouse gas emissions management. A closer look at cluster 5 reveals that the four items within it exhibit low levels of participation, as indicated by the small circle sizes. This finding suggests that these subjects are not frequently addressed, with a frequency of only two occurrences.

Cluster 6, depicted in light blue, comprises four items: corporate sustainability, industrial companies, sustainability accounting, and sustainable development. This cluster pertains to companies' endeavors to incorporate sustainability accounting into their business strategies, in addition to promoting sustainable development on a broader scale. Notably, sustainable development and sustainability accounting emerge as frequent subjects within this cluster. Conversely, subjects such as "corporate sustainability" and "industrial companies" exhibit smaller circles and a paucity of dashes. This observation indicates that these subjects are infrequently associated with other themes and demonstrate a paucity of interconnection with other topics. Consequently, these subjects can be utilized as a point of reference in conducting subsequent research, by establishing connections with other subjects that have not been previously linked.

Cluster 7 is represented by the color orange, encompasses three items: crisis, social accounting, and social and environmental accounting. Within this cluster, social accounting emerges as a recurrent theme, often discussed in conjunction with other subjects. Conversely, subjects such as "crisis" and "social and environmental accounting" exhibit smaller circles and a paucity of dashes. This observation indicates that these subjects are infrequent and exhibit minimal interconnection with other themes.

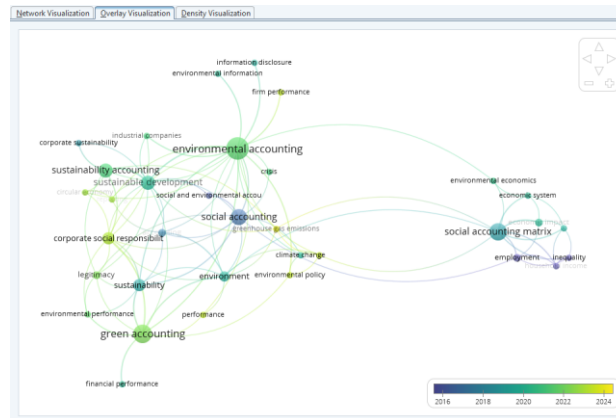


Figure 2. Overlay Visualization of Research Topics

The overlay visualization of VOSviewer in Figure 2 displays keyword circles with various colors. The intensity of the color caption in Figure 2 corresponds to the publication time period of the keyword. The heightened yellow hue in the circles signifies that the keywords represent recent research topics.

The overlay visualization of keywords in Figure 2 reveals that yellow circles indicate novel subjects within the domain of sustainability accounting. The yellow-colored topics, as illustrated in Figure 2, include greenhouse gas, greenhouse gas emissions, environmental policy, corporate social responsibility, firm performance, performance, and circular economics. The identification of these novel subjects indicates a prevailing emphasis within the domain of sustainability accounting on comprehending and overseeing the societal and environmental ramifications of commercial endeavors, while concurrently endeavoring to ensure that business operations contribute favorably to the pursuit of sustainability. The emergence of topics such as greenhouse gases and circular economics in recent research reflects a growing awareness of corporate environmental and social responsibility, which is in line with the principles of stakeholder theory.

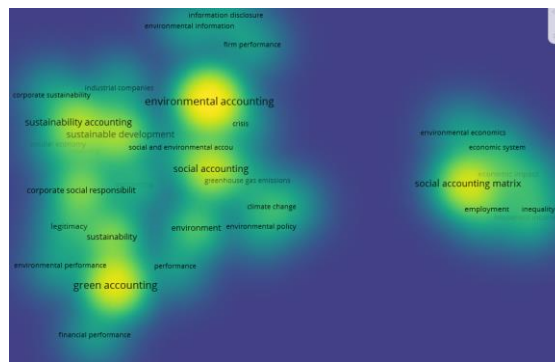


Figure 3. Density Visualization of Research Topics

The density visualization of research topics in Figure 3 demonstrates the density of themes. The density of each theme is represented by a light yellow hue. The lighter color of frequently researched topics indicates their higher frequency. Conversely, the less frequently researched themes are indicated by the dimmer color of the topic.

As illustrated by Figure 3, density visualization reveals that topics such as green accounting, environmental accounting, social accounting matrix, sustainability accounting, and social accounting are frequently researched, as indicated by their light color. Conversely, research on topics such as environmental information, information disclosure, firm performance, and financial performance are examples of themes that remain under-researched.

This observation underscores the potential for future research initiatives to explore these under-researched areas, thereby contributing to the advancement of knowledge in these crucial domains.

The high density of topics such as green accounting and environmental accounting indicates a substantial body of research exploring how companies can integrate environmental aspects into accounting practices, aligning with the principles of stakeholder theory that underscore social and environmental responsibility. Additionally, the prevalence of social accounting matrix and sustainability accounting topics indicates a predominant focus on measuring and reporting corporate contributions to sustainability, a central tenet of the stakeholder approach.

Publications Trend

The total data analyzed in this study amounted to 70 scientific articles obtained from the Scopus database during the period 2009-2024. The subsequent findings address the number of research publications relevant to the theme of sustainability accounting:

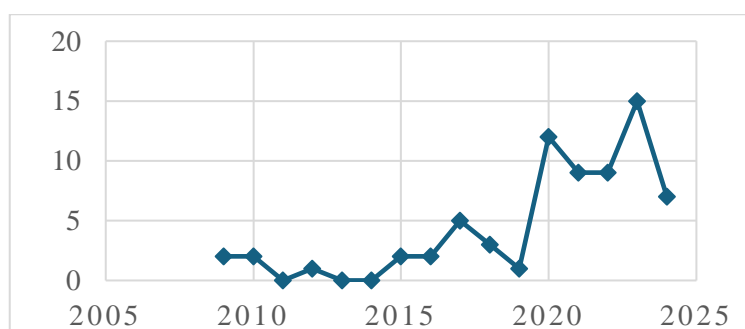


Figure 4. Publications Trend Chart

As illustrated in Figure 4, the publication trend graph in the domain of sustainability accounting has exhibited fluctuations from 2009 to 2019. In the initial period (2009-2013), the number of publications in this field was minimal, with 2011 and 2013 exhibiting no publication activity whatsoever. This decline suggests a lack of awareness regarding the significance of sustainability accounting during that specific timeframe.

However, from 2014 to 2018, there was a notable increase in the number of publications, particularly in 2017, which saw a 7% increase over the previous year. This surge in publications signifies a growing global consciousness regarding environmental and sustainability concerns. This period also signifies the emergence of government policies and international organizations that began to prioritize sustainability aspects in the financial statements of corporations.

From 2019 to 2024, there was a substantial increase, particularly in 2020 with 12 publications, which constituted 17% of the total. This increase persisted, though it was accompanied by a slight decrease in 2019. This substantial surge can be attributed to heightened public demand for transparency and accountability, compounded by escalating regulatory pressures on sustainability reporting. The surge in publications at the close of the period underscores the pressing nature of the global climate problem and its imperative for urgent attention. The proliferation of studies in this field can be attributed to various factors, including augmented research budgets, heightened public interest and awareness of research's significance, government policies that incentivize research, and technological and scientific advancements that unveil novel research prospects (Pugacheva *et al.*, 2020).

The proliferation of publications in the domain of sustainability accounting signifies an escalating cognizance and requisition from stakeholders for enhanced transparency and

accountability on the part of companies with regard to the management of the environmental and social ramifications of business undertakings. Stakeholder theory, a concept that underpins the concept of sustainability accounting, encourages companies to report transparently on how their business decisions affect various stakeholders, including the environment and society. The marked increase in publications in 2020 appears to be a response to these mounting demands. This finding is further substantiated by the findings of previous research. Hasanah's (2023) study demonstrated a notable rise in research publications concerning environmental accounting and sustainable development from 2013 to 2023.

Influential Articles

In the course of conducting a search for articles of a particularly influential nature, the author employs a bibliographic coupling analysis, with the unit of analysis being the document. The author determines the threshold, herein referred to as the "tracehold," which is defined as a minimum of 40 citations for the document. This approach is employed to identify the ten documents with the highest number of citations and to discern the relationship patterns among them.

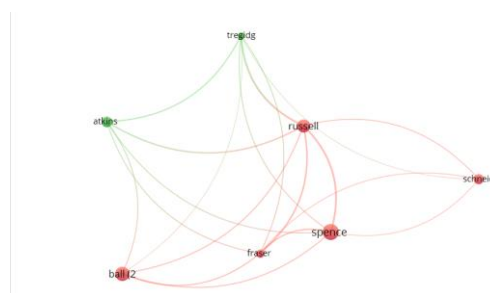


Figure 5. Network Visualization of Influential Articles

Figure 5 presents a network visualization of bibliographic coupling analysis, employing VOSviewer to illustrate the relationship between influential documents in the domain of sustainability accounting research. The size of each circle is indicative of the number of citations received by each article. The circles also represent the authors' names and the years of publication. The relationship between the circles is represented by a line that shows the same references between the documents.

Cluster 1 is represented by the color red and comprises five authors: 1) Spence (2009) with an article titled "Social accounting's emancipatory potential: a Gramscian critique" has received 199 citations. Spence occupies a central position within the red cluster, with a total of six connections to all other articles. The second author, Ball (2010), published an article titled "Using neo-institutionalism to advance social and environmental accounting," which has received 165 citations. Ball's work is closely intertwined with that of Spence and several other authors in the red cluster, with the notable exception of Schneider (2015). 3) Russell (2017) with an article titled "Accounts of nature and the nature of account: critical reflections on environmental accounting and propositions for ecologically informed accounting" which has been cited 134 times. Russell also has good connections to all articles in the red and green clusters. Fraser (2012) is also noteworthy, with an article titled "Fleshing out an engagement with a social accounting technology" that has been cited 56 times. Fraser's work is interconnected with all authors in this cluster, suggesting a shared engagement in academic discourse. Additionally, Schneider (2015) has been cited 79 times for his article, titled "Reflexivity in Sustainability Accounting and Management: Transcending the Economic Focus of Corporate Sustainability." Schneider also contributed significantly to this cluster, having 4

connections with other authors. Notably, two authors, Atkins and Ball, do not have any connections with Schneider.

The referential relationship between Spence and other authors in the red cluster, such as Ball (2010) and Russell (2017), highlights the discourse and development of ideas concerning social and environmental accounting in the extant literature. Ball (2010), employing a neo-institutionalist approach to advance social and environmental accounting, also assumes a pivotal role, with 165 citations, signifying the considerable relevance and broad acceptance of this theoretical framework among academic circles.

Russell's (2017) critical reflections on environmental accounting and his proposal for ecologically informed accounting have been cited 134 times, indicating his contribution to steering the debate in a more critical and reflective direction. Fraser (2012) and Schneider (2015), with 56 and 79 citations, respectively, also contribute to this cluster. Despite having fewer citations, these works demonstrate active interaction and discussion within the broader academic community.

Cluster 2, depicted in green, comprises two authors: 1) Atkins (2015) with an article titled "Good news from nowhere: imagining utopian sustainable accounting" has received 88 citations. Atkins occupies a central position within the green cluster, thereby underscoring his substantial impact on the extant literature. Atkins's work is intertwined with several other authors across the red and green clusters, with the notable exception of Schneider (2015). The second author, Tregidga (2022), published an article titled "On crisis and emergency: is it time to rethink long-term environmental accounting?" which has received 40 citations. Tregidga's work demonstrates a robust association with Atkins's contributions. Atkins's engagement is further evidenced by his connections with all authors in this cluster, suggesting a collective engagement in academic discourse on related subjects.

Atkins' (2015) article on utopian imagination in sustainability accounting has been cited 88 times, indicating that visionary and idealistic approaches have a place in the literature as well. Tregidga's (2022) article, "Crisis and Emergency in Environmental Accounting," although relatively new, has been cited 40 times. This suggests a growing interest in long-term perspectives and crisis management in the field of sustainability accounting.

The distinction in focus between the two clusters is evident in the types of articles contained within each cluster. The red cluster comprises practical articles that are oriented towards the present. Conversely, the green cluster comprises articles of a more conceptual nature, emphasizing future-oriented themes. Despite the evident disparities between these two clusters, a unifying link between them persists. The observed connections indicate that despite the disparities in focus and approach, an ongoing dialogue and exchange of ideas exists between the two clusters. The connecting lines demonstrate the influence of research in sustainability accounting on each other, with ideas from one cluster potentially serving as the catalyst for or contributing to discussions in the other. This dynamic interdisciplinary network of knowledge is continually evolving through the contributions of various authors.

Influential Authors

In the context of academic research, the identification of influential authors has become a critical endeavor. Researchers have employed bibliographic coupling analysis as a method to identify influential authors. This analysis involves the examination of the publications of a particular author. The researchers employ a threshold to identify influential authors, defined as the minimum number of publications required for an author, set at two articles, and the minimum number of citations received by the author, set at one time (Pauji *et al.*, 2023).

Table 1. Influential Authors

| Authors | TLR | Citation |
|----------------------|-----|----------|
| Laine Martias | 128 | 43 |
| Larrinaga Carlos | 126 | 39 |
| Belal Aatur | 12 | 63 |
| Scarpellini Sabina | 9 | 47 |
| Nguyen Thi Kim Tuyen | 7 | 20 |

Source: Yulianto , *et al.* (2024)

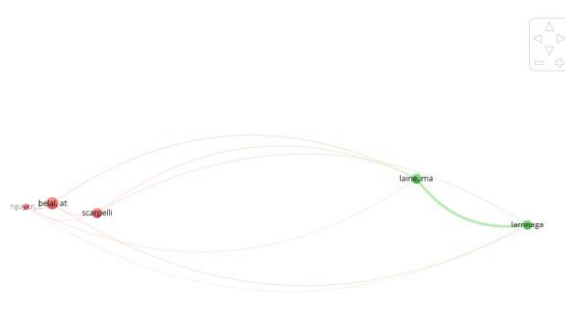
**Figure 6.** Network Visualization of Influential Authors

Figure 6 presents the network visualization outcome of the bibliographic coupling analysis, employing VOSviewer to illustrate the relationship between authors based on the references utilized. In Figure 6, each circle represents an author, with the author's name displayed near the circle. The size of each circle is indicative of the number of citations received by an author's work by other authors. The larger the size of the circle, the more influential the author's work is in the field of sustainability accounting, as evidenced by its frequent citation by other authors. The utilization of color-coding in Figure 6 further enhances the interpretive capacity of the visualization, segmenting the authors into two distinct clusters. The red cluster, for instance, encompasses authors such as Nguyen, Balal, and Scarpellini. Conversely, the green cluster encompasses authors such as Laine and Laffarga.

The distinction between these two clusters lies in the emphasis placed on the articles by each author's publications. Authors in the green cluster prioritize reflection and regulation of environmental accounting and sustainability accounting in European countries. Conversely, the red cluster's authors prioritize the challenges and implementation of social accounting and environmental accounting in developing countries.

In essence, the visualization delineates the collaborative and influential network among researchers in the domain of sustainability accounting. The identified clusters signify groups of authors who frequently engage in research related to similar subjects. The connections across clusters indicate the existence of broader relationships and influences within the research community. This analysis can be useful for understanding the dynamics of scientific collaboration, identifying thought leaders, and directing future collaborative efforts for more synergistic and coordinated research.

Influential countries

In the context of academic research, the identification of influential countries has become a critical endeavor. Researchers have employed bibliographic coupling analysis as a method to identify influential countries. The researchers employ a threshold to identify influential countries, defined as a minimum of two publications from the country and a minimum of one citation (Pauji *et al.*, 2023).

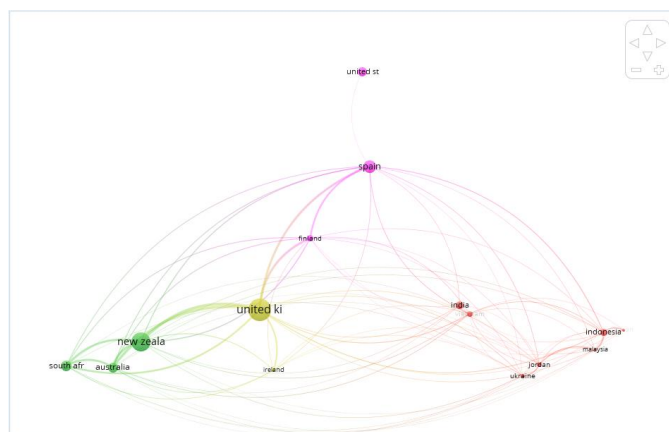


Figure 7. Network Visualization of Influential Countries

Figure 7 presents a network visualization of the results of the bibliographic coupling analysis, which were generated using VOSviewer. This analysis examines the influential countries in the domain of sustainability accounting research and identifies several distinct clusters based on the bibliographic relationships between publications. The size of each circle is determined by the number of citations, which indicates the level of influence and contribution of each country in the field of sustainability accounting. The analysis reveals four distinct clusters: red cluster 1 comprises India, Indonesia, Jordan, Malaysia, Taiwan, Ukraine, and Vietnam. Cluster 2, represented by green, comprises Australia, New Zealand, and South Africa. The fourth cluster, designated by the color purple, comprises the United States, Finland, and Spain. The fourth cluster, represented by dark yellow, comprises Ireland and the United Kingdom. The implementation of sustainability accounting in these countries demonstrates a heightened awareness of the significance of transparency and corporate social responsibility. A comprehensive understanding of these practices can facilitate the identification of policies and regulations that would encourage the implementation of sustainability accounting in Indonesia.

CONCLUSION

The keywords have been divided into 34 groups, which are further subdivided into seven clusters. The most recent research topics include greenhouse gases, greenhouse gas emissions, environmental policy, corporate social responsibility, corporate performance, performance, and the circular economy. Other frequently discussed topics include green accounting, environmental accounting, social accounting matrix, sustainability accounting, and social accounting. Conversely, research topics such as economic impact, economic system, environmental economics, household income, inequality, tourism economy, environmental performance, financial performance, circular economy reporting, environmental information, corporate performance, information disclosure, climate change, environmental policy, greenhouse gas, greenhouse gas emissions, corporate sustainability, industrial companies, crisis, and social and environmental accounting are still rarely researched. These topics may be considered for future research, exploring their relationship with the latest and frequently discussed topics.

A review of research publications indexed in the Scopus database relevant to the topic of sustainability accounting during the period 2009-2024 reveals a total of 70 articles, indicative of a development trend of research publications that experienced fluctuations. A particularly notable peak in publications occurred in 2023, with a total of 15 articles published. The observed increase in the number of publications can be attributed to various factors, including an increase in research funding, heightened interest and awareness of the significance of

research, government policies that promote research, and technological and scientific advancements that generate new research opportunities (Pugacheva *et al.*, 2020).

The following ten articles on the subject of sustainability accounting are particularly influential: "The Emancipatory Potential of Social Accounting: A Gramscian Critique"; "Using Neo-Institutionalism to Advance Social and Environmental Accounting"; Nature Accounting and the Nature of Accounting: Critical Reflections on Environmental Accounting and Proposals for Ecologically Sound Accounting"; "Good News From Nowhere: Imagining Utopian Sustainable Accounting"; "Tourism's Potential to Benefit the Poor: A Social Accounting Matrix Model Applied in Ecuador"; and "Reflexivity in Sustainability Accounting and Management: Exploring the Economic Focus of Corporate Sustainability"; "Structural Path Analysis of India's Carbon Emissions Using Input-Output Framework and Social Accounting Matrix"; "Economic Impact Assessment of Food Waste Reduction in European Countries Through Social Accounting Matrix"; "Refining Engagement with Social Accounting Technologies"; and "On Crises and Emergencies: Is it Time to Rethink Long-Term Environmental Accounting?".

A content analysis of the ten most influential articles reveals that the article written by Spence (2009) entitled "Social accounting's emancipatory potential: a Gramscian critique" has been cited 199 times. The following five authors have been cited most frequently: Matias Laine, Larrinaga Carlos, Aatur Belal, Sabina Scarpellini, and Thi Kim Tuyen Nguyen. Among these five authors, Aatur Belal has the most significant impact, with two publications and 63 citations. The findings from the articles and influential authors can be used as guidelines for the development and implementation of sustainability accounting practices in Indonesia.

A total of fifteen countries have exerted significant influence on the development of sustainability accounting. These countries include the United Kingdom, New Zealand, Australia, South Africa, Spain, Finland, Indonesia, Ireland, Malaysia, Jordan, Vietnam, Ukraine, Taiwan, India, and the United States. Of these fifteen countries, the United Kingdom has the greatest impact, having contributed eleven publications and been cited a total of 544 times. A comprehensive understanding of the practices in these influential countries can facilitate the identification of policies and regulations that would encourage the implementation of sustainability accounting in Indonesia.

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