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A Systematic Literature Review of the Impact of Carbon Accounting Implementation on Sustainability

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Abstract: This study presents a systematic literature review examining the impact of carbon accounting implementation on sustainability within the context of sustainable finance. Employing the PRISMA methodology, 72 articles were identified from the Scopus and Google Scholar databases, with the 9 most relevant studies selected for further descriptive and thematic analysis. The findings indicate that carbon accounting implementation positively influences corporate sustainability by contributing to emissions reduction, enhancing transparency, and strengthening corporate reputation. However, several studies also highlight inconsistencies between carbon accounting practices and the intended sustainability objectives. This review underscores the critical importance of integrating carbon accounting into corporate reporting systems and business strategies to support the achievement of environmental and social goals. The findings also suggest promising avenues for future research, particularly concerning the role of regulatory frameworks, industry-specific contexts, and implementation challenges in developing countries.

Keywords: Carbon Accounting, Sustainability, Sustainable Finance, Emissions Reporting.

INTRODUCTION

In recent years, sustainable finance has become a strategic approach in the global financial world that aims to align investment decisions with environmental and social sustainability goals (OECD, 2020). Sustainable finance emphasizes the importance of integrating environmental, social, and governance (ESG) factors into the financial decision-making process, in response to the increasing risks of climate change, environmental degradation, and social inequality that affect long-term economic stability (UNEP FI, 2021). One of the important pillars in sustainable finance practices is carbon accounting, which is a systematic process for measuring, tracking, and reporting greenhouse gas (GHG) emissions from an organization. By implementing carbon accounting, companies can calculate emissions from three main scopes: Scope 1 (direct emissions from operational activities), Scope 2 (indirect emissions from energy consumed), and Scope 3 (indirect emissions from supply and distribution chains) (Greenhouse Gas Protocol, 2015). This information is the basis for

organizations in setting emission reduction targets, increasing operational efficiency, and developing transition strategies towards a low-carbon economy (CDSB, 2018).

The ability of companies to effectively calculate carbon emissions is very important (Alromaizan et al., 2023). This not only improves the company's understanding of the environmental impact of its operations but also contributes to a more transparent and accurate determination of carbon taxes imposed by government authorities. Transparency in carbon accounting is very important because it supports the decisions of environmentally conscious shareholders. Many investors who prioritize environmentally friendly practices seek to invest in companies that maintain transparent carbon accounting practices and demonstrate a clear commitment to social and environmental responsibility (Kaur et al., 2022). Furthermore, the importance of carbon accounting can help companies meet the demands for transparency and accountability from stakeholders, including investors who use reporting standards such as the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), Carbon Disclosure Project (CDP), and Task Force on Climate-related Financial Disclosures (TCFD) (GRI, 2021; SASB, 2022; CDP, 2023; TCFD, 2021). Compliance with this reporting framework is an essential requirement for accessing funding from sustainable finance sources, such as green bonds and ESG investment funds (World Bank, 2021). For Small and Medium Enterprises (SMEs), carbon accounting opens up opportunities to not only access green finance, but also achieve cost efficiency, improve reputation, and reduce regulatory and market risks (Coolset, 2024). The concept and application of carbon accounting will also have broad implications for the profession and strategic issues of carbon management accounting, especially for developing countries that have implemented the concept of carbon trading in the Carbonomics era (Syam et al., 2024).

Carbon accounting is an important tool for understanding the environmental impacts of human activities and for guiding efforts to reduce greenhouse gas emissions. By accurately tracking emissions and identifying sources of carbon pollution, businesses, governments, and individuals can take action to reduce their carbon footprint and mitigate the impacts of climate change (Meng et al., 2018; Chin et al., 2018). There are a variety of carbon accounting frameworks and methodologies, including the Greenhouse Gas Protocol, the ISO 14064 standard, and the Carbon Trust standard. These frameworks provide guidelines for measuring, reporting, and verifying greenhouse gas emissions and help organizations set carbon reduction targets and strategies (Legosz, 2019; Syam et al., 2024). Carbon accounting is gaining importance as governments and businesses around the world set ambitious targets to reduce greenhouse gas emissions and transition to a low-carbon economy. Carbon accounting is also an important component of carbon offsetting, which involves investing in projects that reduce or offset carbon emissions to compensate for emissions that cannot be eliminated. However, technical challenges and implementation costs remain major barriers to its widespread adoption, especially in developing countries. Therefore, a comprehensive understanding of the benefits, challenges, and strategies of carbon accounting implementation in the context of sustainable finance is essential for policymakers, the private sector, and the academic community. Against this backdrop, this article aims to examine the impact of carbon accounting in supporting sustainable finance goals, and explore how the integration of carbon accounting into business practices can drive the achievement of environmental and social sustainability goals. In examining the impact of carbon accounting on sustainability, it was found that carbon accounting can influence it. Preliminary studies found that carbon accounting influences sustainability, which was previously recommended to be explored. The main objective of this systematic literature review is to review existing publications related to factors influencing sustainability to answer the following questions:

1. Q1: Which journal is the most relevant/significant in discussing the impact of carbon accounting implementation on sustainability?

2. Q2: How does the implementation of carbon accounting affect sustainability?

METHODS

A systematic literature review of the application of carbon accounting was conducted using the preferred reporting items for systematic reviews and meta-analyses (PRISMA) technique, which has transparency, reliability, and replicability of results, as well as limiting bias. The main databases used for this research are Scopus and Google Scholar, which are the largest databases for collecting abstracts, references and works of world-renowned authors.

Google Scholar is essential for eliminating publication bias because it collects both scholarly literature and gray literature and is recognized as the search engine of choice for many researchers. To report publications for the systematic literature review, PRISMA guidelines, which call for four steps (as shown in Figure 1), were used.

Identification Phase

To explore the articles related to carbon accounting with the theme of implementation carbon accounting, a set of words associated with these terms was used from the following key words of carbon accounting, and sustainability. On Scopus, the keywords used for searching were "(carbon accounting on sustainability) and implementation carbon accounting. This database provided a total of 34 documents between 2014 to 2024. In Scopus, Google Scholar, a survey using (carbon accounting on sustainability) obtained a total of 38 documents from 2014 to 2024. Thus, the total of all articles obtained related to the implementation of carbon accounting was 72 articles.

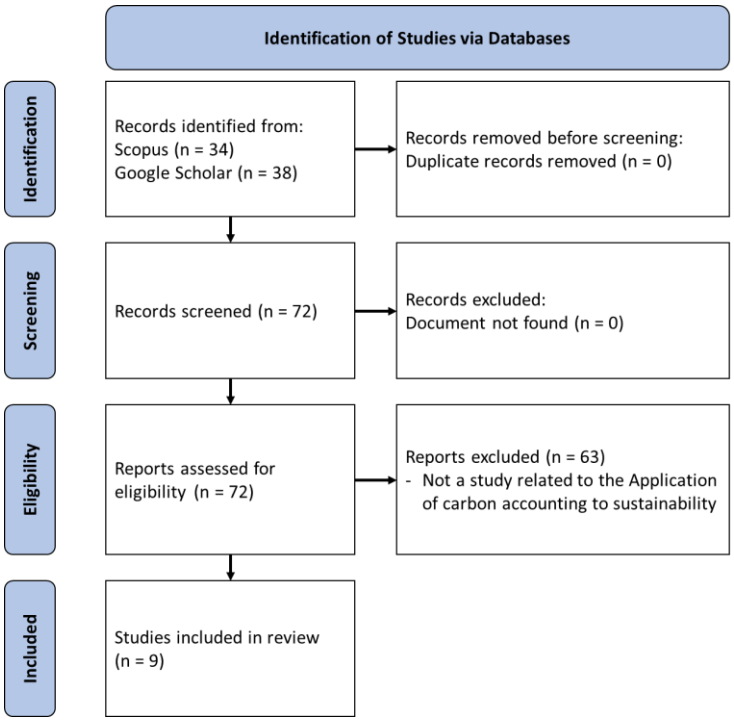
Screening Phase

All 72 publications were considered in the screening phase. All 72 articles can be used as analysis material or no articles are considered duplicates.

Eligibility Phase

In the eligibility phase, the remaining 72 documents were screened. For those not related to implementation of carbon accounting or carbon accounting on sustainability, 63 articles were excluded as they were outside the scope of the research.

Figure 1.
Flow Diagram for Systematic Literature Review Based



This section presents the results of the systematic literature review regarding two main analyses. Descriptive analysis part 1 was conducted to answer Q1 by using which journals are most relevant/important in discussing the Impact of Carbon Accounting Implementation on Sustainability. Thematic analysis part 2 was conducted to answer Q2, identifying themes of factors that influence sustainability and how the implementation of carbon accounting affects sustainability.

RESULTS AND DISCUSSION

This section presents the results of a systematic literature review of two main analyses. Descriptive analysis part 1 was conducted to answer Q1 using publications that contributed year, source, and number of citations. Thematic analysis part 2 was conducted to answer Q2 which identified the impact of carbon accounting implementation on sustainability.

Application of Carbon Accounting with Descriptive Analysis

To identify the most relevant journals discussing the application of carbon accounting, the nine selected articles were categorized according to their year of publication, source, and number of citations, as presented in Table 1.

Table 1
The List of Publications in The Systematic Literature Review

Article Title	Author	Year	Source	Citations
Role of green finance and carbon accounting in achieving sustainability	Juan Wu	2024	Humanities And Social Sciences Communications	(13)
Carbon Accounting: Its Implications on Accounting Practices and Corporate Sustainability Reports	Muh. Ardiansyah Syam, Syahril Djaddang, Adam Adam, Endang Etty Merawati, Mohammad Roziq	2024	International Journal of Economics and Financial	(10)
Carbon Accounting: A Systematic Literature Review and Directions for Future Research	Jillene Marlowe & Amelia Clarke	2022	Green Finance	(54)
Accounting for Carbon Emissions—Current State of Sustainability Reporting Practice under the GHG Protocol	Rainer Kasperzak, Marko Kureljusic, Lucas Reisch and Simon Thies	2023	Sustainability	(27)
An integrated carbon footprint accounting and sustainability index for palm oil mills	Nabila Farhana Jamaludin, Zarina Muis, & Haslenda Hashim	2019	Journal of Cleaner Production	(61)
Do corporate sustainability initiatives improve corporate carbon performance? Evidence from European firms	Faizul Haque, & Collins G. Ntim	2022	Business Strategy and The Environment	(128)
Understanding Carbon Emission Accounting for Sustainability	Norol-janah S. Goling	2020	International Journal of Business and Technology Management	(0)

Article Title	Author	Year	Source	Citations
Determinants of corporate carbon disclosure: A step towards sustainability reporting	Rajesh Desai	2022	Borsa Istanbul Review	(10)
Navigating Sustainability: A Bibliometric Analysis of Carbon Management Accounting	Nazaria MD. Aris, Sofiah MD Auzair, Norman Mohd Saleh, Maizatulakma Abdullah	2024	International Journal of Business and Society	(2)

1. Year of Publication

The selected articles were published between 2019 and 2024. The earliest article addressing factors related to the implementation of carbon accounting appeared in 2019. In 2020, the concept was further developed, followed by a notable increase in interest in 2022, during which three publications were released. In contrast, only one relevant article was published in 2023. Interest in the topic appears to have resurged in 2024, with three additional publications identified.

2. Source of Publication

Each of the selected publications appeared once across various journals, including Humanities and Social Sciences Communications, International Journal of Economics and Financial, Green Finance, Sustainability, Journal of Cleaner Production, Business Strategy and the Environment, International Journal of Business and Technology Management, Borsa Istanbul Review, and International Journal of Business and Society.

3. Number of Citations

The data indicates that the most highly cited publication is "Do Corporate Sustainability Initiatives Improve Corporate Carbon Performance? Evidence from European Firms" by Faizul Haque and Collins G. Ntim.

The Impact of Carbon Accounting Implementation on Sustainability by Thematic Analysis.

Table 2
Summary of Application of Carbon Accounting to Sustainability in thematic analysis

Author	Result	
	Significant Influence	No Significant Influence
Juan Wu (2024)	Companies adopting carbon accounting practices show positive impacts on the Sustainable Development Index (SDI)	-
Muh. Ardiansyah Syam, Syahril Djaddang, Adam Adam, Endang Etty Merawati, Mohammad Roziq (2024)	Research reveals that carbon accounting influences internal accounting practices and external sustainability reporting	-
Jillene Marlowe & Amelia Clarke (2022)	-	Carbon accounting was discovered in the

Author	Result	
	Significant Influence	No Significant Influence
		development phase, where the results obtained were still inconsistent
Rainer Kasperzak, Marko Kureljusic, Lucas Reisch and Simon Thies (2023)	-	There is a mismatch between carbon accounting and sustainability goals
Nabila Farhana Jamaludin, Zarina Muis, & Haslenda Hashim (2019)	The use of carbon accounting provides a more comprehensive understanding of sustainability issues	-
Faizul Haque, & Collins G. Ntim (2022)	Corporate carbon performance has a positive relationship with corporate sustainability	-
Norol-janah S. Goling (2020)	Carbon accounting can implement sustainability-related initiatives to address environmental issues.	-
Rajesh Desai (2022)	Carbon disclosure has an influence on designing a company's sustainability policy	-
Nazaria MD. Aris, Sofiah MD Auzair, Norman Mohd Saleh, Maizatulakma Abdullah (2024)	-	There is a significant gap between sustainability and the CMA carbon accounting model identified

Based on thematic analysis, the majority of previous studies show that the implementation of carbon accounting has a positive impact on sustainability, both directly through emission reductions, and indirectly through increasing transparency and corporate reputation. However, several studies also noted a mismatch between carbon accounting and sustainability goals, indicating the need to develop a more synchronous framework and standards.

Discussion

Carbon Accounting Impacts Sustainability

Several studies have shown that carbon accounting has a positive impact on the sustainability aspects of companies, both internally and externally. Juan Wu (2024) found that companies that adopted carbon accounting practices showed a significant increase in the Sustainable Development Index (SDI), indicating a direct contribution to achieving sustainability goals. In line with these findings, Muh. Ardiansyah Syam, Syahril Djaddang, Adam Adam, Endang Etty Merawati, and Mohammad Roziq (2024) revealed that carbon accounting affects internal accounting practices and external sustainability reporting of companies, which means there is a systemic change in the management of environmental information. Nabila Farhana Jamaludin, Zarina Muis, and Haslenda Hashim (2019) also emphasized that carbon accounting can provide a more comprehensive understanding of

sustainability issues, thus supporting data-based decision making. Faizul Haque and Collins G. Ntim (2022) further found that there is a positive relationship between a company's carbon performance and corporate sustainability. This indicates that the better a company is at managing its carbon emissions, the higher its sustainability performance will be. Norol-janah S. Goling (2020) also stated that carbon accounting supports the implementation of sustainability initiatives in dealing with environmental problems. In line with that, Rajesh Desai (2022) showed that carbon disclosure can influence the design of a company's sustainability policy, making carbon accounting a strategic tool in decision making.

Carbon Accounting Has No Impact or Results Are Still Inconclusive

On the other hand, there are a number of studies that show that carbon accounting has not fully provided a significant influence on sustainability, or the results are still inconsistent. Jillene Marlowe and Amelia Clarke (2022) stated that carbon accounting is still in the development stage. Therefore, the results of its application in supporting corporate sustainability are not yet consistent and tend to vary. Rainer Kasperzak, Marko Kureljusic, Lucas Reisch, and Simon Thies (2023) also found a mismatch between carbon accounting practices and corporate sustainability goals. This shows that although carbon accounting has been implemented, its practices are not fully aligned with the sustainability targets to be achieved. In addition, Nazaria MD. Aris, Sofiah MD Auzair, Norman Mohd Saleh, and Maizatulakma Abdullah (2024) identified a significant gap between sustainability and the carbon management accounting (CMA) model applied in the company. This gap shows that the carbon accounting approach used still needs to be developed to be more effective and relevant in supporting the achievement of sustainability goals.

CONCLUSION

This study aims to systematically evaluate the literature that discusses the relationship between the implementation of carbon accounting and sustainable finance. Based on a review of 9 selected scientific articles from a total of 72 identified articles, it can be concluded that carbon accounting plays an important role in supporting the achievement of corporate sustainability goals. The implementation of carbon accounting encourages companies to be more transparent in managing carbon emissions and demonstrate environmental accountability to stakeholders. In addition, carbon accounting also has a positive correlation with financial performance and corporate reputation, especially in the context of long-term sustainability. However, the effectiveness of carbon accounting implementation is greatly influenced by factors such as applicable regulations, the readiness of the company's accounting system, and the integration between sustainability indicators and financial reporting. Therefore, a deeper understanding of the benefits, challenges, and strategic approaches in carbon accounting is important for policy makers, financial practitioners, and academics.

REFERENCES

Alromaizan, M., Afy-Shararah, M., Jagtap, S., Litos, L., & Salonitis, K. (2023). Developing a Carbon Accounting Tool for SMEs in the Agri-Food Sector. Procedia CIRP, 116. Pp. 492–497.

Aris, N. M., Saleh, N. M., Auzair, S. & Abdullah, M. (2024). Navigating Sustainability a Bibliometric Analysis of Carbon Management Accounting. International Journal of Business and Society, 25(2):440-460. https://doi.org/10.33736/ijbs.7599.2024

Becchetti, L., Lelasi, F., Cucinelli, D., & Rossolini, M. (2022). Corporate social irresponsibility: The relationship between ESG misconduct and the cost of equity. International Review of Financial Analysis, 89(3). https://doi.org/10.1016/j.irfa.2023.102833

Carbon Disclosure Project. (2023). CDP Technical Note: Relevance of Scope 3 Categories. Retrieved from https://www.cdp.net

Chin, J., Jiang, B. C., Mufidah, I., Persada, S. F., & Noer, B. A. (2018). The Investigation of Consumers' Behavior Intention in Using Green Skincare Products: A Pro-Environmental Behavior Model Approach. Sustainability, 10(11), 3922. https://doi.org/10.3390/su10113922

Coolset (2024). Carbon Accounting for SMEs. Retrieved from https://www.coolset.com/academy

Dathe, K., Frank, J., Padberg, S., Hultzsch, S., Beck, E., & Schaefer, C. (2022). Fetal adverse effects following NSAID or metamizole exposure in the 2nd and 3rd trimester: an evaluation of the German Embryotox cohort. BMC Pregnancy Childbirth 22, 666. https://doi.org/10.1186/s12884-022-04986-4

Desai, Rajesh. (2022). Determinants of corporate carbon disclosure: a step towards sustainability reporting. Borsa Istanbul Review, Vol. 22(5), Pp. 886-896.

Global Reporting Initiative. (2021). GRI 1: Landasan 2021. Retrieved from https://globalreporting.org/pdf.ashx?id=14360&page=8

Goling, Norol-Janah S. (2020). Understanding Carbon Emission Accounting for Sustainability. International Journal of Business and Technology Management, Vol. 2, 3, Pp. 117-128.

Haque, F. & Ntim. C. G. (2022). Do corporate sustainability initiatives improve corporate carbon performance? Evidence from European firms. SSRN. Available at SSRN: https://ssrn.com/abstract=5243676

He, R., Luo, L., Shamsuddin, A., and Tang, Q. (2021). Corporate carbonaccounting: A literature review of carbon accounting research from the kyotoprotocol to the Paris agreement. Account. Finance, 62 (1), 12789.

Jamaludin, N. F., Hashim, H., Muis, Z. A., Zakaria, Z. Y., Jusoh, M., Yunus, A., & Murad, S. M. A. (2019). A sustainability performance assessment framework for palm oil mills. Journal of Cleaner Production, Vol. 174, pp. 1679-1693.

Journeault, M., & Henri, J. F. (2017). Eco-control: The Influence of Management Control Systems on Environmental and Economic Performance. Accounting Organizations and Society, 35(1):63-80. https://doi.org/10.1016/j.aos.2009.02.001

Kaplan, R. & Norton, D. (1992) The Balanced Scorecard—Measures That Drive Performance. Harvard Business Review, 79.

Kasperzak, R., Kureljusic, M., Reisch, L., & Thies, S. (2023). Accounting for Carbon Emissions Current State of Sustainability Reporting Practice under the GHG Protocol. Sustainability, 15(2), 994. https://doi.org/10.3390/su15020994

Kaur, R., Patsavellas, J., Haddad, Y., & Salonitis, K. (2022). Carbon accounting management in complex manufacturing supply chains: A structured framework approach. Procedia CIRP, 107, 869–875.

Legosz, I.K. (2019). Carbon Footprint 2019 ATEA Group. Carbon Footprint Accounting Report.

Marlowe, J. & Clarke, A. (2022). Carbon Accounting: A Systematic Literature Review and Directions for Future Research. Green Finance, 4(1): 71-87. https://doi.org/10.3934/GF.2022004

Meng, L., Wang, R., & Meng, Bo. (2018). Tracing Carbon Dioxide Emissions along Global Value Chains. Retrieved from https://www.wto.org/english/res_e/booksp_e/08_gvc23_ch5_dev_report_e.pdf

OECD (2020). Developing Sustainable Finance Definitions and Taxonomies. Organisation for Economic Co-operation and Development.

Pollman, Elizabeth. (2022). The Making and Meaning of ESG (October 31). U of Penn, Inst for Law & Econ Research Paper No. 22-23, European Corporate Governance Institute - Law Working Paper No. 659/2022, Harvard Business Law Review, Vol. 14, Pp. 403. Available at SSRN: https://ssrn.com/abstract=4219857

SASB (2022). Materiality Finder. Sustainability Accounting Standards Board.

Syam, M. A., Djaddang, S., Adam, Merawati, E. E. & Roziq, M. (2024). Carbon Accounting: Its Implications on Accounting Practices and Corporate Sustainability Reports. International Journal of Economics and Financial Issues, Econjournals, Vol. 14(4), pp. 178-187.

TCFD (2021). Recommendations of the Task Force on Climate-related Financial Disclosures. https://www.fsb-tcfd.org

The Greenhouse Gas Protocol. (2015). A Corporate Accounting and Reporting Standard. Retrieved from https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf

UNEP Finance Initiative. (2021). Rethinking Impact to Finance the SDGs. Retrieved from https://www.unepfi.org/impact/rethinking-impact/

World Bank. (2021). Mobilizing Sustainable Finance for Small and Medium Enterprises. Retrieved from https://www.unep.org/resources/report/mobilizing-sustainable-finance-small-and-medium-sized-enterprises-reviewing

Wu, Juan. (2024). Role of Green Finance and Carbon Accounting in Achieving Sustainability. Palgrave Communications, Palgrave Macmillan, Vol. 11(1), Pp. 1-7.