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CARBON ACCOUNTING AND ESG-ORIENTED FINANCIAL DISCLOSURE FIRMS IN INDONESIA: A SYSTEMATIC LITERATURE REVIEW AND BIBLIOMETRIC ANALYSIS

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Abstract

With the increasing urgency of global sustainability, carbon accounting practices have become crucial in enhancing the quality of ESG (Environmental, Social, and Governance)-based information disclosure. This article aims to systematically examine the relationship between carbon accounting, ESG disclosure, and firm value in Indonesia. Using a Systematic Literature Review (SLR) approach and bibliometric analysis of 50 scholarly articles from 2015 to 2025, this study identifies that the effective implementation of carbon accounting can enhance the quality of ESG disclosure and positively impact firm value. This study contributes theoretically by constructing a conceptual framework based on legitimacy theory, stakeholder theory, and signaling theory, as well as providing practical contributions for strengthening sustainability policies and reporting in Indonesia.

Keywords: Carbon Accounting, ESG Disclosure, Firm Value, Indonesia, Systematic Literature Review, Bibliometric

INTRODUCTION

In the last decade, global awareness of climate change and sustainability has significantly increased, prompting fundamental transformations in business practices and corporate reporting (de Villiers, 2021). One key component of sustainability reporting systems is carbon accounting, which is the process of recording, measuring, and reporting carbon emissions or greenhouse gas (GHG) emissions resulting from corporate operational activities. This practice not only symbolizes compliance with environmental regulations but also serves as a primary indicator of accountability and transparency in disclosing environmental performance based on ESG principles (Liesen, 2015). In the context of sustainability, this practice is closely related to ESG-oriented financial disclosure, where companies are required to be accountable not only financially but also regarding the environmental and social impacts they generate

In Indonesia, the importance of ESG disclosure has received serious attention, as reflected in POJK No. 51/POJK.03/2017 concerning the implementation of sustainable finance and sustainability reporting. However, the implementation of carbon disclosure in Indonesia is still in its early stages. A study by Febriyanti (2020) found that many companies in Indonesia lack a structured system and standards for calculating carbon emissions, leading to inconsistent and less informative ESG disclosures. This is in line with findings by Gunawan (2020)), which indicate that sustainability reporting practices in Indonesia are still dominated by symbolic rather than substantive approaches.

Globally, carbon accounting practices have rapidly evolved, particularly in developed countries that have adopted standards such as the GHG Protocol and the Task Force on Climate-related Financial Disclosures (TCFD). However, in the context of developing countries like Indonesia, the adoption of these standards remains low and uneven (Hossain, 2022). The limited literature examining the integration between carbon accounting and ESG-oriented financial disclosure in the context of Indonesia highlights a research gap that needs to be filled (de Villiers, 2021; Tariq, 2021).

Based on these issues, this research formulates four main questions: First, what is the impact of carbon accounting on ESG disclosure in Indonesia? Second, does carbon accounting affect firm value in Indonesia? Third, does ESG disclosure impact firm value in Indonesia? Addressing these questions is vital, considering that the quality of ESG reporting is now a key factor in investment decisions and corporate reputation assessments (Tang, 2017)

This study aims to fill this gap by conducting a Systematic Literature Review (SLR) and bibliometric analysis of 50 selected publications from 2015 to 2025. This research is expected to map the knowledge landscape, thematic trends, and provide theoretical and practical contributions to academics, regulators, and business practitioners. The novelty of this research lies in the integration of SLR and bibliometric approaches to produce a conceptual framework that illustrates the relationship between carbon accounting, ESG disclosure, and firm value in Indonesia, while reinforcing theoretical foundations based on legitimacy theory (Suchman, 2016), stakeholder theory (Freeman, 1984), and signaling theory (Spence, 1973). In this study, the novelty lies in the systematic literature review that combines bibliometric approaches to analyze the knowledge landscape in the field of carbon accounting and ESG disclosure within the context of developing countries. Additionally, this study generates a conceptual framework that depicts the interconnection between carbon accounting practices and the quality of ESG financial disclosure, serving as input for regulators, practitioners, and academics. Conceptually, this article examines the problem framework that links carbon emission measurement practices (carbon accounting) with transparency and accountability in ESG reporting. The low quality of ESG disclosure may be attributed to the minimal application of comprehensive carbon accounting standards, weak regulatory pressure, or limited corporate resources (Liesen , 2015); de Villiers, 2021).

REVIEW AND FORMULATION OF THE PROBLEM

Theoretical Foundation

Legitimacy Theory

Legitimacy theory posits that organizations continuously strive to ensure they operate within the boundaries and norms accepted by the society in which they operate (Suchman, 2016). In the context of ESG, ESG-oriented companies tend to pay more attention to stakeholder expectations regarding environmental issues, including carbon emissions. The application of carbon accounting and the disclosure of related carbon information can be seen as an effort by companies to gain, maintain, or improve their legitimacy in the eyes of stakeholders (Deegan, 2011) By transparently disclosing carbon information, companies demonstrate accountability and compliance with environmental and social pressures.

Stakeholder Theory

Stakeholder theory asserts that companies have responsibilities not only to shareholders but also to various stakeholder groups that can influence or be influenced by the company's actions, such as employees, customers, suppliers, government, and society (Freeman, 1984). Stakeholders increasingly demand broader information regarding a company’s ESG performance, including data related to carbon emissions and the company's efforts to manage them. Carbon accounting provides relevant data and information for stakeholders to evaluate a company's environmental performance, thus encouraging companies to disclose financial information that aligns with their carbon performance.

Signaling Theory

Signaling theory explains that companies use information disclosure to signal to investors and other stakeholders regarding the quality and performance of the company (Spence, 1973). In the context of carbon accounting, comprehensive and credible carbon information disclosure can serve as a positive signal to investors and stakeholders that the company has good environmental management, is efficient in resource use, and has well-managed environmental risks. This positive signal is expected to enhance trust and attractiveness in the eyes of stakeholders, which can ultimately be reflected in better and more relevant financial disclosures, increasing market confidence and firm value (Liesen, 2015; Tang, 2017).

Carbon Accounting and Its Urgency

Carbon accounting is a part of environmental accounting practices that focus on measuring and reporting emissions produced by entities(Schaltegger, 2012). This practice is increasingly relevant in the context of global pressure to reduce greenhouse gas emissions, along with the evolving regulations and environmental reporting standards. Kolk (2008) note that multinational companies are beginning to respond to regulatory climates by enhancing carbon transparency as a form of legitimacy.

The Relationship Between Carbon Accounting and Firm Value

Several studies have shown a positive relationship between carbon disclosure and firm value. Liesen (2015) states that companies with better carbon performance tend to have a higher reputation and achieve more positive financial outcomes. This indicates that carbon accounting not only has compliance value but also strategic value.

ESG Disclosure and Its Development in Indonesia

Environmental, Social, and Governance (ESG) disclosure has now become an important indicator in evaluating corporate sustainability. In Indonesia, ESG disclosure has rapidly developed in response to market demands and government policies Febriyanti (2020) However, studies by Gunawan (2020) and Savitri (2021) show that the quality of ESG disclosures in Indonesia still varies, depending on ownership structures and institutional pressures.

Carbon Accounting within the Framework of ESG Disclosure

Carbon accounting has become a key element in ESG disclosure. Tariq (2021)) emphasizes that the transparency of carbon management significantly determines investor perceptions of the quality of a company's ESG disclosure. In the ASEAN context, Purwanto (2023) found that green accounting and carbon management have a significant impact on the quality of ESG reports.

Previous Literature Review

Research related to carbon accounting and ESG disclosure has rapidly evolved, especially since the strengthening of global sustainability regulations like GRI Standards and TCFD. Empirical research by iesen (2015)) shows a positive relationship between carbon disclosure and firm value. In Indonesia, Febriyanti(2020), Gunawan (2020) and Savitri (2021) reveal that the quality of ESG disclosure is still heavily influenced by institutional pressures and is not uniform. Yanti (2022) adds that manufacturing companies adopting carbon accounting practices are more likely to be accepted by stakeholders. However, these literatures are partial and have not systematically mapped the comprehensive interconnections between carbon accounting, ESG disclosure, and firm value.

Bibliometric Analysis

To understand the structure and trends of research in this field, a bibliometric analysis was conducted using data from 50 selected scholarly articles (2015–2025). Techniques used include co-authorship analysis, co-citation analysis, and keyword co-occurrence analysis with the help of software like VOSviewer. The results show that the topics "carbon disclosure," "green accounting," and "ESG reporting" are three dominant interrelated clusters.

Developing countries, including Indonesia, have begun to show an increase in publications since 2020, in line with growing attention to ESG and carbon issues following the issuance of POJK 51/2017. The most cited authors in the Indonesian context include Febriyanti, Harymawan, and Gunawan. The bibliometric results also indicate that ESG and carbon emissions are increasingly becoming focal points in sustainability indices in the capital market (Purwanto, 2023; Yusman, 2024).

SLR Strategy and PRISMA Diagram

This research methodology employs a Systematic Literature Review (SLR) approach structured according to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The search strategy was conducted through databases such as Google Scholar, Scopus, DOAJ, and Garuda for articles published between 2015 and 2025. The main keywords used include: “Carbon Accounting,” “ESG Disclosure,” “Green Accounting,” “Sustainability Reporting,” “Financial Performance,” and “Firm Value in Indonesia.”

Inclusion criteria involved peer-reviewed articles from 2015 to 2025 that focus on ESG, Carbon Disclosure, or Green Accounting, and conducted relevant quantitative/qualitative studies in Indonesia or other developing countries. Exclusion criteria included non-academic articles, purely conceptual studies without empirical data, and publications outside the corporate context.

Summary of Previous Research Tables

Author & Year	Methodology	Main Variables	Key Findings
Wulandari & Adhariani (2018)	Quantitative	CSR Disclosure, Carbon Emission, Market Value	Carbon disclosure increases market value.
Dewi & Kurniawan (2019)	Quantitative	Environmental Performance, ESG Score	Environmental performance increases ESG score.
Siregar et al. (2019)	Quantitative	Carbon Risk, Cost of Capital	Carbon risk decreases capital efficiency.
Hartanti & Haryanto (2020)	Qualitative	Green Accounting Practices	Larger firms are more prepared to implement green accounting.
Astuti et al. (2020)	Quantitative	Corporate Governance, Environmental Disclosure	GCG structure affects environmental transparency.
Febriyanti & Harymawan (2020)	Quantitative	ESG Disclosure, Institutional Factors	ESG disclosure is influenced by ownership structure and institutional pressure.
Gunawan et al. (2020)	Quantitative	Sustainability Report, Institutional Ownership	ESG is used for legitimacy strategies.
Safriani & Utomo (2020)	Quantitative	ESG Disclosure, Financial Performance	ESG significantly affects operational and financial performance.
Savitri (2021)	Quantitative	Carbon Emission Disclosure, Firm Value	Negative carbon disclosure impact on firm value.
Novita & Surya (2021)	Quantitative	ESG Index, Investor Behavior	Investors positively react to increased ESG Index.
Fitrani & Nugroho (2021)	Quantitative	Environmental Disclosure, Green Innovation	Green innovation enhances disclosure and company image.
Darmawan & Subroto (2021)	Quantitative	Carbon Emission Intensity, Firm Performance	Emission intensity negatively impacts profitability.
Rizqiah et al. (2021)	Mixed Methods	CSR, Carbon Footprint	Companies are inconsistent in carbon footprint reporting.
Pratiwi et al. (2022)	Quantitative (Linear Regression)	Industry, Size, Profitability	All variables significantly affect carbon emission disclosure.
Sarwono et al. (2022)	Quantitative	GHG Disclosure, ROE	GHG disclosure is not significant to ROE.
Mulyadi & Anwar (2022)	Quantitative	ESG Disclosure, Market Performance	ESG disclosure increases investor confidence.
Hossain et al. (2022)	Quantitative	ESG Reporting, Carbon Performance	ESG positively impacts investor perception.
Yanti & Sukoharsono (2022)	Qualitative	Carbon Accounting, Legitimacy	Carbon disclosure provides social legitimacy.
Yuliatma & Kristari (2022)	Quantitative	Carbon Disclosure, CSR, Financial Performance	Negative carbon disclosure; CSR not significant.
Taufiq & Pratiwi (2022)	Quantitative	Carbon Management, Environmental Disclosure	Environmental disclosure positively impacts; CMA does not.
Pertiwi et al. (2022)	Quantitative	Carbon Emission, Tax Avoidance	High carbon emissions correlate with tax
Suryanto et al. (2022)	Quantitative	Environmental Disclosure, Green Investment Policy	ESG disclosure is linked to green investment policies.
Rachmawati & Djalil (2023)	Qualitative	Carbon Governance	Governance plays a critical role in emission control.
Purwanto et al. (2023)	Quantitative	Green Accounting, ESG Disclosure	Green accounting improves the quality of ESG disclosure.

Andrian et al. (2023)	Quantitative (PLS-SEM)	Green Strategy, Green Social Capital	Green strategy and social capital positively impact CMA.
Fadhilah & Mukti (2023)	Quantitative	Carbon Disclosure, Government Regulation	Regulation encourages increased carbon disclosure.
Nafisa (2023)	Quantitative	Green Accounting, Carbon Disclosure, Firm Value	Both significantly positively affect firm value.
Sumarni & Marpaung (2023)	Quantitative (OLS)	GCG, Environmental Performance	Only environmental performance significantly affects carbon disclosure.
Zahri et al. (2023)	Quantitative (Moderated Regression)	Firm Size, GCG (Moderation)	GCG strengthens the effect of size on carbon disclosure.
Andriadi et al. (2023)	Quantitative (Linear Regression)	Size, Financial Performance, Environmental	Firm size positively affects carbon disclosure.
Supriyanti & Wardhani (2023)	Quantitative (Multiple Regression)	Green Accounting, Carbon Disclosure	Green accounting is significant to firm value; carbon disclosure is not.
Nariswari et al. (2023)	Quantitative (Panel Regression)	Size, Leverage, Managerial Ownership	All variables are significant to carbon disclosure.
Lestari (2023)	Quantitative (Panel Regression)	Environmental Performance, Profitability	Environmental performance negatively affects carbon disclosure.
Musthafa & Arifin (2023)	Quantitative (OLS Regression)	Carbon Disclosure, Financial Performance, Investment	Carbon disclosure does not affect performance but is positive for investment efficiency.
Anggita et al. (2023)	Quantitative	Carbon Disclosure, Green Accounting, Firm Value	Carbon disclosure is not significant; green accounting is significant.
Putri et al. (2024)	Quantitative	Carbon Emission, Green Accounting, Environmental Performance	All variables positively affect firm value.
Nuraini & Habibi (2024)	Quantitative	Carbon Emission, Corporate Risk	High carbon emissions increase corporate risk exposure.
Sasmita & Wijaya (2024)	Quantitative	Green Intellectual Capital, ESG Reporting	Intellectual capital supports the quality of ESG reporting.
Alamsyah et al. (2024)	Quantitative	Environmental Cost, Sustainability Report	Environmental cost positively correlates with the completeness of sustainability reports.
Yusman & Syahbannuddin (2024)	Quantitative	Carbon Disclosure, Green Accounting, Profitability	Green accounting is significant; carbon disclosure is negative.
Setiawan & Aini (2024)	Quantitative	Environmental Management, Carbon Efficiency	Effective environmental management reduces carbon intensity.
Rochmah & Taharuddin (2024)	Quantitative	Carbon Disclosure, Green Innovation, Sustainability	Carbon disclosure affects sustainability reporting but not directly on firm value.
Prasetyaningsih et al. (2024)	Quantitative	Green Accounting, Carbon Disclosure, Firm Value	Both variables are not significant to firm value.
Khairani et al. (2024)	Quantitative	Carbon Disclosure, Green Accounting, Performance	Green accounting is positive; carbon disclosure is negative for performance.
Audito & Yuyetta (2024)	Quantitative (Moderated Regression)	ESG Disclosure, Environmental Risk	ESG disclosure is significant to market value; environmental risk strengthens it.
Gayatri & Yuniarta (2024)	Quantitative	Carbon Disclosure, Environmental Performance, Size	Disclosure and green accounting are not significant; size is negative.

Qurniasih et al. (2025)	Quantitative	ESG Disclosure, Good Corporate Governance	ESG positively affects firm value; GCG strengthens the effect.
Maulani et al. (2025)	Mixed Methods	ESG Practice, Stakeholder Engagement	Stakeholder engagement strengthens ESG implementation.

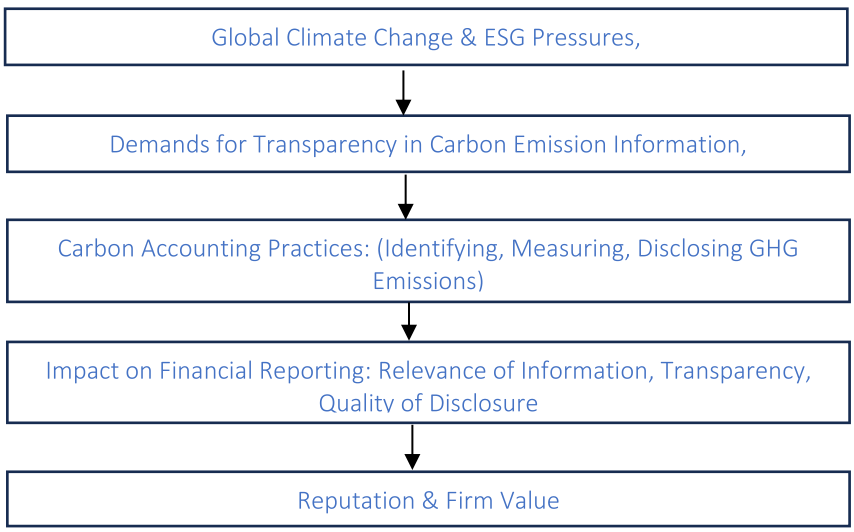
Initial observations and literature reviews indicate that:

1. Few studies explicitly examine the relationship between carbon accounting and financial disclosure in the context of ESG.
2. Existing research is still conceptual, with limited quantitative approaches or empirical testing, particularly in Indonesia.
3. The literature has not fully formed a theoretical consensus or integrative model between carbon reporting and ESG financial transparency.
4. Therefore, there is a need for systematic and bibliometric studies that explore trends, gaps, and theoretical contributions from previous studies while providing direction for future research and corporate policies in Indonesia.

Research Focus Formulation

Based on the theoretical foundations of legitimacy, stakeholder, and signaling theories, as well as supported by previous research indicating a positive relationship between environmental practices and disclosures, this research focuses on exploring that ESG-oriented companies in Indonesia that implement better carbon accounting practices are likely to disclose more comprehensive and relevant financial information related to their environmental performance.
The framework used in this research is as follows:

Table 1: Framework



Based on the research framework, the following logical arguments can be made:
The implementation of carbon accounting allows companies to measure, monitor, and manage carbon emissions more effectively.

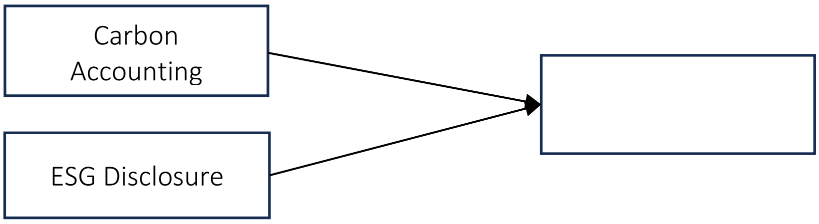
1. ESG-oriented companies have a higher awareness of environmental issues and stakeholder pressures related to their carbon performance.
2. The information generated from carbon accounting provides a stronger basis for companies to disclose financial information relevant to environmental performance, such as environmental-

related costs, investments in green technologies, and potential carbon-related risks and opportunities.

3. The disclosure of financial information relevant to carbon performance can enhance the company's legitimacy in the eyes of stakeholders, meet the expectations of investors increasingly concerned about ESG issues, and provide a positive signal regarding the quality of the company's management.

The research framework is:

Tabel 2: **Research Framework**:



Research Objectives and Research Questions

Based on the literature review and the exposition above, this study aims to understand how carbon accounting and ESG disclosure can enhance firm value in Indoensia, and how carbon accounting and ESG disclosure can enhance firm value in Indonesia?

RESEARCH METHODS

This study employs a Systematic Literature Review (SLR) approach to systematically identify, evaluate, and synthesize various research findings focusing on carbon accounting practices and ESG-oriented financial disclosure in Indonesia. SLR is chosen because it provides a comprehensive understanding of research trends, recurring findings, and gaps that still need to be investigated, using a structured and transparent framework. The implementation of SLR in this study follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, which consist of four main stages: identification, screening, eligibility, and final inclusion.

The identification stage involves searching for scholarly articles from various reputable databases such as Scopus, Web of Science, DOAJ, Google Scholar, and Garuda. The search is conducted using a combination of keywords: "carbon accounting," "ESG disclosure," "green accounting," "sustainability reporting," "financial performance," and "firm value," tailored to the context of companies in Indonesia. The selected publication period ranges from 2015 to 2025 to ensure the relevance and timeliness of the discussion.

In the initial screening stage, the researcher selects articles based on titles and abstracts to ensure topic relevance. Articles that are not relevant to the focus of the study, not available in full text, or do not meet scientific criteria are removed from the list. The eligibility stage involves reading the full content of the remaining articles and evaluating the suitability of the methodology, data quality, and contributions to the SLR topic. A total of 50 articles, consisting of quantitative, qualitative, and mixed-method studies, passed the final selection.

The inclusion criteria used in the article selection include: (1) peer-reviewed articles published between 2015 and 2025, (2) focusing on ESG practices, carbon disclosure, or green accounting, (3) within the context of companies in Indonesia or developing countries, and (4) having clear empirical data. Exclusion criteria encompass non-academic articles, purely conceptual studies without empirical data, and articles that are not accessible in full.

Data from each selected article is coded in a matrix, which includes author identities and publication years, research methods, main variables studied, and key findings. This data is then analyzed thematically to identify key issue clusters and research trends. Additionally, bibliometric analysis is performed to map publication trends, collaboration among researchers, and dominant keywords using software such as

VOSviewer. This process ensures that the presented study has a strong methodological basis and can provide significant academic contributions.

Research Design

The research design is exploratory and qualitative based on document reviews, with the SLR method as the primary approach and bibliometric analysis as a supplementary visual and quantitative method. The goal is to create a knowledge map and conceptual framework based on academic literature trends.

Sources and Criteria for Literature

Literature is obtained from five international scientific databases: Scopus, ScienceDirect, SpringerLink, JSTOR, and Google Scholar. Selected articles must meet the following criteria:

1. Published between 2015 and 2025
2. Peer-reviewed and available in full text
3. Discussing topics: carbon accounting, ESG disclosure, green accounting, sustainability reporting, firm performance, firm value.
4. Focusing on the context of Indonesia or studies that explicitly include Indonesia.
5. PRISMA Procedure Steps

The search is conducted using a combination of keywords. The initial results are collected and filtered using the PRISMA flow:

PRISMA Flow Summary

Stage	Number of Articles	Notes
Found	347	Initial search results from databases
After duplicates removed	268	Unique articles only
After screening	120	Based on abstracts and topic focus
Eligibility evaluation	65	Articles with full text and valid methods
Final articles included	50	Used in SLR and bibliometric analysis

Data Analysis Techniques

Analysis is conducted descriptively and thematically on the selected articles. For bibliometric analysis, software such as VOSviewer is used to map relationships between keywords and author collaborations. The results of the SLR and bibliometric analysis are presented in tables, graphs, and thematic analysis.

Validity and Relevance

Validity is maintained through the use of strict inclusion-exclusion criteria and source triangulation. Relevance is ensured by selecting only articles that fit the context of Indonesia and contribute to the formulation of theoretical frameworks and sustainability policy directions in Indonesia.

RESULTS AND DISCUSSION

Based on the 50 articles identified and analyzed, the majority of studies employ quantitative methods (linear regression, panel data, PLS-SEM), with a small number using qualitative approaches and conceptual reviews. The most frequently studied variables include carbon disclosure, green accounting, ESG disclosure, sustainability reporting, firm performance, and firm value. Most studies focus on the manufacturing and energy sectors in Indonesia, and the research period is dominated by years 2020–2024. The primary focus revolves around the impact of sustainability practices on financial performance and corporate reputation. Out of the 50 articles, 40 studies explicitly examine the Indonesian context, utilizing secondary data from public companies, case studies, and institutional analyses. The remaining articles come from regional ASEAN studies or global research with relevant policy applications in Indonesia.

Systematic Literature Review (SLR) Analysis

The SLR approach is conducted with reference to PRISMA standards to filter literature systematically. From the initial 347 articles, 50 articles are selected through the stages of identification, screening, eligibility, and inclusion. The general characteristics of the articles are as follows: Publication Year: 2015–2025; Data Type: literature review. The variable types are: Independent: Carbon Accounting, ESG Disclosure, Dependent: Firm Value.

Bibliometric Analysis

Bibliometric analysis is performed to identify research trends, author collaboration, and keyword frequency. Key findings reveal that frequently occurring keywords include "Carbon Accounting," "Green Accounting," "ESG Disclosure," "Sustainability Reporting," "Firm Performance," "Firm Value," and "Indonesia." Research centers around authors such as Pratiwi, Yuliatma, and Zahri, who consistently study ESG and environmental performance and play crucial roles in Indonesian literature. The peak publication years of 2022–2024 show a surge in studies due to regulatory pushes and capital market pressures. Global trends indicate an increasing integration between carbon accounting and ESG following the adoption of GRI, TCFD, and POJK 51/2017 regulations. Institutional collaborations predominantly stem from state universities in Indonesia, such as UI, UGM, and UB. Keyword mapping using VOSviewer shows three main clusters: ESG & firm performance; Carbon disclosure & firm value; Green innovation & environmental responsibility.

Thematic Analysis

The collected literature from the 50 scholarly articles published from 2015 to 2025 shows the dynamics and developments of carbon accounting and ESG-oriented disclosure concepts in the context of companies in Indonesia. Synthesizing the research table categorizes key themes as follows:

Theme aligned with Research Question: How Carbon Accounting and Its Impact on ESG Disclosure? Carbon accounting is a strategic approach to measuring, recording, and reporting greenhouse gas (GHG) emissions generated by corporate operational activities. In the context of ESG (Environmental, Social, and Governance) disclosure, the practice of carbon accounting plays a significant role as a foundation for transparent and measurable reporting of environmental aspects. Several studies indicate a positive correlation between the implementation of carbon accounting and the enhancement of ESG disclosure quality. For instance, research by Purwanto (2023) and B. Gunawan & Berliyanda (2024) emphasizes that companies with good carbon accounting systems tend to provide comprehensive and credible ESG information. Additionally, Yuliatma & Kristari (2022) highlight that despite facing challenges in reporting standards, companies consistently adopting carbon accounting show improvements in ESG reporting, particularly in the environmental dimension (E).

However, some findings indicate that the impact of carbon accounting on ESG disclosure is not universally positive. In some cases, as reported by Savitri (2021)), carbon disclosure conducted partially or symbolically does not significantly enhance ESG quality. This suggests that the effectiveness of carbon accounting in promoting ESG transparency heavily depends on management commitment, internal environmental governance, and external pressures such as government regulations and institutional investor demands.

Thus, it can be concluded that carbon accounting plays a crucial role in supporting the implementation of ESG disclosure, especially in environmental aspects. However, to achieve maximum impact, carbon accounting must be integrated into the company’s overall sustainability strategy, supported by transparent and accountable reporting systems.

Theme aligned with Research Question: How Carbon Accounting and Its Impact on Firm Value? Some studies reveal that carbon disclosure does not always positively affect firm value. Savitri (2021) even states the negative impact of carbon emission disclosure on firm value. However, differing results are found in

Nafisa (2023) and Putri (2023)), which conclude that carbon disclosure can enhance firm value when combined with green accounting or good environmental performance.

Theme aligned with Research Question: How ESG Disclosure and Its Impact on Firm Value? Most studies show that Environmental, Social, and Governance (ESG) disclosure significantly influences firm performance. For instance, studies by Safriani (2020)) and Mulyadi (2022) indicate that ESG disclosure positively impacts market value and investor confidence. Similar findings are also presented by Oktaviana et al (2025) which affirm that ESG disclosure can enhance firm value, especially when moderated by good corporate governance (GCG).

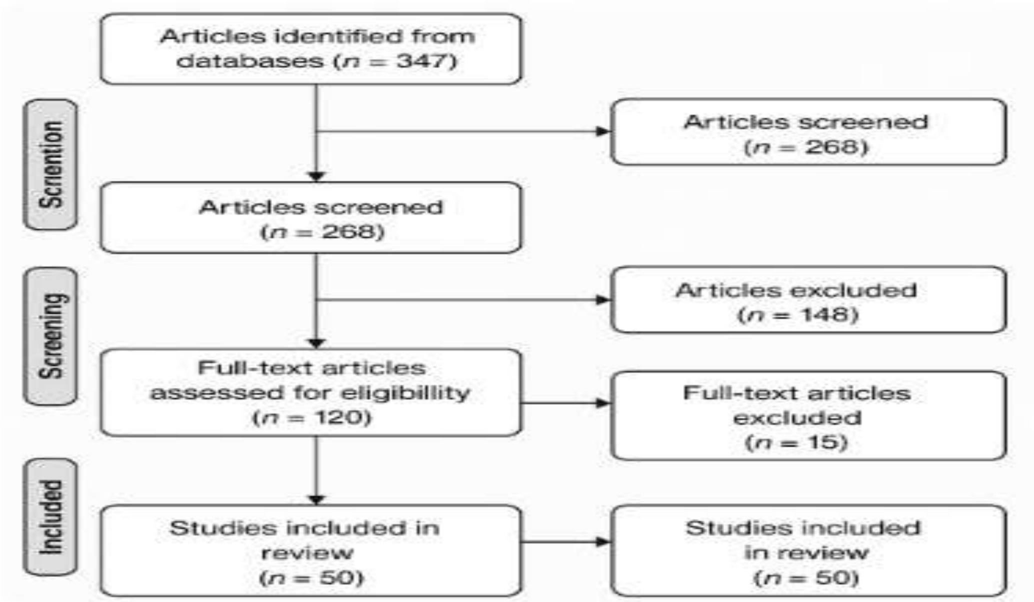
PRISMA Analysis

The PRISMA approach is used to systematically screen the literature. From the initial 347 articles, 50 articles are selected through the stages of identification, screening, eligibility, and inclusion. The selected literature focuses on the context of Indonesia and ESG-carbon disclosure. The PRISMA diagram illustrates the selection flow as follows:

Figure 1: PRISMA Diagram

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) approach is utilized in this study to ensure that the literature selection process is conducted transparently and systematically. The selection stages begin with an initial identification of 347 articles from five major academic databases: Scopus, ScienceDirect, Google Scholar, SpringerLink, and JSTOR. The search process uses a combination of keywords such as "carbon accounting," "green accounting," "ESG disclosure," "sustainability reporting," "firm performance," "firm value," and "Indonesia." The subsequent stage is screening, which involves examining titles and abstracts to filter relevant literature topically. Ultimately, 50 articles that meet all inclusion criteria are analyzed in this study. These articles encompass a publication range from 2015 to 2025, primarily focusing on the implementation of carbon accounting, ESG disclosure, and their impact on firm value in Indonesia. The PRISMA diagram provides a visual and systematic representation of this selection process.

Figure 2: **Prisma Diagram**



CONCLUSION

This study aims to compile a systematic review and bibliometric analysis of research examining the relationships between carbon accounting, ESG-oriented financial disclosure, and firm value in Indonesia. Using a Systematic Literature Review (SLR) approach and bibliometric analysis of 50 scholarly articles published between 2015 and 2025, several key conclusions are drawn: First, carbon accounting practices are closely related to the quality of ESG disclosure. Consistent measurement and reporting of carbon emissions can enhance transparency and legitimacy for companies in the eyes of stakeholders.

Second, carbon accounting positively impacts firm value. Carbon disclosure increases firm value when combined with green accounting or good environmental performance. Third, ESG disclosure has been shown to positively impact firm value and financial performance, although some studies have found variable results depending on sector and company structure.

Bibliometric trends indicate a significant increase in the number of publications since 2020, aligned with heightened regulatory attention to sustainability reporting in Indonesia, particularly following the enactment of POJK 51/2017 and the increased adoption of ESG in the capital market.

Future Research Agenda

Based on the gaps identified in the literature, several future research directions can be developed:

1. Exploration of Primary Data and Mixed Methods.
2. Most of the analyzed studies utilize secondary data based on annual reports. Future research should explore qualitative or mixed methods approaches, such as interviews with management and stakeholders, to delve deeper into ESG reporting and carbon accounting practices internally.
3. Analysis of Non-Manufacturing Sectors.
4. Most research focuses on manufacturing companies. Expanding to other sectors such as agriculture, technology, and SMEs can enrich the understanding of sustainability across industries.
5. Integration of Sustainable Finance Theory.
6. Future studies can integrate modern finance theories and sustainability, such as Integrated Reporting Theory, Triple Bottom Line, or Circular Economy, to broaden the theoretical analysis scope.
7. Longitudinal Evaluation of ESG Regulatory Impact.
8. Longitudinal research is needed to measure the effectiveness of ESG regulation implementation in Indonesia over the long term.
9. Development of a National ESG Index.
10. Future research should also contribute to the development of models or ESG indices tailored to the characteristics of corporate governance in Indonesia.
11. Limitations of longitudinal studies: Most research is cross-sectional, thus failing to capture the long-term impacts of ESG and carbon disclosure on performance.

12. Minimal in-depth qualitative approaches: Most use regression, whereas in-depth interviews could provide a fuller understanding of motivations and ESG practices.
13. Lack of exploration of moderating/mediating factors: Such as the influence of organizational culture, regulatory pressure, and stakeholder perceptions.
14. Limited industry-specific research: The energy, mining, and heavy manufacturing sectors need more focused investigation.

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