



Systematic Literature Review: Disclosure of Carbon Emissions in
Indonesia

✉ **Ni Putu Lion Budanti; Ni Wayan Rustiarini**
Universitas Mahasaraswati Denpasar, Indonesia
✉ lionbudanti09@gmail.com

ARTICLE INFORMATION	ABSTRACT
Received: 23 th , July 2024 Revised: 6 th , November 2025 Accepted: 30 th , April 2026 <i>Keywords: Systematic Literature Review (SLR), carbon emission disclosure, profitability, company size, leverage</i>	The purpose of this study is to examine the literature regarding carbon emission disclosures in Indonesia. The study utilizes the Systematic Literature Review (SLR) methodology, covering the years 2014–2024. The SLR process is divided into three phases: planning, implementation, and reporting, all guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. Using the Publish or Perish software, an initial search yielded 44 publications from the Google Scholar database. Following the application of inclusion and exclusion criteria, 10 articles were selected for review. This study explores four key research areas, including leverage, profitability, and firm size, to assess the impact of carbon emission disclosures. The findings suggest that companies with low leverage, high profitability, and larger size are more inclined to disclose carbon emissions. The study concludes that carbon emission disclosures influence profitability, firm size, and leverage.

INTRODUCTION

The global community has become increasingly focused on the critical issue of climate change, which poses a significant threat to the future of human life. Both developed and developing nations are grappling with the consequences of climate change, most notably global warming, which leads to environmental degradation, such as altered rainfall patterns, floods, droughts, declining water quality, food insecurity, and rising sea levels. These environmental disruptions affect the livelihoods and well-being of billions of people worldwide (Pilomonu, 2023). Firmansyah et al. (2021) estimate that “Indonesia emits between 15 to 20 million tonnes of carbon dioxide per day, making it the sixth-largest carbon emitter globally, if left unchecked, the continuous rise in carbon emissions could result in widespread financial losses for businesses across the world, affecting investments, productivity, and profitability”. Therefore, governments must take action and raise public awareness to mitigate the adverse effects of environmental changes.

To reduce carbon emissions, the Indonesian government has taken proactive steps toward sustainable development. One of the key milestones in this effort was the international conference held in Kyoto, Japan, which led to the Kyoto Protocol, an international agreement aimed at fostering global sustainability. Under the Kyoto Protocol, organizations are required to identify, measure, monitor, and report their carbon emissions. Indonesia ratified this protocol on June 28, 2004, during its first term, through the enactment of Law No. 17 of 2004. The government has since reinforced its commitment by issuing various regulations, such as Presidential Regulation No. 61 of 2011 concerning the National Action Plan for Reducing Greenhouse Gas Emissions (RAN-GRK), and Presidential Regulation No. 71 of 2011 on the Implementation of the National Greenhouse Gas Inventory (Mujiani et al., 2019). Additionally, Indonesia strengthened its efforts by signing the Paris Agreement in 2015, alongside 196 other nations, demonstrating its dedication to reducing carbon emissions and mitigating the impact of natural disasters. In line with this agreement, Indonesia aims to lower its carbon emissions by 29% by 2030. While companies are increasingly reporting their carbon emissions in response to environmental concerns and pollution, it is important to note that in Indonesia, such disclosures remain largely voluntary and are typically driven by stakeholder pressure and corporate policy rather than mandatory regulations.

The disclosure of carbon emissions serves as a mechanism for organizations to demonstrate accountability for their climate-related actions, particularly those associated with trade. It is also integral to sustainability reporting. However, disclosing carbon emissions may introduce potential risks, such as increased operational costs. Factors that drive organizations to disclose carbon emissions, including stakeholder awareness and environmental concerns, place significant pressure on businesses to mitigate emissions stemming from their operational activities (Budanti & Rustiarini, 2024; Primadona & Rustiarini, 2024).

Previous studies on carbon emissions disclosure in Indonesia have produced inconsistent results. For instance, Husnaini et al. (2018) assert that “profitability has no influence on the disclosure of carbon emissions”, whereas Yusuf (2021) argues the opposite. While (Mujiani et al., 2019) found that “leverage positively influences carbon emissions disclosure”, Putri & Amin (2022) reported “no significant impact of leverage on such disclosures”. Additionally, Firmansyah et al. (2021) found “a positive correlation between firm size and carbon emissions disclosure”, contradicting (Mujiani et al., 2019), “who identified a negative relationship”.

This study highlights the importance of comprehensively understanding the complexities of carbon emissions disclosure within Indonesian enterprises. A systematic literature review was employed to conduct this research. Given that carbon emissions distribution significantly affects the sustainability of a business, a thorough examination is essential.

LITERATURE REVIEW

Carbon Emission Disclosure

Reporting carbon emissions from a company’s core operations is critical for transparency. Regular disclosure provides data on a company’s carbon emissions, climate change strategies, and the associated risks and opportunities affecting both internal and external environments. According to Husnaini et al. (2018), “carbon emissions disclosure is a form of company concern and responsibility for the carbon emissions they produce”. This includes information on emission levels, climate change mitigation strategies, reduction targets, and the company’s performance in achieving these goals. Furthermore, it addresses the risks and opportunities related to climate change and offers potential solutions to mitigate these risks.

As public awareness of environmental issues increases, organizations are facing growing pressure to disclose information regarding their operational practices that impact the environment. Companies are now required to report their carbon emissions and address corporate social and environmental responsibilities. The Global Reporting Initiative (GRI) 305 standard (2016) concerning emissions serves as the foundation for preparing carbon disclosure reports in Indonesia (Firmansyah et al., 2021). This standard is applicable across industries; however, disclosure remains voluntary and is influenced by stakeholder pressure and

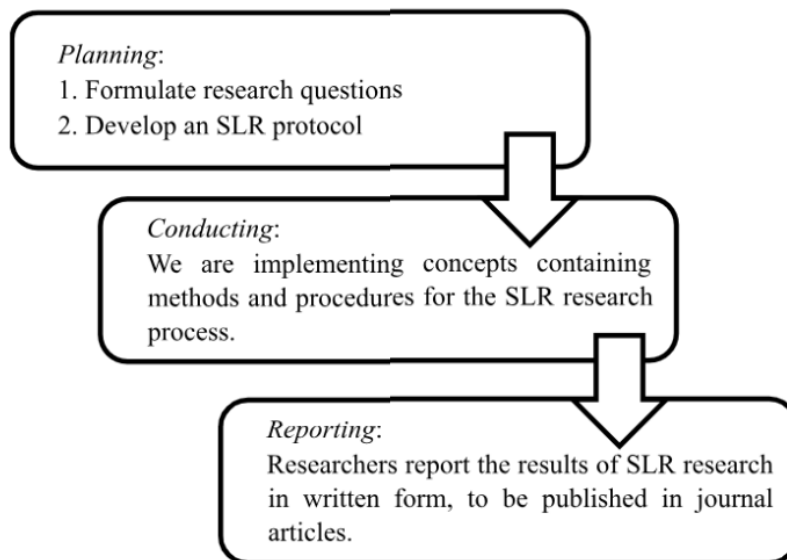
corporate policies. Several studies on carbon disclosure in Indonesia, such as those by Saputra (2016) and Putri & Amin (2022), “have examined the influence of factors such as debt, profitability, and company size on carbon emission reporting”. Similarly, research conducted by Dewi and Nazmel (2022) and Teja et al. (2018) “investigated how managerial ownership and environmental performance affect carbon emission disclosure”.

Systematic Literature Review (SLR)

According to (Triandini et al., 2019), “the term systematic literature review (SLR) refers to a research methodology aimed at gathering and analyzing existing studies within a specific area of inquiry”. The SLR process is utilized to identify, evaluate, and interpret the findings of previous research on a particular issue, providing answers to research questions in a structured manner. This systematic and methodical approach minimizes subjective bias on the part of the researcher.

The objective of the SLR approach is to review, document, and interpret all prior research concerning carbon emission disclosure in Indonesia. The SLR process typically involves three key stages: selection of relevant studies, analysis of collected data, and synthesis of findings:

Figure 1. Systematic Literature Review (SLR) Method Stage



Source: processed data (2024)

RESEARCH METHODS

In the study design, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework is utilized to select studies relevant to the research topic. This process includes defining a topic based on specific criteria, identifying data sources, selecting appropriate studies, collecting relevant papers, and analyzing the gathered literature, all in accordance with PRISMA guidelines. Figure 2 illustrates the PRISMA flow diagram:

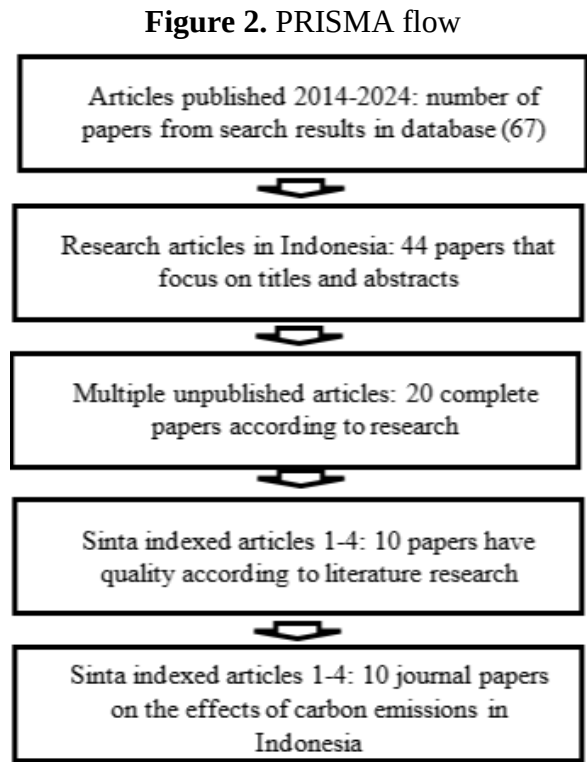
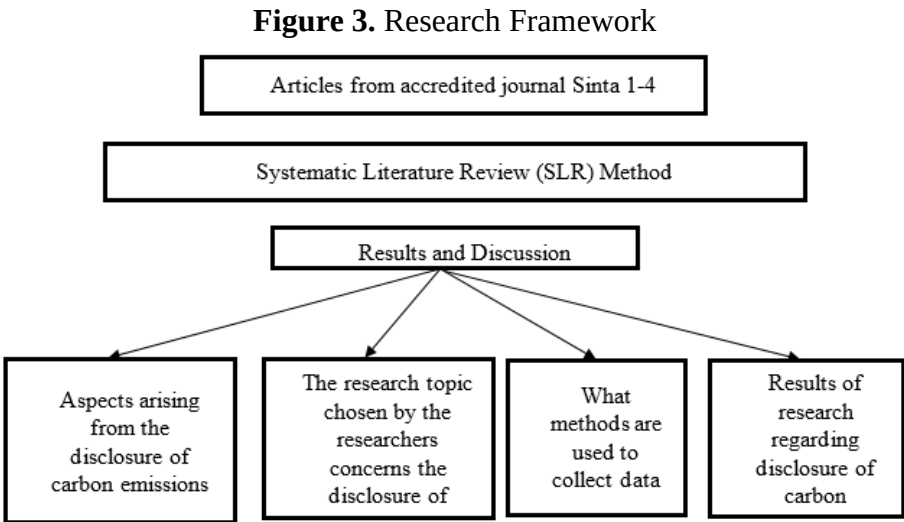


Figure 3 presents a conceptual framework for the study based on the SLR approach, mapping the field analysis. This framework includes four main components: first, the challenges associated with carbon emission disclosure; second, the study topics explored; third, the methods employed in the research; and fourth, the findings and comparative analysis of the studies reviewed.



Due to the high categorization, rigorous selection process, and superior quality of articles published in Sinta 1-4 journals (Sinta.kemdikbud.go.id), the papers for this study were sourced from these journals. The author identified 44 journal articles using Google Scholar, applying search terms covering the period from 2014 to 2024. The papers were then screened based on the titles and abstracts following the inclusion and exclusion criteria. Ultimately, 10 papers were selected for this research. The focus of the study is on Indonesia's carbon emissions disclosure practices. Carbon emissions disclosure is a critical area of study as it significantly impacts organizations and can be utilized by companies to inform decision-making aimed at optimizing operational performance.

The research questions are formulated to address the core issues in the study:

RQ 1: “What aspects arise from the disclosure of carbon emissions in Indonesia?”

RQ 2: “What research topics have been chosen by researchers regarding the disclosure of carbon emissions in Indonesia?”

RQ 3: “What methods are used to collect data regarding carbon emissions disclosure in Indonesia?”

RQ 4: “What are the research results regarding the disclosure of carbon emissions in Indonesia?”

The *Publish or Perish* tool was used to gather secondary data from the Google Scholar database. The search strategy involved the following steps:

1. Define the search based on the study design (PRISMA approach).
2. Identify relevant journals using keywords, titles, and abstracts.
3. Align the journal search with the research questions (RQs).
4. Employ simple search terms aligned with the keywords:
 - a. “Carbon Emission Disclosure”
 - b. “Carbon Emission Disclosure in Indonesia”
 - c. “Carbon Emission Disclosure”
 - d. “Disclosure of Carbon Emissions in Indonesia”

The following criteria were applied to the SLR study on carbon emissions disclosure:

1. The data covers a span of 10 years, from 2014 to 2024.
2. The study focuses on Indonesia.
3. Articles indexed by Sinta 1–4 were included.
4. Certain unpublished works were also considered.

The quality of the identified articles was evaluated using the following questions:

1. QA1. “Are journal papers published in 2014-2024?”
2. QA2. “Does the journal paper examine carbon emissions disclosure?”

The data for this study is secondary in nature and was gathered using Google Scholar, followed by analysis with the *Publish or Perish* tool. Mendeley was used for documentation and storage of the collected data.

RESULT AND DISCUSSION

From the search results for studies found using the 2014-2024 search string in the Google Scholar database, 44 journal papers were found. Next, the data found will be selected by reading the title and abstract of the paper based on the inclusion and exclusion criteria taken by the paper. Then, the final total used in this research was ten papers. This stage is data analysis and the results can answer the Research Question (RQ) determined to discuss the disclosure of carbon emissions in Indonesia.

Results of RQ1: Aspects Caused by Carbon Emissions

Table 1. Aspects Elicited

No	Aspects	Researchers	Amount
1	Profitability	(Mujiani et al., 2019), (Az-Zahra & Aryati, 2023), (Putri & Amin, 2022), (Dewi & Aldhani, 2021), (Yusuf, 2021), (Husnaini et al., 2018), (Omega & Aryati, 2024)	7
2	Leverage	(Mujiani et al., 2019), (Putri & Amin, 2022), (Hariswan et al., 2022), (Yusuf, 2021), (Rusdi & Helmayunita, 2020), (Omega & Aryati, 2024)	6
3	Company Size	(Mujiani et al., 2019), (Firmansyah et al., 2021), (Putri & Amin, 2022), (Hariswan et al., 2022), (Yusuf, 2021), (Rusdi & Helmayunita, 2020)	6

Data source: Processed data (2024)

Results from RQ2: Research Topic

The first topic, identifying problems with the disclosure aspect of carbon emissions in Indonesia (Az-Zahra & Aryati, 2023), (Dewi & Aldhani, 2021), (Yusuf, 2021), examines profitability, which is an aspect related to carbon emission disclosure. Companies that have a high profitability value receive more pressure from the public. “In responding to this pressure with a high profitability value, the company has more

resources to conduct environmental disclosures” (Dewi & Aldhani, 2021). According to research from Yusuf (2021), “companies with a high level of profitability will receive pressure from stakeholders to care about the environment because the company will have more resources to carry out carbon emission disclosures than companies with a low level of profitability”. Companies with high profits will allocate profits generated in the current period by dividing them among shareholders and depositing them in a retained earnings account. Retained earnings are part of equity. This condition makes companies with high-profit levels have sufficient financial resources. Therefore, the higher the level of profitability, the higher the carbon emission disclosure (Az-Zahra & Aryati, 2023), (Dewi & Aldhani, 2021), (Yusuf, 2021).

To better understand the factors that influence the disclosure of carbon emissions, several studies (Yusuf, 2021), (Rusdi & Helmayunita, 2020), (Omega & Aryati, 2024), (Hariswan et al., 2022), (Putri & Amin, 2022) have explored the relationship between leverage and carbon emission disclosures. These studies “emphasize that alongside profitability and leverage, firm size is a significant determinant in carbon emissions reporting” (Mujiani et al., 2019), (Firmansyah et al., 2021), (Putri & Amin, 2022), (Hariswan et al., 2022), (Yusuf, 2021), (Rusdi & Helmayunita, 2020). Larger corporations, in particular, tend to experience greater environmental scrutiny, prompting them to engage in more substantial voluntary carbon disclosures in order to enhance their credibility. In contrast to smaller companies, large enterprises are expected to take a more proactive role in carbon emission transparency (Mujiani et al., 2019), (Firmansyah et al., 2021), (Putri & Amin, 2022), (Hariswan et al., 2022), (Yusuf, 2021).

The second focal point of research highlights the challenge of excessive profitability in relation to carbon emissions disclosure in Indonesian companies (Az-Zahra & Aryati, 2023), (Dewi & Aldhani, 2021), (Yusuf, 2021). Se Findings suggest that higher levels of profitability are often associated with lower leverage and lower carbon emissions disclosure (Yusuf, 2021), (Rusdi & Helmayunita, 2020), (Omega & Aryati, 2024), (Hariswan et al., 2022), (Putri & Amin, 2022). Moreover, large firm size further complicates the disclosure of carbon emissions, as larger firms are subject to greater environmental accountabilitys (Mujiani et al., 2019), (Firmansyah et al., 2021), (Putri & Amin, 2022), (Hariswan et al., 2022), (Yusuf, 2021).

The third area of research focuses on the challenges associated with carbon emissions in Indonesian businesses. Key concerns include high profitability, low leverage, and large firm size, all of which influence carbon disclosure practices. The fourth area addresses potential solutions, suggesting that effective governance frameworks can mitigate these issues. (Firmansyah et al., 2021) argue that “strong corporate governance can encourage firms to be more transparent in their carbon emissions disclosures, thereby fulfilling stakeholder expectations for greater transparency”. Investors, in turn, are likely to respond positively to such transparency, which can enhance the firm's reputation and boost stakeholder confidence, particularly within capital markets. Furthermore, research by (Husnaini et al., 2018) highlights the “potential benefits of implementing the ISO 14001 environmental management system. Companies that adopt this system are generally more inclined to disclose carbon emissions associated with their operations”. Compared to firms lacking an environmental management system, those with ISO 14001 certification tend to provide more accurate and reliable environmental data, further reinforcing the credibility of their disclosures.

The examination of issues related to the disclosure of carbon emissions by Indonesian companies constitutes the fifth topic of study. It can be concluded that high profitability is a significant determinant in the disclosure of carbon emissions (Az-Zahra & Aryati, 2023), (Dewi & Aldhani, 2021), (Yusuf, 2021). Furthermore, low leverage has also been shown to contribute to carbon emissions disclosure (Yusuf, 2021), (Rusdi & Helmayunita, 2020), (Omega & Aryati, 2024), (Hariswan et al., 2022), (Putri & Amin, 2022). Company size is another key factor influencing carbon emissions disclosure (Mujiani et al., 2019), (Firmansyah et al., 2021), (Putri & Amin, 2022), (Hariswan et al., 2022), (Yusuf, 2021). Strengthening corporate governance and implementing the ISO 14001 environmental management system are strategies suggested to address these various issues (Husnaini et al., 2018).

Results from RQ3: Methods Used

At this stage, the researchers have collected secondary data to analyze carbon emissions distribution within Indonesian firms, based on their selected parameters.

Results of RQ4: Research Results

The researchers aim to assess the impact of carbon emissions disclosure on Indonesian corporations. Their findings are expected to yield specific conclusions while also providing more in-depth insights into carbon emissions reduction strategies within Indonesian businesses. According to Yusuf's (2021) research, "corporate governance, company size, profitability, and environmental performance positively influence carbon emissions disclosure". Similarly, Az-Zahra & Aryati (2023) found that "company size and profitability have a significant positive effect on carbon emissions disclosure, while institutional ownership and financial debt show no significant impact". Furthermore, (Putri & Amin, 2022) "emphasize that company size plays a crucial role in the disclosure of carbon emissions".

The discussion section should clarify the interconnections among research findings, identify gaps within the existing studies, and explore the relationship between these findings and relevant theories and prior research.

CONCLUSIONS

The study concludes by employing a Systematic Literature Review approach, which examines research themes, data collection methods, and outcomes to explore the challenges posed by carbon emissions disclosure. This study utilized ten journal articles selected based on inclusion and exclusion criteria, revealing that carbon emissions disclosure is influenced by a company's size, leverage, and profitability.

The first research question (RQ1) concerning the effects of carbon emissions disclosure reveals that low leverage, large company size, and high profitability are influential factors. Additionally, RQ1 highlights potential solutions to these challenges, such as the implementation of the ISO 14001 environmental management system and the enhancement of corporate governance. Profitability, company size, and leverage consistently emerge as significant themes in addressing RQ2. Secondary data collection was the method employed to answer RQ3. Lastly, RQ4 confirms that company size, profitability, and leverage positively impact carbon emissions disclosure.

This research was only carried out in Indonesia and focused on one finding. To gain a more comprehensive understanding, future research suggestions should include other contexts related to carbon emissions disclosure, such as in countries outside Indonesia.

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