

The Influence of Corporate Governance and Gender Board Diversity on Climate Change Disclosure: Evidence from Indonesian Listed Companies

Corporate Governance,
Gender Diversity, and
Climate Disclosure

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ABSTRACT

Climate change disclosure is a crucial aspect of corporate sustainability, reflecting how firms address environmental risks and communicate their climate-related initiatives to stakeholders. This study aims to examine the relationship between board gender diversity, corporate governance, and the extent of climate change disclosure among publicly traded companies in Indonesia. Using a quantitative research design, data were collected from companies listed on the Indonesia Stock Exchange from 2019 to 2023, and regression analysis was conducted to assess the impact of board gender composition, board size, board independence, and other governance structures on climate-related disclosures, with information sourced from sustainability reports and annual reports. The results reveal that board gender diversity, particularly independent female directors, and larger board size positively and significantly influence the level of climate change disclosure, whereas financial performance measures such as firm size, return on assets, return on equity, and leverage do not exhibit significant effects. These findings indicate that governance and structural factors, rather than purely financial metrics, drive voluntary environmental transparency. This study highlights the importance of promoting gender-diverse boards and strengthening corporate governance to enhance climate-related reporting, improve stakeholder trust, and support sustainable business practices aligned with global environmental goals.

Keywords: Board Composition, Board Gender Diversity, Climate Change Disclosure, Corporate Governance, Sustainability Reporting.

ABSTRAK

Pengungkapan informasi terkait perubahan iklim merupakan aspek penting dalam keberlanjutan perusahaan, mencerminkan bagaimana perusahaan menghadapi risiko lingkungan dan mengkomunikasikan inisiatif terkait iklim kepada para pemangku kepentingan. Penelitian ini bertujuan untuk mengkaji hubungan antara keberagaman gender dalam dewan direksi, tata kelola perusahaan, dan tingkat pengungkapan perubahan iklim pada perusahaan publik di Indonesia. Dengan menggunakan desain penelitian kuantitatif, data dikumpulkan dari perusahaan yang terdaftar di Bursa Efek Indonesia selama periode 2019 hingga 2023, dan analisis regresi dilakukan untuk menilai pengaruh komposisi gender dewan, ukuran dewan, independensi dewan, serta struktur tata kelola lainnya terhadap pengungkapan terkait perubahan iklim, dengan sumber informasi berasal dari laporan keberlanjutan dan laporan tahunan perusahaan. Hasil penelitian menunjukkan bahwa keberagaman gender di dewan, khususnya direktur wanita independen, serta

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ukuran dewan yang lebih besar, memiliki pengaruh positif dan signifikan terhadap tingkat pengungkapan perubahan iklim, sedangkan indikator kinerja keuangan seperti ukuran perusahaan, return on assets, return on equity, dan leverage tidak menunjukkan pengaruh signifikan. Temuan ini menunjukkan bahwa faktor tata kelola dan struktural, bukan semata-mata metrik keuangan, mendorong transparansi lingkungan secara sukarela. Penelitian ini menekankan pentingnya mendorong keberagaman gender dalam dewan dan memperkuat tata kelola perusahaan untuk meningkatkan pelaporan terkait iklim, membangun kepercayaan pemangku kepentingan, dan mendukung praktik bisnis berkelanjutan yang sejalan dengan tujuan lingkungan global.

Kata kunci: Komposisi Dewan, Keberagaman Gender Dewan, Pengungkapan Perubahan Iklim, Tata Kelola Perusahaan, Pelaporan Keberlanjutan.

INTRODUCTION

Countries have committed to prioritizing progress for those who are behind regarding the Sustainable Development Goals (SDGs) that were declared in 2015 to ensure that by 2030, everyone will enjoy peace and prosperity. The Sustainable Development Goals (SDGs) aim to end poverty, hunger, AIDS, and discrimination against women and girls. Achieving these goals requires creativity, knowledge, technology, and financial resources from everyone in society, and also in balance with social, economic, and environmental sustainability.

SDGs are standards adopted by various countries in the world. This standard is formed from several global problems that need to be resolved to achieve sustainability in social and environmental aspects (Shayan et al., 2022). In this research, a social phenomenon included in the SDGs is examined, namely gender equality. Through these standard points, it is hoped that women's participation in a company's board of directors will positively impact the company, especially in developing disclosures related to climate change (Majid & Jaaffar, 2023). The relationship between gender diversity on the board of directors and corporate sustainability performance has been widely studied in various contexts (Pareek et al., 2023; Elsheikh et al., 2024; Sahu et al., 2025). Previous research has shown that gender-diverse boards are more likely to promote sustainable practices and environmental disclosures (Gavana et al., 2024; Sundarasen et al., 2024; Omenihu et al., 2025)

Corporate governance, which has changed due to the COVID-19 pandemic, has greatly influenced company performance and requires companies to pay attention to stakeholders (Perwitasari et al., 2022). Companies need to consider not only financial performance but also environmental and social factors (Aydoğmuş et al., 2022; Handoyo & Anas, 2024; Shmelev & Gilardi, 2025). Effective corporate governance involves protecting stakeholder rights and responding to their diverse interests, which includes focusing on environmental performance (Irshad et al., 2023; Annesi et al., 2025).

Many Companies, especially in Indonesia have gone beyond financial reporting and publishing sustainability reports to disclose environmental, social, and governance information (Sebrina et al., 2023). This increased disclosure is likely driven by greater stakeholder scrutiny and demands for improved corporate transparency (Sulemana et al., 2025). Board diversity and corporate governance have been identified as crucial factors influencing a firm's environmental and social performance (Lippi & Galavotti, 2024). Specifically, the presence of women on corporate boards has been linked to increased transparency and disclosure on sustainability-related issues, including climate change (Babiker et al., 2025). This research paper aims to investigate the relationship between board gender diversity, corporate governance, and the extent of climate change disclosure among publicly traded companies, especially companies listed in IDX or the Indonesian Data Exchange (Wahyuningrum et al., 2025).

The existing literature provides a strong theoretical basis for this study. Previous research has found that the inclusion of female directors on corporate boards can positively impact a firm's sustainability reporting and disclosure practices (Wu et al.,

2024). The research gap concerning the effect of board diversity and corporate governance on climate change disclosure in several key areas, like less attention given to other structural and functional aspects of board diversity, such as educational background and professional expertise. This limited scope can create the opportunity to investigate these various elements that affect environmental governance and climate-related disclosure

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

Upper Echelon Theory

There are theories, such as the Upper Echelon Theory, that suggest that the characteristics of the Director of the company can affect the company's sustainability disclosure and performance (Tjahjadi et al., 2021; Ghardallou, 2022). The central idea of UET is that executives make decisions based on their own interpretations of the situations and options they face. These interpretations are highly personalized and are influenced by the executives' experiences, personalities, values, and other human factors. For instance, the diversity of the board, specifically gender diversity, has been linked to increased transparency and accountability in corporate reporting (Martínez et al., 2022; Haque et al., 2024).

Several theoretical perspectives underpin the relationships between corporate governance, gender diversity, and climate change disclosure. Agency Theory posits that a well-structured board can mitigate agency problems by aligning the interests of management with those of shareholders, thus fostering transparency (Khidmat et al., 2024; Koeswayo et al., 2024; Angsoyiri et al., 2025; Anh & Yen, 2025; Sunny & Hoque, 2025). Resource Dependence Theory adds that diverse board compositions, including gender diversity, enhance access to a variety of resources and insights, which support robust environmental governance and climate-related reporting (Sundarasan et al., 2024; EmadEldeen et al., 2025). Additionally, Upper Echelons Theory suggests that the values and backgrounds of executives influence decision-making, leading to more comprehensive climate disclosures when gender diversity is present in the boardroom (Peng & Chandarasupsang, 2023; Lippi & Galavotti, 2024; Saadah et al., 2024).

Corporate Governance and Climate Change Disclosure

Corporate governance has long been recognized as an important measure for ensuring transparency and accountability within businesses. Strong corporate governance systems, such as an independent board and effective monitoring processes, have been linked to better levels of environmental and social responsibility, including climate change disclosure (Nicolo et al., 2023; Wahyuningrum et al., 2025). The COVID-19 epidemic has heightened the relevance of corporate governance, as stakeholders demand that firms account for environmental and social implications in addition to financial success (Bui & Krajcsák, 2024; Suhartini et al., 2024). Effective governance that incorporates climate-related concerns is increasingly viewed as not only a legislative necessity but also a means of improving business image and financial success (Martiny et al., 2024). The relationship between corporate governance and climate change disclosure has been a topic of increasing interest in recent years (Honey et al., 2025).

Huang et al. (2025) show that proactive climate-related measures and carbon disclosures, along with the development of climate-friendly products, can enhance a company's image and financial performance. The corporate governance itself represents the compliance and management of the company, which can impact the transparency and disclosure of the firm's climate-related information (Dilling et al., 2024). Existing studies have examined the effect of corporate governance on climate change disclosure. A study found that carbon performance and disclosure as climate change management tools take a prominent place in modern stakeholder relations (Velte et al., 2020). Corporate social responsibility disclosure, which provides decision usefulness, is a mutually preferred remedy to close information gaps regarding climate change management (Pfajfar et al., 2022). Another study revealed that corporate output growth, deregulation, and low profits

under deregulation significantly affect the choice between greenwashing and brown washing in environmental, social, and governance disclosures (Gregory, 2024).

H1: Corporate governance has a significant positive impact on climate change disclosure.

Gender Diversity on Boards and Environmental Disclosure

Gender diversity on corporate boards has emerged as a significant factor influencing corporate behavior and transparency (Dwaikat et al., 2021). It is associated with enhanced environmental disclosure and corporate social responsibility (Hoang et al., 2021). Female directors tend to support sustainability and transparency initiatives, aligning with Upper Echelons Theory, which connects diverse backgrounds and values to broader strategic perspectives (Al-Najjar & Salama, 2022). Companies with greater board gender diversity demonstrate higher awareness of climate change, as women often bring risk-averse and stakeholder-oriented perspectives that encourage long-term sustainability (Mohy-ud-Din, 2023; McLeod et al., 2025). Women differ from men in leadership styles and organizational approaches, emphasizing communication, community welfare, and ethical considerations (Galsanjigmed & Sekiguchi, 2023). This supports the view that gender-diverse boards can achieve superior performance (Boukattaya & Omri, 2021; Mvita & Du Toit, 2024).

Dwivedi et al. (2023) note that women directors contribute diverse insights that improve decision-making, risk management, and both financial and non-financial outcomes. Studies further suggest that female representation strengthens environmental, social, and governance initiatives, thereby enhancing firms' sustainability performance (Gavana et al., 2024; Tong & Chen, 2024; Yasin, 2025). Women also help address ESG issues more effectively at the board level and encourage greater ESG disclosure and CSR engagement (Zhu et al., 2024; Al-Kubaisi & Abu Khalaf, 2025; Adardour et al., 2025; Anifowose, 2025). This is attributed to women's stronger ethical and social orientation compared to men (Fernandez-Muñoz et al., 2022). While gender diversity remains central, other forms of diversity, such as varied board experience, are increasingly recognized as influencing climate change disclosure. Although underexplored in Indonesian firms, evidence suggests that boards with diverse expertise are better equipped to address complex environmental challenges (Sambodo et al., 2022; Raihan et al., 2023; Surtiari et al., 2024).

H2: Board gender diversity has a significant positive impact on climate change disclosure.

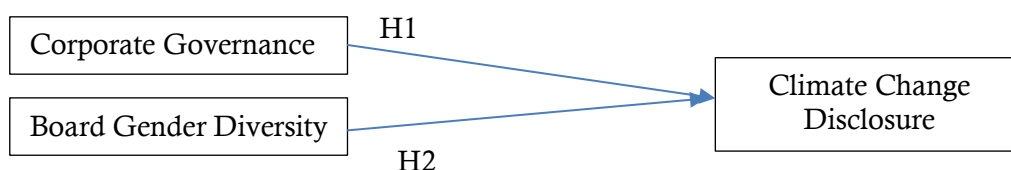


Figure 1. Research Framework

According to empirical research by Pareek et al. (2023), businesses with a diverse board generally perform better on Environmental, Social, and Governance (ESG) indicators. However, few studies have looked at the impact of board diversity on climate change disclosure in Indonesia; most of them concentrate on developed or Western markets (EmadEldeen et al., 2025; Wahyuningrum et al., 2025). In order to close this gap, this study examines how gender board diversity and corporate governance affect climate change disclosure in Indonesian publicly listed businesses, where sustainability reporting is still in its infancy. Previous research supports the idea that diversity and strong governance frameworks improve environmental openness by establishing a fundamental connection between corporate governance, gender diversity on boards, and climate

change disclosure. Based on Figure 1, this study adds to the corpus of research by providing insights into the ways that governance frameworks and gender diversity affect climate-related disclosures in developing nations.

RESEARCH METHODS

The data used in this article is based on the listed companies in IDX (Indonesian Stock Exchange) that have disclosed any of their sustainability disclosures, such as GRI from 2020 to 2024. The financial data was acquired from the annual report of each listed company. The climate change disclosure data was acquired from the GRI index list in each of the listed companies' annual reports. The board's gender diversity and corporate governance data were also retrieved from the listed company's annual report and internet sources. The data analysis included Statistic descriptive, the correlation matrix and multivariate logistic regression.

Detailed description of the variables used in this study, along with their measurements. The dependent variable is the GRI Disclosure Index (GRID), which measures the extent of climate change disclosure based on the Global Reporting Initiative (GRI) framework, taking the value of one if the company reports climate-related information and zero otherwise (Butar-Butar & Itan, 2025). The independent variables consist of Board Gender Diversity (BGD), measured as the percentage of female members on the Board of Directors (Ramadana et al., 2024), and corporate governance variables, including Board Independence (INDE), which represents the proportion of independent directors on the board, and Board Size (BSIZE), defined as the total number of directors serving on the board (Butar-Butar et al., 2024; Itan et al., 2024).

To ensure the robustness of the model, several control variables are included. Firm Size (FIRMSIZE) is measured as the natural logarithm of total assets, while Leverage (LEV) represents the debt-to-equity ratio (Itan et al., 2024). Firm Age (AGE) is calculated as the logarithm of the number of years since the company's initial listing on the Indonesia Stock Exchange (IDX) plus one. In addition, the firm's financial performance is captured through Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM) (Butar-Butar, 2023). The Standard Industrial Classification (SIC) variable is also included to control for industry-specific effects. Investigated the effect of board gender diversity (BGD) and Corporate Governance (CG) on climate change disclosure using the following logistic regression model:

$$\begin{aligned} & \text{Logit}(P(\text{GRID}=1)) \\ & = \beta_0 + \beta_1 (\text{BGD}) + \beta_2 (\text{INDE}) + \beta_3 (\text{BSIZE}) + \beta_4 (\text{FSIZE}) + \beta_5 (\text{LEV}) + \beta_6 (\text{AGE}) \\ & + \beta_7 (\text{ROA}) + \beta_8 (\text{ROE}) + \beta_9 (\text{NPM}) + \beta_{10} (\text{SIC}) + \varepsilon \end{aligned}$$

RESULTS

The sample is consisted of company that were included in the IDX index from 2019–2023. Table 1 shows the summary statistics of al variables on account. Based on the table, an average of 39% of the sample company provided information to the GRI about climate change disclosure, although the sample company is relatively small, as demonstrated by the average size (Log total assets) of 13.313.

Table 2 displays the correlation analysis. Based on the results of the correlation analysis, it was found that the gender disclosure variable (GRIDISCLOSURE) has a positive and significant relationship with board gender diversity (BGD), board size (BOARDSIZE), company size (FSIZE), and company age (AGE), indicating that companies with higher gender diversity, larger board sizes, and those that are larger and longer established tend to be more open in disclosing information related to gender issues.

The correlation between GRIDISCLOSURE and financial performance variables such as ROA, ROE, and NPM, as well as capital structure variables such as LEV, is not significant, indicating that these financial factors do not directly influence a company's tendency to make gender disclosures.

Table 1. Statistic Descriptive

Variables	N	Mean	SD	Min	Max
GRID	147	0.390	0.250	0.000	0.857
BGD	147	0.174	0.181	0.000	0.727
INDE	147	0.169	0.259	0.000	1.000
BSIZE	147	6.714	2.545	0.000	12.000
FSIZE	147	13.313	0.745	11.144	15.149
AGE	147	1.576	0.251	0.602	1.959
ROA	147	0.080	0.084	-0.035	0.358
ROE	147	0.164	0.259	-0.116	1.451
NPM	147	0.194	0.560	-0.232	6.597
LEV	147	0.451	0.212	0.088	0.986

Table 2. Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11
GRID	1.000										
BGD	0.336*** (0.000)	1.000									
INDE	-0.148* (0.073)	0.155* (0.060)	1.000								
BSIZE	0.337*** (0.000)	0.270*** (0.001)	0.017 (0.833)	1.000							
FSIZE	0.168** (0.042)	0.106 (0.199)	-0.470*** (0.000)	0.478*** (0.000)	1.000						
AGE	0.327*** (0.000)	0.115 (0.167)	-0.136* (0.1000)	0.319*** (0.000)	0.274*** (0.001)	1.000					
ROA	0.029 (0.731)	-0.121 (0.121)	0.209** (0.011)	0.018 (0.830)	-0.042 (0.615)	0.213*** (0.009)	1.000				
ROE	0.117 (0.159)	0.051 (0.539)	0.129 (0.120)	0.267*** (0.001)	0.052 (0.530)	0.268*** (0.001)	0.803*** (0.000)	1.000			
NPM	0.103 (0.214)	-0.097 (0.242)	-0.122 (0.140)	0.154* (0.063)	0.300*** (0.0000)	-0.110 (0.185)	0.218*** (0.008)	0.139* (0.093)	1.000		
LEV	0.118 (0.153)	0.345*** (0.000)	-0.155* (0.060)	0.286*** (0.000)	0.275*** (0.001)	0.129 (0.118)	-0.224*** (0.006)	0.198** (0.016)	-0.118 (0.155)	1.000	
SIC	-0.103 (0.213)	0.367*** (0.000)	0.349*** (0.000)	0.199** (0.016)	0.17** (0.040)	0.119 (0.151)	-0.102 (0.221)	-0.005 (0.949)	0.102 (0.220)	0.292*** (0.000)	1.000

p-values in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01

In addition, there is a fairly high correlation between several control variables, such as between company size (FSIZE) and board size (BOARDSIZE), and between company age (AGE) and company size, indicating the potential for multicollinearity that needs to be considered in the regression model. These findings support the assumption that company structural factors and diversity in leadership have a greater influence on gender transparency than the company's financial condition.

Table 3 presents the results of the regression on GRIDISCLOSURE and any other variables. The results of the multivariate logistic regression analysis presented in Table 4 indicate that several independent variables significantly influence the probability of companies making gender disclosures. The board gender diversity (BGD) variable has a positive coefficient and is statistically significant at the 1% level ($\beta = 0.521$; $z = 4.37$), indicating that the more gender diversity in the composition of the board of directors, the more likely the company is to disclose gender-related information in its reporting. This finding supports the argument that gender diversity at the decision-making level can encourage transparency and more inclusive sustainability practices.

Furthermore, the board size variable also showed a positive and significant effect ($\beta = 0.027$; $z = 2.93$; $p < 0.05$), indicating that the larger the board size, the higher the company's tendency to disclose gender diversity. This may be due to the increased oversight capacity and diversity of perspectives held by a larger board. The age variable also had a significant positive effect ($\beta = 0.219$; $z = 2.80$; $p < 0.01$), indicating that longer-established companies have a greater tendency to disclose gender diversity issues, possibly because they have more mature reporting and governance systems.

Furthermore, an interesting finding is shown by the net profit margin (NPM) variable, which also has a significant positive effect ($\beta = 0.215$; $z = 3.08$; $p < 0.01$). This means that companies with higher profit efficiency are more likely to be open about gender issues, which may reflect their strategic approach to sustainability and corporate image. In contrast, variables such as firm size (FSIZE), return on assets (ROA), return on equity (ROE), and leverage (LEV) do not show a significant effect on gender disclosure. This suggests that financial factors do not directly encourage companies to make gender disclosures, but rather structural and governance factors play a more important role.

This model, which also controls for industry fixed effects, yields a pseudo-R² value of 0.138, indicating that the model explains approximately 13.8% of the variability in corporate decisions to disclose gender-related information. While this value is relatively modest, the results still provide valuable insights into the structural determinants of gender disclosure practices among companies.

Table 3. Regression Results

Variable	Coefficient	Z Stat
BGD	0.521***	(4.37)
INDEPENDENCE	-0.157	(-1.27)
BOARDSIZE	0.027***	(2.93)
FSIZE	-0.050	(-1.42)
AGE	0.219***	(2.80)
ROA	0.144	(0.30)
ROE	-0.066	(-0.47)
NPM	0.215***	(3.08)
LEV	0.000	(0.00)
Constant	0.507	(1.25)
Industry FE	Yes	
Observations	147	
Pseudo R2		0.138

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

DISCUSSION

The results of the multivariate logistic regression analysis show that board gender diversity (BGD) has a significant positive effect on the likelihood of companies disclosing

gender-related information ($\beta = 0.521$; $z = 4.37$; $p < 0.01$). This finding supports the Upper Echelons Theory, which states that individual backgrounds and characteristics in decision-making can influence company strategy and performance, including in sustainability reporting (Tacheva et al., 2020; Tjahjadi et al., 2021; Nie et al., 2025). This research also aligns with previous studies such as Lippi and Galavotti (2024), Babiker et al. (2025), and Mshana et al. (2025), which found that women on boards of directors tend to bring perspectives based on social and ethical concerns and have leadership styles that encourage transparency and accountability in climate and environmental reporting. Thus, gender diversity not only fulfills social responsibility but also has a positive impact on increasing corporate information disclosure.

Furthermore, the *BOARDSIZE* variable also has a significant positive effect ($\beta = 0.027$; $z = 2.93$; $p < 0.05$), indicating that boards with larger membership tend to have more diverse capacities and perspectives in overseeing and directing gender disclosure policies. This finding is supported by Resource Dependence Theory, where larger boards potentially provide access to diverse resources and insights, which encourage better sustainability reporting practices (Wijayanti & Setiawan, 2023; Khalaf, 2024; Naim & Alomair, 2024). Similarly, the *AGE* variable, which indicates company age, has a significant positive relationship ($\beta = 0.219$; $z = 2.80$; $p < 0.01$), reflecting that more mature companies tend to have established stronger governance and reporting systems, making them better prepared to respond to stakeholder transparency demands.

An interesting finding is also shown by Net Profit Margin (NPM), which has a significant positive effect ($\beta = 0.215$; $z = 3.08$; $p < 0.01$), indicating that companies with higher profit efficiency are also more likely to be open in reporting gender issues. This is in line with the view that companies with high profitability have stronger reputational incentives to project a positive image through engagement in sustainability reporting (Zimon et al., 2022; AlHares, 2025; Barker, 2025).

Variables such as *INDEPENDENCE*, *FSIZE*, *ROA*, *ROE*, and *LEV* do not show a significant effect, indicating that financial factors and board independence structure do not directly influence companies' tendency to disclose gender issues. Independence had a negative coefficient (-0.157) but lacked significance, suggesting that the proportion of independent board members does not meaningfully influence the outcome in this sample. Similarly, *FSIZE* (-0.050) and *LEV* (0.000) demonstrate negligible effects, implying that the overall size of the firm and its capital structure do not significantly alter the dependent variable. Profitability measures, *ROA* (0.144) and *ROE* (-0.066), also failed to reach significance, indicating that short-term financial performance does not have a strong explanatory power in this context. The lack of significance for these variables may reflect the moderating roles of other governance factors, firm characteristics, or contextual elements not captured in the model.

These results strengthen the hypothesis that corporate governance structures and gender diversity on boards play a crucial role in promoting information disclosure, particularly in the context of sustainability and climate reporting. These findings are also consistent with previous studies showing that board diversity, particularly the inclusion of women, contributes to improved corporate social responsibility practices and the achievement of Sustainable Development Goals (SDGs) targets, particularly those related to gender equality and climate action (Sekarlangit & Wardhani, 2021; Denhere, 2024; Faisal et al., 2024; Zamponi et al., 2024).

CONCLUSION

This study investigates how board composition influences climate change disclosure in Indonesia using data from the largest firms between 2019 and 2023, based on the GRI Corporate Climate Change Disclosure Database. Findings show that board independence strongly predicts climate disclosure, while the presence of female directors alone has little effect. However, independent female directors with professional qualifications and board influence positively contribute to voluntary climate disclosure, highlighting that not all female directors exert the same impact. These results are particularly relevant in contexts

with weak environmental regulation, high ownership concentration, and controlling shareholders.

The findings highlight the strategic importance of gender-diverse boards and strong corporate governance in enhancing climate change disclosure, which can improve transparency, stakeholder trust, and long-term competitiveness for firms, particularly in Indonesia. However, this study is limited by its focus on board independence and gender diversity, without considering other governance factors such as board tenure, foreign directors, audit committee expertise, or CEO duality. Future research could expand the range of governance variables, employ longitudinal or multi-year panel data to better capture causal effects, and use comparative analyses across emerging and developed markets to examine regulatory and cultural influences on disclosure. Additionally, qualitative or mixed-method approaches, including interviews with directors and sustainability officers, could provide deeper insight into the decision-making processes behind corporate environmental reporting, ultimately helping firms optimize governance and sustainability practices.

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