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GRI 301-306 Environmental Disclosures and SDG Reporting Quality among Indonesian Property Companies

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Abstract

This study investigates how corporate social responsibility (CSR) disclosure contributes to the environmental dimension of the Sustainable Development Goals (SDGs). The analysis uses a quantitative design and relies on secondary data obtained from the Indonesia Stock Exchange, company websites, annual reports, and sustainability reports. The sample consists of 82 property companies listed during the 2020–2024 period, resulting in 410 firm-year observations. Panel data regression analysis is applied to evaluate the relationship between environmental CSR disclosure and SDG reporting quality. The findings indicate that environmental disclosures influence SDG reporting quality differently. Energy disclosure and water disclosure have positive and statistically significant effects, with water disclosure showing the strongest effect. Material disclosure has a negative and statistically significant relationship with SDG reporting quality. In contrast, biodiversity, emissions, and waste disclosures do not show statistically significant effects. Overall, these findings suggest that SDG reporting quality in Indonesian property companies is more closely associated with substantive and measurable environmental practices related to energy efficiency and water management. The results also confirm that environmental CSR disclosure should not be treated as a single aggregate construct, because each GRI 301–306 dimension has different explanatory power in relation to SDG reporting quality.

KEYWORDS

corporate social responsibility; sdgs; gri environmental disclosures; environment; property companies.

Introduction

In contemporary business practice, CSR is no longer viewed merely as philanthropy or regulatory obedience. It has developed into a strategic approach that embeds social and environmental considerations into core corporate operations (Kumari & Pareek, 2025; Singh & Misra, 2021). This shift is driven by growing awareness of social and environmental issues, changing consumer expectations and increasing regulatory pressure (Ardiansyah & Alnoor, 2024). Consequently, CSR is now regarded as a strategic imperative that determines a company's legitimacy, reputation and sustainability, whilst simultaneously supporting the creation of long-term value through sustainable business practices and the strengthening of relationships with stakeholders (W. Li et al., 2025; Sharofiddin et al., 2024; Susanti et al., 2022). From this perspective, CSR reflects a company's commitment to mitigating the social and environmental impacts of its operational activities, as well as strengthening its contribution to economic development and the quality of life of communities (Marthadevi & Mimba, 2023; Sudirman & Disemadi, 2021). Consequently, CSR is no longer viewed as a cost factor, but rather as a strategic investment that can enhance customer loyalty, operational efficiency, reputation and the company's competitiveness (Evans & Kasztelnik, 2025; Irawan Dwi et al., 2021; Rizqi & Munari, 2023; Setiawan, 2023). However, the absence

of uniform implementation standards still leads firms to interpret CSR differently. As a result, some companies emphasise reputational appearance rather than delivering meaningful social and environmental outcomes (Zervoudi et al., 2025). Therefore, effective CSR strategies must authentically reconcile financial objectives with social responsibility in order to avoid accusations of hypocrisy and build a sustainable reputation for the organisation (Duarte and Coelho, 2026); 'Impact of Social Responsibility Strategies on the Perception of the Exemplary Organisation in the Global Fashion Industry',

Corporate Social Responsibility (CSR) is no longer understood merely as a philanthropic practice, but as a strategic tool that is increasingly playing a central role in supporting the achievement of the Sustainable Development Goals (SDGs). Although research on CSR and sustainability has expanded considerably, important conceptual and empirical gaps remain. Prior studies Chagas et al. (2022) have often examined CSR disclosure or SDG reporting at an aggregate level, which may obscure the different ways in which specific environmental disclosure dimensions contribute to SDG reporting quality. This study addresses this gap by adopting a disaggregated GRI 301–306 approach to examine environmental disclosures among Indonesian property companies. This approach is important because materials, energy, water, biodiversity, emissions, and waste disclosures differ in terms of operational relevance, stakeholder visibility, and measurability. Therefore, analysing these dimensions separately provides a more precise understanding of which environmental disclosures are substantively associated with SDG reporting quality and which may remain largely symbolic.

The originality of this study lies not merely in its Indonesian property-sector setting, but in its combination of sector-specific analysis, indicator-level environmental disclosure measurement, and panel data evidence. The property sector is theoretically relevant because its activities are closely connected to land development, material consumption, energy use, water management, emissions, biodiversity disturbance, and waste generation. By examining GRI 301–306 separately, this study contributes to the CSR–SDG literature by showing that environmental CSR disclosure should not be treated as a single aggregate construct. Instead, different environmental dimensions may have different explanatory power in relation to SDG reporting quality. In this way, the study provides both empirical and theoretical insight into the distinction between substantive sustainability disclosure and symbolic SDG reporting quality.

This contribution is important because previous studies have provided limited evidence on how specific environmental CSR disclosure dimensions can be measured at the indicator level and linked directly to SDG reporting quality (Banso et al., 2023; Sharofiddin et al., 2024). To date, there is no strong consensus on a framework capable of integrating environmental and social metrics strategically and operationally into the SDG agenda, which presents companies with the challenge of credibly measuring, comparing and reporting on their contributions (Paiva et al., 2025; Windari & Dewi, 2024). The lack of uniform reporting standards also undermines cross-sector and cross-regional assessments and limits the literature's ability to make informed generalisations regarding companies' contributions to sustainable development (Windari & Dewi, 2024).

At the same time, existing studies continue to have limitations in terms of both their content and geographical scope. Several review articles show that the number of publications on CSR and the SDGs has indeed increased significantly since 2019. Nevertheless, the majority continue to focus on specific SDGs, particularly SDGs 1, 4, 6, 8, 12 and 17, leading to an incomplete understanding of corporate contributions to all 17 Sustainable Development Goals (Dwivedi, 2023; Elalfy et al., 2021; Rekunenko et al., 2021). Furthermore, the dominance of Western perspectives in the literature has overlooked the complexity of local norms, institutional contexts and regional inequalities, which precisely determine the form and effectiveness of CSR implementation in supporting the SDGs (Joshi et al., 2025). This gap is becoming increasingly significant, as whilst many companies have begun to mention the SDGs in their reporting, only a small proportion actually treat them as strategic business priorities, whilst others continue to view the SDGs merely as symbolic narratives without integrating them substantively into corporate objectives (Nasreen et al., 2025).

The growing adoption of sustainability principles by global firms, including those operating in Indonesia, has encouraged the development of more sustainable business practices. In response, stakeholders increasingly expect companies to evaluate and disclose their contributions to the SDGs across the economic, social, and environmental dimensions, with sustainability reporting serving as a key communication mechanism (Erin et al., 2022; Global Reporting Initiative, 2020). From the perspective of stakeholder theory, sustainability reporting serves as a form of interaction between a company and its stakeholders (J. W. H. van der Waal & Thijssens, 2020a). Sustainability reporting is therefore important for companies as part of a framework for corporate sustainability, as it can support business continuity whilst simultaneously strengthening the company's competitive advantage

Data from the National Centre for Sustainability Reporting indicate that sustainability reporting in Indonesia expanded gradually. What began with only one voluntary report in 2006 had grown substantially by 2016, when 70 of 400 IDX-listed firms had already adopted sustainability reporting based on GRI guidelines (Gunawan et al., 2022). To strengthen this development, the Indonesian Financial Services Authority issued Regulation No. 51/2017, requiring companies to prepare sustainability reports after a two-year transition period. Consequently, since the end of December 2019, both domestic commercial banks and foreign banks operating in Indonesia have been required to produce sustainability reports. From 2020 onwards, this requirement also applies to other sectors.

Hourneaux Jr. et al. (2018) identify nine key indicators for assessing environmental performance in the industrial sector. These indicators are grounded in internationally recognized standards, particularly the GRI 300 series, which promotes consistency in sustainability reporting across organisations. The nine indicators include energy consumption, energy intensity, greenhouse gas emissions, water consumption, waste management, resource efficiency, disposal of hazardous waste, use of renewable energy, and implementation of recycling and reuse initiatives. Through these indicators, organisations are able to evaluate environmental impacts more systematically and in measurable terms.

Prior research by Liang & Renneboog (2017) suggests that environmental CSR practices in the real estate sector are highly heterogeneous, with firms adopting different sustainability priorities and strategies. For that reason, examining the property sector specifically is more appropriate than relying on a broad cross-industry sample. The impacts of CSR on the environmental dimensions of the SDGs are not merely direct. They are also determined by factors such as green innovation and the adoption of environmentally friendly technologies (Pignoni, 2024). Recent studies also place the real estate industry at the centre of sustainability discussions, highlighting its environmental footprint and strategic relevance for sustainability research Riratanaphong & Pewklieng (2024); Shahid et al. (2024) and Walker & Goubran (2020); therefore, research on environmental CSR in real estate companies is appropriate both theoretically and practically and opens up

research opportunities to investigate mechanisms related to the optimal impact of CSR on the environment within the real estate sector.

The Global Reporting Initiative (GRI) is widely recognized as one of the main reference frameworks for sustainability reporting because it provides standardized indicators for disclosing organisational economic, environmental, and social impacts (Bebbington et al., 2017; Villiers et al., 2022).

To support corporate alignment with the SDGs, UNGC and GRI introduced several reporting tools, including the SDG Compass launched in 2015 (Global Reporting Initiative, 2015; United Nations, 2015). Later guidance connected each of the 17 SDGs with relevant GRI Standards, thereby helping companies incorporate SDG-related information into their sustainability reports (García-Vinuesa et al., 2025).

The relationship between the GRI Standards and the SDGs has been widely discussed in recent studies, particularly in relation to the SDG Compass. García-Sánchez & García-Sánchez (2020) show that institutional investors, including foreign investors and pension funds, are increasing the relevance of the information disclosed in relation to the 2030 Agenda. Avrampou et al. (2019) also found that the contribution to the SDGs in the annual sustainability reports of major European banks remains relatively low.

Other sectoral studies have also examined the suitability of the GRI Standards for operationalising the SDGs and as a framework for analysing the relationship between GRI and the SDGs (Perello-Marin et al., 2022). Although the integration *of the SDG Compass* remains limited, the use of the GRI guidelines for implementing the SDG indicators is already widespread among large companies (García-Sánchez & García-Sánchez, 2020).

Literature review

Corporate Social Responsibility and the Sustainable Development Goals

According to stakeholder theory, CSR becomes more effective when a firm considers the expectations of parties influenced by its activities, such as communities, regulators, investors, and the natural environment (Friedman, 1962). In the context of sustainability, CSR functions not only as a tool for regulatory compliance but also as a cooperative strategy for building social legitimacy and integrating sustainability values into business operations (Setiawan, 2023). Consequently, the greater the involvement of stakeholders in the planning and implementation of CSR, the greater the company's potential to achieve better environmental performance.

This argument is consistent with legitimacy theory, which holds that firms depend on social approval to maintain their continued existence. In this context, sustainability reporting serves as a strategic mechanism for companies to demonstrate alignment between operational activities and societal expectations regarding sustainable development (Sicoli et al., 2024). However, if reporting is merely symbolic in nature, the contribution of CSR to the SDGs tends to be weak and insignificant (Silva, 2021). Thus, the effectiveness of CSR in supporting environmental SDGs is determined not only by the existence of CSR programmes per se, but also by the extent to which companies can meaningfully engage stakeholders and secure social legitimacy through substantive sustainability practices.

This relationship becomes especially important in the property sector because corporate activities directly affect surrounding communities and environmental conditions (De Serres & Maldini, 2023; Vasiljeva et al., 2023). Findings from (López-Concepción et al., 2021; Vola et al., 2025)suggest that stakeholder engagement, the disclosure of sustainability data and social legitimacy are key elements that explain how CSR can improve environmental performance and support the achievement of the SDGs. Based on this, it can be assumed that CSR has a positive influence on the achievement of the environmental dimension of the SDGs, and this influence will be even stronger if companies are able to effectively build *stakeholder engagement* and social legitimacy.

Sustainable Development Goals

The United Nations 2030 Agenda for Sustainable Development emphasises the crucial role that companies play as drivers of finance, technology and resources for sustainability. Indeed, the Agenda explicitly calls for action not only from governments, but also from the private sector and civil society (Mio et al., 2020). As opportunities open up for companies to achieve sustainability through the SDGs, it becomes relevant, given the essential role of the private sector, to observe how this sector is progressing in the implementation of the 17 SDGs.

According to X. Li (2020) and Stuart (2017), the 2030 Agenda reflects the approach to sustainability globally for the period 2015–2030. Indeed, this Agenda emphasises the need to view people, the planet, prosperity, peace and partnerships as the foundation for achieving global sustainable development (Cantele et al., 2018).

Reporting on the SDGs is increasingly becoming the focus of various researchers (Matuszak et al., 2025). SDG reporting helps companies organize, monitor, and communicate their efforts to contribute to global development targets (Ordonez-Ponce & Khare, 2021). According to (J. Waal & Thijssens, 2020), the experience gained and knowledge developed through reporting can serve as a starting point for understanding a company's sustainability commitments and its contributions to the SDGs. Sustainability reports are largely published on the basis of the Global Reporting Initiative (GRI) standards, which provide a comprehensive set of indicators for assessing a company's contribution to the SDGs (Bebbington & Unerman, 2018). The GRI standards can thus help companies report on their impact on the SDGs (García-Sánchez & García-Sánchez, 2020).

Unlike prior studies that primarily relied on keyword frequency to identify SDG reporting, this framework emphasises the quality and accuracy of the disclosures rather than the mere appearance of SDG-related terms in sustainability reports (Silva, 2021a; J. W. H. van der Waal & Thijssens, 2020b). Furthermore, while earlier research generally assessed reporting accuracy at the level of SDG goals, the present framework evaluates it at the indicator level by examining the extent of alignment between GRI indicators and SDG indicators Cantele et al.,(2018); Pizzi et al., (2021). This indicator-level approach improves measurement validity because it assesses the substantive alignment between environmental disclosure items and SDG-related reporting, rather than merely identifying the presence of SDG-related keywords. Keyword-based approaches may capture symbolic references to the SDGs, but they do not necessarily indicate whether companies disclose measurable actions, targets, or environmental management practices. By contrast, indicator-level measurement allows this study to evaluate whether GRI 301–306 disclosures are meaningfully connected to SDG reporting quality. This approach therefore provides a more precise interpretation of corporate SDG contributions and helps distinguish substantive sustainability reporting from symbolic disclosure

In the context of the property sector in Indonesia, the application of GRI 300 is highly relevant, as property development and management activities have a significant impact on the environment. Ordonez-Ponce & Khare (2021) explain that GRI 300 can serve as a measurement tool for assessing corporate contributions to the Sustainable Development Goals. In the Indonesian property sector, environmental reporting through GRI is relevant for

demonstrating corporate transparency in natural resource management, construction waste control, and compliance with sustainable development principles. The GRI 300 series, which has been adopted as a standard and used as a measurement framework in this study, comprises GRI 301–306, consisting of six main indicator categories that comprehensively cover environmental dimensions: materials, energy, water, biodiversity, emissions, and waste (Global Reporting Initiative, 2020).

GRI 301 Disclosure and SDG Reporting quality

More comprehensive disclosure on materials and resource use under GRI 301 is expected to increase the likelihood that a company can demonstrate tangible contributions to the SDGs, particularly with regard to responsible consumption and production, resource efficiency and circular economy practices. Research by García-Vinuesa et al. (2025) show that the application of GRI standards in sustainability reporting is associated with better SDG performance and reporting. GRI helps companies to structure information on environmental, social and governance issues in such a way that their contributions to the SDGs become clearer and more measurable. Similarly, research by Lungu et al. (2025) show that transparency in the disclosure of environmental, social and governance (ESG) information is regarded as a factor that can increase the prioritisation of the SDGs in sustainability reporting. Although broader GRI 301 disclosure may improve transparency regarding material use, material disclosure in the property sector may also reflect higher consumption of resource-intensive construction inputs. Therefore, the relationship between GRI 301 disclosure and SDG reporting quality may depend on whether material disclosure represents substantive sustainability practices or merely the reporting of material consumption. A study conducted by Zampone & Guidi (2024) examines the influence of the degree of compliance with GRI standards on the scope and depth of SDG disclosures in sustainability reports. It is expected that a higher degree of compliance will lead to more comprehensive and in-depth disclosures.
H1: GRI 301 material disclosures has a significant effect on SDG reporting quality.

GRI 302 disclosure and SDG reporting quality

Sustainable Development Goals (SDGs) of companies, particularly in the energy sector, which is characterised by high resource intensity and significant environmental impacts (Molnár et al., 2024). In this context, energy disclosure reflects more than transparency alone, it also signals a firm's commitment to efficiency improvement, emissions reduction, and progress toward SDGs related to clean energy and climate action.

Specifically, the study by Meiryani et al. (2023) examines the relationship between the quality of GRI 302 disclosures and the completeness of SDG reporting, emphasising that more complete and well-structured disclosure may strengthen the informational quality of sustainability reports. The study focuses on companies listed on the Indonesian stock exchange, as listed companies play a key role in meeting transparency and accountability requirements towards stakeholders.
H2: GRI 302 disclosures have a positive impact on SDG reporting quality

GRI 303 disclosures and SDG reporting quality

GRI 303 disclosures, which focus on aspects of water management, play a crucial role in improving the quality of reporting on the Sustainable Development Goals (SDGs), particularly with regard to clean water and sanitation (SDG 6). Through transparent disclosures on the use, efficiency and management of water resources, companies can demonstrate their commitment to environmental sustainability. An assessment framework for water utilities in Italy uses the GRI 303 standard to evaluate how companies protect water resources and contribute to sustainable development (Cantele et al., 2018). A systematic review of water accounting also confirms that the integration of water reporting into frameworks such as GRI is crucial to supporting the achievement of the SDGs. However, significant challenges remain regarding reporting standards and scope (Nurlita et al., 2025).
H3: GRI 303 disclosures have a positive effect on SDG reporting quality

GRI 304 disclosures and SDG reporting quality

GRI 304 is a topic-specific standard on biodiversity. Previous studies indicate that GRI 304 disclosure is relevant for evaluating corporate contributions to SDGs 14 and 15, which address aquatic and terrestrial ecosystems as well as to other environmental SDGs. However, the quality and depth of the reports often still leave much to be desired. The integration of the SDGs into GRI-based reporting (via the SDG Compass) makes reports more relevant, structured and useful for investors in assessing contributions to the 2030 Agenda (García-Sánchez, Aibar-Guzmán, et al., 2020; García-Sánchez, Rodríguez-Ariza, et al., 2020). GRI 304 contains more biodiversity disclosure requipments compared broader sustainability standards. However, the standard is often criticized for providing limited emphasis on concrete action plans and extinction risk, which may also create room for greenwashing (Haque & Jones, 2020).
H4: GRI 304 disclosures have a positive impact on SDG reporting

GRI 305 disclosure and SDG reporting quality

Asare et al. (2022) indicate that GRI 305 emissions disclosure is relevant to SDG reporting because it reflects corporate climate-related actions, particularly in relation to SDG 13 on Climate Action. In the property sector, emissions are not only associated with direct production activities but also with building energy consumption, electricity use, heating, ventilation, and air conditioning systems, construction activities, and property management operations. Previous studies on construction and real estate sustainability also emphasise that emissions management is an important component of environmental responsibility in the built environment (Shahid et al., 2024b; Walker & Goubran, 2020). Therefore, GRI 305 disclosure remains theoretically relevant for examining how property companies communicate their commitment to environmental impact management and SDG-related reporting.
H5: GRI 305 disclosures have a positive effect on SDG reporting quality

GRI 306 disclosure and SDG reporting quality

GRI 306 disclosure provides evidence of how companies manage solid and liquid waste and how these practices relate to environmental goals, particularly SDGs 6, 12, 14, and 15 (Calabrese et al., 2021; Davianti & Putri, 2022). By applying the GRI 306 indicators, companies can present the volume, type and treatment methods of waste in a structured manner, thereby enabling the contribution to SDG targets such as sustainable waste management, protection of terrestrial and marine ecosystems, and prevention of water pollution to be measured and compared. Research in the mining and environmentally impactful industrial sectors shows that the implementation of GRI 306 improves the completeness and comparability of reports. Overall, however, the level of disclosure regarding waste and wastewater remains low and does not yet fully support SDG 6 or other environment-related SDGs (Andrian et al., 2022; Elrazaz et al., 2024). Therefore, the hypothesis is:

H6: GRI 306 disclosures have a positive effect on SDG reporting quality

Methods

This study uses secondary data collected from property companies listed on the Indonesia Stock Exchange during the 2020–2024 period. The data were obtained from annual reports and sustainability reports published on the IDX website and the official websites of the sampled firms. The sample was selected using purposive sampling based on several criteria: companies classified in the property sector, companies consistently listed during the observation period, and companies with accessible annual reports or sustainability reports containing the required environmental and SDG-related information. The final sample consists of 82 companies observed over five years, resulting in 410 firm-year observations. Therefore, the unit of analysis in this study is firm-year observation.

The independent variables consist of environmental disclosure scores based on GRI 301, GRI 302, GRI 303, GRI 304, GRI 305, and GRI 306. Each disclosure item was measured using content analysis, where disclosed items were assigned a score of 1 and undisclosed items were assigned a score of 0. The disclosure index for each GRI dimension was calculated by dividing the number of disclosed items by the total number of applicable items in each GRI category. Therefore, higher index values indicate a higher level of environmental disclosure.

The dependent variable in this study is SDG reporting quality. This variable was measured by assessing the extent to which company reports disclosed information aligned with relevant SDG indicators, particularly those related to environmental sustainability. Similar to the GRI disclosure variables, SDG reporting quality was measured using a disclosure index, where disclosed SDG-related items were assigned a score of 1 and undisclosed items were assigned a score of 0. The total score was then divided by the number of applicable SDG-related items. A higher score indicates better SDG reporting quality.

This study does not include control variables in the main regression model. The model focuses specifically on examining the direct relationship between disaggregated environmental disclosure dimensions, namely GRI 301, GRI 302, GRI 303, GRI 304, GRI 305, and GRI 306, and SDG reporting quality (Figure 1). This approach is consistent with the objective of the study, which is to identify which environmental disclosure dimensions have stronger explanatory power in relation to SDG reporting quality. Nevertheless, the absence of control variables is acknowledged as a limitation, and future studies are encouraged to include firm-level control variables such as firm size, profitability, leverage, and firm age to obtain more comprehensive results

The data were analysed using panel data regression with EViews 12. To determine the most appropriate panel regression model, three specification tests were conducted: the Chow test, the Hausman test, and the Breusch-Pagan Lagrange Multiplier test. The Chow test was used to compare the common effect model and the fixed effect model. The Hausman test was used to compare the fixed effect model and the random effect model. The Lagrange Multiplier test was used to compare the common effect model and the random effect model. Based on the model selection results, the Chow test rejected the common effect model, the Hausman test supported the random effect model over the fixed effect model, and the Lagrange Multiplier test confirmed that the random effect model was preferable to the common effect model. Therefore, the random effect model was selected as the most appropriate model for hypothesis testing.

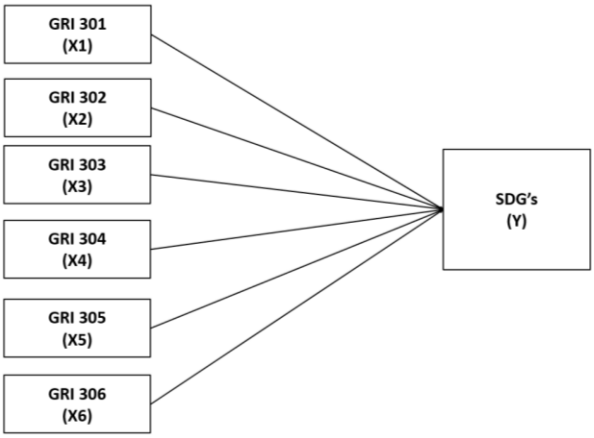


Figure 1. Research framework

Result and Discussion

Table 1 presents the descriptive statistics for 410 firm-year observations, consisting of 82 property companies observed during the 2020–2024 period. The mean value of SDG reporting quality is 0.678688, indicating that the sampled firms generally show a relatively moderate to high level of SDG-related disclosure. Among the environmental disclosure dimensions, GRI 303 has the highest mean value of 0.557613, followed by GRI 302 at 0.541254 and GRI 306 at 0.540244. This suggests that water, energy, and waste disclosures are relatively more frequently reported by property companies. In contrast, GRI 304 has the lowest mean value of 0.441254, indicating that biodiversity disclosure remains relatively less developed among the sampled firms.

The standard deviation values show that the level of disclosure varies across companies and years. SDG reporting quality has the highest standard deviation of 0.282240, indicating substantial differences in the extent and quality of SDG reporting among the observed firms. The Jarque-Bera probability values indicate that most variables are not normally distributed at the 5% significance level, although GRI 303 has a probability value of 0.057402, which is slightly above 0.05. The skewness values also show that most GRI disclosure variables are positively skewed, while SDG reporting quality is negatively skewed.

Overall, the descriptive statistics suggest that although SDG reporting quality is relatively higher than several environmental disclosure dimensions, the consistency of GRI-based environmental disclosure still differs across firms. This indicates that property companies do not disclose all environmental dimensions equally, leaving room for improvement in the quality, balance, and consistency of sustainability reporting

The Chow test result is statistically significant at the 5% level, indicating that the null hypothesis should be rejected (see Table 2). Therefore, the common effect model is not appropriate, and the fixed effect model is preferred over the common effect model.

Based on the Hausman test, the probability value is 0.1646, which is greater than 0.05 (see Table 3). This indicates that the null hypothesis cannot be rejected. Therefore, the random effect model is preferred over the fixed effect mode

Based on the LM test, the probability value is 0.0000, which is lower than 0.05 (see Table 4). This means that the null hypothesis is rejected. Therefore, the random effect model is preferred over the common effect model.

Table 1. Descriptive statistics (n=410)

	GRI_301	GRI_302	GRI_303	GRI_304	GRI_305	GRI_306	SDGs
Mean	0.503496	0.541254	0.557613	0.441254	0.456521	0.540244	0.678688
Median	0.333333	0.600000	0.600000	0.500000	0.428571	0.600000	0.833333
Maximum	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1,000000
Minimum	0.200000	0.142857	0.142857	0.000000	0.142857	0.000000	0.166667
Standard deviation	0.184041	0.185657	0.226696	0.220965	0.256729	0.239995	0.282240
Skewness	0.421599	0.214875	0.198780	0.439130	0.606007	0.226206	0.455614
Kurtosis	2.112675	3.627631	2.579876	3.323762	2.421497	2.320225	1.887499
Jarque-Bera	25.59645	9.884532	5.715357	14.96777	30.81220	11.39065	35.32822
Probability	0.000003	0.007138	0.057402	0.000562	0.000000	0.003362	0.000000
Total	206.4333	221.9143	228.6214	180.9143	187.1738	221.5000	278.2619
Sum of squared deviations	13.85332	14.09762	21.01894	19.96971	26.95709	23.55751	32.58078
Observation	410	410	410	410	410	410	410

Source: Eviews12 data analysis results

Table 2. Chow test

Effect test	Statistic	F.	Prob.
F cross-section	20.260886	(24.96)	0.0000
Chi-square contingency table	225.321385	24	0.0000

Source: Eviews 12 data processing results

Table 3. Hausman test dan tabel

Test summary	Chi-square statistic	Chi-square d.f.	Probability
Common distributed across the sections	9.162436	6	0.1646

Source: Eviews 12 data processing results

Table 4. LM test

	Test hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	42.75895	392.1083	434.8672
	(0.0000)	(0.0000)	(0.0000)
Honda	6.539033	19.80172	18.62573
	(0.0000)	(0.0000)	(0.0000)
King Wu	6.539033	19.80172	20.74870
	(0.0000)	(0.0000)	(0.0000)
Honda Standard	6.858061	22.54088	13.97374
	(0.0000)	(0.0000)	(0.0000)
King-Wu standard	6.858061	22.54088	20.28742
	(0.0000)	(0.0000)	(0.0000)
Gourieroux et al.	--	--	434.8672
			(0.0000)

Source: Eviews 12 data processing results

Result

Based on the panel model specification tests, the random effect model was selected as the most appropriate estimation model. Therefore, the regression analysis was conducted using the random effect model to examine the effect of GRI 301, GRI 302, GRI 303, GRI 304, GRI 305, and GRI 306 disclosures on SDG reporting quality. The results are presented in Table 5:

Based on the estimated coefficients from the random-effect model presented in Table 5, the regression equation can be expressed as follows:

SDGs_it = 0.524140 - 0.224678GRI_301_it + 0.230253GRI_302_it + 0.246659GRI_303_it - 0.079155GRI_304_it + 0.046315GRI_305_it + 0.035707GRI_306_it + u_i + e_it

Where SDGs_it represents SDG reporting quality for firm i in year t, u_i represents the firm-specific random effect, and e_it represents the idiosyncratic error term. The equation above uses the estimated coefficients from the random-effect model. The probability values are not included in the equation because they are used only to determine statistical significance, not to represent the magnitude of the effect.

The random-effect model estimation results show that GRI_301 has a negative and statistically significant effect on SDG reporting quality, with a coefficient of -0.224678 and a probability value of 0.0058. This indicates that higher material disclosure is associated with lower SDG reporting quality among the observed companies. In contrast, GRI_302 and GRI_303 have positive and statistically significant effects on SDG reporting quality, with probability values of 0.0038 and 0.0005, respectively. These findings indicate that energy and disclosures significantly contribute to improving SDG reporting quality. Meanwhile, GRI_304, GRI_305, and GRI_306 do not have statistically significant effects at the 5% level, as their probability values are 0.2013, 0.4310, and 0.5490, respectively. Therefore, biodiversity, emissions, and waste disclosures do not provide statistically strong evidence in explaining SDG reporting quality in this model.

Based on the table above, the calculated JB value is 30.69875 with a probability value of 0.178277 (see Graph 1). As the probability value is greater than 0.05, it is concluded that the data residuals are normally distributed.

Table 6 shows the correlation between the GRI and SDG variables. The SDGs show a positive correlation with most variables, particularly with GRI 303 (0.2515) as the highest value, followed by GRI 302 (0.1918), GRI 305 (0.1489) and GRI 306 (0.1217). At the same time, the SDGs show a weak negative correlation with GRI 301 (-0.0444) and GRI 304 (-0.0407).

Among the independent variables, the highest correlations were observed between GRI 302 and GRI 303 (0.3576) and between GRI 303 and GRI 305 (0.3266), indicating a relatively strong relationship. In general, all correlation values continue to be classified as low to moderate (< 0.4), so there are no signs of strong multicollinearity in the model.

Based on Table 7, each of the variables X1, X2, X3, X4, X5, and X6 has a Sig value greater than 0.05. As there are variables with a Sig value of over 0.05, it is concluded that there is no violation of the assumption of heteroscedasticity.

Results of the panel data regression

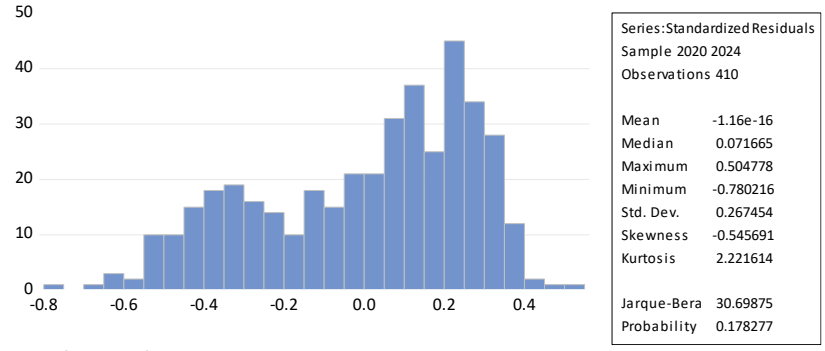
Having identified the best model for this study, it can be concluded that the random effect model is the most suitable.

Table 5. Random Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Result	Decision
C	0.524140	0.065502	8.001849	0.0000		
GRI_301	-0.224678	0.081041	-2.772400	0.0058	Negative and Significant	Supported in term of significance
GRI_302	0.230253	0.079124	2.910032	0.0038	Positive and Significant	Supported
GRI_303	0.246659	0.070411	3.503122	0.0005	Positive and Significant	Supported
GRI_304	-0.079155	0.061842	-1.279952	0.2013	not significant	Not Supported
GRI_305	0.046315	0.058750	0.788351	0.4310	not significant	Not Supported
GRI_306	0.035707	0.059532	0.599798	0.5490	not significant	Not Supported

Source: Eviews 12 data processing resultswater

Graph 1. Normality test



Source: Eviews12 data processing results

Table 6. Multicollinearity test (correlation between independent variables)

	SDGS	GRI_301	GRI_302	GRI_303	GRI_304	GRI_305	GRI_306
SDGs	1.000000						
GRI_301	-0.044444	1.000000					
GRI_302	0.191763	0.133268	1.000000				
GRI_303	0.251547	0.260205	0.357626	1.000000			
GRI_304	-0.040657	0.135901	0.004329	0.166059	1.000000		
GRI_305	0.148871	0.253962	0.243033	0.326583	0.040979	1.000000	
GRI_306	0.121723	0.157377	0.235764	0.195781	-0.065310	0.239709	1.000000

Source: Eviews 12 data processing results

Table 7. Heteroscedasticity test

Variable	Coefficient	Standard error	t-statistic	Probability
C	0.195390	0.030923	0.000000	0.0000
GRI_301	-0.008981	0.039527	-0.227202	0.8204
GRI_302	0.143585	0.040397	3.554367	0.7894
GRI_303	-0.034610	0.034545	-1.001909	0.3170
GRI_304	0.021526	0.031769	0.677579	0.4984
GRI_305	-0.007873	0.029292	-0.268764	0.7882
GRI_306	-0.050726	0.030215	-1.678807	0.9940

Source: Eviews 12 data processing results

Table 8. Coefficient of determination

	Weighted statistics		
MSE-squared	0.263265	R-squared	0.279940
Mean of the dependent variable	0.941158	Adjusted R-squared	0.269219
Standard deviation of the dependent variable	0.774651	Standard error of the regression	0.265542
Sum of squares of the residuals	28.41655	F-statistic	26.11259
Durbin-Watson statistic	1.058514	Probability (F-statistic)	0.000000

Source: Eviews 12 data processing results

The following table presents the estimation results using the random effect model:

Coefficient of determination

Based on Table 8, the model explains 27.99% of the variation in the dependent variable, as indicated by the R-squared value of 0.279940. This means that the remaining 72.01% of the variation is explained by other factors outside the model. Therefore, although the GRI environmental disclosure variables contribute to explaining SDG reporting, a substantial proportion of variation remains influenced by variables not examined in this study.

The panel regression results, based on 82 firms and 410 firm-year observations from 2020 to 2024, indicate that the

influence of environmental disclosure on SDG reporting differs across GRI dimensions. The findings show that GRI 301 has a negative and significant effect on SDG reporting, while GRI 302 and GRI 303 have positive and significant effects. Meanwhile, GRI 304, GRI 305, and GRI 306 do not significantly affect SDG reporting. These differences suggest that environmental disclosure dimensions have varying relevance and explanatory power in the property sector.

The positive effects of GRI 302 and GRI 303 indicate that energy and water disclosures are closely linked to SDG reporting because these dimensions are directly associated with operational efficiency, environmental management, and sustainability performance in property companies. In the property sector, energy use and water consumption are highly visible environmental issues due to the sector's intensive use of buildings, infrastructure, and utilities. Stakeholders, including investors and regulators, tend to pay greater attention to disclosures related to energy efficiency and water management because these aspects are directly connected to sustainable building practices and environmental responsibility. Therefore, firms that disclose more comprehensive information regarding energy and water management are more likely to demonstrate stronger commitments to SDG implementation.

In contrast, GRI 301 shows a negative and significant relationship with SDG reporting. This finding may indicate that material disclosure in the property sector does not necessarily reflect better sustainability practices. Property companies rely heavily on construction materials such as cement, steel, and other resource-intensive inputs that are often associated with high environmental impacts. As a result, higher material disclosure may reflect greater material consumption and environmental burden rather than improved sustainability performance. From the perspective of legitimacy theory, firms may disclose extensive material-related information to respond to stakeholder pressure and maintain legitimacy, even when actual environmental improvements remain limited. This suggests a possible gap between disclosure quantity and disclosure quality.

Meanwhile, the insignificant effects of GRI 304, GRI 305, and GRI 306 may be explained by sector characteristics and measurement limitations. Biodiversity disclosure (GRI 304) is often less relevant for many property firms because biodiversity impacts are generally site-specific and long-term, making them difficult to measure consistently across companies. Similarly, emissions and waste disclosures may not yet be fully integrated into SDG-oriented reporting practices in the property sector. Many firms may disclose emissions and waste information primarily to comply with reporting standards rather than to demonstrate measurable sustainability outcomes. In addition, differences in reporting quality, disclosure depth, and the lack of standardized sustainability metrics may weaken the statistical relationship between these disclosure dimensions and SDG reporting. Therefore, although biodiversity, emissions, and waste disclosures are conceptually important, their contribution to explaining SDG reporting quality remains limited in this study.

GRI 301 Disclosure on the SDGs

The implementation of GRI 301 standards, which focuses on material disclosure, often creates data inconsistencies, as companies tend to obscure significant negative environmental impacts in order to emphasise their positive contributions toward SDG targets (Chagas et al., 2022). This finding is consistent with the regression results, where GRI 301 shows a negative and significant effect on SDG reporting, with a coefficient value of -0.224678 and a probability value of 0.0058. This indicates that higher material disclosure is associated with lower SDG reporting quality among the observed firms. This selective reporting practice is reinforced by the flexibility of the materiality principle, which allows companies to disclose only indicators that support their corporate image, thereby limiting transparency regarding the actual environmental impacts of real estate sector operations (De Villiers & Van Staden, 2006). Furthermore, the misalignment between GRI 301 standards and SDG indicators creates difficulties in comparing sustainability performance across companies, as organisations frequently fail to comprehensively identify and disclose all relevant material issues (Adams & Mueller, 2022). This condition is further exacerbated by the lack of adequate sector-specific guidelines capable of bridging the relationship between materiality data and the complex SDG targets, making it difficult for companies to translate material disclosures into substantive sustainability actions (Ordonez-Ponce & Khare, 2021a). As a result, a gap emerges between the sustainability commitments claimed by companies and the actual implementation of such commitments within their operational activities (Ionaşcu et al., 2020). Ambiguity in the interpretation of disclosure topics also creates difficulties in assessing the relationship between material reporting and its contribution to individual SDG goals (Idawati & Hanifah, 2022).

Moreover, the output-based approach adopted in GRI 301 often fails to represent the actual environmental impacts, thereby limiting companies' ability to demonstrate substantive contributions toward SDG achievement (Ordonez-Ponce & Khare, 2021a). This limitation creates opportunities for greenwashing due to the flexibility of GRI standards, which enables companies to prepare symbolic disclosures without being accompanied by substantive environmental improvements. In practice, companies tend to employ selective disclosure by highlighting decorative environmental information in order to maintain social legitimacy, while important aspects related to environmental impacts remain insufficiently disclosed in a transparent manner (Papa et al., 2022).

This phenomenon indicates that material disclosure in the real estate sector is still frequently trapped in symbolic actions rather than substantive sustainability implementation, thereby encouraging SDG-washing practices aimed at enhancing corporate legitimacy without genuine integration into sustainable operational strategies (Silva, 2021b). In addition, heterogeneity in sustainability reporting practices creates difficulties for stakeholders in conducting objective evaluations and performance comparisons, as the indicators used are often subjective and unable to fully capture the complexity of corporate environmental impacts (Huq & Mohammadrezaei, 2024). The lack of interdisciplinary expertise in preparing sustainability reports further weakens disclosure quality, resulting in reporting mechanisms that are still unable to comprehensively capture actual environmental impacts (Chopra et al., 2024).

GRI 302 Disclosure on the SDGs

The results indicate that GRI 302 disclosure has a positive and statistically significant effect on the achievement of Sustainable Development Goals (SDGs) in the real estate sector. This is reflected in the coefficient value of 0.230253, which suggests that an increase in the quality or extent of GRI 302 disclosure is associated with an improvement in sustainability performance related to the SDGs. Furthermore, the t-statistic value of 2.910032 exceeds the critical threshold of 1.96, while the probability value of 0.0038 is below the 5% significance level, confirming that the relationship is statistically significant. The standard error value of 0.079124 also indicates that the coefficient estimation is relatively stable and reliable.

The positive relationship can be explained by the fact that GRI 302 focuses on energy disclosure, including energy consumption, energy efficiency initiatives, and the use of

renewable energy sources. In the real estate sector, energy efficiency is strongly linked to operational performance because buildings represent one of the largest contributors to global energy consumption and carbon emissions. Consequently, companies that disclose energy management practices more comprehensively are often perceived as having stronger commitments toward sustainability and environmental responsibility (Ordonez-Ponce & Khare, 2021b). In addition, energy-related initiatives frequently generate direct economic benefits through cost efficiency, reduced operational expenses, and improved asset value, which strengthens the strategic relevance of GRI 302 disclosures within the property industry (Ramanathan & Isaksson, 2022)

From a theoretical perspective, these findings support legitimacy theory and stakeholder theory. Legitimacy theory suggests that firms disclose environmental information to maintain social acceptance and align corporate activities with societal expectations regarding sustainability (Deegan, 2002). Meanwhile, stakeholder theory argues that transparent energy disclosures help firms address the expectations of investors, regulators, tenants, and other stakeholders who increasingly demand sustainable business practices Freeman (1984). Therefore, companies with stronger GRI 302 disclosures are more likely to enhance their sustainability performance and contribute more effectively toward the achievement of SDGs. This finding is consistent with the study conducted by Newell et al. (2023), which stated that property companies with better energy management practices and energy disclosures tend to demonstrate stronger sustainability commitments and greater contributions toward the achievement of the SDGs.

GRI 303 Disclosure on the SDGs

The results indicate that GRI 303 disclosure has a positive and statistically significant effect on the achievement of Sustainable Development Goals (SDGs) in the real estate sector. This is reflected in the coefficient value of 0.246659, indicating that greater disclosure related to water management under GRI 303 is associated with improved sustainability performance. The relationship is statistically significant, as evidenced by the t-statistic value of 3.503122, which exceeds the critical threshold of 1.96, and the probability value of 0.0005, which is below the 5% significance level. Furthermore, the standard error value of 0.070411 suggests that the coefficient estimation is relatively stable and reliable.

The positive relationship may be explained by the increasing importance of water resource management within the real estate industry. GRI 303 emphasises water withdrawal, consumption, recycling, and efficiency practices, which are becoming critical sustainability concerns due to rising environmental pressures and urban resource constraints. In the property sector, efficient water management contributes not only to environmental sustainability but also to operational efficiency and long-term asset resilience. Companies that disclose water-related practices comprehensively can improve the transparency and accountability of water resource management and demonstrate stronger alignment with sustainable development objectives (Cantele et al., 2018). Mo reover, effective water management supports several SDGs, particularly Goal 6 (Clean Water and Sanitation) and Goal 11 (Sustainable Cities and Communities), thereby strengthening the strategic relevance of GRI 303 disclosures.

From a theoretical perspective, these findings are consistent with stakeholder theory and legitimacy theory. Stakeholder theory suggests that companies disclose environmental information to satisfy the expectations of investors, regulators, tenants, and the wider community regarding responsible resource management Freeman (1984). At the same time, legitimacy theory argues that transparent disclosure practices help firms maintain public trust and social legitimacy by demonstrating accountability for environmental impacts (Deegan, 2002). Therefore, firms with stronger GRI 303 disclosures are more likely to improve sustainability performance because water management is increasingly recognized as a key component of sustainable real estate development and long-term corporate resilience

GRI 304 Disclosure relating to the Sustainable Development Goals (SDGs)

The regression results show that GRI 304 has a negative but insignificant effect on SDG reporting, with a coefficient value of -0.079155, a t-statistic of -1.279952, and a probability value of 0.2013. Since the probability value is greater than 0.05, biodiversity disclosure does not significantly influence SDG reporting quality in the property sector. This finding may be explained by the characteristics of the property industry, where biodiversity issues are often site-specific, long-term, and difficult to measure consistently across companies. As a result, biodiversity disclosure tends to have limited comparability and weaker relevance to operational sustainability performance.

From the perspective of legitimacy theory, companies frequently use biodiversity disclosure as a symbolic reporting mechanism to maintain corporate legitimacy rather than to demonstrate substantive environmental performance (Diaz-Sarachaga, 2021). The flexibility of sustainability reporting standards also enables firms to engage in selective disclosure by emphasizing favorable environmental information while limiting transparency regarding actual ecological impacts (Olanipekun et al., 2020). Consequently, biodiversity disclosure may not fully reflect companies' real contributions to SDG achievement and may instead function as symbolic compliance to satisfy stakeholder expectations.

In addition, the absence of adequate sector-specific guidelines and the misalignment between biodiversity disclosure and SDG indicators make it difficult for companies to integrate biodiversity issues into measurable sustainability strategies Adams (2017) Megawati & Pratama (2024b). From the stakeholder theory perspective, property companies tend to prioritize disclosures that are more directly related to operational efficiency and stakeholder concerns, such as energy and water management, rather than biodiversity issues. This condition weakens the quality and consistency of biodiversity reporting, causing its contribution to SDG reporting to remain statistically insignificant in this study. This finding is consistent with the study conducted by Diaz-Sarachaga (2021) which stated that biodiversity disclosure in sustainability reports is often symbolic in nature and has not yet been able to reflect companies' actual contributions toward the achievement of the Sustainable Development Goals

GRI 305 Disclosure on the Sustainable Development Goals (SDGs)

The regression results show that GRI 305 has a positive but statistically insignificant effect on SDG reporting quality, with a coefficient value of 0.046315, a standard error of 0.058750, a t-statistic of 0.788351, and a probability value of 0.4310. Since the probability value is greater than 0.05, emissions disclosure does not have a statistically significant effect on SDG reporting quality in the property sector. This finding suggests that emissions disclosure may not yet be fully integrated into SDG reporting quality among Indonesian property companies. In the property sector, companies may prioritize operational and financial objectives over long-term emissions management because emissions reduction often requires substantial investment, technological adaptation, and changes in construction and property management processes. As a result, emissions disclosure may remain more compliance-

oriented than performance-oriented, which may explain why it does not show a statistically significant effect on SDG reporting quality.

From the perspective of legitimacy theory, firms may disclose emissions-related information primarily to maintain corporate legitimacy and respond to stakeholder expectations, rather than to demonstrate measurable environmental improvements that are reflected in SDG reporting quality (Silva, 2021b). Reporting behavior in this sector may therefore be influenced by impression management practices, in which companies emphasise symbolic sustainability narratives without clearly demonstrating how emissions management contributes to measurable SDG reporting quality. Awuah et al. (2023) and Squier & Booth (2023) also suggest that sustainability reporting may focus more on visibility and corporate image than on measurable environmental outcomes.

In addition, the statistically insignificant relationship may also be explained by measurement limitations and the lack of standardized integration between emissions disclosure indicators and SDG reporting quality indicators. Many companies still rely on descriptive reporting metrics that do not adequately capture the managerial implications of integrating SDGs into operational activities (Awuah et al., 2023). This finding is consistent with the arguments of This finding is consistent with Deegan (2002) , who distinguish between symbolic climate-related commitments intended to manage stakeholder perceptions and substantive commitments that are associated with measurable reductions in greenhouse gas emissions.

GRI 306 Disclosure in relation to the Sustainable Development Goals (SDGs)

Despite the increasing emphasis on waste management disclosure within the Global Reporting Initiative (GRI) framework, sustainability reporting in the property sector remains insufficiently aligned with SDG reporting quality. GRI 306 disclosure focuses on waste generation, waste treatment, recycling, reuse, and disposal practices. These disclosures are relevant for assessing how property companies manage environmental impacts arising from construction, building operations, renovation, and property management activities. However, waste-related disclosure in the property sector may still be limited, inconsistent, or compliance-oriented, which can weaken its ability to explain differences in SDG reporting quality (Diaz-Sarachaga, 2021). Companies tend to prioritize basic waste management metrics, such as waste generation and disposal, over more comprehensive disclosures related to waste reduction, recycling, reuse, and circular economy practices (Squier & Booth, 2023). This fragmented reporting approach reflects a tendency toward symbolic compliance rather than the substantive integration of sustainability strategies within corporate real estate practices. In this context, waste-related disclosures may be less visible and less directly connected to short-term operational efficiency or financial performance. This may explain why waste management disclosure has not yet shown a statistically significant contribution to SDG reporting quality in the property sector. Conversely, negative relationships may emerge because certain environmental disclosures impose additional compliance costs and operational burdens that are not immediately translated into financial or sustainability performance improvements. Moreover, the absence of standardized benchmarks further obscures the sector's actual contribution to the achievement of SDGs (Raidén & King, 2021).

The empirical findings of this study support this interpretation. Although GRI 306 shows a positive coefficient value of 0.035707, the relationship is statistically insignificant, as indicated by the t-statistic of 0.599798 and probability value of 0.5490, which exceeds the 5% significance threshold. This suggests that waste-related disclosures have not yet contributed significantly to SDG reporting quality in the real estate sector. One possible explanation is that waste management practices in real estate are often operationally indirect and heavily outsourced to third-party contractors, limiting firms' direct control over waste outcomes and reducing the strategic relevance of GRI 306 disclosures in SDG reporting. Furthermore, companies may disclose waste-related information mainly to demonstrate regulatory compliance, without clearly linking waste management initiatives to measurable SDG contributions. As a result, the positive but insignificant relationship may reflect the limited integration of waste management into broader sustainability strategies. These findings are consistent with prior arguments that sustainability disclosure can function as symbolic compliance when reporting is not supported by substantive operational integration (Dahlmann et al., 2017). Therefore, real estate companies need to strengthen the quality, specificity, and strategic orientation of GRI 306 disclosures by connecting waste reduction, recycling, reuse, and circular economy initiatives more explicitly to relevant SDG targets.

Conclusion

This study concludes that environmental disclosure influences SDG reporting quality differently across GRI 301–306 dimensions. This finding confirms that environmental CSR disclosure should not be treated as a single aggregate construct, because each disclosure dimension reflects different levels of operational relevance, measurability, and stakeholder visibility in the property sector. These findings suggest that the quality of corporate sustainability reporting responds more strongly to specific environmental issues that are directly related to operational efficiency, resource management and observable environmental impacts.

Disclosures on energy and water have proven to be the most consistent positive and statistically significant factors contributing to improved SDG reporting quality. This suggests that companies which present their management practices regarding energy consumption, water use and conservation, and emissions control more transparently tend to demonstrate better SDG reporting. These three aspects appear to be easier to integrate into companies' sustainability strategies, as they are closely linked to operational efficiency, compliance with environmental regulations and stakeholder requirements. In this context, water-related issues seem to play a dominant role, suggesting that water management is a crucial element in strengthening a company's contribution to the sustainable development agenda.

Conversely, material disclosure shows an inverse relationship with SDG reporting quality. This finding suggests that a higher level of disclosure on material aspects does not always lead to improved quality of reporting on the Sustainable Development Goals. This finding suggests that material disclosures among the companies examined may remain largely administrative in nature or have not yet been fully integrated into the strategic presentation of the SDGs. In other words, the information presented regarding the consideration of material aspects does not necessarily reflect a strong commitment to achieving broader sustainability goals.

With regard to biodiversity, the research findings show a negative trend, albeit one of relatively low magnitude. This suggests that biodiversity issues have not yet become a primary determinant of the quality of SDG reporting among the companies examined. A relevant explanation for this is that the benefits of biodiversity management are generally long-term and do not always translate directly into short-term sustainability successes. Furthermore, disclosures on biodiversity may still be limited in many companies, meaning

that their contribution to the quality of SDG reporting is not yet clearly discernible.

Waste disclosure shows a positive coefficient however, the relationship is not statistically significant. Therefore, this study cannot conclude that GRI 306 disclosure has a confirmed effect on SDG reporting quality. The positive but insignificant coefficient only suggests a possible tendency that requires further empirical investigation. This finding indicates that although waste management is conceptually aligned with sustainable development principles, the waste disclosure practices of the sampled companies may not yet be sufficiently detailed, consistent, or strategically integrated to explain differences in SDG reporting quality.

Overall, the findings indicate that SDG reporting quality is more strongly associated with environmental disclosures that are directly related to key resource use and observable operational impacts, particularly energy and water. In contrast, biodiversity, emissions and waste disclosures show statistically insignificant effects, indicating that these dimensions are not yet as strongly integrated into SDG reporting quality in the property sector. This finding extends the CSR–SDG literature by showing that environmental disclosure does not contribute to SDG reporting quality uniformly, but depends on the operational relevance, measurability, and strategic integration of each disclosure dimension. Consequently, companies must not only expand the scope of their environmental disclosures but also ensure that every aspect disclosed is genuinely integrated into their sustainability strategies and Sustainable Development Goals. These findings also suggest that high-quality SDG reporting requires a substantive approach and not merely formal compliance with disclosure standards.

The main contribution of this study lies in its disaggregated approach to environmental CSR disclosure. By examining GRI 301–306 separately, this study advances CSR–SDG research beyond prior studies that often treat CSR disclosure as a broad aggregate measure or assess SDG reporting in general terms. The findings show that energy and water disclosures are positively and significantly associated with SDG reporting quality, while material disclosure shows a negative and statistically significant association. In contrast, biodiversity, emissions, and waste disclosures show statistically insignificant effects. This provides new empirical evidence that the quality of SDG reporting depends not only on the amount of environmental information disclosed, but also on whether the disclosure reflects measurable and substantive sustainability practices. Therefore, this study contributes to the literature by clarifying the distinction between symbolic environmental reporting and substantive SDG-oriented disclosure in the Indonesian property sector.

Author contributions

Riani Sukma Wijaya contributed to the conceptualization, data collection, data analysis, and manuscript drafting. Sharul Effendy Bin Janudin contributed to supervision, methodology review, and critical revision of the manuscript. Nor Hanani Binti Ahamad Rapani contributed to supervision, validation, and final manuscript review. All authors have read and approved the final version of the manuscript.

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