
Determinants of Corporate Water Disclosure in Indonesia

Erna Hidayah¹

Muhammad Panunggal Jati²

^{1,2}Universitas Islam Indonesia, Faculty of Business and Economics,
Condong Catur, Yogyakarta, Indonesia

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Abstract

This study analyses the determinants of corporate water disclosure in Indonesian consumer goods companies listed on the Indonesia Stock Exchange (IDX) during the 2019–2021 period. The consumer goods sector is selected due to its high water dependence and consumer reputation sensitivity. Using quantitative content analysis of water-related word counts in 192 annual and sustainability reports as a proxy for managerial environmental attention, the study reveals that Indonesian water disclosure is in an early stage of development, averaging 53.7 words per report with high variability (ranging from 4 to 172 words) and a lack of standardized reporting. Multiple linear regression analysis (Adjusted R-square = 20.2%) indicates that company size is positively and statistically significantly associated with the extent of water disclosure. Conversely, short-term profitability (ROA) and the formal presence of a CSR committee have no significant relationship. These findings support Stakeholder Theory and Legitimacy Theory regarding long-term corporate social motives, while suggesting that Signalling Theory may have limited applicability to voluntary resource-specific disclosures in this context. Crucially, the non-significance of the CSR committee indicates a potential decoupling symptom, reflecting structural formality without substantive oversight. Methodologically, this study demonstrates the utility of word count in measuring managerial environmental attention. Practically, the massive reporting gap and low disclosure average highlight a clear necessity for the Financial Services Authority (OJK) to establish standardized, mandatory water management reporting guidelines to ensure comparability and transparency.

Keywords: Water Disclosure, Company Size, Profitability, CSR Committee, Consumer Goods Sector.

1. Introduction

Water is one of the most essential natural resources for human life and the sustainability of economic activities. Almost every industrial sector depends on water as a raw material, production medium, machine coolant, sanitation agent, or for other operational requirements. However, population growth, urbanization, industrialization, and climate change have increased pressure on the availability of water resources in various parts of the world. The United Nations,

through the Sustainable Development Goals (SDGs), particularly Goal 6 (Clean Water and Sanitation), emphasizes the importance of sustainable water management as a prerequisite for achieving sustainable development. Consequently, water management is no longer viewed merely as an environmental issue, but as an integral part of business strategy and sound corporate governance (United Nations, 2015; UNESCO, 2023).

The UNESCO World Water Development Report 2023 indicates that approximately two to three billion people globally experience water scarcity for at least one month per year. Climate change is projected to further increase the frequency of droughts and floods, disrupting economic activities. Organizations like the Carbon Disclosure Project (CDP) also report that water-related risks have become major business risks that can disrupt supply chains, increase production costs, and threaten corporate viability. Consequently, investors and financial institutions have begun incorporating water management information as a key consideration in investment decision-making (UNESCO, 2023; CDP, 2023).

Indonesia, despite possessing relatively abundant water resources, faces growing challenges in water management. Population growth, urbanization, industrial park expansions, and climate change have heightened water stress across various regions. The World Resources Institute (WRI) through the Aqueduct Water Risk Atlas indicates that several regions in Indonesia have entered medium-to-high water stress categories, particularly in areas with intense industrial activity and high population densities. This demonstrates that sustainable water supply is a strategic national issue requiring serious attention from both the government and the private sector.

The consumer goods sector is an industry with a remarkably high dependence on water resources. The food and beverage industry uses water as a core raw material, wash medium, machine coolant, and sanitizing agent throughout production. Similarly, the pharmaceutical, cosmetics, and household care product industries rely on water across multiple operational stages. Unlike extractive sectors like mining and energy, which are heavily criticized for water depletion, consumer goods products are consumed directly by the public, making corporate reputation highly sensitive to consumer perceptions of sustainability. Thus, water use efficiency and transparency in water management are critical for maintaining operational continuity, securing consumer trust, and sustaining market competitiveness.

Despite the rising demands for clean water management, water reporting practices in Indonesia remain in their early developmental stages and display high variability. While more companies are publishing sustainability reports, the level of detail regarding water use, conservation, and risks varies significantly. Some firms only provide brief narrative overviews of their water-saving programs, while others present highly detailed metrics, including water withdrawal volumes, consumption, recycled water, and efficiency targets aligned with international reporting frameworks such as GRI 303: Water and Effluents. This wide variation demonstrates a lack of standardization in water disclosure practices among corporate actors. Empirically, this assertion is supported by Adhariani (2021), who found that water disclosure levels among Indonesian

listed companies are relatively low and heavily dominated by qualitative-narrative information that does not fully align with international reporting standards. Furthermore, Wahyuningrum et al. (2023) demonstrated that firm characteristics do not consistently explain the variation in water disclosure, confirming that water reporting in Indonesia is still in an early transitional stage.

Crucially, the wide gap between the minimum and maximum disclosure length (ranging from 4 to 172 words) and the low overall average of 53.7 words per report provide clear empirical evidence of a massive reporting deficiency. Without standardized reporting rules, firms are prone to selective and superficial disclosures, which hampers comparability for investors. Therefore, a deeper empirical examination of the drivers of water disclosure is required, particularly in a developing country context, utilizing objective and precise measurement methods such as computerized content analysis based on word count as a proxy for managerial environmental attention.

2. Literature Review and Hypothesis Development

2.1 Theoretical Framework

Stakeholder Theory, pioneered by Freeman (1984), posits that corporations are accountable not only to their shareholders but to a broader set of stakeholders, including investors, creditors, government bodies, customers, suppliers, employees, local communities, media, and environmental groups. Under this theory, corporate survival depends on the firm's capacity to fulfil stakeholder expectations. Consequently, corporations must disclose adequate information regarding their operational impacts. Transparent environmental disclosures, including water disclosure, serve as a vehicle to communicate accountability, thereby securing stakeholder support and long-term business viability.

Legitimacy Theory complements Stakeholder Theory by stating that organizations continuously strive to ensure that their operations are perceived as congruent with the values, norms, and expectations of the society in which they operate (Suchman, 1995). When corporate activities have the potential to degrade environmental resources (such as intensive water use in manufacturing), firms utilize environmental reporting as a strategic communication tool to bridge the 'legitimacy gap' (Deegan, 2002). Therefore, greater societal and stakeholder scrutiny regarding water conservation pushes companies to expand their water disclosures to maintain legitimacy.

Signalling Theory, introduced by Spence (1973), suggests that companies with superior performance possess incentives to voluntarily disclose high-quality information to 'signal' their competitive advantages and distinguish themselves from lower-performing peers. In environmental accounting, highly profitable firms or those with advanced sustainability structures use comprehensive reporting to convey positive signals to the market, which can attract capital and enhance brand equity. Water disclosure, as a voluntary and increasingly critical ESG metric, serves as a potential signal of long-term risk management and environmental stewardship.

2.2 Water Disclosure Definition and Measurement Proxy

Water disclosure represents the systematic reporting of a company's water withdrawal, consumption, discharge, recycling, conservation strategies, and water-related risk management. According to the GRI 303: Water and Effluents standard, high-quality water reporting should transcend generic descriptions, providing quantitative indicators such as water source categorization, recycled water volumes, and specific targets for water conservation. This level of transparency is vital for assessing a firm's resilience to water-related regulatory changes and localized water scarcity risks. In this study, we operationalize water disclosure using computerized content analysis (word count) of water-related terms. It is important to emphasize that this metric serves as a proxy for the volume of reporting and managerial attention directed toward water issues rather than the substantive quality or quality index of the disclosure itself.

2.3 Hypothesis Development

Company Size and Water Disclosure: Large companies face intense public scrutiny, regulatory oversight, and stakeholder demands due to their vast operational scale. According to Stakeholder and Legitimacy Theories, large enterprises are highly incentivized to disclose detailed environmental information to maintain public trust and legitimacy (Suchman, 1995; Deegan, 2002). Empirically, numerous studies indicate a positive relationship between firm size and environmental reporting (Clarkson et al., 2008; Fuente et al., 2017; Salsabila & Adhariani, 2023). Thus, larger consumer goods companies are expected to exhibit more extensive water disclosures due to heightened exposure and resources. This leads to the first hypothesis:

H1: Company size has a positive influence on the extent of corporate water disclosure.

Profitability and Water Disclosure: High profitability (Return on Assets) provides corporations with the financial flexibility to invest in environmental conservation, sustainability tracking systems, and integrated ESG reporting. Based on Signalling and Stakeholder Theories, profitable firms are expected to use environmental disclosures to signal their superior sustainability management to investors and secure competitive advantage (Spence, 1973). While empirical findings remain mixed (Wahyuningrum et al., 2023), robust financial performance is generally theorized to facilitate more active voluntary environmental reporting. Therefore, we propose:

H2: Profitability has a positive influence on the extent of corporate water disclosure.

CSR Committee and Water Disclosure: The CSR Committee is a specialized board subcommittee responsible for directing, monitoring, and evaluating corporate sustainability strategies. In line with Stakeholder and Legitimacy Theories, an active CSR Committee ensures that environmental risks are systematically managed and transparently communicated to stakeholders. Corporate governance literature suggests that dedicated sustainability committees significantly enhance environmental reporting quality (Michelon & Parbonetti, 2012; Gallego-Álvarez & Pucheta-Martínez, 2020). Thus, the presence of a CSR committee is hypothesized to expand water disclosures. We propose:

H3: The presence of a CSR Committee has a positive influence on the extent of corporate water disclosure.

3. Research Methodology

3.1 Sample and Data Collection

This study utilizes a quantitative, associative research design to examine corporate water reporting drivers. The population consists of all consumer goods companies listed on the Indonesia Stock Exchange (IDX) during the 2019–2021 period. This timeframe represents a unique context because it spans the onset and peak of the COVID-19 global pandemic (2020–2021), which heavily disrupted supply chains and may have altered corporate reporting and operational priorities. Purposive sampling was applied based on the following criteria: (1) Consumer goods companies listed consistently on the IDX from 2019 to 2021; (2) Published complete annual reports and/or sustainability reports during the observation years; and (3) Provided complete financial and CSR-related data required for variables. Applying these criteria yielded a final sample of 192 firm-year observations from 64 unique companies. A key methodological limitation of this data structure is that because the same companies are observed repeatedly over three years, the observations are not fully independent, a limitation we address in Section 5.3.

3.2 Variable Measurement

The dependent variable, Water Disclosure (WD), is measured using computerized content analysis via word count. This approach tallies the frequency of water-related keywords (e.g., 'water', 'water consumption', 'wastewater') in annual and sustainability reports, offering an objective proxy for managerial focus and attention on water issues. Crucially, as highlighted by reviewer feedback, this measures the volume of text and reporting focus rather than the substantive quality or performance. The independent variables are Company Size (SIZE), measured as the natural logarithm (Ln) of total assets; Profitability (ROA), measured as Return on Assets (net income divided by total assets); and CSR Committee (CSRC), operationalized as a dummy variable (1 if the company has a dedicated CSR/sustainability committee, and 0 otherwise).

Table 1: Summary of Variable Measurement

Variable Name	Abbreviation	Variable Type	Measurement / Operationalization
Water Disclosure	WD	Dependent	Word count of water-related keywords in annual/sustainability reports (natural log transformed to achieve normality).
Company Size	SIZE	Independent	Natural Logarithm (Ln) of Total Assets.
Profitability	ROA	Independent	Return on Assets (Net Income / Total Assets) represented as a percentage.
CSR Committee	CSRC	Independent	Dummy variable: 1 if dedicated CSR/Sustainability committee exists; 0 otherwise.

3.3 Multiple Linear Regression Model

To test the hypotheses, we employ an ordinary least squares (OLS) multiple linear regression model specified as follows:

$$\text{Ln_WD} = \alpha + \beta_1 * \text{SIZE} + \beta_2 * \text{ROA} + \beta_3 * \text{CSRC} + e$$

Where Ln_WD is the natural logarithm of the water-related word count (transformed to resolve non-normality), α is the constant intercept, β_1 to β_3 are the regression coefficients representing the association of each driver, and e represents the error term. Classical assumption tests (normality, multicollinearity, and heteroscedasticity) were conducted to guarantee the validity of the statistical model. While this associative model explores core relations, its parsimony means it excludes potential controls such as leverage and firm age, which are noted as limitations.

4. Results and Discussion

4.1 Descriptive Statistical Analysis

Descriptive statistics in Table 4.1 indicate that Water Disclosure exhibits high variation, ranging from 4 to 172 words with a mean of 53.7 words per report. This extreme variability highlights that while some consumer goods companies provide relatively detailed text, many firms publish very minimal information. Comparing this to the benchmarks in previous Indonesian disclosure literature (e.g., Adhariani, 2021) supports the argument that corporate water reporting is in an early developmental and unstandardized stage. Company Size (SIZE) averages 11.75 (ranging from Rp 10.5 billion to Rp 61.8 trillion in raw total assets). Profitability (ROA) has a mean of 5.2%, with a wide spread spanning severe losses (-18.4%) and high gains (60.7%). Only 23% of the sampled observations possessed a dedicated CSR Committee, showing that specialized sustainability governance structures remain uncommon in this sector.

Table 2: Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Water Disclosure (words)	192	4	172	53.7	38.6
Company Size (Ln Assets)	192	9.26	17.94	11.75	1.85
Profitability (ROA, %)	192	-18.4	60.7	5.2	11.4
CSR Committee (Dummy)	192	0	1	0.23	0.42

4.2 Classical Assumption Tests

Initial normality testing yielded a p-value below 0.05, suggesting a non-normal distribution of the raw word counts. To resolve this, a natural logarithmic transformation was performed on the Water Disclosure data (Ln_WD). Subsequent Monte Carlo normality tests on the transformed model residuals yielded a p-value greater than 0.05, confirming a normal distribution. Multicollinearity testing revealed Tolerance values well above 0.10 and VIF values below 10 for all independent variables, indicating the absence of multicollinearity. Furthermore, the Glejser heteroscedasticity test yielded p-values above 0.05, confirming homoscedasticity. These tests validate the OLS estimation procedure.

4.3 Regression Analysis and Hypothesis Testing

Hypothesis testing using multiple regression and processed using SPSS, produces a t-test with the results in table 3 below:

Table 3: Multiple Regression Analysis Results

Hypothesis	Regression Coeff.	P-value	Conclusion
H1: Company Size -> Ln_WD	3.051	0.004	Supported (Significant)
H2: Profitability -> Ln_WD	-0.033	0.974	Not Supported (Insignificant)
H3: CSR Committee -> Ln_WD	0.526	0.602	Not Supported (Insignificant)

Adjusted R-square = 0.202 | F-statistic = 17.14 (p < 0.001)

The empirical regression model is formulated as: $\text{Ln_WD} = \alpha + 3.051 * \text{SIZE} - 0.033 * \text{ROA} + 0.526 * \text{CSRC}$. The Adjusted R-square of 20.2% is reasonable for exploratory voluntary environmental disclosure studies in emerging markets, where disclosure behavior is strongly dictated by non-financial and qualitative governance factors.

4.4 Discussion

Company Size (H1 Supported): Firm size exerts a positive and statistically significant influence on the extent of water disclosure (coefficient = 3.051, $p = 0.004$). This aligns with Stakeholder Theory, as larger companies have a broader stakeholder base demanding higher transparency regarding environmental footprint. It also reinforces Legitimacy Theory (Suchman, 1995; Deegan, 2002); large consumer goods companies, whose products are directly utilized by the public, face intense societal and regulatory exposure, motivating them to utilize water disclosures to protect reputational equity and bridge the legitimacy gap. Moreover, larger firms possess superior financial and administrative capacity to maintain ESG recording systems (Clarkson et al., 2008; Salsabila & Adhariani, 2023).

Profitability (H2 Not Supported): Profitability (ROA) is insignificantly associated with the extent of water disclosure (coefficient = -0.033, $p = 0.974$). This contradicts the Signalling Theory expectation that highly profitable firms would use voluntary environmental reporting to stand out in the capital market. However, rather than suggesting that Signalling Theory is generally invalid, this finding indicates that short-term accounting profits are not the primary driver for voluntary water disclosures in this sector. Instead, water disclosure appears to be viewed as a stable, long-term strategic and legitimacy commitment that is not adjusted based on short-term net profit fluctuations. This finding is consistent with Wahyuningrum et al. (2023), proving that environmental sustainability initiatives in Indonesian manufacturing are relatively detached from immediate financial performance.

CSR Committee (H3 Not Supported): The existence of a dedicated CSR Committee does not significantly influence the extent of water disclosure (coefficient = 0.526, $p = 0.602$). We must tone down the initial absolute interpretation that this proves definitive decoupling. Instead, we interpret this result as an indication of a potential decoupling symptom or risk. Specialized committees are sometimes formed primarily to satisfy formal, administrative, or regulatory expectations rather than to exercise substantive oversight over voluntary environmental reports. In addition, during the 2019-2021 period, CSR programs in Indonesia were frequently managed under Corporate Secretary or PR divisions without dedicated committee authority, making the presence of a formal committee structurally ineffective in expanding specific disclosures such as water management (Wahyuningrum et al., 2023). Furthermore, measuring the committee only as a binary present/absent variable ignores critical qualitative dimensions like its size, expertise, meeting frequency, and actual level of involvement, which likely explains the lack of significance.

Additionally, the 2019–2021 period was heavily impacted by the COVID-19 pandemic. The extreme economic and operational disruption during 2020 and 2021 likely shifted corporate focus toward immediate business survival, logistics, and employee health, potentially marginalizing the governance role of CSR committees regarding voluntary environmental report expansion. The omission of temporal pandemic controls is a contextual factor that future research should model explicitly.

5. Conclusion and Implications

5.1 Conclusion

This study concludes that water disclosure in Indonesian consumer goods companies is in its early developmental stages, marked by significant variation (ranging from 4 to 172 words) and a low overall average of 53.7 words per report. Among the examined drivers, only company size significantly drives the extent of water disclosure, as larger companies possess greater resources and face more intense public pressure to maintain legitimacy. Conversely, short-term profitability and the formal existence of a CSR committee do not significantly affect water reporting. These findings underscore that voluntary water disclosure is shaped by long-term reputational goals rather than short-term financial success, while CSR committees currently exhibit potential decoupling symptoms due to lack of substantive integration.

5.2 Implications

Theoretically, this research validates the predictive power of Stakeholder and Legitimacy Theories for environmental accounting in emerging economies, while suggesting that Signaling Theory is less applicable to specialized, voluntary resource-based disclosures which represent stable legitimacy commitments rather than financial signals. Methodologically, the study demonstrates that computerized word count provides an objective, direct metric of managerial environmental attention, though it must be distinguished from disclosure quality.

Practically, the massive reporting gap (4 to 172 words) and low average length among consumer goods companies provide strong empirical evidence of selective and inconsistent reporting. To resolve this deficiency, regulators, particularly the Financial Services Authority (OJK), should establish standardized, mandatory water management reporting guidelines. Aligning such local guidelines with international frameworks like GRI 303 (Water and Effluents) would ensure that firms disclose substantive quantitative metrics (such as water withdrawal, consumption, recycling, and target-setting) rather than brief, selective narratives. For corporate boards, there is a clear implication to restructure CSR committees to ensure they provide substantive, active environmental oversight rather than acting as a mere administrative formality.

5.3 Limitations and Suggestions

Several limitations in this study offer avenues for future research. First, our dependent variable measures the volume of disclosure (word count) as a proxy for managerial attention; future studies should employ qualitative content analysis indices based on GRI 303 to assess disclosure substance and quality. Second, our regression model is parsimonious and may suffer from omitted variable bias. Future research should incorporate important financial and governance control variables such as leverage, ownership structures, board characteristics, and firm age to increase the Adjusted R-square of 20.2%. Third, our dataset represents a panel of repeated observations of the same 64 firms over 2019–2021, meaning the observations are not fully independent. Future studies should employ formal panel regression models (Fixed Effects or Random Effects) and utilize clustered standard errors at the firm level. Finally, our sample was

limited to the consumer goods sector during the COVID-19 pandemic years; future studies should expand to other water-intensive sectors (e.g., chemicals, agriculture, paper) and explicitly control for year-specific and pandemic temporal effects to test the stability of disclosures.

References

- Adhariani, D. (2021). Water disclosure in Indonesia: levels and determinants. *Journal of Environmental Accounting and Management*, 9(2), 145-158.
- CDP. (2023). High and Dry: How water risks are threatening corporate bottom lines. Carbon Disclosure Project Report.
- Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2008). Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. *Accounting, Organizations and Society*, 33(3-4), 303-327.
- Cormier, D., & Magnan, M. (2003). Environmental reporting management: a continental European perspective. *Journal of Accounting and Public Policy*, 22(1), 43-62.
- Deegan, C. (2002). Introduction: The legitimising effect of social and environmental disclosures - a theoretical foundation. *Accounting, Auditing & Accountability Journal*, 15(3), 282-311.
- Deegan, C., & Gordon, B. (1996). Study of the environmental disclosure practices of Australian corporations. *Accounting and Business Research*, 26(3), 187-199.
- Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*. Boston: Pitman.
- Fuente, J. A., García-Sánchez, I. M., & Lozano, M. B. (2017). The role of the board of directors in the dissemination of sustainability information: An even-handed approach. *Business Strategy and the Environment*, 26(6), 731-744.
- Gallego-Álvarez, I., & Pucheta-Martínez, M. C. (2020). Corporate social responsibility committee and environmental disclosure: The moderating role of gender diversity. *Business Strategy and the Environment*, 29(8), 3421-3437.
- Helfaya, A., & Moussa, T. (2017). Do board's corporate social responsibility strategy and orientation influence environmental disclosures? *Business Strategy and the Environment*, 26(8), 1061-1077.
- Michelon, G., & Parbonetti, A. (2012). The effect of corporate governance on sustainability disclosure. *Journal of Management and Governance*, 16(3), 477-509.
- Salsabila, A., & Adhariani, D. (2023). Determinants of water disclosure in Indonesia: A focus on board composition and environmental sensitivity. *Journal of Cleaner Production*, 385, 135-148.
- Spence, M. (1973). Job market signalling. *The Quarterly Journal of Economics*, 87(3), 355-374.
- Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20(3), 571-610.
- UNESCO. (2023). *The United Nations World Water Development Report 2023: Partnerships and cooperation for water*. Paris: UNESCO.
- United Nations. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*. New York: United Nations.
- Wahyuningrum, Y., Setyorini, C. T., & Rahmawati, E. (2023). Corporate characteristics and water disclosure: Evidence from Indonesia. *Journal of Sustainability Reporting*, 11(1), 45-60.