

ESG Disclosure and Sustainability Risk Governance in the Non-Financial Sector: Regulatory Perspectives and Policy Prioritisation

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Abstract

Purpose: This study examines whether Environmental, Social, and Governance (ESG) disclosure in Indonesia's non-financial sector functions as an effective instrument for sustainability risk governance or remains largely a compliance-oriented reporting practice.

Methodology: A qualitative policy research design is employed, integrating document analysis, policy-oriented Focus Group Discussions (FGDs) with senior officials from the Otoritas Jasa Keuangan, and the Analytic Hierarchy Process (AHP). Regulatory frameworks, corporate sustainability reports, and global ESG standards are analysed to assess the extent of risk integration, while FGD insights are prioritised using AHP to identify key policy interventions.

Findings: Findings indicate a persistent gap between the growing volume of ESG disclosure and its limited functionality as a sustainability risk governance tool. Disclosures remain largely narrative, fragmented, and weakly embedded within enterprise risk management systems. Critical sustainability risks, including climate-related physical and transition risks, social conflicts, and governance failures, are insufficiently incorporated into supervisory assessments. AHP results identify the integration of ESG risks into risk-based supervision as the highest policy priority, followed by standardisation aligned with International Sustainability Standards Board (ISSB) and Task Force on Climate-Related Financial Disclosures (TCFD) frameworks, mandatory independent assurance, and capacity-building initiatives.

Novelty: A reconceptualisation of ESG disclosure is proposed, positioning it as a core instrument of risk governance within a risk-based supervisory architecture to strengthen early warning systems, mitigate greenwashing, and reinforce financial stability in emerging markets.

Keywords: ESG disclosures, ERM, non-financial sector, policy brief, AHP

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Introduction

Growing global commitments to sustainable development and the transition towards a low-carbon economy have intensified the imperative to integrate ethical, social, and environmental considerations into economic systems, particularly to ensure long-term continuity and systemic resilience (Lestari and Pambekti, 2023; Pambekti and Lestari, 2023). Across both secular and value-based perspectives, such considerations are increasingly operationalised through the environmental, social, and governance (ESG) framework, which has emerged as a strategic approach for strengthening corporate competitiveness and enabling sustained long-term value creation (Al-Jayyousi, 2023). Scenario-based projections suggest that the global ESG market may exceed USD 40 trillion by 2030, representing a significant share of the estimated USD 140 trillion in global assets under management (AUM), despite slower growth and increasingly polarised investor sentiment (Bloomberg Intelligence, 2024). At the same time, mounting pressure from investors and consumers indicates that ESG disclosure extends beyond reputational signalling and increasingly serves as a prerequisite for financial resilience and

sustained market confidence, particularly in the context of accelerating climate and energy transitions (TCFD Report, 2025).

Across the Asia-Pacific region, ESG implementation remains uneven due to fragmented regulatory frameworks and a reliance on voluntary guidelines and market-led initiatives (Angir & Weli, 2024; Putra, 2025). As a result, disclosure quality and assurance vary widely, ESG risks are weakly integrated into risk management, and greenwashing risks persist, constraining effective climate risk management and sustainable transition efforts (Colantonio, 2011; Li & Lin, 2016; Wester, 2017). By contrast, in Indonesia, the commitment to sustainable finance and sustainability transition has been formally institutionalised through Indonesian Financial Services Authority's Regulation No. 51/POJK.03/2017, which mandates financial institutions, listed companies, and public firms to develop a Sustainable Finance Action Plan and publish sustainability reports (Pambekti & Lestari, 2023). This regulatory framework is further reinforced by the Sustainable Finance Roadmap Phase II (2021–2025) of Indonesia, which aims to harmonise national practices with the Indonesia Green Taxonomy and align ESG disclosure with international standards, including the Global Reporting Initiative (GRI), the International Sustainability Standards Board (ISSB) under International Financial Reporting Standards (IFRS) S1 and IFRS S2, and the Task Force on Climate-related Financial Disclosures (TCFD) (Angir & Weli, 2024).

Non-financial sector constitutes a central role in the real economy, where sustainability risks initially materialise and subsequently transmit to the financial system. Firms are increasingly exposed to environmental risks arising from climate change and supply-chain disruptions (Ali et al., 2025; Álvarez-Quiroz & Quispe-Calderón, 2026), social risks related to labour practices, community relations, and legitimacy (Ali et al., 2025; Putra, 2025), and governance risks associated with inconsistent ESG disclosure, limited assurance, and weak risk integration (Eriandani & Winarno, 2024; Ferreira et al., 2025). Empirical evidence from emerging and Asia-Pacific markets further indicates that fragmented ESG reporting heightens greenwashing risks and constrains effective risk management and firm value creation (Butar Butar & Itan, 2025; Putra, 2025). These interrelated challenges underscore the need for a risk-based ESG disclosure framework capable of capturing real-sector sustainability risks and their implications for financial stability.

Prior studies demonstrate a strong linkage between ESG disclosure and sustainability risk management. Eccles et al. (2014) find that firms with strong sustainability orientation exhibit more comprehensive non-financial disclosure and superior long-term performance. Similarly, Liu & Zhu (2024) and Yanto et al. (2025) emphasise that disclosure of material ESG issues is essential for explaining financial performance and corporate resilience, particularly under transition-related uncertainty. Empirical evidence from Angir & Weli (2024) and Yeye & Egbunike (2023) further indicates a positive relationship between ESG disclosure quality and firm value, although the magnitude of this relationship varies across industries. Lagasio & Cucari (2019) also highlight the role of governance mechanisms in enhancing disclosure credibility and mitigating greenwashing risks. Nevertheless, ESG disclosure quality in the non-financial sector remains uneven, indicating a persistent gap between regulatory ambitions and corporate practices (Bansal & Song, 2017), especially in translating disclosure into effective sustainability risk governance (Eriandani & Winarno, 2024).

Against this backdrop, this study develops a risk-based ESG disclosure framework tailored to Indonesia's non-financial sector by integrating sustainability risk mapping, regulatory perspectives, and structured multi-criteria decision analysis. Unlike previous studies that primarily examine the association between ESG disclosure and firm performance or reporting quality, this research focuses on identifying the ESG disclosure priorities required to strengthen sustainability risk governance from a regulatory perspective. To achieve this objective, the study combines Focus Group Discussions (FGDs) with senior officials of the Indonesian Financial Services Authority and the Analytic Hierarchy Process (AHP) (Ferla et al., 2024; Holmes et al., 2025; Saadallah, 1994; Saaty, 1979) to systematically evaluate the relative importance of ESG disclosure components and translate expert judgements into a prioritised

policy framework. This integrated approach extends the existing ESG literature by moving beyond descriptive assessments of disclosure practices towards a decision-oriented framework that supports risk-based supervision, enhances disclosure quality, and facilitates the integration of sustainability risks into corporate governance and financial oversight.

Literature Review

Theoretical Background

Stakeholder Theory

Stakeholder Theory, as articulated by Freeman et al. (1984), posits that firms are accountable not only to shareholders but also to a wide range of stakeholders affected by corporate activities, including employees, customers, regulators, local communities, and the natural environment. Corporate sustainability, therefore, depends on the firm's ability to balance and respond to the expectations of these diverse stakeholder groups (Bansal & Song, 2017). Within the ESG disclosure framework, stakeholder theory emphasises the importance of non-financial transparency as a form of accountability and engagement. ESG disclosure enables firms to address stakeholder concerns, reduce information asymmetry, prevent conflicts of interest, and strengthen trust (Ali et al., 2025). ESG disclosure supports firms in responding to stakeholder demands by reducing information asymmetry, mitigating conflicts of interest, and strengthening confidence among investors and other stakeholders. Empirical evidence shows that greater transparency in ESG reporting lowers asymmetry between corporate insiders and external stakeholders, thereby enhancing trust and market credibility (An et al., 2025; Jafar et al., 2024). Comprehensive ESG disclosure is also associated with stronger stakeholder confidence, competitive advantage, and improved firm value, contributing to sustainable organisational outcomes (Aditya & Hasnawati, 2025). Such evidence indicates that transparent non-financial disclosure improves perceptions of corporate intent and long-term viability (Itan et al., 2025).

Legitimacy Theory

Legitimacy theory suggests that corporate survival depends on maintaining a social license to operate, which is granted when organisational actions are perceived as congruent with societal values, norms, and expectations (Deegan, 2002; Suchman, 1995). Firms continuously adapt their practices and communications to preserve legitimacy and avoid reputational damage, public scrutiny, or regulatory sanctions (Prencipe, 2025). In the context of ESG disclosure, legitimacy is pursued by demonstrating commitment to environmental responsibility, social accountability, and sound governance practices (Yanto et al., 2025). ESG reporting operates as a strategic communication tool that firms use to signal conformity with societal expectations and regulatory norms (Eriandani & Winarno, 2024). While such disclosure can enhance legitimacy and reduce reputational risk, prior research cautions that without substantive risk management integration, ESG disclosure may remain symbolic, potentially increasing the risk of greenwashing rather than mitigating it (Kopnina, 2019).

ESG-Based Enterprise Risk Management (ERM)

The Enterprise Risk Management (ERM) framework, particularly as extended to ESG-related risks by COSO (2018), underscores the need to integrate environmental, social, and governance risks into enterprise-wide risk management systems. ESG-related risks, including climate-related physical risks, transition risks arising from decarbonization policies, reputational risks associated with greenwashing, legal and litigation risks, and the risk of stranded assets in carbon-intensive industries, are increasingly recognized as financially material (Li & Lin, 2016; Muchiri et al., 2025). Integrating ESG considerations into ERM enhances corporate resilience by enabling firms to anticipate uncertainties, assess risk interdependencies, and develop mitigation strategies aligned with long-term sustainability objectives (Chang, 2024). In this framework, credible ESG disclosure serves not merely as a reporting outcome, but as tangible evidence of ESG risk integration within internal governance and

risk management processes. Such disclosure signals a firm's preparedness to manage sustainability-related uncertainties for regulator and investors (Eriandani & Winarno, 2024; Mankowski, 2024).

Previous Studies

Research on ESG disclosure and sustainability risk has expanded across institutional and industrial settings, producing mixed empirical evidence. Seminal work by Eccles et al., (2014) demonstrates that firms with strong sustainability performance tend to exhibit superior governance structures, more comprehensive non-financial disclosure, and stronger long-term financial outcomes than firms with weaker sustainability orientation. Such evidence indicates that ESG disclosure quality reflects internal organisational processes and strategic commitment to sustainability rather than symbolic compliance. In line with this reasoning, subsequent studies emphasise the importance of materiality in sustainability issues. Eriandani & Winarno, (2024), Khan et al. (2016), and Yanto et al. (2025) argue that ESG dimensions contribute unevenly to firm performance. Empirical findings show that investments in material ESG issues are positively associated with firm performance, whereas investments in immaterial ESG issues generate limited or insignificant effects.

Within this analytical context, corporate governance research underscores board characteristics as critical determinants of ESG disclosure quality. Meta-analytical evidence provided by Lagasio & Cucari (2019) indicates that board independence, board size, and female representation enhance disclosure transparency and credibility, while concentrated managerial ownership and Chief Executive Officer (CEO) duality weaken disclosure quality. Such findings are consistent with governance theories emphasising monitoring and oversight functions in mitigating information asymmetry and opportunistic reporting behaviour (Mahrani & Soewarno, 2018).

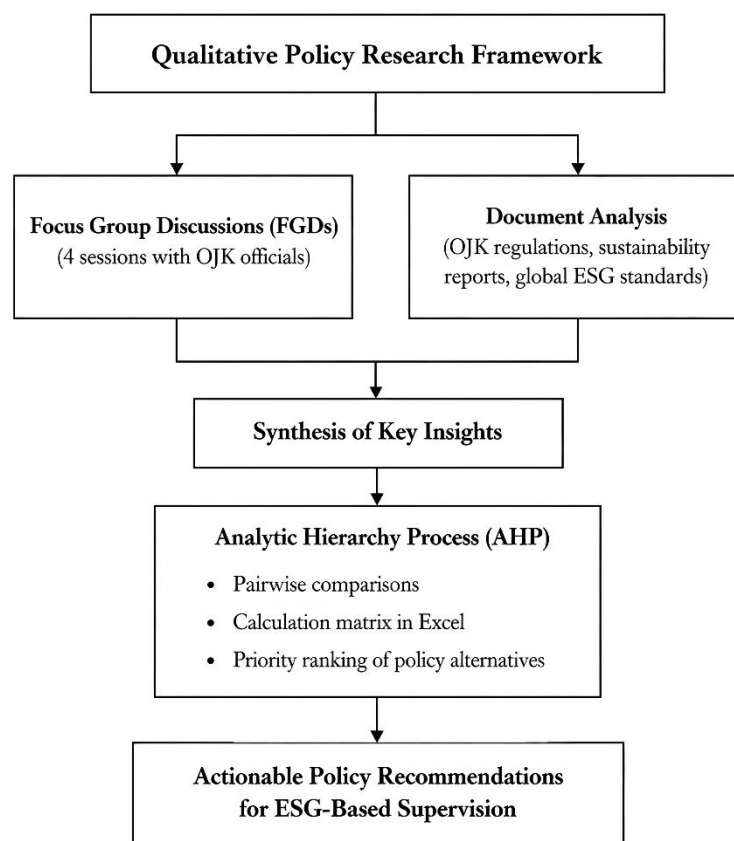
In emerging market settings, empirical evidence reveals strong contextual variation in ESG outcomes. In Indonesia, Angir & Weli (2024) and Yeye & Egbunike (2023) report that ESG disclosure does not significantly reduce information asymmetry or enhance firm value and may even display negative associations. By comparison, evidence from Nigeria indicates a positive relationship between ESG disclosure and firm value in manufacturing firms, although profitability moderates the relationship. Beyond disclosure–performance linkages, recent studies increasingly emphasise sustainability risks faced by non-financial firms, including climate-related disruptions, ecosystem degradation, and natural hazards (Azmi et al., 2021; Ropkins & Beck, 2002), alongside governance risks such as litigation, reputational damage, and stranded assets in carbon-intensive industries (Li & Lin, 2016; Muchiri et al., 2025). The literature therefore reveals a persistent gap between the conceptual promise of ESG disclosure and its effectiveness in managing sustainability risks, particularly in emerging market contexts.

Method

This study adopts a qualitative policy research framework designed to generate actionable policy recommendations for ESG-based supervision in the non-financial sector (Lim, 2025; Steiner-Khamisi & Morais de Sa e Silva, 2024; Tierney & Clemens, 2011). Such an approach is appropriate for regulatory and supervisory research, as it integrates empirical evidence with institutional decision-making perspectives while prioritising policy relevance over causal inference (Colantonio, 2011). As illustrated in **Figure 1**, empirical and regulatory insights were generated through Focus Group Discussions with managers and division heads of the Indonesian Financial Services Authority, complemented by document analysis. The Focus Group Discussions (FGDs) were conducted in May 2025. FGDs were organised over two days, comprising four sessions in total, with two sessions conducted each day. Each session lasted approximately two to two and a half hours and followed a semi-structured format to explore ESG disclosure practices, sustainability risk identification, and supervisory policy priorities (Krueger, 2002). FGDs were conducted involving three senior officials, resulting in a total of twelve expert participations across the study. Participants were selected using purposive expert sampling based

on three criteria: (1) holding a managerial or division-head position; (2) direct responsibility for sustainable finance, ESG supervision, or regulatory policy; and (3) active involvement in the development or implementation of ESG-related supervisory frameworks.

In parallel, document analysis covered Indonesian Financial Services Authority regulations, sustainability and annual reports of non-financial firms, and international ESG standards, including GRI, ISSB (IFRS S1 and S2), and TCFD. Insights derived from expert discussions and documentary evidence were systematically compared, consolidated, and synthesised into common regulatory issues. These issues were subsequently translated into the three evaluation criteria and four policy alternatives that formed the AHP decision hierarchy. Pairwise comparisons were then performed using the Analytic Hierarchy Process (AHP) (Rangone, 1996), which enables qualitative judgements to be transformed into quantitative priority weights (Canco et al., 2021; Mengyuan et al., 2025). Calculation matrices were developed using Microsoft Excel to ensure transparency, replicability, and clarity of policy prioritisation (Oncioiu et al., 2020).



Source: Authors own work

Figure 1. Methodological Framework for ESG Policy Prioritisation Using AHP

Adopted from (Lim, 2025; Steiner-Khamisi & Morais de Sa e Silva, 2024)

Results And Discussion

Findings from Document Analysis

Document analysis covered 20 sustainability reports and 20 annual reports published by listed non-financial companies representing the manufacturing, mining, agriculture, infrastructure, consumer goods, and energy sectors. Using the content analysis framework presented in Appendix A, each report was systematically evaluated across ten predefined ESG disclosure dimensions related to sustainability risk governance. The results indicate considerable variation in disclosure quality across firms, with mean company scores ranging from 1.70 to 2.80. Overall, although the volume of ESG disclosure has increased, the quality, analytical depth, and risk orientation of the disclosed information remain highly

heterogeneous across firms. ESG reporting therefore continues to function predominantly as a compliance-oriented reporting practice, with limited evidence that sustainability information is systematically embedded within corporate risk management and strategic decision-making processes (Andriani et al., 2021; Angir & Weli, 2024). Similar tendencies have been widely documented in emerging markets, where ESG reporting is often shaped by regulatory pressure rather than internalised sustainability strategy (Emma et al., 2024).

The content analysis further demonstrates that environmental risk disclosure (CA1) represents one of the strongest dimensions across the sampled firms. ESG disclosures predominantly emphasise operational initiatives such as energy efficiency, emission reduction programmes, waste management, and environmental management systems (United Nations Development Programme, 2018). However, these disclosures rarely incorporate quantitative assessments of climate-related physical risks, including the impacts of extreme weather events on assets and supply chains, or transition risks associated with regulatory changes, carbon pricing, and shifts in investor and consumer preferences toward low-carbon economies (Wester, 2017). The absence of forward-looking environmental risk metrics limits the strategic relevance of ESG disclosure and undermines its role in enhancing corporate resilience to climate-related uncertainties (Li & Lin, 2016; TCFD Report, 2025). Prior studies emphasise that failure to integrate environmental risk assessments into ESG reporting may expose firms to underestimated financial risks and potential asset stranding (Asiedu et al., 2025; Kathan et al., 2025).

Regarding the social dimension (CA2), the content analysis indicates a moderate level of disclosure across the sampled firms. ESG reporting remains largely centred on corporate social responsibility (CSR) programmes, workforce-related indicators, and philanthropic activities. While such disclosures reflect corporate engagement with social issues, they often neglect more material and structural social risks, including human rights violations, land-use conflicts, community resistance, and labour risks embedded within global supply chains (Chang, 2024; Yeye & Egbunike, 2023). This selective disclosure practice weakens the ability of ESG reports to capture the true social risk exposure faced by non-financial firms, particularly those operating in resource-intensive and labour-intensive sectors (Eriandani & Winarno, 2024). Empirical evidence suggests that unmanaged social risks can significantly affect corporate legitimacy, operational continuity, and firm value, especially in emerging economies with complex socio-environmental contexts (Fadhilurrahman & Sari, 2025; Samosir & Alvia, 2024).

The analysis of governance disclosure (CA3) demonstrates relatively stronger formal compliance, particularly in reporting board structures, audit committees, ethics, compliance mechanisms, and internal control systems (Emma et al., 2024). Nevertheless, explicit disclosure concerning board-level oversight of ESG-related risks (CA8) remains comparatively limited, indicating a disconnect between formal governance arrangements and effective sustainability risk governance. Information describing how boards identify, monitor, and integrate ESG risks into enterprise-wide risk management systems is rarely disclosed in a structured manner. This finding aligns with prior research suggesting that governance quality does not automatically translate into effective ESG risk oversight unless sustainability responsibilities are clearly embedded within board mandates and incentive structures (Angir & Weli, 2024; Jafar et al., 2024; Lagasio & Cucari, 2019).

Despite relatively favourable performance in environmental and governance disclosure, the content analysis identifies substantially weaker performance in ESG integration into Enterprise Risk Management (CA4). Sustainability information is generally presented separately from organisational risk management processes, indicating that ESG-related risks remain largely disconnected from enterprise-wide risk registers and strategic decision-making. Consequently, ESG disclosures continue to function primarily as reporting documents instead of serving as instruments for identifying, evaluating, and mitigating sustainability-related risks. This finding reinforces concerns raised in previous studies that ESG reporting frequently remains symbolic and insufficiently integrated into

organisational risk governance (Deegan, 2002; Emma et al., 2024; Álvarez-Quiroz & Quispe-Calderón, 2026; Putra, 2025).

Similarly, the analysis reveals comparatively weak performance in alignment with ISSB/IFRS S1–S2 standards (CA6) and independent ESG assurance (CA9). Most firms continue to rely primarily on the Global Reporting Initiative (GRI), while disclosures aligned with ISSB, IFRS S1, IFRS S2, and TCFD remain limited and inconsistent. Furthermore, external assurance of sustainability reports is still uncommon across the sampled firms, reducing the comparability, reliability, and decision-usefulness of ESG information for regulators, investors, and other stakeholders. These findings suggest that current ESG reporting practices have yet to provide sufficiently credible and standardised information capable of supporting effective sustainability risk governance.

Sustainability Risk Mapping in the Non-Financial Sector

Environmental Risk

The findings indicate that environmental risks represent the most salient sustainability risks faced by non-financial companies in Indonesia, particularly due to the country's high exposure to climate change, natural hazards, and resource dependency (Angir & Weli, 2024; Rahayu et al., 2025). Environmental risks manifest primarily in three interrelated forms: physical risks, transition risks, and ecosystem-related risks (Chang, 2024; Samosir & Alvia, 2024). Physical risks include floods, droughts, extreme weather events, and climate-induced supply chain disruptions, which directly affect production capacity, logistics, asset integrity, and operational continuity. Empirical studies emphasise that firms operating in climate-vulnerable regions are increasingly exposed to financial losses and operational disruptions if physical risks are not systematically assessed and disclosed (An et al., 2025; Migliorelli, 2023). In the Indonesian context, such risks are particularly relevant for non-financial sectors such as agriculture, manufacturing, mining, and infrastructure, where climate shocks can propagate into broader financial system vulnerabilities (Eriandani & Winarno, 2024; Fei & Lin, 2016; Yeye & Egbunike, 2023).

Beyond physical risks, transition risks pose a growing challenge for non-financial firms as global and domestic policies shift toward low-carbon and sustainable economic models (Li & Lin, 2016). Transition risks arise from regulatory changes such as carbon pricing mechanisms, emissions caps, environmental taxes, and sustainability-related disclosure mandates, as well as from changing investor preferences toward ESG-compliant assets (Putri & Paramita, 2025; Setiani et al., 2024). International evidence shows that firms with high carbon intensity face higher cost of capital, valuation discounts, and increased exposure to policy-induced shocks when transition risks are not adequately managed (Liu et al., 2024; Mengyuan et al., 2025). In Indonesia, regulatory initiatives such as POJK No. 51/2017, the Sustainable Finance Roadmap Phase II (2021–2025), and the Indonesia Green Taxonomy signal increasing regulatory pressure on firms to internalize environmental risks within their business strategies. However, the findings reveal that most non-financial companies have yet to translate these regulatory signals into structured transition risk disclosures aligned with ISSB or TCFD standards (TCFD Report, 2025).

A further dimension of environmental risk relates to ecosystem degradation and biodiversity loss, including land degradation, deforestation, water scarcity, and ecosystem service depletion (Nguyen et al., 2023; Zhang et al., 2023). These risks are particularly material for non-financial firms whose operations depend heavily on natural capital and land use. Global sustainability frameworks increasingly recognize biodiversity and ecosystem risks as financially material, given their implications for supply chain stability, regulatory exposure, and social license to operate (Kumar et al., 2025). Despite this growing recognition, the study finds that biodiversity-related risks remain largely absent from ESG disclosures of Indonesian non-financial firms, reflecting a narrow interpretation of environmental risk that prioritizes emissions over broader ecological impacts.

Social Risk

The analysis further demonstrates that social risks constitute a critical yet underreported dimension of sustainability risk in the non-financial sector. Social risks are particularly pronounced in contexts involving land use, labor-intensive operations, and complex stakeholder relations (Bao et al., 2024; Chang, 2024), all of which are prevalent in Indonesia's non-financial industries. One of the most significant social risks identified is land-use conflict involving local communities and indigenous peoples, often arising from large-scale industrial, agricultural, and extractive activities (Froese et al., 2022). Such conflicts can lead to operational delays, legal disputes, reputational damage, and loss of social legitimacy. Prior research underscores that unresolved land and community conflicts pose substantial long-term risks to firm performance and project viability (Gamage & Kumar, 2024; Guenichi et al., 2025; Zamora & Estrada, 2020), especially in emerging economies with plural land tenure systems.

In addition to land-related issues, labor and occupational health and safety risks remain central components of social sustainability risk (Guenichi et al., 2025). Non-financial firms frequently disclose workforce statistics and training programmes, however, disclosures related to workplace accidents, labor rights compliance, and supply chain labor standards are often fragmented or qualitative in nature (Álvarez-Quiroz & Quispe-Calderón, 2026; Andriani et al., 2021). Empirical evidence suggests that weak labor governance increases exposure to operational disruptions, regulatory sanctions, and reputational crises, particularly in global supply chains subject to international scrutiny (Bao et al., 2024; Giupponi et al., 2025). From a regulatory perspective, Indonesian labor and safety regulations, as well as international standards such as International Labour Organisation Conventions, increasingly intersect with ESG expectations, yet these linkages remain weakly reflected in corporate ESG disclosures (Liu et al., 2024; Sulaiman et al., 2025).

Another salient social risk identified is reputational risk arising from human rights violations, either within a firm's own operations or along its supply chain. Global investors and stakeholders increasingly treat human rights performance as a material ESG issue, with direct implications for access to capital and market legitimacy (Bartolozzi, 2025). However, the findings indicate that most non-financial firms in Indonesia continue to frame social disclosures within a CSR paradigm (Alfan et al., 2023; Nareswari et al., 2023), rather than adopting a risk-based human rights due diligence approach. This disconnect limits the effectiveness of social risk disclosure and reinforces the symbolic nature of ESG reporting practices.

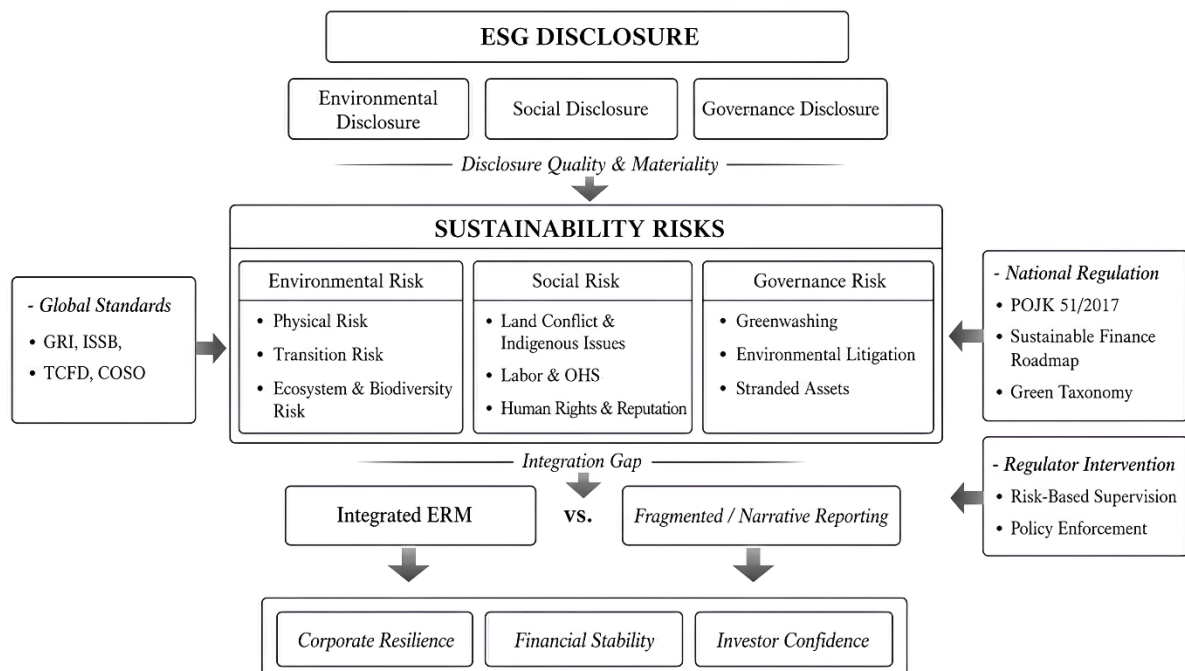
Governance Risk

The study also identifies governance-related risks as a cross-cutting dimension that amplifies environmental and social sustainability risks. One of the most prominent governance risks in the context of ESG disclosure is greenwashing, defined as the strategic use of sustainability narratives that are not substantiated by substantive performance or risk management practices (Kathan et al., 2025). Prior literature consistently shows that weak governance structures and limited assurance mechanisms increase the likelihood of greenwashing, thereby undermining stakeholder trust and market credibility (Ben Mahjoub, 2024; Janik et al., 2025; Sneideriene & Legenzova, 2025). In Indonesia, the absence of mandatory ESG assurance for non-financial firms further exacerbates this risk, despite growing regulatory emphasis on sustainable finance (Nareswari et al., 2023).

In parallel, environmental litigation risk is emerging as a significant governance concern, particularly for firms operating in environmentally sensitive sectors. Litigation related to environmental damage, pollution, and regulatory non-compliance can result in substantial financial penalties, project suspension, and long-term reputational harm (Setiani et al., 2024). Global evidence suggests that firms with weak environmental governance are more vulnerable to litigation risk and regulatory enforcement actions (Nguyen et al., 2023). Although Indonesian environmental laws and enforcement mechanisms are evolving, corporate ESG disclosures rarely reflect litigation risk as a material governance issue,

limiting transparency and risk awareness among investors and regulators (Alfan et al., 2023; Putri & Paramita, 2025).

The risk of stranded assets constitutes a critical governance challenge for firms operating in carbon-intensive industries (Setiani et al., 2024). As climate policies, technological innovations, and market preferences evolve, certain assets may lose economic value prematurely, posing significant financial and strategic risks. Sustainable finance literature underscores that stranded asset risk is closely associated with weak governance oversight and insufficient integration of climate considerations into long-term planning (Pambekti & Lestari, 2023; Yanto et al., 2025). Despite its materiality, stranded asset risk continues to be predominantly absent from ESG disclosures of Indonesian non-financial firms, further reinforcing the gap between ESG reporting and enterprise-wide risk management.



Source: Authors own work

Figure 2. Conceptual framework of ESG disclosure and sustainability risk integration in the non-financial sector

The foregoing discussion supports the development of a conceptual framework that explains the relationship between ESG disclosure practices and sustainability risk governance in non-financial companies (see Figure 2). ESG disclosure is organised across three core dimensions, environmental, social, and governance, each of which gives rise to distinct categories of sustainability risk (Chang, 2024). These include physical and transition risks associated with environmental factors; social risks related to land use, labour conditions, and human rights; and governance risks such as greenwashing, litigation exposure, and stranded assets. The framework demonstrates that, in the absence of systematic integration into Enterprise Risk Management (ERM), ESG-related risks tend to remain fragmented and are predominantly disclosed through narrative, compliance-oriented reporting (Bao et al., 2024; Samosir & Alvia, 2024). Regulatory pressures and global sustainability frameworks, including GRI, ISSB, and TCFD, operate as external drivers shaping firms' disclosure practices (Kathan et al., 2025). However, effective integration of ESG risks into ERM is positioned as a critical mechanism for transforming ESG disclosure from a symbolic reporting exercise into a substantive tool for risk mitigation and value protection. In this context, policy intervention by regulators, particularly through risk-based supervision, standardisation, and assurance mechanisms, emerges as a key enabler of such integration.

Policy Perspectives from Focus Group Discussions (FGD)

This section presents the policy-oriented findings derived from a series of Focus Group Discussions (FGDs) conducted with senior officials of the Indonesian Financial Services Authority. The FGDs involved managers and division heads responsible for sustainable finance, risk supervision, and market oversight, and were designed to capture regulatory perspectives on ESG disclosure practices, sustainability risk materiality, and supervisory challenges in the non-financial sector. The discussion is organised thematically to reflect key policy-relevant insights rather than descriptive accounts of the discussions (Krueger, 2002; Yayeh, 2021).

ESG Disclosure as a Supervisory Instrument: Current Limitations

Participants consistently emphasised that, from a regulatory perspective, ESG disclosure in the non-financial sector has not yet functioned as an effective supervisory tool. Although the volume of ESG reporting has increased following the implementation of POJK No. 51/2017, regulators noted that disclosures remain largely narrative, non-comparable, and weakly linked to firms' underlying risk profiles. Participants further noted that the absence of standardised, materiality-driven ESG metrics constrains Indonesian Financial Services Authority's ability to assess cross-sectoral risk exposure and transmission channels between the real sector and the financial system. While firms formally reference frameworks such as GRI, the lack of alignment with ISSB or TCFD limits the usefulness of ESG disclosures for prudential oversight, particularly in assessing climate-related and sustainability-related financial risks (An et al., 2025). Participants emphasised that ESG disclosure in the non-financial sector has not yet functioned as an effective supervisory instrument. As one senior supervisor noted:

“Most ESG reports are predominantly descriptive. They tell us what companies want to show, but not what we actually need to assess risk.” (Senior Supervisor, Indonesian Financial Services Authority)

Another participant highlighted the lack of comparability across firms and sectors:

“It is difficult to benchmark ESG risks because disclosures are not standardised and often ignore materiality.” (Policy Analyst, Indonesian Financial Services Authority)

As a result, ESG reports provide limited input for risk-based supervision and early warning mechanisms (Ben Mahjoub, 2024; Sneideriene & Legenzova, 2025). This finding aligns with prior studies suggesting that sustainability disclosures in emerging markets often prioritize symbolic compliance over decision-useful information (Deegan, 2002; Giupponi et al., 2025; Janik et al., 2025; Kathan et al., 2025).

Material Sustainability Risks and Systemic Implications

Participants emphasised that climate-related risks and social risks should no longer be treated as non-financial or peripheral issues, but rather as risk drivers with direct implications for prudential supervision. Participants unanimously acknowledged that sustainability risks originating in the non-financial sector may generate systemic implications for financial stability. Climate-related disruptions, social conflicts, and governance failures in the real sector were regarded as potential transmission channels to the financial system. One division head explained:

“If climate risk hits the real sector, it will eventually hit banks through credit risk. The problem is that we don't yet see this clearly reflected in ESG disclosures.” (Head of Division, Indonesian Financial Services Authority)

This concern was reinforced by other participants, who highlighted that risk transmission is not confined to physical climate shocks but is increasingly shaped by transition dynamics, including regulatory shifts, investor expectations, and changing market sentiment. As noted by a senior policy director:

“Transition risk is not only about regulation. Investor pressure and market sentiment are changing faster than many companies realize.” (Senior Policy Director, Indonesian Financial Services Authority)

This perspective is consistent with global regulatory developments, where sustainability risks are increasingly incorporated into supervisory stress testing, risk-based capital assessment, and disclosure requirements (Mankowski, 2024; Nguyen et al., 2023). In contrast to global regulatory frameworks that increasingly embed sustainability risks within prudential supervision and financial stability mandates (Álvarez-Quiroz & Quispe-Calderón, 2026; An et al., 2025). Such misalignment constrains the capacity of ESG disclosures to function as an effective early-warning mechanism for sustainability-related systemic risks within the Indonesian financial system (Alfan et al., 2023; Nareswari et al., 2023).

ESG Disclosure and Enterprise Risk Management (ERM): The Integration Gap

Participants identified a critical disconnect between ESG disclosure practices and Enterprise Risk Management (ERM) within non-financial companies. As one risk supervision officer noted:

“ESG risks are reported, but they are not managed. They sit outside the company’s risk register.” (Risk Supervision Officer, Indonesian Financial Services Authority)

This concern was echoed by senior supervisory staff, who emphasised the institutional separation between reporting and risk governance:

“From our assessment, ESG risks are rarely integrated into internal risk governance. Reporting and risk management are treated as two separate worlds.” (Senior Supervisor, Indonesian Financial Services Authority)

A similar view was expressed by another supervisory participant, who pointed to the absence of internal accountability for ESG risks:

“As long as ESG is handled by the sustainability team and not by the risk function, it will never become part of risk management.” (Supervisory Officer, Indonesian Financial Services Authority)

This finding reinforces the COSO (2018) framework, which positions ESG-related risks as integral components of enterprise-wide risk management, and supports empirical evidence linking integrated risk governance to improved long-term performance and resilience. A central theme emerging from the FGDs concerns the disconnect between ESG disclosure and Enterprise Risk Management (ERM) practices within non-financial firms. Regulators observed that ESG issues are typically reported in sustainability reports, while ERM frameworks continues to focus primarily on financial and operational risks (Chang, 2024; Nguyen et al., 2023).

Policy Priorities for Strengthening ESG-Based Supervision

FGDs revealed a convergence of regulatory perspectives on several policy priorities aimed at enhancing the effectiveness of ESG disclosure and sustainability risk supervision in the non-financial sector. Participants repeatedly emphasised the need for greater standardisation of ESG disclosure, particularly through gradual alignment with ISSB standards (IFRS S1 and IFRS S2) and the TCFD framework. FGDs underscored the need for independent assurance mechanisms to enhance the credibility of ESG disclosures and mitigate greenwashing risks. Without assurance, ESG information remains vulnerable to strategic manipulation, limiting its value for regulators, investors, and other stakeholders (Ben Mahjoub, 2024; Sulaiman et al., 2025). As one policy director noted:

“Without a global baseline like ISSB, it is highly challenging for regulators to use ESG data consistently.” (Policy Director, Indonesian Financial Services Authority)

Alongside standardisation, regulators emphasised that ESG-related risks need to be embedded within risk-based supervisory processes rather than treated as a stand-alone reporting requirement (Eriandani & Winarno, 2024). A senior supervisor highlighted this concern succinctly:

“If ESG is not part of risk-based supervision, then it will remain a reporting exercise.” (Senior Supervisor, Indonesian Financial Services Authority)

Participants also underscored the urgency of independent assurance mechanisms to address greenwashing risks and enhance the credibility of disclosed ESG information (Mahjoub, 2024). As articulated by the head of a sustainable finance unit:

“We need assurance. Otherwise, we cannot distinguish between real performance and good storytelling.” (Head of Sustainable Finance Unit, Indonesian Financial Services Authority)

This approach reflects international regulatory practice, where sustainability risks are increasingly embedded within prudential supervision and macroprudential policy tools (Alfan et al., 2023; Guenichi et al., 2025).

Policy Prioritisation and AHP Results

This section presents the results of the policy prioritisation analysis using the Analytic Hierarchy Process (AHP), aimed at identifying the most critical policy interventions to strengthen ESG disclosure and sustainability risk supervision in the non-financial sector. The AHP analysis synthesizes insights from the Focus Group Discussions (FGDs) with Indonesian Financial Services Authority officials and evidence from document analysis, enabling qualitative regulatory judgments to be systematically translated into quantitative policy priorities.

Policy Evaluation Criteria

Based on the FGDs and regulatory objectives of Indonesian Financial Services Authority, three main policy evaluation criteria were established. First, risk materiality and systemic relevance refer to the extent to which a policy addresses sustainability risks that may affect financial stability through risk transmission from the real sector to the financial system. Second, regulatory effectiveness captures the policy’s potential to improve supervisory capacity, data quality, and risk-based oversight. Third, implementation feasibility reflects practical considerations, including institutional readiness, regulatory complexity, and compliance capacity of non-financial firms. These criteria are consistent with policy-oriented applications of AHP, which emphasise the suitability of the method for structuring complex regulatory decisions involving multiple stakeholders and competing objectives (Lyu et al., 2025; Olson, 1996; Olson & Wu, 2010; Saaty, 1979).

Policy Alternatives Assessed

Policy alternatives were derived through the synthesis of findings from the document analysis and Focus Group Discussions (FGDs). Recurring issues were subsequently translated into four policy interventions reflecting the priorities emphasised by regulatory experts, namely: (1) integration of ESG risks into risk-based supervision, (2) standardisation of ESG disclosure based on ISSB and TCFD frameworks, (3) mandatory independent ESG assurance, and (4) capacity building for non-financial firms. These alternatives formed the third level of the AHP hierarchy and were subsequently evaluated through pairwise comparisons against the three policy evaluation criteria to determine their relative priorities (COSO, 2018; OECD, 2020; TCFD Report, 2025) (see Table 1).

Table 1. AHP Results: Policy Priority Ranking

Panel A. Criteria Weights

Criteria	Description	Weight
Risk Materiality & Systemic Relevance	Ability to address ESG risks with direct implications for financial stability and risk transmission	0.42
Regulatory Effectiveness	Capacity to improve supervisory oversight, data quality, and risk-based supervision	0.33

Criteria	Description	Weight
Implementation Feasibility	Practicality considering regulatory readiness, institutional capacity, and compliance costs	0.25
Total		1.00

Note: Criteria weights were derived from pairwise comparisons based on FGD inputs and regulatory objectives of Indonesian Financial Services Authority. Consistency Ratio (CR) < 0.10.

Panel B. Policy Alternatives and Priority Weights

Policy Alternatives	Risk Materiality (0.42)	Regulatory Effectiveness (0.33)	Feasibility (0.25)	Composite Weight	Priority Rank
Integration of ESG Risks into Risk-Based Supervision	0.36	0.38	0.30	0.34	1
Standardisation of ESG Disclosure (ISSB/TCFD)	0.32	0.31	0.27	0.30	2
Mandatory Independent ESG Assurance	0.20	0.21	0.23	0.21	3
Capacity Building for Non-Financial Firms	0.12	0.10	0.20	0.15	4
Total	1.00	1.00	1.00	1.00	

Panel C. Consistency Test

Indicator	Value
Consistency Ratio (CR)	0.06
Acceptable Threshold	< 0.10
Judgment Consistency	Acceptable

AHP Results and Priority Ranking

The AHP results indicate a clear ordering of priorities of policy interventions. Integration of ESG-related risks into risk-based supervision emerged as the highest priority, receiving the largest composite weight. Regulators viewed this policy as essential to reposition ESG disclosure from a compliance-oriented reporting exercise into a core supervisory input that supports early risk identification and financial stability. The second-highest priority is standardisation of ESG disclosure based on global standards. Alignment with ISSB and TCFD frameworks was considered critical for improving data comparability, materiality, and the decision-usefulness of ESG information for prudential oversight. This finding reinforces empirical evidence that standardised, materiality-driven ESG disclosure enhances risk assessment and long-term performance (Eriandani & Winarno, 2024; Rahayu et al., 2025).

The third-ranked policy option is mandatory independent assurance of ESG disclosures. Mandatory independent assurance of ESG disclosures emerged as a ranked lower, yet strategically important, policy option. Regulatory participants acknowledged that assurance can play a critical role in mitigating greenwashing and enhancing the credibility of ESG information. However, its prioritisation was moderated by concerns related to implementation costs, the limited readiness of domestic assurance markets, and the risk of adding regulatory burden before foundational disclosure structures are fully established. This sequencing aligns with prior research suggesting that assurance mechanisms are most effective when built upon robust disclosure standards and materiality-based

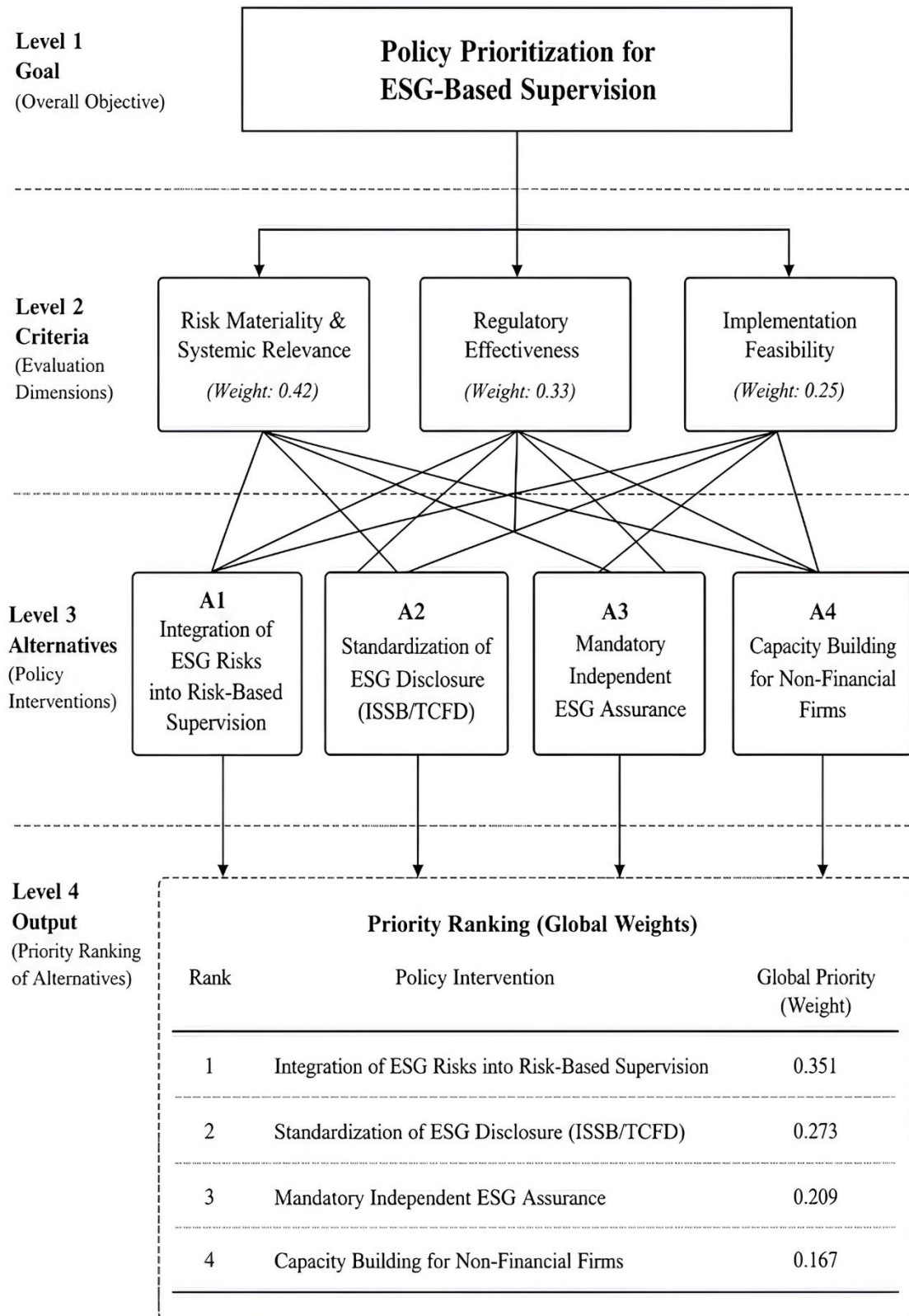
reporting frameworks (Emma et al., 2024). Studies in sustainability reporting and assurance emphasise that, in the absence of standardised and decision-useful ESG information, assurance may reinforce procedural compliance without substantially improving risk relevance (An et al., 2025; Chang, 2024; Kathan et al., 2025). From a regulatory perspective, assurance therefore complements, rather than substitutes for, standardisation and supervisory integration, explaining why regulators view it as a necessary medium-term instrument, particularly for high-risk sectors, rather than an immediate supervisory priority.

Finally, capacity-building initiatives were ranked as the lowest priority among the four alternatives. Although capacity building is essential for long-term improvement in ESG reporting quality, regulators emphasised that without strong supervisory incentives and regulatory signals, capacity-building efforts alone are unlikely to produce substantive behavioural change (see Figure 3) (Angir & Weli, 2024; Bartolozzi, 2025). Therefore, AHP consistency ratio was below the acceptable threshold of 0.10, indicating a satisfactory level of judgment consistency and robustness of the prioritisation results (see Table 1) (Saaty, 1979).

Figure 3 presents a structured Analytic Hierarchy Process (AHP) framework designed to prioritise policy interventions for strengthening ESG-based supervision in the non-financial sector. The hierarchy is organised into four levels. The first level defines the overall objective of policy prioritisation. The second level introduces three evaluation criteria, risk materiality and systemic relevance, regulatory effectiveness, and implementation feasibility, each weighted based on regulatory perspectives derived from Focus Group Discussions. These criteria reflect the extent to which policy options address financially material sustainability risks, enhance supervisory capacity, and remain feasible within existing institutional and market conditions.

The third level specifies four alternative policy interventions: integration of ESG risks into risk-based supervision, standardisation of ESG disclosure aligned with ISSB and TCFD frameworks, mandatory independent ESG assurance, and capacity-building initiatives for non-financial firms. The AHP structure illustrates how each alternative is evaluated against all criteria through pairwise comparisons. The final level presents the resulting priority ranking, indicating that integration of ESG risks into risk-based supervision emerges as the most critical intervention, followed by disclosure standardisation, assurance mechanisms, and capacity building. This hierarchy demonstrates how qualitative regulatory insights are systematically translated into quantitative policy priorities, thereby supporting more coherent and risk-oriented supervisory decision-making.

In operational terms, the proposed framework may be implemented progressively according to sectoral risk exposure and institutional readiness. Regulators may initially require firms in environmentally and socially sensitive sectors, including mining, agriculture, manufacturing, and infrastructure, to incorporate material ESG risks into corporate risk registers, board-level oversight, and supervisory reporting. Standardised disclosure requirements and independent assurance may subsequently be introduced in stages, beginning with high-risk and large firms before being extended to smaller entities. Implementation within firms requires closer coordination between sustainability, risk management, internal audit, and board functions, while regulators need sector-specific supervisory indicators, technical guidance, and institutional capacity to evaluate ESG-related risk transmission.



Note: Weights are derived from the Analytic Hierarchy Process (AHP) based on pairwise comparisons of criteria and alternatives.

Source: Authors own work

Figure 3. AHP-Based Policy Prioritisation Framework for ESG-Based Supervision

Conclusions

This study demonstrates that ESG disclosure in Indonesia's non-financial sector has not yet evolved into an effective instrument for sustainability risk governance. Although disclosure practices have expanded, they remain insufficiently integrated with enterprise risk management and therefore provide limited value for prudential supervision and early-warning systems. By combining document analysis, policy-oriented Focus Group Discussions with the Indonesian Financial Services Authority, and Analytic Hierarchy Process (AHP), the study identifies a clear regulatory priority: integrating ESG-related risks into risk-based supervision, followed by disclosure standardisation, independent assurance, and capacity-building initiatives. These findings extend legitimacy and risk governance perspectives by reframing ESG disclosure from a transparency-oriented reporting mechanism into a governance instrument that supports risk identification, supervisory decision-making, and financial stability. Methodologically, the study also demonstrates how qualitative regulatory insights can be systematically translated into quantitative policy priorities through AHP, providing a replicable framework for policy-oriented sustainability research.

The findings carry important implications for both regulators and non-financial firms. Regulators should prioritise embedding ESG risks within supervisory frameworks while progressively strengthening disclosure standards and assurance mechanisms to improve the materiality, comparability, and credibility of ESG information. At the organisational level, firms should integrate ESG risks into Enterprise Risk Management (ERM) to strengthen resilience and support long-term value creation instead of treating sustainability reporting primarily as a compliance exercise. This study is limited to the Indonesian non-financial sector and relies primarily on regulatory perspectives obtained through FGDs. Future research may extend the analysis through cross-country comparisons, firm-level investigations, and longitudinal evidence examining the financial consequences of ESG-ERM integration.

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Appendix A.

Content Analysis Dimension

Code	Content Analysis Dimension	Evidence Sought	Scoring Criteria (0–3)
CA1	Environmental Risk Disclosure	Disclosure of environmental risks, including emissions, pollution, biodiversity, waste management, and resource use.	0–3
CA2	Social Risk Disclosure	Labour practices, occupational health and safety, human rights, community relations, supply chain social risks, and stakeholder engagement.	0–3
CA3	Governance Risk Disclosure	Board governance, ethics, anti-corruption, compliance, audit, and internal control related to ESG.	0–3
CA4	ESG–ERM Integration	Evidence that ESG risks are incorporated into Enterprise Risk Management (ERM) processes and corporate risk registers.	0–3
CA5	Materiality Assessment	Identification and prioritisation of material ESG issues relevant to business operations.	0–3
CA6	ISSB / IFRS S1–S2 Alignment	Reference to ISSB Sustainability Disclosure Standards or IFRS S1 and IFRS S2.	0–3
CA7	Climate-Related Risk Disclosure	Discussion of physical climate risks, transition risks, scenario analysis, and resilience planning.	0–3
CA8	Board Oversight of ESG	Evidence of board responsibility, ESG committees, or governance structures overseeing sustainability risks.	0–3
CA9	Independent ESG Assurance	External assurance or verification of sustainability disclosures by an independent party.	0–3
CA10	Decision-Useful Disclosure	Forward-looking, measurable, comparable, and decision-useful ESG information for investors and regulators.	0–3

Interpretation: 0 = Not disclosed; 1 = General narrative; 2 = Specific disclosure with supporting evidence; 3 = Comprehensive disclosure integrated into corporate strategy and risk management.

Summary of Content Analysis Results Across Sampled Companies

No.	Company	Sector	Total Score	Mean	Overall Interpretation
1	PT Semen Indonesia (Persero) Tbk	Manufacturing	25	2.50	High ESG disclosure quality
2	PT Indocement Tungal Prakarsa Tbk	Manufacturing	23	2.30	Moderate–High
3	PT Chandra Asri Pacific Tbk	Manufacturing	20	2.00	Moderate
4	PT Astra International Tbk	Diversified Manufacturing	26	2.60	High
5	PT Indofood CBP Sukses Makmur Tbk	Consumer Goods	18	1.80	Moderate
6	PT Unilever Indonesia Tbk	Consumer Goods	27	2.70	High
7	PT Kalbe Farma Tbk	Healthcare	23	2.30	Moderate–High
8	PT Vale Indonesia Tbk	Mining	26	2.60	High
9	PT Bukit Asam Tbk	Mining	24	2.40	Moderate–High
10	PT Aneka Tambang Tbk	Mining	20	2.00	Moderate
11	PT Merdeka Copper Gold Tbk	Mining	25	2.50	High
12	PT Medco Energi Internasional Tbk	Energy	24	2.40	Moderate–High

No.	Company	Sector	Total Score	Mean	Overall Interpretation
13	PT Pertamina Geothermal Energy Tbk	Energy	28	2.80	High
14	PT Perusahaan Gas Negara Tbk	Energy	24	2.40	Moderate-High
15	PT Jasa Marga (Persero) Tbk	Infrastructure	17	1.70	Moderate-Low
16	PT Wijaya Karya (Persero) Tbk	Infrastructure	17	1.70	Moderate-Low
17	PT Waskita Karya (Persero) Tbk	Infrastructure	17	1.70	Moderate-Low
18	PT Dharma Satya Nusantara Tbk	Agriculture	19	1.90	Moderate
19	PT BISI International Tbk	Agriculture	17	1.70	Moderate-Low
20	PT Japfa Comfeed Indonesia Tbk	Agrifood	19	1.90	Moderate