Original Article

Integrating Sustainability into Indonesia's Mining Regulation: A Normative Assessment of Downstreaming, Reclamation, and ESG Policies

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Abstract

The growth of the mining sector in Indonesia has contributed significantly to national economic development, but it has also imposed serious environmental externalities. In response, the central government has enacted policies such as downstreaming mandates, post-mining reclamation requirements, and the promotion of Environmental, Social, and Governance (ESG) principles to promote green mining. This study evaluates the extent to which these policies embed sustainability principles and provide legitimate environmental protection in the mining sector. Using normative legal research, we analyze mining, environmental, and green mining regulations, supported by qualitative examination of policy implementation reports. We find that although sustainability dimensions are formally incorporated, policy execution faces major constraints: (1) downstreaming focuses heavily on economic interests with insufficient environmental controls, (2) reclamation obligations are often weakly supervised, and (3) ESG implementation remains voluntary, reducing legal certainty. We recommend stronger binding ESG regulation, integration of downstream policy with environmental instruments, and establishment of transparent oversight.

Keywords: Downstreaming; ESG Regulation; Green Mining; Reclamation; Sustainability;

Introduction

The mining sector has long been a strategic pillar of Indonesia's national development, contributing significantly to export revenue, industrial supply chains, and foreign investment. However, its rapid expansion has generated severe environmental and social impacts that expose fundamental weaknesses in Indonesia's mining governance framework. Empirical evidence shows that large-scale mining has caused extensive deforestation, water contamination, soil degradation, biodiversity loss, and social displacement, particularly in Kalimantan and Sumatra. Indonesia is among the four largest contributors to tropical deforestation caused by mining, accounting for approximately 1,901 km² or 58.2% of mining-related forest loss in 26 countries studied.[1] Mining activities have also degraded surface and groundwater quality through acid mine drainage and waste runoff, damaging aquatic ecosystems and surrounding habitats.[2]

In response, the Indonesian government has enacted various regulatory instruments aimed at mitigating mining-related environmental harm. Key among these are Law Number 32 of 2009 on Environmental Protection and Management and Law Number 3 of 2020 on Mineral and Coal Mining, supplemented by Government Regulation Number 96 of 2021 and sectoral ministerial regulations. These regulations introduce several policy mechanisms intended to promote sustainable or "green" mining, including mandatory mineral downstreaming, reclamation and post-mining

[1] T. Hernaningsih, 'Dampak Pertambangan Batubara Terhadap Air Permukaan Dan Mitigasinya', *Jurnal Sains Dan Teknologi Mitigasi Bencana*, 16.2 (2022), 38.

[2] Asep Saepudin and others, 'Indonesia Green Mining Industry', *European Journal of Development Studies*, 2.5 (2022), 22–31 <https://doi.org/10.24018/EJDEVELOP.2022.2.5.169>.

obligations, and the voluntary promotion of Environmental, Social, and Governance (ESG) principles.

Normatively, these policies appear to reflect a commitment to sustainability. Downstreaming obligations require domestic mineral processing prior to export; reclamation rules mandate land rehabilitation supported by financial guarantees; and ESG frameworks encourage responsible corporate behavior. However, the central legal problem lies not in the absence of regulation, but in the limited capacity of these legal instruments to function as effective mechanisms of environmental protection.

Empirical studies consistently show that downstreaming policies remain predominantly oriented toward economic value creation, while environmental safeguards for processing and refining activities are weak and poorly enforced.[3] Rather than reducing ecological harm, downstreaming has in some cases generated new sources of pollution due to inadequate oversight of smelter development.[4] Similarly, reclamation and post-mining obligations often result in mere administrative compliance, with many former mining sites left ecologically degraded despite formal fulfillment of legal requirements. [5] Weak institutional coordination and fragmented supervision further undermine post-mining accountability.

The voluntary nature of ESG implementation exacerbates these shortcomings. Although ESG principles are normatively acknowledged within Indonesia's regulatory framework, they lack binding legal force and enforceable standards. As a result, corporate compliance is largely driven by reputational considerations rather than legal obligation, limiting ESG's capacity to induce systemic behavioral change in the mining sector.

From an environmental law perspective, effective protection requires more than the formal existence of legal norms. It depends on normative adequacy, institutional capacity, and compliance behavior, all of which must be grounded in core environmental principles such as prevention, precaution, polluter pays, and state responsibility.[6] While Indonesia has formally adopted the principle of sustainable development in its environmental legislation, these principles are insufficiently operationalized within mining-specific regulations. Economic objectives continue to dominate, while ecological and social dimensions are treated as secondary or declarative concerns.

Previous studies confirm this structural imbalance. Reclamation obligations are frequently implemented without meaningful ecological restoration, and downstreaming policies have introduced new environmental risks due to weak enforcement.[7] Although mining regulations are often described as consistent with ESG principles, sustainability remains largely rhetorical, lacking binding instruments and integrated supervision mechanisms.[8]

Accordingly, Indonesia's mining governance continues to face a persistent gap between economic priorities and environmental sustainability. Existing regulatory solutions have failed to resolve this problem because they emphasize economic growth, rely on administrative compliance, and treat sustainability principles as non-binding aspirations. This study therefore seeks to assess the extent to which sustainability principles are substantively embedded in Indonesia's mining laws and to identify legal and institutional reforms necessary to transform those principles into effective instruments of environmental protection.

[3] A. Rifai and R. Widyati, 'Kebijakan Hilirisasi Pertambangan Mineral Dalam Perspektif Pembangunan Berkelanjutan Di Indonesia', *Jurnal Hukum Ius Quia Iustum*, 29.3 (2022), 431.

[4] R. Suharto and A. V. Yulianingrum, 'Evaluasi Pelaksanaan Reklamasi Dan Pascatambang Di Kalimantan Timur Dalam Perspektif Hukum Lingkungan', *Jurnal Mimbar Hukum*, 33.2 (2021), 287–305.

[5] R. Marbun and H. Sugianto, 'Efektivitas Hukum Lingkungan Dalam Perspektif Perlindungan Ekologis Di Indonesia', *Jurnal Hukum Ius Quia Iustum*, 28.4 (2021), 543.

[6] S. S. Rangkuti, 'Prinsip-Prinsip Hukum Lingkungan Sebagai Dasar Perlindungan Lingkungan Yang Efektif Di Indonesia', *Jurnal Mimbar Hukum*, 32.2 (2020), 259.

[7] A. P. Dewi and T. Nugroho, 'Implementasi Prinsip Keberlanjutan Dalam Perlindungan Lingkungan Di Sektor Pertambangan', *Jurnal Hukum Dan Pembangunan*, 52.3 (2022), 373.

[8] A. Fitria and D. Prasetyo, 'Implementasi Prinsip Environmental, Social, and Governance (ESG) Dalam Tata Kelola Pertambangan Berkelanjutan Di Indonesia', *Jurnal Hukum Dan Pembangunan*, 52.3 (2022), 433.

Method

This study utilizes normative legal research, supplemented with qualitative policy document analysis. The normative approach focuses on interpreting and critically evaluating statutory texts, regulations, and policy instruments in Indonesia's mining sector to assess how well they incorporate sustainability principles and environmental protection mandates. This method systematically examines legal norms, recognizing that law inherently carries prescriptive and value-oriented characteristics that shape its role in society. It highlights the importance of doctrinal and systematic analysis to understand the nature, scope, and application of legal norms, particularly in academic and legal practice. The qualitative component complements this by analyzing implementation reports, audit findings, academic studies, and secondary sources to evaluate real-world compliance and identify gaps between formal norms and actual practices. This approach provides a comprehensive assessment of both the adequacy of legal frameworks and their practical effectiveness in environmental protection. For document collection, primary legal and regulatory sources were gathered, including Law No. 4 of 2009 on Minerals and Coal (amended by Law No. 3 of 2020), which serves as the core legal basis for mining sector management, emphasizing sustainability and environmental responsibility. Additionally, Government Regulation No. 78 of 2010 on Reclamation and Post-Mining provides the technical legal foundation for ecological restoration following mining activities. The research also incorporates Permen ESDM No. 25 of 2018, which outlines the regulations for mining down streaming, and Permen ESDM No. 26 of 2018, which governs good mining practices and environmental governance in Indonesia's mining sector. Secondary legal materials, including concepts on sustainability and legal effectiveness, as well as implementation oversight and evaluation reports from ministries and audit bodies, were also examined to provide further context and insight.[9] We developed a coding framework based on key sustainability principles: (i) Precautionary principle [10]; (ii) Polluter-pays principle[11]; (iii) Intergenerational equity[12]; (iv) Ecological integrity / restoration.[13]; (v) Public participation / transparency.[14]; (vi) Adaptive management.[15]. The research systematically analyzed qualitatively each regulatory instrument or policy document for the presence, strength, and binding nature of these principles.[16] It then contrasted legal design with available empirical or implementation evidence to identify gaps or contradictions.

Results and Discussions

The implementation of the sustainability principle within Indonesia's downstreaming (*hilirisasi*) policy reveals a tension between economic growth objectives and environmental stewardship. Overall, Law No. 4 of 2009 in conjunction with Law No. 3 of 2020 has integrated economic, social, and environmental dimensions into a single national mining legal framework. Law Number 32 of 2009 which is implemented through Government Regulation Number 22 of 2021, also requires an environmental permit/approval as a prerequisite for a business license. The AMDAL/UKL-UPL

[9] Sholahuddin Al-Fatih, *Perkembangan Metode Penelitian Hukum Di Indonesia* (Malang: Universitas Muhammadiyah Malang, 2023).

[10] Hari Sutra Disemadi, 'Lenses of Legal Research: A Descriptive Essay on Legal Research Methodologies', *Journal of Judicial Review*, 24.2 (2022), 289–304 <https://doi.org/10.37253/JJR.V24I2.7280>.

[11] Fausto Corvino, 'The Forward-Looking Polluter Pays Principle for a Just Climate Transition', *Critical Review of International Social and Political Philosophy*, 1–28 <https://doi.org/10.1080/13698230.2023.2243729>.

[12] Ling Zhu, 'Some Thoughts on Application of the Polluter Pays Principle for Controlling Marine Greenhouse Gas Emissions', *Marine Policy*, 158 (2023), 105877 <https://doi.org/10.1016/J.MARPOL.2023.105877>.

[13] Quanliang Ye, Yuli Shan and Klaus Hubacek, 'Promoting Intergenerational Equity Calls for Strategic Investments in Long-Lasting Capital Systems', *Cell Reports Sustainability*, 1.9 (2024), 100153 <https://doi.org/10.1016/J.CRSUS.2024.100153>.

[14] Paul R. Elsen and others, 'Priorities for Embedding Ecological Integrity in Climate Adaptation Policy and Practice', *One Earth*, 6.6 (2023), 632–44 <https://doi.org/10.1016/J.ONEEAR.2023.05.014>.

[15] Otelemate Ibim Dokubo, Maria Alina Radulescu and Lorenzo Squintani, 'What Law Does Not Understand about Public Participation', *Heliyon*, 10.11 (2024), e32001 <https://doi.org/10.1016/J.HELIYON.2024.E32001>.

[16] Johan Månsson and others, 'Understanding and Overcoming Obstacles in Adaptive Management', *Trends in Ecology & Evolution*, 38.1 (2023), 55–71 <https://doi.org/10.1016/J.TREE.2022.08.009>.

document forms the basis of the requirements and can be grounds for rejection/cancellation if not fulfilled.

However, in practice, various studies previously described show that the implementation of these sustainability principles still faces challenges, particularly in terms of oversight, corporate compliance, and the effectiveness of environmental law enforcement in the mining sector. The amended Mining Law (Law No. 3 of 2020) intensifies down streaming obligations by requiring domestic processing and refining prior to export, with nickel as a key focus of the policy agenda.[17] This is regulated in Article 103 paragraph (1) of Law No. 3 of 2020. However, Article 102 of Law Number 3 of 2020 regulates the obligation to "increase the added value of minerals through processing and refining" as part of production operations. It is supported by Government Regulation Number 96 of 2021 (Implementation of Mineral and Coal Mining Business Activities) that emphasizes domestic processing and refining an obligation and regulates commodities whose added value must be increased. The practice of nickel down streaming is framed by the government as a success story of industrialization and national pride, with accelerated expansion and export revenues, while environmental dimensions emerge as only a subordinate issue.[18] There is disharmony between downstream mandates that are completely unrelated to environmental protection issues and environmental statutes that strictly prohibit activities that cause pollution, including when downstream facilities themselves can generate pollution.

ESDM Regulation Number 25 of 2018 mandates mining business license holders to enhance the added value of minerals through domestic processing and refining activities. This regulation addresses several key aspects of down streaming implementation. Articles 75 to 78 require holders of IUP and IUPK licenses to carry out processing and/or refining of mining products within the country, applying to all types of metal minerals listed in the regulation's appendix and specifying a minimum refining grade. Articles 79 to 80 provide limited export permits to companies still in the process of constructing smelting facilities, on the condition that they show physical progress in construction according to a verified schedule. Furthermore, Articles 81 to 83 require companies to periodically report their smelter development progress to the Directorate General of Mineral and Coal, with the government holding the authority to impose sanctions if development targets are not met. Finally, Articles 106 to 108 outline the supervision and administrative sanctions, including the temporary suspension of business activities or revocation of permits, for companies that fail to meet their processing and refining obligations.

ESDM Regulation Number 25 of 2018 strengthens the downstream policy by emphasizing the obligation to build domestic processing facilities and supervise their progress. This policy supports sustainable development goals in the economic aspect through increased added value and national industrialization. But, when we use environmental perspective, this regulation does not explicitly regulate sustainability standards or the mitigation of ecological impacts from smelter development, so the implementation of sustainability principles is still limited to the economic dimension without strengthening environmental and social aspects.

Although ESDM Regulation Number 26 of 2018 does not explicitly mention Environmental, Social, and Governance (ESG), its provisions effectively cover all three ESG dimensions environment, social, and governance by establishing regulations that prioritize sustainability in mining activities. The regulation sets forth several crucial provisions aimed at ensuring that mining operations are conducted responsibly and contribute positively to the environment, society, and governance systems.

Articles 2 to 3 are foundational in requiring holders of IUP and IUPK licenses to adhere to good mining practices, which are broad in scope and directly tied to ESG principles. These practices include technical management, occupational safety, conservation of mineral and coal resources, environmental protection, and social responsibility toward the community. By embedding these practices into mining operations, the regulation implicitly ensures that mining companies contribute

[17] Eve Warburton, 'Nationalist Enclaves: Industrialising the Critical Mineral Boom in Indonesia', *The Extractive Industries and Society*, 20 (2024), 101564 <https://doi.org/10.1016/J.EXIS.2024.101564>.
[18] Warburton.

to sustainable development, reduce environmental degradation, and safeguard worker welfare, thus aligning with the environmental and social aspects of ESG.

Further reinforcing the environmental dimension of ESG, Articles 19 to 23 mandate companies to implement comprehensive environmental management strategies. These provisions specifically focus on pollution prevention, land reclamation, and post-mining rehabilitation. Such requirements address the ecological responsibility of mining companies, ensuring that mining activities do not lead to long-term environmental damage. These rules ensure that environmental sustainability is maintained, mitigating the impact of mining activities on ecosystems and local communities.

The social dimension of ESG is addressed in Articles 24 to 26, which impose obligations on companies to engage in community development and empowerment around mining areas. These articles aim to ensure that mining activities bring sustainable social benefits to local communities, focusing on improving the livelihoods of people in mining-affected areas. By requiring companies to contribute to the welfare of local populations, the regulation aligns mining operations with broader social responsibility goals, such as reducing inequality and promoting community resilience.

Finally, Articles 27 to 30 focus on governance mechanisms by establishing requirements for government reporting and supervision. These provisions mandate regular evaluations of compliance with environmental, social, and safety aspects of mining operations, ensuring that companies are held accountable for their actions. Through effective oversight and reporting, the regulation helps to ensure transparency, accountability, and adherence to the principles of good governance within the mining sector, thus supporting the governance pillar of ESG.

In conclusion, while ESDM Regulation Number 26 of 2018 does not explicitly mention ESG, it incorporates key principles of environmental protection, social responsibility, and governance. By regulating mining practices across these three dimensions, the regulation ensures that mining activities in Indonesia are aligned with sustainability goals, addressing the critical need for responsible resource management and fostering a positive social impact on affected communities.

ESDM Regulation Number 26 of 2018 serves as an umbrella for the implementation of ESG principles in the mining sector, as it emphasizes a balance between economic productivity, environmental protection, and social responsibility. Through these regulations, the government seeks to encourage mining practices that are not only oriented towards economic profit but also consider the sustainability of resources and the welfare of communities around the mine. Unfortunately, in practice, the effectiveness of the implementation of these regulations still depends on the monitoring system, corporate compliance, and inter-agency synergy between the Ministry of Energy and Mineral Resources and the Ministry of Environment and Forestry. Even where downstreaming is legally mandated, environmental safeguards are weak. Environmental assessment and pollution control at downstream processing facilities are often deprioritized. The Indonesia Mining Industry Green Mining study argues that environmental oversight in downstream operations is patchy and regulatory loopholes permit lax environmental standards.[19]

Government Regulation Number 78 of 2010 mandates that mining companies restore the environment from the exploration phase through to post-mining operations, with several key provisions ensuring environmental sustainability. Articles 2 to 4 require every holder of a Mining Business Permit (IUP) and Special Mining Business Permit (IUPK) to carry out reclamation and post-mining activities, focusing on restoring land conditions so that they can once again serve their designated environmental functions. Articles 5 to 7 stipulate that permit holders must prepare reclamation and post-mining plans before production activities begin, and these plans must be approved by the government to ensure they meet environmental standards.

Articles 23 to 27 introduce the requirement for mining companies to provide a reclamation guarantee in the form of a deposit or bank guarantee, which the government can access if the company fails to carry out the reclamation as outlined in their approved plan. Furthermore, Articles 38 to 42 regulate the implementation of post-mining plans, including measures for mine pit closure, erosion control, revegetation, and the restoration of environmental quality to ensure that the land can be reused by the community. Finally, Articles 43 to 45 impose administrative sanctions on companies that fail to fulfill reclamation or post-mining obligations, with penalties ranging from

[19] Saepudin and others.

written warnings to temporary suspensions of activities, or even the revocation of mining business licenses. These provisions ensure that mining companies are held accountable for environmental restoration throughout the entire mining lifecycle.

Normatively, Government Regulation Number 78 of 2010 affirms the principles of environmental accountability and sustainability in mining activities, placing license holders as the parties fully responsible for post-mining ecosystem restoration. In practice, various research findings show that the effectiveness of this regulation is still low due to weak supervision, limited guarantee funds, and a lack of enforcement against companies that neglect to carry out reclamation in practice.

A study conducted in East Kalimantan found no significant improvement in the reclamation ratio after the regulation was enacted (compared to the pre-regulatory period); in fact, the reclamation ratio declined from 67.91% to 62.98%. Many water-filled voids were left without backfilling or fencing, located near residential areas (in violation of distance requirements), thereby posing serious safety risks (dozens of drowning incidents) and causing environmental contamination.[20] This indicates non-compliance with standard rehabilitation practices as well as weak oversight and a lack of transparency in inter-agency licensing data. There is an urgent need to (i) establish mandatory reclamation performance criteria (including backfilling, slope stability, and water quality) as preconditions for license or RKAB continuity; (ii) integrate mining permit maps and post-mining void data into an inter-ministerial public dash board to ensure accountability; and (iii) impose progressive administrative sanctions up to license revocation for mining operators that abandon voids. Saepudin [21] and Hernaningsih [22] shown similar facts. This indicates weak implementation despite the existence of a normative framework.[23]

From the above discussion, the implementation gaps and institutional barriers in integrating sustainability into Indonesia's mining regulation can be identified through three key notes: downstreaming, reclamation/post-mining, and ESG. The downstreaming and "resource nationalism" agenda particularly in the nickel sector focuses on the policy consequences of mineral beneficiation and the export ban on nickel ore for sustainability governance. Nickel down streaming has been positioned as a strategic industrialization project the export ban is coupled with mandatory domestic processing obligations, which have triggered a surge in investment (especially from China) and reinforced "nationalist enclaves" surrounding smelter industrial zones.[24] This explains why social and environmental standards often lag behind production capacity targets and intermediate metal export goals (such as nickel pig iron and matte). An evaluation of nickel resource nationalism policies from 2008 to 2023 shows that the downstreaming policy has been effective in shifting value-added activities domestically and strengthening Indonesia's bargaining position in the global market. However, the policy design and its implementing instruments have primarily focused on optimizing macroeconomic indicators including production, export performance, foreign exchange earnings, and investment inflows.[25] Sustainability requirements such as clean energy use, slag/tailing circularity, and occupational health and safety (OHS) standards have not yet been positioned as binding licensing or incentive "hard gates." As a result, corporate ESG commitments remain highly uneven and are often reactive to external pressures (such as market prices or European and U.S. sustainability demands) rather than being driven by binding regulatory obligations.

The key findings relevant to the "implementation gaps" in downstreaming are as follows: (i) High dependence on foreign investment and technology has resulted in uneven environmental and labor standards across industrial zones, coupled with weak central local government coordination, leading

[20] Tim T. Werner and others, 'Patterns of Infringement, Risk, and Impact Driven by Coal Mining Permits in Indonesia', *Ambio*, 53.2 (2024), 242–56 <https://doi.org/10.1007/S13280-023-01944-Y>.
[21] Saepudin and others.
[22] Hernaningsih.
[23] Sonny Widyagara Nadar and others, 'Evaluating Mine Land Reclamation Policy In Indonesia: The Case Study Of East Kalimantan Province', *Jurnal Ilmiah Administrasi Publik*, 4.3 (2018), 229–35 <https://doi.org/10.21776/UB.JIAP.2018.004.03.7>.
[24] Warburton.
[25] Selma Benazir Khalil and Anna Broughel, 'Stainless Success, Battery Lag: Evaluation of Indonesia's Resource Nationalism in Nickel', *The Extractive Industries and Society*, 23 (2025) <https://doi.org/10.1016/J.EXIS.2025.101677>.

to inconsistent environmental supervision; and (ii) Regulatory fragmentation involving the amendments to the Mining Law (UU Minerba), LKPM reporting rules, and environmental standards set by the Ministry of Environment and Forestry (KLHK/PROPER) has created unsynchronized compliance burdens for both companies and enforcement agencies. Similar findings were reported in Khalid's research.[26] Downstreaming requires a conditional industrial policy, in which downstreaming incentives are explicitly linked to environmental and labor performance thresholds, supported by the establishment of a cross-ministerial "green compliance gateway" for smelter operations..

For the reclamation and post-mining node, the findings of the doctrinal analysis (based on Law No. 3 of 2020 and Government Regulation No. 78 of 2010) as also reflected in Pratiwi's et al,[27] Nasir,[28], and Sujono,[29] research findings, The findings reveal several implementation gaps in the reclamation and post-mining framework, as follows: (i) Low historical compliance, prior to the regulatory reforms, although the reclamation guarantee fund was already mandated, only around 52% of IUP holders fulfilled their reclamation and post-mining obligations; (ii) Misinterpretation of the guarantee fund mechanism, the placement of the fund is often perceived as a substitute rather than a complement to physical reclamation duties, coupled with inconsistent administrative and criminal enforcement; (iii) Overlapping authorities between central and provincial/district governments, along with limited environmental inspection capacity, continue to hinder effective enforcement; (iv) Technical standards for restoration remain incompatible with local biophysical conditions (such as nutrient-poor soils or quartz overburden), reclamation success criteria unrealisti; and (v) Public participation and data transparency on mining locations and permits are still limited, impeding accountability and monitoring.

Within the reclamation/post-mining node, it is essential to affirm that the placement of guarantee funds does not absolve the physical reclamation obligation, while strengthening supervisory mechanisms and harmonizing the Environmental Law and the Mining Law to ensure that the obligation to perform is backed by effective sanctions. Furthermore, an ecosystem-based reclamation framework should be established anchored in ecological targets, scientific baselines, and collaborative governance among local governments, the Ministry of Environment and Forestry (KLHK), the Ministry of Energy and Mineral Resources (ESDM), and community stakeholders accompanied by a publicly accessible tracking system for post-mining site status.

Unlike down streaming and reclamation, ESG practices in the mining sector remain largely voluntary. Some mining companies (especially public ones or those with international exposure) issue ESG or sustainability reports, but there is no binding legal requirement across the sector. A study of mining companies listed on the IDX shows that reporting consistency remains low. Of the 65 mining companies, only 11 published sustainability reports consecutively from 2017 to 2021 (purposive sample study). This indicates a gap in compliance and uneven quality in the mining sector. A broader cross-period study also found that reporting practices in Indonesia have developed rapidly in line with regulations, but are heterogeneous in terms of content depth and quality.[30]

[26] Nurul Listiyani and others, 'Strengthening Reclamation Obligation through Mining Law Reform: Indonesian Experience', *Resources 2023, Vol. 12, Page 56*, 12.5 (2023), 56 <https://doi.org/10.3390/RESOURCES12050056>.

[27] Pratiwi and others, 'Managing and Reforesting Degraded Post-Mining Landscape in Indonesia: A Review', *Land*, 10.6 (2021) <https://doi.org/10.3390/LAND10060658>.

[28] Mohamad Nasir, Laurens Bakker and Toon van Meijl, 'Environmental Management of Coal Mining Areas in Indonesia: The Complexity of Supervision', *Society & Natural Resources*, 36.5 (2023), 534–53 <https://doi.org/10.1080/08941920.2023.2180818>.

[29] Sujono, Suwarno and Renny Friska, 'Building a Sustainable Mining Governance Model Through Decentralization Performance and Governance Transformation in Indonesia', *International Journal of Sustainable Development and Planning*, 20.6 (2025), 2651–60 <https://doi.org/10.18280/IJSDP.200632>.

[30] Ridoni Fardeni Harahap Dr. Makaryanawati Ria Zulkha Emayda Rizka Furqorina, 'SUSTAINABILITY REPORTING OF INDONESIAN MINING COMPANIES: HOW COMPLIANT ARE THEY?', *South East Asia Journal of Contemporary Business, Economics and Law*, 23.1 (2020), 172–81.

The facts show that ESG disclosure has not significantly correlated with firm value in the Indonesian mining sector.[31] Other fact in Indonesian industry more broadly echo the weak financial market recognition of ESG disclosures.[32] Thus, the policy architecture embeds sustainability rhetorically, but lacks strong, enforceable instruments in ESG. While, other facts remain in capital market sector. For issuers and public companies in the capital market (including many mining companies on the IDX), sustainability reporting is no longer voluntary since the enactment of Financial Services Authority Regulation (POJK) No. 51 of 2017. The OJK is also implementing the Phase II Sustainable Finance Roadmap (2021–2025), publishing the Indonesian Green Taxonomy (2022; latest version 2025), and POJK 14 of 2023 on carbon exchange (IDXCarbon). This means that Indonesia's policy architecture has shifted from mere rhetoric to mandatory disclosure in the capital/financial market—although substantive ESG performance obligations (e.g., science-based targets, emission sanctions) are still limited, especially in unlisted mining companies.[33]

Because ESG is voluntary, adoption is uneven. Some firms adopt robust ESG frameworks; many do not. The lack of regulatory teeth or consistent market penalties means many firms have little incentive. The weak or non-significant impact of ESG disclosure on firm value in Indonesian mining suggests limited market pressure.[34] Moreover, a study on the causal relationship between ESG performance and financing in Indonesian mining indicates ESG may influence access to financing, suggesting a reinforcing loop, but the empirical evidence is still nascent.[35] The concept of Environmental, Social, and Governance (ESG) is not yet a legal requirement in Indonesia. Article 16(d) Law No. 25 of 2007, only addresses social and environmental responsibility in general terms, without binding indicators or standards.

Mining and ESG governance are increasingly subject to transnational standards and scrutiny. Domínguez-Gómez et al. (2021) analyze governance conceptions in mining via Scopus-indexed literature, emphasizing that global governance efforts sometimes fill regulatory gaps in national frameworks The Mineral Resource Governance review underscores that transparent and multilateral frameworks are necessary to avoid resource conflict and ensure long-term sustainability.[36] The rise of sustainable mining technologies (Gairola et al., 2025) shows technical feasibility of waste minimization and resource efficiency, but adoption remains limited by regulatory, financial, and capacity constraints.[37]

ESG signals remain weak in the mining sector because the carbon exchange, established only in 2023, is still in the early stage of ecosystem development.[38] Existing mandatory legal frameworks in Indonesia remain limited to reporting obligations rather than performance-based requirements. The Financial Services Authority Regulation (POJK) obliges companies to disclose ESG-related information; however, binding emission reduction or biodiversity conservation targets, as well as performance-linked sanctions, have yet to be institutionalized as sector-wide norms.

The weak market recognition of Environmental, Social, and Governance (ESG) principles in Indonesia does not necessarily indicate that ESG lacks value, but instead highlights several critical issues, particularly the underdeveloped quality and comparability of ESG disclosures, the dominance

[31] Raden Suharto and others, 'The Impact of ESG Disclosure and Green Mining on Firm Value: Evidence from Indonesia', 8 (2025), 1753–61.

[32] Heny Kuswanti Suwarsinah Diva Adisti1, Tanti Novianti, 'ENVIRONMENTAL, SOCIAL, AND GOVERNANCE (ESG) RISK MANAGEMENT OF PT XYZ INDONESIA (ESG DISCLOSURE APPROACH 2023)', *Business Review and Case Studies,* 5.3 (2024), 498–509 <https://doi.org/http://dx.doi.org/10.17358/brcs.5.3.498>.

[33] IDX, '- IDX Sustainability', 2025.

[34] Suharto and others.

[35] Galih Mahardhika, Inggis Achmad and Kusuma Putri, 'Causality Analysis between ESG Performance and Financing Support: Case Study Mining Holding Company in Indonesia', *Journal of Business and Political Economy : Biannual Review of The Indonesian Economy*, 3 (2024), 93–108 <https://doi.org/10.46851/130>.

[36] Patrice Christmann, 'Mineral Resource Governance in the 21st Century and a Sustainable European Union', *Mineral Economics*, 34.2 (2021), 187–208 <https://doi.org/10.1007/S13563-021-00265-4>.

[37] Shikha Uniyal Gairola, Ajay Kumar Khanduri and · V Bhuvaneswari, 'Sustainable Mining: Reducing Waste and Enhancing Resource Efficiency', *Discover Civil Engineering 2025 2:1*, 2.1 (2025), 1–18 <https://doi.org/10.1007/S44290-025-00233-9>.

[38] Kresna Panggabean Jeremiah Purba Yusuf Thareq, 'Indonesia Launched Its First Carbon Exchange Market | United States | Global Law Firm | Norton Rose Fulbright', 2023.

of retail investors, and significant uncertainty surrounding ESG standards in high-emission and high-externality industries, such as the mining sector. These challenges reflect systemic issues in the application of ESG principles, where despite global recognition of their importance, the mining sector, in particular, has been slow to embrace comprehensive sustainability measures. As such, to effectively integrate sustainability into Indonesia's regulatory framework, it is essential to address the current weaknesses by adopting a more structured and binding policy approach across the different stakeholders involved in the mining sector.

One of the first necessary measures is the establishment of a unified compliance framework. This framework should consolidate the regulatory efforts of various ministries, including the Ministry of Energy and Mineral Resources (ESDM), the Ministry of Environment and Forestry (KLHK), the Ministry of Industry, and the Investment Coordinating Board (BKPM). By creating a centralized sustainability compliance gateway, the framework would link critical regulatory processes such as downstreaming licenses, mining work plans (RKAB) approvals, PROPER (environmental performance) ratings, and reclamation guarantee funds with verifiable environmental and social performance metrics. This would ensure a more streamlined, transparent, and consistent approach to monitoring sustainability across the sector.

Additionally, binding conditionality is essential to ensure that the incentives offered to companies, such as tax holidays or access to industrial zone facilities, are linked to mandatory performance covenants. These covenants should include strict requirements, such as emission limits, tailing/slag management protocols, occupational health and safety standards, and commitments to a just transition for local workers. By making these conditions non-negotiable and tied to tangible benefits, the government would be able to incentivize companies to adopt responsible and sustainable practices that align with national sustainability goals.

Furthermore, reclamation efforts should be treated as a performance obligation rather than a mere administrative requirement. Currently, reclamation is often viewed as a form of compliance, with companies depositing reclamation guarantee funds as a financial assurance without necessarily performing the required physical reclamation. Treating the guarantee fund as a performance bond, with clear consequences for failure to meet reclamation obligations, would place greater pressure on companies to complete the necessary reclamation efforts. Strengthening sanctions for non-compliance and implementing third-party verification mechanisms would further ensure accountability and the integrity of reclamation practices.

Transparency and public participation also play a critical role in ensuring that sustainability practices are effectively monitored and enforced. The establishment of public dashboards that provide open access to licensing data, reclamation plans, and ESG performance records would facilitate both social and scientific oversight of mining operations. Such transparency would allow the public, civil society organizations, and other stakeholders to track the performance of companies, hold them accountable, and advocate for improvements when necessary.

Lastly, it is imperative to establish stronger ESG obligations and audit mechanisms, moving beyond voluntary disclosure towards legally binding ESG duties. Currently, the voluntary nature of ESG adoption in Indonesia leaves room for inconsistency and weak enforcement. To strengthen Indonesia's regulatory framework, it is necessary to establish mandatory reporting requirements and audit mechanisms that ensure compliance with environmental and social standards. This would involve creating robust guidelines for auditing ESG disclosures, ensuring that companies meet established sustainability benchmarks, and penalizing non-compliance.

In conclusion, while the normative design of Indonesia's mining regulatory framework has partially incorporated sustainability principles, it still lacks binding ESG obligations and strong ecological mandates. Implementation has been hindered by overlapping authority, weak enforcement, regulatory gaps, and the voluntary nature of ESG adoption, which together undermine the effectiveness of sustainability initiatives. In comparison with international best practices, Indonesia's framework remains underdeveloped, lacking the necessary mechanisms to ensure systemic environmental protection and sustainable practices in the mining sector. Therefore, the proposed measures unified compliance frameworks, binding conditionality, improved reclamation practices, enhanced transparency, and stronger ESG obligations are crucial steps toward ensuring

that Indonesia's mining sector aligns with global sustainability standards and contributes to long-term environmental and social stability.

Conclusion

Indonesia's policy instruments for mining, namely downstream mandates, reclamation obligations, and ESG encouragement, show rhetorical alignment with sustainability goals. Yet, in practice, environmental protection is compromised by weak enforcement, regulatory fragmentation, underdeveloped guarantee mechanisms, and voluntary ESG adoption. The current regime fails to reliably safeguard ecological integrity in mining operations. Based on these conclusions, it is recommended that Indonesia undertake substantive legal and institutional reforms to strengthen environmental protection in the mining sector. ESG principles should be transformed from voluntary commitments into binding legal requirements within the mining licensing regime, with ESG performance serving as a minimum condition for permit issuance and supported by clear and enforceable sanctions. Downstreaming policies must be integrated with robust environmental safeguards, including mandatory environmental impact assessments, emissions controls, and legally binding restoration obligations for mineral processing and refining activities. In addition, reclamation and post-mining financial guarantee mechanisms should be strengthened through the use of bonds, escrow accounts, or third-party trust arrangements, accompanied by periodic audits and clearly defined triggers for fund forfeiture in cases of noncompliance. Equally important are reforms aimed at improving governance, accountability, and ecological outcomes. Institutional oversight should be consolidated through the establishment of a centralized interministerial body with clear authority and capacity to monitor, audit, and sanction mining, environmental, and downstream activities in an integrated and transparent manner. Public accountability should be enhanced by requiring standardized, periodic ESG and environmental disclosures from mining companies, while ensuring meaningful public and civil society participation in monitoring and compliance reviews. Legal harmonization is also necessary to address inconsistencies among mining laws, downstream regulations, and environmental statutes, and to support sustained capacity building and adequate funding for regulatory institutions, particularly at the subnational level. Finally, reclamation and post-mining obligations should be reoriented toward ecological justice by prioritizing the restoration of ecological functions such as habitat quality and ecosystem connectivity rather than superficial land-use conversion, including the consideration of innovative approaches such as ecosystem guardianship or the recognition of ecological legal interests, so that economic development and environmental stewardship can be mutually reinforcing.

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