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Making Environmental Costs Visible: Green Accounting Practices and Environmental Cost Disclosure in Mining Companies in Kolaka

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ABSTRACT

This study aims to explore green accounting practices and environmental cost disclosure in mining companies in Kolaka, Southeast Sulawesi, Indonesia. Using a qualitative approach, data were collected through in-depth interviews with parties involved in environmental management and accounting activities. The findings reveal that mining companies have allocated environmental costs for reclamation, land rehabilitation, waste management, environmental monitoring, and post-mining activities. However, some environmental costs remain embedded within general operating expenses, reducing their visibility in accounting records and corporate reports. The results also indicate that companies tend to disclose information about environmental activities more clearly than the specific monetary values associated with those activities. This condition demonstrates a gap between environmental management practices and the transparency of environmental cost information. The study suggests that strengthening environmental cost classification, recognition, recording, and disclosure is essential to enhance the visibility of environmental costs. Improved green accounting practices can support greater corporate transparency, accountability, and stakeholder understanding of the environmental impacts and responsibilities associated with mining activities.

Keywords: Environmental Cost Disclosure; Environmental Management; Green Accounting; Mining Companies; Nickel Mining

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INTRODUCTION

Indonesia is one of the world's largest mineral producers, with a mining industry that contributes significantly to national and regional economic growth. Kolaka Regency, Southeast Sulawesi, is recognized as a rapidly growing nickel mining hub and serves as an operational site for various national and international mining enterprises. Beyond its economic contributions, mining activities also generate significant environmental impacts, including land degradation, water pollution, biodiversity loss, carbon emissions, and an increasing need for post-mining rehabilitation.

The evolution of the sustainable development concept has transformed stakeholder expectations of corporations. Today, companies are no longer evaluated solely on financial performance, but also on how effectively they manage their social and environmental footprints. In this context, green accounting emerges as an accounting approach that integrates environmental costs into corporate accounting systems, ensuring transparent disclosure regarding natural resource utilization and environmental restoration expenditures. Proper environmental accounting practices provide critical metrics for evaluating corporate sustainability and long-term viability, aligning corporate activities with broader socioeconomic and ecological objectives (Sary et al., 2022). Furthermore, systematic recognition of environmental overheads helps bridge the gap between financial reporting and ecological responsibility, transforming environmental management from a passive compliance burden into an active value-creation mechanism (Deegan, 2014; Larrinaga, 2021).

Heightened public scrutiny and regulatory risks at the global level have driven companies to adopt strategic environmental management practices. As highlighted by Banerjee et al. (2025) and Liu et al. (2026) through the lenses of signaling and legitimacy theories, strict environmental regulations heighten compliance risks, leading capital markets and institutional investors to penalize firms that fail to provide transparent environmental signals or engage in symbolic greenwashing. However, this strategic external orientation is rarely accompanied by internal financial transparency, particularly regarding how environmental costs are specifically identified, allocated, and reported within corporate accounting systems. Extractive enterprises frequently struggle to transition from symbolic commitment to operational accounting execution, leading to discrepancies between narrative sustainability reports and actual financial record-keeping (Bebbington et al., 2014; Milne & Gray, 2013).

Strict environmental regulations and enforcement mechanisms, such as regulatory penalties, serve as crucial coercive pressures that compel heavy-polluting enterprises to enhance environmental transparency and repair corporate legitimacy (Hu & Xu, 2025; Liu et al., 2026). However, while regulatory sanctions often force companies to improve external ESG reporting and green innovation disclosures, they do not automatically translate into internal accounting reform. In resource-extraction sectors like nickel mining, environmental expenditures often remain embedded within general operational costs rather than explicitly recognized as distinct financial items. Furthermore, corporate financial performance, capital structure, and firm scale often moderate how management prioritizes environmental disclosures, where financially robust firms possess greater operational flexibility to absorb compliance expenditures compared to their constrained peers. This financial asymmetry is particularly evident in high-impact industries, where capital reallocation toward green practices depends heavily on managerial discretion and short-term liquidity demands (Clarkson et al., 2008; Tilt, 2016).

Although Indonesian regulations increasingly encourage corporations to fulfill their environmental responsibilities through sustainability reporting, practices regarding the recording and disclosure of environmental costs remain limited. Many companies have allocated funds for land reclamation, rehabilitation, waste management, environmental conservation, and eco-based CSR programs; however, these expenditures are often not specifically identified as environmental costs within their accounting systems. As conceptualized by Yuan and Bao (2025), financially constrained or resource-intensive firms often resort to environmental disclosure hype, strategically using complex narrative disclosures to satisfy regulatory expectations while deflecting attention from internal accounting opacity. Consequently, information on environmental expenses remains obscured as hidden environmental costs, thereby diminishing corporate transparency and accountability to stakeholders.

The lack of standardized environmental cost visibility creates significant informational asymmetry among internal decision-makers, external investors, and local communities. Corporate governance structures and risk management frameworks play a crucial role in shaping the quality of environmental cost disclosures, as strong oversight mechanisms encourage firms to disclose both positive and negative environmental externalities rather than relying on selective disclosures (Michelon & Parbonetti, 2025). When internal accounting systems fail to disaggregate environmental expenditures (such as tailing treatment, dust suppression, and soil restoration) from routine operational overheads, management lacks accurate cost data for strategic environmental planning (Schaltegger & Burritt, 2018). This issue is particularly pronounced in emission-intensive sectors such as mining, where environmental compliance and sustainability initiatives require substantial capital outlay and operational adjustments. As highlighted by Dogan et al. (2026), the financial and operational trade-offs of environmental practices are highly sector-specific, with resource-intensive industries often experiencing high upfront compliance costs that complicate the alignment between environmental management and financial reporting.

In developing host communities, the socio-environmental footprint of extractive operations extends beyond regulatory compliance into local ecological stability and community trust. When mining enterprises operate without transparent environmental accounting routines, local stakeholders (including local governments, customary institutions, and nearby villages) are left without verifiable financial indicators regarding the true extent of corporate remediation commitments. This institutional disconnect reinforces external skepticism, as narrative sustainability claims lack empirical reconciliation with actual budget allocations for erosion control, tailing management, and post-mining reforestation (Ali et al., 2017).

Recent literature demonstrates that market-based mechanisms, particularly green investors, actively compel corporations to enhance environmental disclosure quality through green innovation, reduced financing constraints, and heightened media scrutiny (Cheng et al., 2025). However, in resource-intensive and developing regions, the lack of explicit environmental cost visibility within internal accounting systems creates a structural barrier that prevents companies from providing such transparent financial signals. Without a clear accounting framework that maps environmental expenditures directly into financial ledgers, external disclosures remain prone to accusations of impression management and greenwashing (Cho et al., 2015; Patten, 2002).

Most prior studies have primarily examined the relationship between environmental practices and macro-level factors (such as political risk, market valuation, or profitability) using quantitative approaches (e.g., Banerjee et al., 2025; Khan et al., 2016). While these studies offer valuable insights into broad environmental responses like carbon

emission reduction, they leave a critical gap regarding micro-level accounting mechanisms. Specifically, little is known about how extractive mining enterprises in developing regions (such as nickel mining operations in Kolaka) identify, measure, record, and disclose actual environmental costs in their daily accounting routines. Therefore, this qualitative study fills this empirical gap by exploring the inner workings of green accounting practices and the visibility of environmental cost disclosures.

While recent empirical studies have explored the financial and risk implications of ESG, carbon reduction strategies, and market reactions to environmental regulatory shocks in emerging economies (e.g., Banerjee et al., 2025; Dogan et al., 2026; Liu et al., 2026), these works predominantly rely on macro-level quantitative metrics and capital market divestment behaviors. They leave a critical gap regarding how extractive mining enterprises in developing regions (such as nickel mining operations in Kolaka) practically identify, classify, record, and disclose these environmental costs within their internal accounting routines. By examining the qualitative dimensions of green accounting implementation in an active Indonesian mining corridor, this study aims to reveal how corporate accountants navigate regulatory mandates, internal cost structures, and localized environmental pressures to make hidden environmental costs visible.

LITERATURE REVIEW

Institutional Pressures and Legitimacy in Extractive Sectors

The theoretical foundation of corporate environmental reporting heavily relies on Legitimacy Theory and Institutional Theory, which posit that corporations do not operate in a vacuum but within a broader socio-political dynamic. To secure their social license to operate, companies must continuously align their operational practices, disclosure strategies, and environmental commitments with evolving societal expectations and regulatory mandates. In emission-intensive and resource-extractive industries, such as open-pit mining, corporate operations naturally generate severe ecological externalities, ranging from topsoil erosion, heavy metal contamination, and deforestation to air pollution and acid mine drainage. Consequently, these industries face heightened public scrutiny, localized community resistance, and stringent governmental enforcement mechanisms, which manifest as critical coercive institutional pressures.

Extensive contemporary literature demonstrates that state-level enforcement mechanisms, including regulatory penalties, legal sanctions, and mandatory environmental impact assessments (AMDAL), serve as powerful drivers forcing heavy-polluting enterprises to enhance their external environmental information disclosure quality and restore threatened corporate legitimacy (Hu & Xu, 2025; Liu et al., 2026; Wang et al., 2026). When regulatory bodies impose severe financial or operational penalties on non-compliant firms, capital markets interpret these regulatory actions as indicators of systemic operational risk. To mitigate negative market reactions and re-establish institutional legitimacy, penalized firms frequently increase the volume and visibility of their sustainability reports, corporate social responsibility (CSR) releases, and environmental mitigation narratives (Hu & Xu, 2025).

However, recent empirical inquiries highlight that institutional pressures do not impact all corporate entities uniformly across the business landscape. As specified by Wang et al. (2026), political connections, corporate ownership structures, and market dominance act as significant moderating factors that buffer certain firms from external regulatory threats. Politically connected enterprises often possess informal channels to negotiate, defer, or neutralize coercive regulatory sanctions, allowing them to resolve legitimacy crises through political leverage rather than undertaking substantive public reporting reform. Conversely, non-politically connected firms operating in highly competitive, resource-

constrained environments absorb the full impact of regulatory enforcement shocks. For these vulnerable entities, enhancing external environmental signals becomes an indispensable survival strategy to retain market access, maintain credit ratings, and avoid regulatory shutdown.

Signaling Theory, Capital Markets, and the Greenwashing Paradox

While external institutional pressures compel corporations to produce elaborate sustainability disclosures, accounting scholars identify a pervasive structural disconnect between external ESG messaging and internal accounting integration. Grounded in Signaling Theory, transparent environmental disclosures should ideally function as credible, verifiable signals that reflect a firm's underlying ecological performance and long-term sustainability commitment (Cho & Patten, 2007). In modern capital markets, institutional investors, green bond underwriters, and socially responsible investment funds actively scrutinize these corporate signals. Empirical evidence indicates that capital markets penalize firms presenting ambiguous, unverified, or impressionistic environmental disclosures by elevating their cost of capital, increasing borrowing spreads, or initiating equity divestment (Banerjee et al., 2025; Cheng et al., 2025; Liu et al., 2026). Conversely, corporations that provide transparent, high-quality environmental signals are rewarded with reduced financing constraints, enhanced market valuations, and broader access to international green capital (Cheng et al., 2025).

Despite these market-based incentives, recent empirical studies reveal a persistent paradox within corporate environmental management: regulatory enforcement and market demands frequently compel firms to improve external ESG ratings, purchase green certifications, or publish eco-innovation narratives without reforming their internal financial cost accounting structures (Hu & Xu, 2025). Financially constrained, highly leveraged, or resource-intensive firms regularly resort to strategic narrative disclosures, a phenomenon conceptualized by Yuan and Bao (2025) as "environmental disclosure hype". By leveraging complex, qualitative, and optimistic rhetoric regarding biodiversity conservation or carbon neutrality goals, management satisfies external regulatory expectations while deliberately deflecting stakeholder attention away from internal accounting opacity. Consequently, while a firm's environmental activities are heavily publicized in glossy sustainability brochures, the actual monetary expenditures incurred for site restoration, tailing management, and pollution control remain embedded, unclassified, and invisible within general operational overheads (Dogan et al., 2026; Hu & Xu, 2025).

Stakeholder Alignment and Governance Oversight

From the Stakeholder Theory and Resource Dependence Perspective, a corporation's strategic orientation toward environmental transparency is governed by the expectations of critical stakeholders who control vital operational resources, including institutional creditors, commercial banks, equity holders, trade suppliers, and local host communities (Freeman, 1984; Pfeffer & Salancik, 1978; Wang et al., 2026). In capital-intensive sectors like mining, executing environmental compliance, land rehabilitation, and post-mining ecosystem restoration demands substantial, continuous monetary outlays. These expenditures create direct financial and operational trade-offs, as capital allocated to environmental management temporarily reduces short-term operating margins and liquidity metrics (Dogan et al., 2026). When primary resource suppliers demand explicit environmental metrics to assess counterparty operational risks, corporations exhibiting cumulative resource dependence across multiple stakeholder channels respond by establishing more rigorous disclosure practices (Wang et al., 2026).

Furthermore, internal corporate governance mechanisms play a crucial role in shaping the quality, objectivity, and granular detail of environmental disclosures. Robust

corporate governance structures, characterized by independent board oversight, active audit committees, and integrated enterprise risk management frameworks, curb executive discretion to manipulate or hide environmental liabilities (Michelon & Parbonetti, 2025). Independent board oversight encourages firms to adopt comprehensive green accounting practices, ensuring that both positive environmental investments and negative environmental externalities are accurately captured in corporate financial records rather than selectively disclosed (Maulana & Prasetio, 2025). However, in developing host economies and resource-rich regions, the absence of explicit mandates requiring the financial segregation of environmental costs within internal accounting ledgers prevents even governance-conscious firms from delivering standardized, verifiable environmental financial data to external stakeholders.

Green Accounting Fundamentals and Financial Constraints

The operational execution of green accounting requires systematic accounting procedures encompassing four core stages: the identification, recognition, measurement, and reporting of environmental expenditures incurred throughout the corporate value chain (Deegan, 2014; Schaltegger & Burritt, 2018). Environmental costs broadly comprise internal environmental protection costs (e.g., waste treatment, pollution prevention equipment, environmental monitoring, and compliance audits) and external costs resulting from environmental damage caused to surrounding ecosystems and communities (Schaltegger & Burritt, 2018). In the context of emerging markets, corporate financial performance, capital structure, and organizational scale heavily dictate the structural depth of green accounting adoption.

Empirical research in developing market contexts demonstrates that firms possessing higher profitability and lower leverage maintain greater financial slack, granting management the operational flexibility to absorb the administrative and technological compliance costs necessary to implement a specialized Chart of Accounts (COA) for environmental cost tracking. Conversely, smaller enterprises and auxiliary service contractors operating under tight operational margins frequently prioritize basic legal compliance and immediate tax minimization over sophisticated accounting segregation. These resource-constrained firms treat green accounting as an unnecessary administrative overhead rather than a strategic decision-support system, leading to fragmented, ad-hoc environmental record-keeping that is fundamentally detached from core general ledgers (Cho et al., 2015; Sary et al., 2022).

Accounting Routines in Mining Supply Chains and Sub-Contracting Systems

In extractive industrial corridors (such as the nickel mining hubs of Southeast Asia), the operational structure of mining supply chains introduces additional layers of complexity that hinder green accounting implementation. Primary mining concession holders (Mining Business Permit or IUP holders) routinely outsource daily heavy operational tasks to an extensive network of third-party support contractors. These contractors execute earthmoving, topsoil stripping, overburden removal, ore hauling, heavy equipment maintenance, and jetty loading operations. While statutory national mining laws assign ultimate legal responsibility for long-term post-mining land reclamation and environmental guarantee funds to primary IUP holders, sub-contractors absorb the immediate, daily field-level environmental degradation.

Crucially, standard financial accounting frameworks (such as IFRS or local GAAP/PSAK) do not provide explicit, mandatory account codes tailored for classifying field-level environmental operating expenses incurred by sub-contractors. Consequently, daily environmental expenditures, including hauling road dust suppression through continuous water spraying, hazardous waste handling (used lubricants, oil filters, and heavy equipment batteries), emission testing, and contractually mandated local village

greening projects, are habitually bundled into general site operation, fleet maintenance, or fuel consumption accounts (Schaltegger & Burritt, 2018). This systematic cost bundling renders environmental expenditures monetarily invisible within corporate accounting records, effectively burying actual environmental operational costs under generic operational overheads.

Micro-Level Empirical Gap in Localized Extractive Hubs

The vast majority of existing empirical research on corporate environmental disclosure has evaluated macro-level relationships utilizing quantitative, cross-sectional capital market datasets, panel regressions, or composite ESG index scores (e.g., Banerjee et al., 2025; Hu & Xu, 2025; Liu et al., 2026; Khan et al., 2016; Wang et al., 2026). While these macro-quantitative studies offer invaluable insights regarding stock market reactions, international investor divestment behaviors, and broad regulatory impacts, they leave a critical micro-level empirical gap regarding how extractive enterprises practically operationalize daily green accounting routines on the ground.

Specifically, in localized, resource-intensive mining corridors like Kolaka Regency, Southeast Sulawesi (a critical, globally significant node in the nickel supply chain), there is a profound lack of qualitative, field-based inquiry investigating the internal accounting mechanics of mining enterprises. Little is known about how corporate accountants, site financial controllers, and operational managers practically identify, measure, classify, record, and report environmental costs within their daily bookkeeping routines. Furthermore, existing accounting literature rarely addresses how localized socio-cultural dynamics, such as customary norms (*adat*) and village-level socio-environmental expectations, interact with formal accounting systems. This study directly addresses this empirical gap by employing an interpretive qualitative framework to examine the inner workings of green accounting practices, revealing the organizational, structural, and cultural factors that keep environmental costs hidden within accounting ledgers in Kolaka's nickel mining sector.

RESEARCH METHOD

This study adopts a qualitative research design with an interpretive phenomenological approach to explore how mining support contractors in Kolaka, Southeast Sulawesi, operationalize environmental cost accounting and navigate barriers to environmental cost visibility. A qualitative phenomenological framework is selected because it enables an in-depth exploration of organizational routines, accounting practices, and the lived experiences of key personnel directly involved in financial and environmental decisions. The empirical focus on Kolaka is critically relevant, as it represents a core nickel mining hub where corporate operations involve complex contractual ecosystems between mining permit holders (IUP holders) and heavy equipment, hauling, and infrastructure contractors under local socio-cultural dynamics.

Data collection relied on primary and secondary data sources to achieve empirical depth and data triangulation. Primary data were gathered through semi-structured, in-depth interviews with key organizational actors, including site accounting personnel, financial controllers, operational managers, and environmental compliance staff from mining support services in Kolaka. The interview instrument investigated cost identification criteria (e.g., dust control, waste management of oils/filters/batteries, and greening initiatives), ledger allocation practices, tax planning considerations, contractual provisioning, and socio-environmental complexities including local customary norms (adat). Secondary data were collected from internal financial records, Notes to Financial Statements (CALK), vendor contracts, waste management compliance documents, and verification invoices to corroborate interview responses.

Data analysis was conducted using the interactive analysis model, encompassing data condensation, data display, and conclusion drawing or verification. All interview transcripts and field notes were coded iteratively to identify key thematic categories, such as the absence of a standardized environmental chart of accounts, implicit cost bundling within general maintenance expenses, tax-oriented budget adjustments, vendor relationship dynamics, and field-level measurement constraints. To ensure qualitative rigor, this study applied trustworthiness criteria comprising credibility, transferability, dependability, and confirmability. Credibility was achieved through source triangulation between financial documents and field interviews as well as member-checking, while dependability was established by maintaining a clear audit trail of the analytical and data collection processes.

RESULTS

The empirical findings reveal that mining support contractors in Kolaka identify environmental costs based on operational heavy equipment activities, including hauling, road maintenance, stockpiles, and jetty operations. Environmental expenditures primarily comprise dust control through road watering, hazardous waste management (such as used oil, filters, and batteries), vehicle emission compliance, and contract-mandated greening or CSR programs. However, a significant gap exists regarding cost recognition. Hazardous waste processing costs handled by third-party vendors are clearly recognized, whereas operational environmental expenses such as dust suppression watering, fuel, and emission controls are implicitly bundled into general maintenance and site operational budgets.

Accounting recognition and ledger practices further demonstrate that environmental costs are recognized on an accrual basis but lack a uniform, dedicated environmental COA. Consequently, environmental expenditures remain embedded within general site maintenance accounts, making their visibility implicit and restricted to a few internal accounting staff. Measurement and valuation are predominantly governed by contractual agreements rather than environmental accounting standards. Monthly vendor contracts define short-term commitments for hazardous waste and road watering, while long-term liabilities such as post-mining rehabilitation and land reclamation are legally shifted to primary mining permit (IUP) holders, relieving contractors from formal long-term environmental provisioning in their financial ledgers.

From a managerial decision-making perspective, environmental cost information is primarily utilized for tax planning and profit estimation rather than evaluating environmental efficiency or eco-friendly operational performance. Management adjusts environmental expenditure allocations strategically within budget lines, often facilitated by close relationships with local vendor partners. Furthermore, external disclosure across corporate financial statements and Notes to Financial Statements (CALK) remains minimal and non-specific. Accountability is maintained chiefly through legal compliance documents (such as waste transport manifests and invoice verifications by the finance team) rather than comprehensive environmental reporting.

The opacity of environmental costs in accounting systems stems from structural, operational, and socio-cultural barriers. Structurally, the absence of standardized environmental account codes and the contractors' position as service providers prioritize contractual compliance over environmental transparency. Operationally, quantifying environmental impacts incurs additional costs, such as soil and water assessment expenses. Crucially, socio-cultural complexities in Kolaka, where surrounding local communities strictly adhere to diverse customary norms (adat), create substantial

variation in site-level environmental expectations and costs across different villages, complicating the establishment of a uniform environmental accounting framework.

To further illustrate these ledger practices, a senior site accountant highlighted the operational dilemma faced during monthly financial closing:

> "We track all daily expenditures for water trucks, fuel, and road maintenance meticulously. However, because our Chart of Accounts does not contain specific codes for environmental operational expenses, these figures are automatically grouped under general site operational or heavy equipment maintenance costs. From an internal reporting standpoint, as long as the total project budget aligns with operational targets, upper management rarely requires us to isolate dust suppression costs as a distinct environmental line item."

This practice confirms that field-level environmental management is executed as a routine operational necessity rather than a distinct accounting category. Furthermore, measurement and valuation challenges are compounded by vendor relationship dynamics and internal tax considerations. An operational controller noted as follows.

> "When we engage third-party environmental services, such as hazardous waste transport for used oil and heavy machinery batteries, the financial records strictly reflect the exact vendor invoices. We make sure these manifests and invoices are complete for legal compliance and tax deductibility. However, measuring the broader environmental impact or quantifying localized site restoration during ongoing operations is far more complex. Consequently, we rely on short-term contractual commitments rather than setting up long-term environmental provisions, as ultimate land reclamation liabilities legally rest with the primary mining permit (IUP) holders."

These empirical observations demonstrate that internal accounting routines in mining support enterprises prioritize legal compliance, tax planning, and short-term liquidity over detailed environmental cost visibility. The lack of standardized environmental account classifications creates an accounting facade where field-level environmental activities take place, yet their monetary traces remain buried within administrative overheads (Maulana & Prasetio, 2025; Sary et al., 2022). As a result, environmental cost information functions primarily as an operational compliance metric rather than a strategic decision-making tool for eco-efficiency.

DISCUSSION

The empirical findings from nickel mining support contractors in Kolaka illustrate a profound disconnect between external regulatory pressures and internal green accounting integration. Grounded in Legitimacy Theory and Institutional Theory, heavy-polluting industries face heightened societal and regulatory scrutiny that forces them to demonstrate environmental compliance (Hu & Xu, 2025; Liu et al., 2026). However, the evidence reveals that in localized sub-contracting ecosystems, regulatory pressure is absorbed primarily as contractual compliance rather than financial accounting reform. While primary mining permit (IUP) holders manage high-level statutory obligations like reclamation provisions, support contractors treat environmental expenditures (such as dust suppression watering and emission checks) as routine operational overheads embedded within general site maintenance accounts.

This implicit bundling of environmental costs aligns with the concept of internal accounting opacity and strategic disclosure behavior. As conceptualized by Dogan et al. (2026) and Yuan & Bao (2025), resource-intensive enterprises experiencing high operational trade-offs often rely on qualitative or contractual narratives to satisfy external stakeholders while leaving internal ledgers opaque. In Kolaka, environmental expenditures are actively utilized for tax planning and profit adjustments rather than evaluating environmental efficiency or eco-friendly operational performance. As Wang et al. (2026) emphasize regarding the boundary conditions of institutional pressure, when regulatory enforcement lacks explicit mandates for ledger-level cost segregation, firms lack the internal incentive to isolate environmental monetary metrics, keeping environmental costs invisible within accounting ledgers.

From a Stakeholder and Resource Dependence perspective, corporate transparency is dictated by the specific resource demands of key financial partners (Freeman, 1984; Wang et al., 2026). In capital markets, institutional investors and green creditors penalize environmental opacity (Banerjee et al., 2025; Cheng et al., 2025). However, support contractors in Kolaka operate within localized counterparty structures where accountability is satisfied merely through vendor invoices, waste handling manifests, and legal compliance verification by internal finance teams. Because local resource providers do not demand explicit financial account codes for environmental liabilities, contractors maintain short-term, contract-based provisioning rather than establishing dedicated environmental chart of accounts.

Crucially, the study uncovers unique socio-cultural barriers that extend beyond standard accounting literature. Measuring and monetizing environmental impacts in Kolaka is severely constrained by site-level socio-environmental complexities, where surrounding indigenous communities observe diverse customary norms (*adat*). This cultural heterogeneity generates varying community expectations and environmental compensation demands across different villages, making uniform environmental cost estimation difficult and costly. Consequently, strengthening environmental cost visibility in emerging mining hubs requires not only standardized accounting codes and regulatory mandates, but also accounting frameworks capable of accommodating localized socio-cultural realities and sub-contracting operational structures.

To deeper analyze these localized dynamics, the empirical evidence illustrates how the absence of a dedicated environmental COA reinforces institutional decoupling within mining supply chains. While external institutional pressures and regulatory mandates compel primary permit holders to disclose high-level sustainability narratives, subcontracting enterprises operate under an operational facade where environmental costs are systematically buried inside general overheads (Bebbington et al., 2014; Hu & Xu, 2025). This structural opacity aligns with the conceptual framework of environmental disclosure hype, wherein organizational routines prioritize narrative compliance over ledger-level financial transparency (Yuan & Bao, 2025). Because local contract structures emphasize immediate cost efficiency and tax deductibility, support contractors lack the economic incentive to isolate and report specific environmental line items unless explicitly mandated by regulatory frameworks (Wang et al., 2026).

Furthermore, from a Signaling Theory perspective, the reliance on short-term vendor contracts and legal manifests creates an asymmetric information environment for external stakeholders (Cheng et al., 2025). Capital markets and local communities receive aggregate financial figures that mask the true cost of site-level ecological mitigation, such as dust suppression and hazardous waste handling. In localized mining corridors like Kolaka, this financial ambiguity is further exacerbated by complex socio-cultural interactions, where customary norms (*adat*) introduce unquantified community

expectations. When internal accounting frameworks fail to capture these localized socio-environmental liabilities, corporate reporting loses its strategic signaling value, reducing green accounting to a passive administrative exercise rather than a proactive tool for sustainable governance (Deegan, 2014; Michelon & Parbonetti, 2025). Consequently, bridging this empirical gap requires integrated accounting guidelines that harmonize formal ledger mechanics with regional operational realities.

CONCLUSION

This study investigated green accounting practices and environmental cost visibility among nickel mining support contractors in Kolaka, Southeast Sulawesi. The findings reveal that while companies actively allocate funds for environmental management activities (such as hazardous waste handling, road watering for dust control, emission compliance, and contract-mandated greening) the visibility of these expenditures within formal accounting systems remains severely limited. Except for regulated hazardous waste disposal, most environmental costs are implicitly embedded within general site operational and equipment maintenance ledgers. This opacity is driven by the absence of a standardized environmental COA, contractors' legal position as service providers rather than primary mining permit holders, and the strategic utilization of environmental expenses for short-term tax planning and profit management rather than eco-efficiency evaluation.

The theoretical and practical implications of this research highlight the need to bridge the gap between regulatory compliance and internal financial transparency in extractive supply chains. Scientifically, this study expands environmental accounting literature by illustrating how localized subcontracting structures and socio-cultural dynamics, such as diverse community customary norms (adat) in emerging mining hubs, impede uniform environmental cost monetization. Practically, regulators and professional accounting bodies must establish standardized environmental account classification guidelines tailored for mining support service contractors. Mining enterprises can enhance corporate transparency, accountability, and stakeholder trust by institutionalizing explicit environmental cost ledgers, thereby making environmental costs visible and driving sustainable mining operations.

LIMITATION

Despite its valuable insights, this study has several limitations. The empirical inquiry focused primarily on qualitative data from mining support contractors within a single geographic region (Kolaka), which may limit the direct generalizability of the findings to primary mining permit holders or other mineral sectors. Future research should consider employing quantitative or mixed-methods approaches across broader geographic areas and multiple tiers of the mining supply chain. Furthermore, future studies could explore the integration of local socio-cultural metrics into formal environmental management accounting frameworks to better capture the full spectrum of localized environmental liabilities.

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DECLARATION OF CONFLICTING INTERESTS

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. The authors state that the research was conducted independently without any financial or personal relationships with commercial entities, mining enterprises, or governmental bodies that could inappropriately influence or bias the findings presented in this study.

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