

Perception and Awareness of Environmental Auditing in Vietnam's Mining Industry

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Abstract

This study investigates how mining companies in Vietnam perceive and engage in environmental audits, addressing an important gap in understanding compliance barriers and factors affecting environmental awareness in the mining industry. The study aims to identify the main obstacles to an effective environmental audit and to propose practical recommendations to improve regulatory compliance and sustainable development practices. Using qualitative research methodology, data was collected through 25 semi-structured interviews with mining company executives, independent auditors and policy makers, as well as 2 focus group discussions with mining company representatives. The findings reveal a significant disparity between large firms - which see auditing as a strategic tool for sustainability - and SMEs, which see environmental audits as a financial and administrative burden. Weak enforcement, cost concerns, and technical knowledge gaps were identified as major barriers. These results are significant because they demonstrate the need for stricter regulatory enforcement, the need to build capacity, and the financial incentives for mining companies to encourage voluntary environmental audits. The implementation of these measures can improve environmental protection efficiency in Vietnam's mining industry, ensuring long-term sustainability and management efficiency.

Keywords: Environmental auditing, Mining industry compliance, Regulatory enforcement, Sustainability in mining.

1. INTRODUCTION

Vietnam's mining sector plays an important role in the country's economy, by providing essential raw materials for many sectors, including construction, manufacturing, and energy. Vietnam possesses large reserves of coal, bauxite, titanium and rare earth elements, making the mining industry a significant contributor to economic growth (General Department of Geology and Minerals of Vietnam, 2020). However, mining activities also lead to serious environmental consequences, including indiscriminate deforestation, soil erosion, air and water pollution (Nguyen et al., 2018). The exploitation of minerals, especially through open pit and underground mines has led to habitat destruction, loss of biodiversity and increased greenhouse gas emissions (Pham & Wilson, 2021).

Although governments and authorities have enacted legal frameworks to minimize environmental damage, compliance with them remains a challenge due to inadequate enforcement, lack of transparency, and limited resources. Many mining companies prioritize economic benefits over environmental responsibilities that exacerbate ecological degradation. Therefore, environmental audits are seen as an important tool to assess and ensure compliance with environmental standards in Vietnam's mining industry (Doan & Tran, 2019).

An environmental audit serves as a systematic review process to assess the company's compliance with environmental laws and policies. Environmental audits help mining companies identify environmental risks, assess compliance, and implement remedial measures to minimize negative impacts on the environment (International Organization for Standardization, 2015). For sustainable exploitation, environmental audits play an important role in promoting responsible resource exploitation, reducing pollution and strengthening corporate accountability. By integrating environmental audits into corporate strategies, operators can improve sustainability performance, enhance reputation, and build trust with stakeholders, including regulators, local communities, and investors (World Bank, 2020). Furthermore, environmental audits enable companies to proactively address their environmental obligations, avoid legal penalties, and adopt cleaner technologies for resource extraction and waste management (UNEP, 2019).

Around the world, environmental audits have become an essential component of responsible mining activities. Many countries, including Australia, Canada, and the United States have established stringent environmental audit requirements to ensure compliance with mining regulations (ICMM, 2021). International frameworks, such as the International Council on Mining and Metals Sustainability (ICMM) Principles and the Global Reporting Initiative (GRI) Standards emphasize the importance of environmental audits in achieving sustainable mining practices (GRI, 2020). In Southeast Asia, countries such as Indonesia and Thailand have adopted environmental audits as part of their governance strategies, implementing policies that require companies to conduct regular audits, disclose their environmental performance, and engage with stakeholders (ADB, 2018). However, in Vietnam environmental audits are still underdeveloped, with inconsistent implementation and limited awareness in mining companies (Hoang & Bui, 2022). Strengthening environmental audits in Vietnam's mining sector is essential to align with global sustainability standards and mitigate environmental risks.

Viet Nam has established many environmental regulations, such as the Law on Environmental Protection (2020) and the Decree on Environmental Impact Assessment to regulate mining activities and minimize environmental damage. Despite these regulatory frameworks, compliance among mining companies remains limited and inconsistent. Many companies do not conduct environmental audits or consider them to be a formality rather than a strategic tool for sustainability. Weak enforcement mechanisms, lack of technical capacity, and limited awareness have widened the gap between legal regulations and actual environmental performance (Nguyen & Le, 2021).

While existing studies have extensively explored environmental audit perceptions and behaviors in the mining industry in developed economies such as Australia, Canada, and the United States (e.g., Smith et al., 2019; Johnson & Lee, 2020), few have focused on emerging markets such as Vietnam, where companies face unique regulatory challenges, weak enforcement mechanisms, and resource constraints. On the other hand, the existing studies in Viet Nam are mainly quantitative analyses (e.g. Tran et al., 2021; Nguyen & Pham, 2022)

focusing on compliance rates and audit frequency. However, the lack of qualitative studies impairs the ability to understand how mining companies perceive environmental audits, the motivations behind their compliance behavior, and the underlying challenges they face during implementation.

Therefore, the purpose of this study is to examine how mining companies in Vietnam perceive environmental audits, assess their level of performance and commitment to environmental audits, and identify factors affecting their perceptions and behavior. Specifically, this study seeks to answer the following questions: (i) How do mining companies in Vietnam perceive environmental auditing? (ii) What is the level of awareness and commitment of mining companies to environmental audits? and (iii) What factors influence the perception and behavior of environmental auditing in Vietnam's mining industry?

This study will provide valuable insights into the current state of environmental auditing in Vietnam's mining industry, pointing to compliance constraints and areas for improvement. The findings will inform policy recommendations to strengthen the audit framework, strengthen regulatory enforcement, and promote sustainable mining practices. For mining companies, research will serve as guidelines to improve the audit process, apply standards, and enhance environmental performance, ultimately supporting compliance and corporate reputation. In addition, the study will benefit stakeholders - including government agencies, NGOs, and local communities - by providing insight into corporate awareness and actions on environmental audits.

2. LITERATURE REVIEW

2.1. The concept of environmental audit

An environmental audit can be defined as a systematic, documented, and objective assessment of an organization's environmental performance, regulatory compliance, and compliance with sustainability standards (International Organization for Standardization [ISO], 2015).

In addition, Darnall et al. (2008) argue that environmental auditing is a process that helps organizations systematically evaluate their environmental performance, identify areas of risk, and develop strategies to reduce environmental impact while ensuring compliance with environmental regulations. This definition combines compliance, risk management, and sustainability improvement.

In the mining industry, environmental audits play an important role in assessing the environmental impact of mining activities, ensuring sustainable resource management and minimizing negative environmental impacts such as deforestation, land degradation and water pollution (International Council on Mining and Metals [ICMM], 2021).

The primary purpose of environmental audits in the mining sector is to assess compliance with environmental laws and regulations, evaluate the effectiveness of environmental management systems, and make recommendations for improvement (World Bank, 2020). Environmental audits help mining companies identify potential risks, improve their sustainability performance, and enhance their reputation and relationships with stakeholders (Global Reporting Initiative [GRI], 2020).

There are several types of environmental audits applicable to the mining industry, each serving distinct purposes:

(i) Compliance Audits – These audits assess whether a mining company complies with local, national, and international environmental regulations, permits, and standards (U.S.

Environmental Protection Agency [EPA], 2019). They help ensure that companies meet their legal obligations and avoid penalties.

(ii) Performance audits – These audits evaluate the effectiveness of the company's environmental management system, policies, and operations beyond mere compliance. They focus on operational efficiency, resource conservation, and pollution control measures (ISO, 2015).

(iii) Risk-based audits – These audits identify and assess the environmental risks associated with mining operations, including hazardous waste management, water pollution, and soil restoration (ICMM, 2021). They help companies develop proactive risk management strategies.

(iv) Due Diligence Audits – Often conducted prior to a merger, acquisition, or financing agreement, these audits assess a mining company's environmental obligations, ensuring that investors and stakeholders understand the potential environmental risks (World Bank, 2020).

(v) Internal Audit vs. External Audit – Internal audits are conducted by the environmental management team of the organization, while external audits are conducted by auditors of an independent third party to ensure objectivity and reliability (GRI, 2020).

Therefore, environmental audits serve as important tools to help operators manage their environmental responsibilities, ensure regulatory compliance, and contribute to sustainable mining operations.

2.2. Environmental audit in the mining industry

Environmental audit requirements for the mining industry in some countries

Environmental audits have become an integral part of sustainable mining practices around the world. Countries with thriving mining industries such as Australia, Canada, and South Africa have implemented comprehensive environmental audit frameworks to ensure responsible resource extraction (Smith et al., 2019). These include:

(i) Mandatory environmental audits: In Australia, mining companies are legally obligated to conduct periodic environmental audits as part of their licensing conditions (Australian Government Department of Industry, Science, Energy and Natural Resources, 2020).

(ii) Independent third-party audits: Canada requires independent environmental audits for large-scale mining projects, ensuring transparency and accountability (Natural Resources Canada, 2021).

(iii) Public disclosure of audit results: In South Africa, companies must publicly report their environmental audit results, increase stakeholder engagement and corporate accountability (Ministry of Mineral Resources and Energy, South Africa, 2020).

(iv) Integration with Corporate Sustainability Reporting: Many multinational mining corporations link their environmental audits to the Global Reporting Initiative (GRI) and International Financial Institutions (IFC) Performance Standards, ensuring consistency in sustainability reporting (GRI, 2020).

(v) Technology-based audit method: The use of remote sensing technology, Geographic Information Systems (GIS), and real-time monitoring technology has improved the accuracy and efficiency of environmental audits in mining operations (UNEP, 2019).

These practices demonstrate the importance of environmental audits in promoting sustainable mining practices and minimizing harm to the ecosystem.

Framework for environmental audit and legal requirements in Vietnam

Viet Nam has established various legal frameworks to regulate environmental audits in the mining sector. The Law on Environmental Protection (2020) serves as the main legal document governing environmental compliance, requiring mining companies to conduct environmental impact assessments (EIAs) and periodic audits (Ministry of Natural Resources and Environment of Vietnam [MONRE], 2021). In addition, Decree No. 40/2019/ND-CP requires closer environmental monitoring and reporting for industries with high environmental impact, including mining (Government of Vietnam, 2019).

Despite the existing management measures, environmental audits in Vietnam's mining industry still face a number of challenges. The weak enforcement mechanism makes many mining companies consider auditing only as a form and not an effective management tool (Nguyen & Pham, 2022). In addition, SMEs often lack the technical expertise and resources needed for a comprehensive audit leading to an inadequate assessment of environmental risks (Doan et al., 2021). Many companies also see environmental audits as a compliance requirement rather than a strategic initiative geared towards sustainability and this limits their meaningful implementation commitment (Le & Tran, 2020). Moreover, Vietnam is not required to publish audit results for environmental audits that reduce stakeholder participation and corporate accountability compared to international standards (Hoang & Bui, 2022).

2.3. Awareness and response to environmental audits

Theoretical Framework

Corporate perceptions and behaviors about environmental governance are influenced by a variety of theoretical frameworks that explain how businesses interpret and respond to environmental responsibilities. One widely used view is Institutional Theory, the institutional theory that organizations adopt environmental audit practices in response to regulatory pressures, industry norms, and societal expectations (DiMaggio & Powell, 1983). According to this theory, businesses comply with environmental regulations not only to avoid fines but also to gain legitimacy within their industry and among stakeholders (Scott, 2014).

Another related framework is the Stakeholder Theory, which states that corporations must balance the interests of multiple stakeholders, including government regulators, investors, local communities, and environmental organizations (Freeman, 1984). Mining companies that recognize the importance of environmental audits often do so to meet stakeholder expectations, improve a company's reputation, and enhance long-term sustainability (Clarkson, 1995).

The firm's resource-based perspective (RBV) emphasizes how the firm's perception of environmental auditing is shaped by internal competencies and resources (Barney, 1991). Companies with well-developed environmental management systems and expertise in sustainable practices are more likely to view environmental auditing as a strategic advantage than a compliance burden (Hart, 1995).

These theoretical perspectives provide a foundation for understanding how mining companies in Vietnam perceive and respond to environmental audits. While some companies see environmental audits as a regulatory requirement, others see them as a tool to improve operational efficiency, mitigate risk, and gain a competitive advantage.

Factors affecting the perception of enterprises on environmental audits

Some key factors affecting how mining companies perceive and participate in environmental audits in Vietnam:

Regulatory pressures: Government regulations play an important role in shaping business perceptions of environmental audits. Companies operating in a tight regulatory

environment are more likely to view auditing as a compliance requirement rather than an opportunity to improve the environment (Nguyen & Pham, 2021). In Viet Nam, the implementation of the Law on Environmental Protection (2020) and Decree No. 40/2019/ND-CP have raised awareness of environmental protection responsibilities, but weak enforcement mechanisms have led to different levels of compliance (MONRE, 2021).

Economic benefits: Mining companies that recognize the financial benefits of environmental audits tend to have a more positive perception of this activity. Environmental audits help companies reduce waste, improve resource efficiency, and reduce long-term operating costs (Porter & van der Linde, 1995). In addition, compliance with environmental standards can attract foreign investment and increase access to international markets where sustainability requirements are very stringent (World Bank, 2020).

Reputation and reputation of the company: Reputation management is another important factor affecting the perception of the business about environmental audit. Companies that prioritize corporate sustainability and social responsibility are more likely to adopt environmental auditing as a means to enhance their public image (Bansal & Roth, 2000). In the Vietnamese mining industry, companies that actively participate in environmental audits often receive greater support from local communities and government agencies (Le & Tran, 2020).

Influence of companies in the same industry: The behavior of companies in the same industry also affects the attitude of businesses to environmental audits. As leading mining companies implement robust environmental audit programs, smaller companies can learn to remain competitive and in line with industry practices (Hoffman, 2001). International mining corporations operating in Vietnam often set higher environmental standards, impacting domestic companies to adopt similar practices (Hoang & Bui, 2022).

3. RESEARCH METHOD

To answer the research question, this article uses qualitative research methods using semi-structured interviews and focus group discussions to explore the perception and behavior of enterprises towards environmental auditing in Vietnam's mining industry. The qualitative approach is considered appropriate to understand the perspectives, motivations, and challenges faced by industry stakeholders in relation to environmental audits. The study was designed as a diverse case study, focusing on selected mining companies operating in Vietnam. The case studies provide an in-depth examination of the actual activities allowing a comprehensive analysis of the attitude of the business towards environmental audits.

The study uses a deliberate sampling method to select participants who can provide appropriate expertise and experience in the field of environmental auditing. To gain insights, 25 semi-structured interviews were conducted with key stakeholders from different sectors of the mining industry, including 17 representatives from the mining company (including executives, environmental officers) who have at least 3 years of experience in environmental management; 6 auditors from independent auditing firms who have direct experience in conducting audits for mining companies; 3 officers from the Ministry of Natural Resources and Environment (MONRE) and the District Department of Natural Resources and Environment where the mining company is located.

Data is collected primarily through interviews conducted in a semi-structured format that gives participants flexibility in presenting their answers while ensuring that key topics are covered. Each interview takes place between 45 – 60 minutes, conducted in person or on the Google Meet platform between July 15 and October 20, 2024. The content of the interviews

focuses on five key areas. First, participants were asked about their perceptions and understanding of environmental auditing. Second, discussions explore the motivation for compliance, considering whether audits are primarily driven by regulatory requirements, corporate responsibilities, or economic interests. Third, the study investigates challenges in implementation, identifies technical, financial and regulatory barriers that hinder effective auditing. Fourth, participants assessed the impact of government policies, assessed the effectiveness of Vietnamese regulations, and proposed necessary improvements. Finally, the interviewees made recommendations for improvement, proposing strategies to improve the efficiency of environmental audits in Vietnam's mining industry.

In addition to individual interviews, two focus group discussions were conducted to facilitate knowledge exchange and explore trends across the industry. Each focus group consisted of 8 participants, for a total of 16 individuals in two sessions. Each focus group discussion lasted 90 minutes and was conducted in September 2024 in Hanoi.

Data collected through interviews and focus group discussions are analyzed by means of thematic analysis, a method widely used in qualitative research to identify, analyze, and interpret the models or topics in the data (Braun & Clarke, 2006). This approach enables research that explores perceptions, motivations, and challenges associated with environmental auditing. The study also implemented coding to sort and classify data into meaningful topics. According to Miles et al. (2014), coding serves as a practical tool for condensing large volumes of qualitative data into manageable segments, allowing researchers to draw meaningful connections between key aspects of participants' experiences and practices.

4. FINDINGS AND DISCUSSION

4.1. Perception of Environmental Auditing in Vietnam's Mining Industry

How mining companies review environmental audits

Findings from both semi-structured interviews and focus group discussions reveal differences in perceptions of environmental auditing in Vietnam's mining industry. While large mining companies tend to see audits as a strategic tool for sustainability, SMEs often see them as a legal requirement with few tangible benefits.

Among large-scale mining companies, participants pointed to the long-term benefits of environmental audits, particularly in enhancing the company's reputation and improving operational efficiency. An executive of a bauxite mining company in Lam Dong explained: *"An environmental audit helps us streamline resource use, reduce costs, and meet international sustainability standards. They are not only aimed at avoiding penalties but also improving our overall business strategy."* This view has been reinforced in focus group discussions in which representatives from major companies insist that international investors and customers demand environmental accountability. A participant from a titanium mining company in Binh Thuan stated, *"Without proper environmental audits, we risk losing contracts with global partners that require strict adherence to sustainability standards."*

However, SMEs have a different view of environmental audits, seeing them as an administrative obligation rather than a strategic opportunity. A small-scale granite mining company in Thanh Hoa expressed disappointment that, *"We conducted the audit because the law required it, not because we saw any real value. This process is expensive, time-consuming, and offers few practical benefits for small companies like us."* This view was echoed several times during focus group discussions, where representatives of SMEs voiced concerns about financial and technical challenges. A participant from a rare earth mining company in Lai Chau bluntly stated, *"Unlike large corporations, we do not have a dedicated environmental*

department. We even have difficulty in understanding the audit reports, let alone implementing the recommendations.”

The auditors also noted that many firms approach audits with the mentality of doing only what is minimal to meet regulatory requirements. An independent auditor in Quang Nam commented, *“Some companies see auditing as a necessity rather than an opportunity for improvement. They have very little incentive to go beyond basic compliance.”* In addition, officials from the Department of Natural Resources and Environment (DONRE) in Thai Nguyen similarly commented, *“Many companies see auditing as a form of just avoiding fines, not a real effort to improve environmental performance.”*

Differences in perception between large-scale and small-scale operators

The size and resources of mining companies significantly influence their perception of environmental audits. Large mining companies, especially those with foreign investment or relationships with international market customers, tend to adopt a proactive approach to compliance. These companies integrate environmental audits into their corporate sustainability strategies and see auditing as a way to enhance operational efficiency and maintain industry reputation.

For example, an executive from a coal mining company in Quang Ninh emphasized, *“We voluntarily adopt international environmental standards, such as ISO 14001 because sustainability is critical to long-term success. Auditing helps us refine our environmental policies and improve efficiency.”* This view is further shared among focus group participants from large scale companies who emphasize that high environmental performance will enhance their market competitiveness. A participant from an apatit mining company in Lao Cai explained, *“When we demonstrate good environmental protection practices, it strengthens our relationships with local communities and regulators, reducing conflict and delays in project approval.”*

In contrast, small mining companies, especially those operating in remote areas with limited regulatory oversight, often see environmental audits as a financial and administrative burden. *“The cost of compliance is too high for small companies like us,”* said a small-scale rare earth mining company in Yen Bai. *We don't have the resources to hire consultants or conduct costly environmental audits.”* This concern was reiterated in focus group discussions, in which representatives of SMEs argued that audit requirements are often unrealistic for smaller companies. An executive from a granite mining company in Phu Yen noted: *“The government applies the same auditing standards to small companies as they do to large corporations. There needs to be a more flexible system that considers the financial and operational constraints of SMEs.”*

Furthermore, many SME representatives doubt the effectiveness of audits, questioning whether they actually lead to environmental improvement. A small bauxite mining company in Dak Nong in a focus group stated, *“We submitted an audit report, but we never received feedback or assistance on how to improve. If audits don't come with practical guidance, how can we change it?”* Similarly, an interviewee from a small titanium mining company in Ninh Thuan expressed skepticism, saying, *“Some companies skip compliance altogether because enforcement is weak. If large companies can get away with breaches, why should we invest in costly audits?”*

These findings highlight the urgent need for policy reforms to make environmental audits more effective and accessible across a variety of firm sizes. Appropriate regulatory approaches - such as simplified audits for SMEs, financial incentives, and technical assistance

programs - can help smaller companies see audits as a valuable tool rather than a financial burden. In addition, strengthening enforcement mechanisms and improving public transparency in audit results may encourage stricter compliance across the industry.

4.2. Factors affecting perception and understanding

Enforcement of government regulations and initiatives

The effectiveness of regulatory enforcement and government initiatives is seen as an important factor influencing the perceptions and actions of mining companies on environmental audits in Viet Nam. While large-scale mining companies often view government regulations as a guiding framework for sustainability, SMEs express concerns about inconsistent enforcement and lack of support for compliance.

An executive of a rare earths mining company in Lai Chau emphasized the role of strict enforcement in shaping the behavior of the industry: *“When the government actively monitors compliance and imposes strict penalties for violations, companies will attach more importance to environmental audits. In areas where enforcement is weak, many companies completely ignore audits.”* Similarly, a compliance officer of a coal mining company in Quang Ninh noted, *“Our company recognizes that close regulatory monitoring will lead to better environmental outcomes. We prefer clear guidelines and frequent inspections rather than a system where enforcement is unpredictable.”*

However, SMEs expressed frustration over inconsistent enforcement, arguing that this creates an unfair playing field. A small apatite mining company in Lao Cai said, *“Some companies are out of the scrutiny while others are under close scrutiny. This inconsistency makes it difficult for smaller companies like us to justify investing in environmental audits when we see others operating with very little oversight.”* This concern was widely reiterated in focus group discussions, in which participants argued that some firms ignored environmental requirements due to poor regulatory monitoring. A participant from a granite mining company in Thanh Hoa commented, *“If the enforcement is fair and transparent, we will be more willing to invest in environmental compliance because we know that everyone must comply with the same standards”.*

In addition to differences in enforcement, SMEs also cited the lack of government support as a barrier to compliance. A small bauxite mining company in Dak Nong explained, *“We don’t have the same resources as large corporations. The government should provide more training and technical assistance to help smaller companies understand and perform environmental audits properly.”* An environmental officer from the Department of Natural Resources and Environment in Thai Nguyen acknowledged this gap, stating, *“We have found that SMEs have difficulty complying due to limited resources. We are taking initiatives to provide more guidance and financial support for environmental audits, but implementation remains a challenge.”*

Economic and financial considerations when applying environmental audits

Economic and financial constraints significantly affect mining companies' willingness to implement environmental audits. While large corporations often see environmental compliance as an investment in long-term sustainability and profitability, small and medium-sized enterprises see it as a financial burden with little immediate return.

An executive of a titanium mining company in Binh Thuan highlighted the economic benefits of an environmental audit, saying, *“By proactively managing environmental risks, we reduce costs associated with waste management, regulatory fines, and community disputes. In the long run, an environmental audit will improve our efficiency and profitability.”* Similarly,

a director of a coal mining company in Quang Ninh noted that, *“Many investors prefer to work with companies that adhere to strict environmental standards. Our commitment to environmental audits has helped us secure funding from international partners.”*

In contrast, SMEs struggle to justify the upfront costs of environmental audits. A small scale rare earth mining company in Yen Bai explained, *“Hiring audit firms to perform environmental audits, upgrade equipment, and implement audit recommendations are all costly. For a small company like us, these costs can be huge.”* This concern was reiterated in focus group discussions in which representatives of SMEs argued that the government should offer financial incentives to encourage compliance. A participant from a limestone mining company in Thanh Hoa suggested, *“If there are tax incentives or subsidies for companies conducting environmental audits, more of us would be willing to do them.”*

In addition, some SME owners question the financial return on investment for environmental audits. A granite mining company in Phu Yen frankly stated, *“We don't see immediate financial benefits from environmental audits. Unless there is a clear economic advantage, most small businesses will do the bare minimum to meet legal requirements.”* An environmental auditor in Quang Nam supported this view, noting, *“Many SMEs only comply with environmental regulations when they run the risk of being fined. If there is a financial benefit associated with compliance, more companies will be willing to engage in environmental audits.”*

Effects of environmental standards and foreign investment

Companies that export minerals or receive foreign investment are more likely to adopt international environmental audit practices, while domestically concentrated SMEs remain less affected by such standards.

An executive of a bauxite mining company in Lam Dong explained, *“Foreign investors require us to comply with international environmental standards such as ISO 14001. Without strict compliance, we risk losing contracts and investment opportunities.”* Similarly, a sustainability officer of a nickel mining company in Son La noted, *“Many of our buyers are international corporations that demand high environmental standards. Conducting a rigorous environmental audit is not only a regulatory compliance but also a business need.”*

In contrast, SMEs that primarily serve the domestic market find little incentive to adopt international standards. A small-scale sand mining company in Dong Nai said, *“We sell locally, so there is no pressure to comply with global environmental standards. Our priority is to keep costs low, not to meet international requirements.”* This view is widely shared in focus group discussions, where representatives of SMEs argue that international standards are too complex and expensive for small firms to adopt. A participant from an apatite mining company in Lao Cai commented, *“Large corporations have enough resources to comply with international environmental standards, but for small businesses like us, the requirements are too strict and expensive.”*

However, some SMEs recognize that compliance with international standards can have long-term benefits. A rare earth mining company in Lai Chau noted, *“If we want to expand our market and attract foreign investment, we need to improve our environmental protection practices. The challenge is to find the financial and technical support to do that.”* An environmental officer in Bac Kan reinforced this view, stating, *“Small and medium-sized enterprises that proactively adopt international environmental protection practices will have a competitive advantage in the long term, especially when global supply chains require higher sustainability commitments.”*

4.3. Challenges and barriers to implementation

Lack of technical expertise

A major challenge identified in both interviews and focus group discussions is the lack of technical expertise in conducting and implementing environmental audits, particularly in small and medium sized mining enterprises. While large-scale operators often have dedicated environmental departments, smaller firms face limited knowledge and resources, making compliance difficult.

An environmental director of a bauxite mining company in Lam Dong highlighted this gap, saying, *"We have a team of trained professionals who handle environmental audits, ensuring that we meet both national and international standards. However, many smaller firms lack the expertise to conduct even basic environmental assessments."* Similarly, an environmental officer of a coal mining company in Quang Ninh noted, *"Our company regularly sends staff for environmental training, but we recognize that smaller companies may not have the capacity to do so."*

In contrast, SMEs expressed frustration with the complexity of environmental audit requirements. A small-scale apatite mining company in Lao Cai admitted, *"We don't have in-house environmental experts, so we have to rely on external auditors, which is very expensive. Even when we receive an audit report, we don't always understand how to implement the recommendations."* This concern was widely shared in focus group discussions, in which many SME representatives felt that complex technical terminology and regulations made compliance difficult for them. The director from a granite mining company in Thanh Hoa explained, *"The audit reports are full of technical terms that we don't fully understand. If the Industry Association provides simpler guidelines or hands-on training, that will help smaller companies like us comply more effectively."*

Environmental auditors also acknowledge the technical knowledge gap between SMEs. A certified environmental auditor in Bac Kan observed, *"Many small mining companies struggle even with the basic concepts of environmental risk assessment. They often see auditing as a bureaucratic requirement rather than a tool to improve sustainability."* An official from the Department of Natural Resources and Environment in Ha Giang concurred with this concern, stating, *"It is clear that more educational initiatives are needed to close the knowledge gap in environmental auditing, especially for smaller mining operations."*

Financial capacity

The financial burden of environmental auditing is another significant challenge, especially for small-scale operators operating with limited budgets. While larger firms see auditing as an investment in long-term sustainability, SMEs see it as an additional cost that is not profitable in the short term.

An executive of a titanium mining company in Binh Thuan explained, *"An environmental audit helps us identify inefficiencies that, in the long run, will help reduce costs. However, we understand that smaller companies may struggle with the initial investment required to comply."* Similarly, a director of a rare earth mining company in Lai Chau noted, *"For us, environmental compliance is not only about avoiding fines but also about maintaining our reputation and securing long-term partnerships with international customers."*

However, SME representatives expressed disagreement with the additional environmental regulations on the grounds of high costs and unclear benefits. A small bauxite mining company in Dak Nong said, *"We hardly make enough profit. If the authorities continue to issue more environmental regulations, small businesses like us will not be able to survive."*

This concern was reiterated in focus group discussions, where participants argued that compliance costs could force smaller firms into bankruptcy. A director of a limestone mining business in Thanh Hoa emphasized, *“Unlike large companies, we do not have a dedicated environmental team or budget to hire independent auditors. Each new regulation adds to our financial burden.”*

Some companies also question whether compliance costs translate into real benefits. A granite mining company in Phu Yen commented, *“We don't see how these audits directly benefit our operations. If the government offers financial incentives, like tax breaks or subsidies, more companies will be willing to comply voluntarily.”* Independent auditors support this view, with one auditor in Quang Nam stating, *“Many SMEs only comply with environmental regulations when they fear fines. If we have a financial support mechanism in place, we will see a much higher rate of voluntary compliance.”*

Weak enforcement and monitoring mechanisms

Another barrier identified in the study is poor enforcement and inadequate monitoring mechanisms that contribute to reduced compliance rates, especially among SMEs. While large miners operating under international standards often adhere to strict environmental regulations, smaller ones seek to ignore or delay compliance due to lax oversight mechanisms.

An executive of a coal mining company in Quang Ninh expressed concerns about unfair enforcement, saying, *“We invest a lot in environmental compliance, but we see smaller companies operating with little or no oversight. If the enforcement is stricter and fairer, it will create a level playing field, encouraging businesses to comply with the regulations.”* Similarly, an environmental officer of a nickel mining company in Son La noted, *“Companies that value environmental audits should not compete with companies that evade regulations with minimal consequences.”*

On the other hand, SME representatives in focus group discussions argue that enforcement is inconsistent and that there is sometimes inequality between companies. A small scale rare earth mining company in Yen Bai said, *“Some companies received heavy fines for minor violations, while others continued to operate in worse conditions without penalty. This inconsistency makes environmental audits difficult.”* Another participant from a sand mining company in Dong Nai added, *“There are companies that completely ignore environmental regulations and still operate. If the enforcement is fair, maybe we will feel more pressure to comply.”*

Independent auditors also expressed frustration with poor regulatory oversight. A certified auditor in Bac Kan explained, *“Many violations are recorded in audit reports, but little action is taken then. If companies know that they won't face real consequences, they have no incentive to improve their environmental performance.”* An official of the Department of Natural Resources and Environment in Ha Giang admitted, *“We face resource constraints in monitoring mining activities. Our enforcement teams are small, and we can't check every site regularly.”*

Focus group participants suggested that stronger enforcement mechanisms-such as public reporting of audit results and stricter penalties for non-compliance-can improve industry accountability. A participant from an apatit mining company in Lao Cai proposed, *“If the audit results are made public, companies will be more motivated to improve their environmental protection practices because they don't want to damage their reputation.”* Others called for more frequent and unscheduled checks to prevent non-compliance.

4.4. Some other recommendations

Recommendations to raise awareness and understanding of environmental audits

Focus group interviews and discussions show that corporate awareness and action on environmental audits can be improved through better education, incentives, and clear legal communication. While large-scale operators often recognize the strategic benefits of an environmental audit, SMEs often see it as a legal burden with few tangible benefits.

An environmental officer from a coal mining company in Quang Ninh stressed the importance of internal training programs and said, *“We regularly conduct workshops and training sessions for our employees to ensure they understand environmental regulations and the benefits of compliance. When employees see auditing as a tool to improve operational efficiency and not just a legal requirement, they will be more engaged.”* Similarly, an executive from a bauxite mining company in Lam Dong noted, *“We incorporate environmental awareness into our corporate culture, making it part of our long-term business strategy. This helps us stay ahead of regulations and maintain a good reputation with our stakeholders.”*

However, for SMEs, limited access to training and technical resources remains a barrier. A small-scale apatite mining company in Lao Cai admitted, *“We don’t have the expertise to fully understand environmental auditing. If the government or industry associations provide free or low-cost training, more companies like us will take this issue more seriously.”* This concern was reiterated in focus group discussions, in which several representatives of SMEs suggested that government-issued outreach programs could raise awareness. A participant from a limestone mining company in Thanh Hoa said, *“If environmental regulators held regular workshops explaining the requirements and benefits of audits, we would be more willing to comply.”*

Another effective strategy discussed is recognition and reward programs for companies with high environmental performance. A director of a titanium mining company in Binh Thuan suggested, *“The public recognition of companies that excel in environmental audits will create positive momentum. If companies see that compliance can enhance their reputation and attract business opportunities, they will be more willing to invest in it.”*

Policy recommendations

Many interview participants and focus groups highlighted the need for policy improvements to make environmental audits more efficient and accessible. The most commonly proposed recommendations include financial incentives, regulatory simplification, and effective enforcement mechanisms.

A senior executive of a rare earths mining company in Lai Chau stressed the importance of financial support, stating, *“The cost of compliance is one of the biggest hurdles for SMEs. If the government provides tax breaks or subsidies to companies that voluntarily conduct environmental audits, more companies will be encouraged to participate.”* This was reinforced by a focus group participant from a granite mining company in Phu Yen, who argued that, *“Rather than just penalizing cases of non-compliance, the government should provide financial support to help smaller companies improve their environmental performance.”*

Some participants also called for simplification of audit procedures, especially for SMEs. A small bauxite mining company in Dak Nong expressed disappointment, saying, *“The audit process is too complicated for small businesses. We don’t have a dedicated environmental team, so the paperwork gets overwhelming.”* A government official from the Department of Natural Resources and Environment in Thai Nguyen acknowledged this concern, stating, *“We*

are looking at ways to simplify audit requirements for small businesses while maintaining high environmental standards.”

The enforcement mechanism is another important area for policy improvement. An independent auditor in Quang Nam noted, *“Many companies only comply because they are afraid of being fined, but the enforcement is inconsistent. If audits are strictly enforced and followed up with real consequences for violations, companies will take them more seriously.”* A focus group participant from a sand mining company in Dong Nai proposed, *“Random inspections and stricter penalties for repeat offenders will ensure that all companies large and small are held accountable for their environmental impact.”*

Another recommendation is to increase transparency in audit results. A company environmental officer from a nickel mining company in Son La proposed, *“If the results of the companies' environmental audits are made public, it will encourage them to improve their compliance because no business wants to be known for poor environmental practices.”*

5. POLICY IMPLICATIONS FOR MANAGERS

The findings of the study show that some important aspects need to be improved to improve the efficiency of environmental auditing in Vietnam's mining industry. While large-scale mining companies often have the resources and incentive to comply with environmental regulations, SMEs face significant challenges, including weak enforcement, lack of technical expertise, and financial constraints. To address these issues, the authors propose the following key recommendations:

Firstly, strengthening the enforcement of regulations on environmental audits

One of the most important findings of this study is that poor enforcement and inconsistent regulatory oversight hinder the effectiveness of environmental audits in Vietnam's mining industry. Many SME representatives interviewed expressed concern that the lack of strict sanctions allows some companies to ignore environmental regulations, creating an unfair competitive environment. A small scale rare earth mining company in Yen Bai said, *“Some companies completely ignore environmental audits because they know that enforcement is weak. If the penalties are stricter, compliance will improve.”*

To enhance enforcement, this study proposes the following policy measures:

- (i) Increase the frequency of inspections and conduct ad-hoc inspections to ensure companies comply with environmental regulations.
- (ii) Impose harsher penalties for non-compliance, especially on repeat offenders, to prevent them from failing to carry out their environmental responsibilities.
- (iii) Enhance transparency by publicizing audit results, which will encourage companies to improve their environmental performance to maintain their reputation.
- (iv) Establishment of independent supervisory bodies to supervise environmental audits and ensure fair enforcement.

By tightening enforcement mechanisms, policymakers can increase compliance rates, improve environmental performance, and create a more equitable regulatory environment for all companies in the mining sector.

Second, capacity building for mining companies on environmental audit activities

Another important finding of this study is that many SMEs lack the technical expertise needed to conduct effective environmental audits. While large companies often have dedicated environmental teams, smaller mining companies have difficulty understanding audit requirements and implementing recommendations. A small bauxite mining company in Dak

Nong admits, *“We have no environmental experts and hiring independent auditors is expensive. We need more training to understand how to properly comply with audits.”*

To address this issue, this study recommends:

(i) Develop specialized training programs for SMEs, focusing on simple audit procedures, risk assessment, and compliance strategies. One participant from a limestone mining company in Thanh Hoa proposed, *“If the government provides free or low-cost training sessions, more small companies will participate in environmental audits.”*

(ii) Provide technical assistance and access to guidance documents that clearly and practically explain the regulations on environmental auditing.

(iii) Promote partnerships between large mining companies and SMEs to encourage knowledge sharing on environmental protections.

(iv) Encourage collaboration among universities, research institutes, and the mining industry to develop certification programs for environmental audit professionals.

An environmental auditor in Quang Nam highlighted the importance of training, stating: *“There is a significant knowledge gap in SMEs. Many companies don't understand the purpose of audits, let alone how to use them to improve operations. Capacity building programs will have a long-term impact on environmental compliance.”*

By investing in technical education and training, policymakers and industry stakeholders can ensure that mining companies, regardless of size, have the necessary skills and knowledge to participate effectively in environmental audit processes.

Third, encourage companies to voluntarily adopt environmental audits

The study findings also indicate that many SMEs view environmental audits as a financial burden rather than a business advantage. While large companies have investors, international clients often voluntarily adopt environmental standards, locally-focused SMEs have little incentive to pursue environmental audits that go beyond legal requirements. A granite mining company in Phu Yen explained, *“We did not see an immediate financial benefit from the environmental audit. Unless there is a clear incentive, most small businesses will do the bare minimum to comply with regulations.”*

To encourage voluntary participation in environmental audits, this study recommends:

(i) Providing tax incentives or financial subsidies to companies conducting regular voluntary environmental audits and implementing recommended improvements. A director of the Binh Thuan titanium mining company suggested, *“If the government provides financial incentives, more companies, especially small and medium enterprises, will be encouraged to adopt voluntary environmental audits.”*

(ii) Introduce public recognition programs, such as government or industry awards, to highlight environmentally responsible companies and enhance their reputation. A focus group participant from a sand mining company in Dong Nai noted, *“If customers and investors know which company is an environmental leader, that creates a competitive advantage for those who comply voluntarily.”*

(iii) Providing incentives in government contracts and mining licenses to companies that demonstrate high environmental protection efficiency.

(iv) Provide access to low-interest green loans for companies investing in sustainable mining and environmental compliance measures.

An official from the Department of Natural Resources and Environment of Ha Giang Province highlighted the potential of incentives when stating, *“Currently, companies consider environmental auditing as an expense, but if we give financial benefits, many companies will*

voluntarily participate in the audit, leading to better environmental performance throughout the industry.”

By combining voluntary compliance with specific financial benefits, policymakers can encourage mining companies to become more involved in environmental audits, promoting a culture of sustainability, and proactive environmental stewardship.

6. CONCLUSION

This research provides critical insights into how mining companies in Vietnam perceive and engage with environmental auditing, revealing a divergence in attitudes between large-scale mining corporations and small- and medium-sized enterprises (SMEs). Large corporations, particularly those with international investors or export-oriented operations, generally recognize environmental auditing as an essential component of their sustainability strategies and risk management frameworks. They view audits as a means to enhance operational efficiency, secure investment, and maintain regulatory compliance, with many voluntarily adopting higher environmental standards such as ISO 14001. In contrast, SMEs predominantly perceive environmental auditing as a bureaucratic or financial burden, complying only to the extent necessary to avoid penalties. Many smaller firms lack the technical expertise and financial resources to conduct thorough audits, and they struggle to see the immediate economic benefits of compliance. Furthermore, weak enforcement mechanisms allow some SMEs to evade auditing requirements, further exacerbating the disparity in engagement between large and small companies.

The study also identifies several key factors influencing awareness and commitment to environmental auditing. Regulatory enforcement emerged as a crucial determinant, with companies operating in regions with strict oversight and frequent inspections demonstrating higher compliance levels. Conversely, inconsistent enforcement and selective penalties have created an environment where some companies feel little pressure to prioritize environmental audits. Economic considerations also play a significant role, as companies with stable financial capacity are more likely to integrate environmental auditing into their business strategies, while SMEs lacking financial support often view it as an unnecessary expense. Additionally, foreign investment and international best practices significantly influence environmental awareness, with companies engaged in global supply chains more likely to adopt proactive environmental policies.

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