

Post-Mining Land Restoration from an Environmental Fiqh Perspective (A Case Study of PT. Ang and Fang Brother's Mining Excavation in Morowali Regency)

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| Keywords | Abstract |
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| Land Restoration, Environmental Fiqh, Mining, Maqashid Syariah, PT. AFB Morowali | This study examines post-mining land restoration from the perspective of environmental fiqh, focusing on a case study of PT. Ang and Fang Brother (PT. AFB) in Morowali Regency, Indonesia. Mining activities significantly contribute to economic growth but also generate severe environmental degradation, including soil damage, water pollution, and ecosystem disruption. Although regulatory frameworks exist, their implementation often remains ineffective due to technical, financial, and governance constraints. Therefore, this study aims to analyze how environmental fiqh principles can strengthen post-mining restoration practices and enhance ecological sustainability. This research employs a qualitative approach using field research methods. Data were collected through in-depth interviews with company representatives and affected local communities, as well as documentation analysis of relevant policies and reports. The data were analyzed using the Miles and Huberman model, including data reduction, data display, and conclusion drawing. The findings reveal a significant gap between restoration planning and field implementation. While PT. AFB has established reclamation programs, issues such as poorly maintained revegetation, abandoned mining pits, and limited community involvement persist. Environmental fiqh principles, including <i>hifzh al-bi'ah</i> , <i>islah al-ardh</i> , and <i>ihya al-mawat</i> , are found to align with national regulations and provide a strong ethical foundation for restoration. In conclusion, integrating environmental fiqh into post-mining policies can enhance moral responsibility, strengthen community participation, and support sustainable land restoration. |

INTRODUCTION

Mining activities play an important role in supporting the Indonesian economy, but they also have negative environmental impacts, such as ecosystem damage; water, air, and soil pollution; and permanent changes in land morphology (Sembiring et al., 2024). Post-mining land restoration is necessary to restore the ecological and social functions of affected land. However, its implementation still faces various challenges, such as severe physical and chemical damage to the soil, technological limitations, weak regulatory enforcement, and a lack of local community involvement (Fauzia & Makarim, 2024; Harahap, 2016).

In the context of Indonesia as a country with a Muslim-majority population, the environmental fiqh approach (*fiqh al-bi'ah*) offers a strong theological and ethical foundation to encourage sustainable land restoration (Amanda et al., 2024). Environmental jurisprudence plays not only an ethical role but also serves as a legal instrument that can strengthen land restoration policies (Ubaidillah, 2010). Principles such as *hifzh al-bi'ah* (environmental conservation), *islah al-ardh* (improving the earth), and *ihya al-mawat* (reviving dead land) are

relevant to be integrated into post-mining land restoration regulations and practices (Sholihin, 2025; Istiani & Purwanto, 2019).

Land degradation and ecological decline have become major global concerns in the twenty-first century, especially in regions shaped by extractive industries. Recent international evidence shows that up to 40% of the world's land is already degraded, affecting more than 3 billion people, while global restoration efforts require at least USD 2.6 trillion by 2030 to restore more than one billion hectares of degraded land. This global situation indicates that environmental restoration is no longer a peripheral agenda but a strategic necessity closely linked to climate resilience, biodiversity protection, and sustainable development. In this context, mining areas represent some of the most critical landscapes because extraction often leaves long-term ecological burdens that cannot be resolved solely through short-term technical reclamation.

The urgency of this issue is even stronger in countries rich in mineral resources, including Indonesia, where mining simultaneously drives economic growth and environmental pressure. According to the Extractive Industries Transparency Initiative, Indonesia's extractive sector contributes 10.52% of GDP, 36.9% of exports, and 9.2% of government revenues, showing how central mining is to the national economy. At the same time, the Indonesian government reported that post-mining reclamation reached 7,920.77 hectares in 2023, or 111.95% of the annual target, suggesting serious regulatory efforts to address ecological damage. However, the existence of reclamation targets and achievements does not automatically mean that restoration outcomes are ecologically sufficient, socially accepted, or sustainably monitored in the field.

In practice, Indonesia still faces a substantial compliance problem in post-mining governance. A 2024 Transparency International Indonesia assessment reported that 112 of 121 mining companies failed to fulfill obligations related to reclamation and post-mining guarantee funds, revealing that formal obligations often do not translate into accountable restoration. This concern is reinforced by the Ministry of Energy and Mineral Resources, which in September 2025 imposed temporary sanctions on 190 mining permits that had not fulfilled reclamation and post-mining guarantee obligations. These facts show that the core challenge is not merely the absence of regulation but the weak consistency of implementation, supervision, and ethical commitment among mining actors.

The issue becomes more specific and more relevant in nickel-producing regions such as Morowali, where mining expansion is closely tied to the global energy transition and the rising demand for critical minerals. As the uploaded article explains, PT. Ang and Fang Brother in Lalampu Village, Bahodopi District, operates in a setting where restoration is expected to recover ecological and social functions; yet the field findings show a gap between formal planning and actual implementation. The manuscript notes that restoration is constrained by physical soil damage, technological limitations, weak law enforcement, and limited community involvement, while local residents still report abandoned pits, poorly maintained revegetation, murky water, dust, and declining agricultural productivity. This makes Morowali an important site for examining not only reclamation techniques but also the ethical and participatory foundations of post-mining recovery.

Previous studies have discussed post-mining restoration from several important angles. Recent studies indexed on major scholarly platforms show that post-mining sustainability in

Indonesia has been framed as a governance challenge requiring stronger institutional design, social readiness, and equitable reclamation. Siahaan's 2025 study emphasizes that post-mining landscapes in Indonesia require a dual-pathway framework linking institutions and behavioral readiness, while Wicaksono's 2024 work argues that reclamation rules in Indonesia still lack a sufficiently strong ecological justice foundation. Other work on post-mining communities in Indonesia highlights that organizational involvement and local agency significantly influence readiness for ecological transformation after mining decline. These studies are valuable, but they are still dominated by governance, legal, or socio-ecological perspectives rather than a direct integration of Islamic environmental ethics with restoration practice in a concrete mining case.

A further stream of research has begun to connect mining governance with Islamic legal and moral reasoning, but the discussion remains relatively underdeveloped and often normative. Recent publications indicate that *fiqh al-bi'ah* can serve as a moral framework for land reclamation, while other legal studies recommend the incorporation of Islamic values into reclamation planning, environmental assessment, and public monitoring. Even so, much of this literature still focuses on doctrinal interpretation or general policy recommendations rather than showing how principles such as *hifzh al-bi'ah*, *islah al-ardh*, and *ihya al-mawat* operate within an actual company–community relationship in a post-mining setting. As a result, there is still limited empirical understanding of how environmental *fiqh* can function as a complementary mechanism to positive law in improving restoration legitimacy and community participation.

This condition reveals a clear research gap. Existing studies have generally examined post-mining restoration through technical reclamation, legal compliance, stakeholder perception, or sustainability governance, but they have rarely integrated three dimensions at once: field-based restoration practice, community experience, and environmental *fiqh* as an ethical-legal framework. The uploaded manuscript itself identifies that, in PT. AFB's case, restoration tends to remain limited to administrative and technical compliance, while local participation, local wisdom, and religious-ethical internalization are still weak. Therefore, a study that combines empirical findings from Morowali with the conceptual lens of *fiqh al-bi'ah* can fill an important gap by showing how restoration may be strengthened when ecological recovery is understood not only as a regulatory duty but also as a moral obligation before society and God.

The urgency of this research is grounded in both policy and social realities. Indonesia continues to tighten supervision of reclamation and post-mining compliance, while the broader expansion of critical mineral extraction increases the risk of new degraded landscapes if recovery mechanisms remain weak. In a Muslim-majority context, relying only on state coercion may be insufficient to shape environmentally responsible conduct, especially in communities where religious values continue to influence public morality. The manuscript's field findings are especially important because they show that local actors perceive religious appeals and *ulama*-based guidance as potentially more persuasive than legal threats alone. This means that environmental *fiqh* is not merely a theological discourse but may become a practical resource for strengthening accountability, trust, and long-term stewardship in post-mining areas.

The novelty of this research lies in its effort to place post-mining land restoration within an integrative analytical framework that connects environmental science, mining regulation,

and Islamic environmental jurisprudence in one case study. Unlike prior studies that mainly discuss reclamation from technical or legal viewpoints, this research specifically examines how environmental fiqh can enrich post-mining restoration by providing an ethical-spiritual basis for compliance, strengthening community participation, and reactivating local moral responsibility toward damaged land. The case of PT. AFB in Morowali also gives this study contextual originality because it addresses a nickel mining area that is strategically important in Indonesia's contemporary extractive economy while simultaneously revealing how restoration tensions unfold at the local level between company claims and community experience.

Based on that background, this research aims to analyze post-mining land restoration at PT. Ang and Fang Brother from the perspective of environmental fiqh, to examine the relevance of fiqh al-bi'ah principles to restoration practice, and to evaluate how those principles may complement national mining regulations in strengthening ecological recovery and public participation. More specifically, the study seeks to identify the existing restoration practices and challenges in Lalampu Village, to interpret them through the concepts of hifzh al-bi'ah, islah al-ardh, and ihya al-mawat, and to formulate a more holistic understanding of post-mining recovery in a Muslim-majority social context. The expected contribution of this research is theoretical, practical, and social: theoretically, it enriches interdisciplinary scholarship on mining restoration and Islamic environmental thought; practically, it offers policy insights for more participatory and ethically grounded reclamation; and socially, it provides benefits for communities, companies, and regulators by promoting restoration that is not only legally compliant but also ecologically meaningful and morally legitimate.

METHOD

This research used a qualitative approach with the type of field research. The location of the research is PT. Ang and Fang Brother (PT. AFB), a nickel ore mining company operating in Lalampu Village, Bahodopi District, Morowali Regency, Central Sulawesi Province.

The research informants were selected using purposive sampling techniques, including employees of PT. AFB and the Lalamp community affected by the mine. Data collection techniques are carried out through:

1. Interviews – direct dialogue with informants to dig up in-depth information related to post-mining land restoration.
2. Documentation – the collection of data from written documents such as relevant archives, regulations, activity reports, and policies.

The data validity technique uses triangulation by comparing the results of interviews, observations, and documentation. Data analysis follows the Miles and Huberman model through three stages:

1. Data Reduction – filtering relevant data;
2. Data Presentation – compiling data in the form of narratives and tables;
3. Drawing Conclusions and Verification – drawing provisional conclusions and verifying with additional data.

RESULT AND DISCUSSION

The Concept of Land Restoration in Environmental Science

Land restoration is defined as a strategic process to restore ecosystems that have been degraded due to human activities, including mining (Umami et al., 2024). In the context of mining, restoration includes reclamation, revegetation, and rehabilitation aimed at restoring the ecological function, soil productivity, and socio-economic value of land (Regulation of the Minister of Energy and Mineral Resources No. 26/2018). Commonly used methods include land recontouring, planting local vegetation, and erosion control (Herdiyanti et al., 2022).

However, post-mining land restoration in Indonesia still faces serious obstacles, such as heavy land damage, technological limitations, and weak supervision (Directorate of Open Access Land Damage Recovery, 2018). Case study at PT. AFB shows that although companies have developed reclamation plans, their implementation is often constrained by financial and technical factors (Field Data, 2025).

Land restoration in environmental science is a systematic effort to restore degraded ecosystems to a condition close to their original state, both in terms of biodiversity, ecological function, and economic potential. Based on an interview with the management of PT. AFB, this concept is implemented through a series of technical methods. To overcome land degradation, the company conducts gradual revegetation, starting with pioneer crops (acacia, sengon) to improve the soil, then continuing with perennials and fruits (mahogany, jackfruit) to build a more sustainable ecosystem (Yoga Interview, 2025). On the other hand, to deal with water pollution, mine acid water treatment technology is applied using limestone and sedimentation ponds (Yoga Interview, 2025). However, findings from the people of Lalampu Village reveal a gap between planning and implementation. The community stated that many mine pits were left gaping and the revegetation carried out was not taken care of, so that the ecological function of the land had not recovered optimally (James Interview, 2025). Technical challenges such as changes in soil contours and weather, as well as fluctuating budget commitments, also affect the effectiveness of these restorations (Yoga Interview, 2025).

Environmental Fiqh and Its Relevance to Land Restoration

Environmental jurisprudence (fiqh al-bi'ah) is a set of Islamic sharia rules that govern human behavior towards the environment. Its main principles include:

1. Hifzh al-Bi'ah – environmental conservation as part of the sharia maqashid (Rifzikka, 2024).
2. Islah al-Ardh – the command to repair the earth and not to do any damage (QS. Al-A'raf: 56).
3. Prohibition of Dharar – the rules of fiqh la darar wa la dirar that prohibit actions that are harmful to the environment (Sabani, 2022; Idris & Anita, 2020).
4. Ihya al-Mawat – reviving the dead land as a social worship (HR. Bukhari) (Ginoga et al., 2024).

These principles are aligned with the goal of land restoration, which is to restore damage and create sustainable benefits. In the context of PT. AFB, the environmental fiqh approach can encourage companies to be more morally and spiritually responsible in carrying out reclamation (Field Data, 2025).

Environmental Fiqh (Fiqh al-Bi'ah) is an elaboration of Islamic law that regulates the relationship between humans and the environment, based on principles such as *hifzh al-bi'ah* (protecting the environment), *islah al-ardh* (repairing damage to the earth), and *ihya al-mawat* (reviving the dead land). Although the term "Environmental Fiqh" is specifically less familiar at the management level of PT. AFB, its basic principles are understood and their relevance is recognized (Yoga Interview, 2025). The company's resource person stated that the principle of *ihya al-mawat* is very much in line with the mission of reclamation, which is not only seen as a legal obligation, but also as a moral responsibility (Yoga Interview, 2025). At the community level, James Roberto Makatutu firmly identifies environmental destruction activities without restoration as sinful acts that are contrary to the teachings of Islam (James Interview, 2025). He explicitly links the obligation of post-mining land restoration to the concept of **ihya al-mawat**, equating barren former mining land with "dead land" that must be revived (James Interview, 2025). This perspective shows that Environmental Fiqh offers a strong ethical and spiritual framework to encourage environmental conservation actions.

Integration of Environmental Fiqh and National Regulations

Land restoration regulations in Indonesia, such as Law No. 3 of 2020 concerning Mineral and Mineral Resources (Articles 91-92) and the Minister of Energy and Mineral Resources Regulation No. 26/2018, have regulated reclamation and post-mining obligations (Alfharizi et al., 2023). However, its implementation is still weak due to a lack of supervision and infirm sanctions (Lubis & Lubis, 2024).

The integration of environmental jurisprudence can strengthen these regulations by providing an ethical and spiritual foundation. For example, the concept of *waqf al-bi'ah* (environmental waqf) can be applied to manage post-mining land as a sustainable asset for the benefit of the people (Rilansari & Ulhaq, 2024). MUI Fatwa No. 22/2011 on Environmentally Friendly Mining can also be used as a reference to encourage ethical mining practices (Hafizd et al., 2017).

National regulations, such as the Mineral and Mineral Law No. 3/2020 and the Minister of Energy and Mineral Resources Regulation No. 26/2018, have established clear legal obligations for mining companies to reclaim and restore the environment. PT. The AFB acknowledges that these regulations are their "legal license to operate" (Yoga Interview, 2025) and is aware of the existence of severe sanctions, including revocation of licenses, for violators of them (Yoga Interview, 2025). However, the effectiveness of these sanctions is recognized to be highly dependent on the consistency of government supervision (Yoga Interview, 2025). This is where Environmental Fiqh can play a complementary role. Both the company and the public agreed that positive law and religious values reinforce each other. Positive law serves as a compelling obligatory framework, while the fatwa of scholars and religious values provide an intrinsic "spirit" or motivation that builds awareness that environmental restoration is not only an obligation to the state, but also to the Creator (Yoga Interview, 2025). In fact, the community sees religious appeals, in the form of ulama fatwas on the prohibition of damaging the environment, can be more effective in creating a deterrent effect than legal threats alone, especially in religious communities such as Lalampu Village (James Interview, 2025).

Field Findings at PT. The Brothers and Sisters of the Fang Brothers

Based on interviews and observations, PT. AFB has been carrying out reclamation efforts by planting local vegetation and recontouring the land. However, community participation is still limited, and long-term monitoring is not optimal (Field Data, 2025). Local communities complain about the impact of mining on water and soil quality, as well as the lack of sustainable economic benefits (Field Data, 2025).

The environmental fiqh approach, through socialization by religious leaders and religious institutions, can increase public and corporate awareness of environmental responsibility as part of worship (Indrajati et al., 2023).

Findings on the ground illustrate a complex situation. On the one hand, PT. The AFB already has a documented system of planning, budgeting, and technical methods of restoration and has received government approval (Yoga Interview, 2025). The company also has a closely supervised reclamation guarantee fund mechanism (Yoga Interview, 2025). However, on the other hand, there is a significant disparity between the company's claims and the public's first-hand perception and experience. Communities report ongoing negative impacts, such as dust, murky water, and decreased agricultural yields (James Interview, 2025). They also feel not substantively involved in the restoration planning and oversight process, resulting in a sense of distrust (James Interview, 2025). The CSR program run by the company is considered to have not touched the core needs of the community, namely access to post-mining productive land and alternative economic empowerment (James Interview, 2025). This gap is exacerbated by the fading of the local wisdom of "take care of the debt to nature" that was once upheld by the community (Interview James, 2025). These findings indicate that the approach of PT. AFB towards restoration still tends to be limited to fulfilling legal and technical administrative aspects (Yoga Interview, 2025), without a holistic approach that fully involves the community and integrates the ethical-religious dimension and local wisdom in depth.

CONCLUSION

The study on post-mining land restoration at PT. AFB reveals a clear gap between well-developed technical planning and its actual implementation in the field, as evidenced by the continued presence of abandoned mine pits and poorly maintained revegetation despite formal reclamation efforts such as staged revegetation and acid mine drainage treatment. Restoration practices remain largely focused on meeting administrative and legal requirements, with limited community participation and minimal integration of local wisdom. The findings demonstrate that Environmental Fiqh provides a relevant ethical-spiritual framework to strengthen restoration efforts, particularly through the principle of *ihya al-mawat* (reviving dead land), which aligns with both ecological objectives and community values. The integration of national regulatory frameworks with Environmental Fiqh creates a complementary synergy in which positive law ensures compliance while religious values foster intrinsic motivation and moral responsibility; notably, *ulama*-issued fatwas are perceived as more persuasive within religious communities such as Lalampu Village. Future research should explore comparative case studies across different mining regions to assess how the institutionalization of *fiqh al-bi'ah* can be operationalized in policy design, community engagement models, and long-term monitoring systems to enhance both ecological effectiveness and social legitimacy of post-mining restoration.

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