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Ecological justice in Indonesia and China post-mining land use?

Rian Saputra [a,1,*], M. Zaid [b,2], Matthew Marcellinno Gunawan [c,3] Wu Pei-Chi [d,4]
[a] Faculty of Law, Universitas Slamet Riyadi, Surakarta, Indonesia
[b] Faculty of Law, Universitas Islam Riau, Pekanbaru, Indonesia
[c] Faculty of Law, Universitas Islam Sultan Agung, Semarang, Indonesia
[d] National Cheng kung University, Tainan City, Taiwan
* corresponding author: riansaputra@unisri.ac.id

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Abstract
This paper thoroughly examines the regulation and implementation of post-mining land use in Indonesia and China. This study employs a statutory and comparative legal approach to examine both countries' regulations and utilization of post-mining land. The research findings indicate that Indonesia lacks legal rules for post-mining land utilization. The Mineral and Coal Mining Law in Indonesia and other legislation solely governs the transfer of post-mining land from companies to eligible parties via the Minister, Governor, or Regent/Mayor. These provisions indicate that post-mining land use in Indonesia continues to adopt an anthropocentric perspective and has not yet embraced ecological justice. In China, the utilization of post-mining land is modified to align with ecological, social, and economic requirements, designating it for agricultural purposes, straw cultivation, and infrastructure, including agricultural land, straw fields, grasslands, forests, wildlife habitats, biofuel crops, and areas designated for industrial, commercial, and residential development. Interestingly, when the decision is made to convert post-mining state land into agricultural land, following feasibility approval by local authorities in China, the transfer is granted to rural communities collectively or to those surrounding the post-mining area for management as agricultural land.

1. Introduction

Reclamation and post-mining practices globally have consistently posed challenges, encompassing the execution of reclamation and the utilization of post-mining land. In this study, the author will concentrate on the legal implications of post-mining land. Indonesia, an economy dependent on mining, is intrinsically linked to post-mining land

utilization.[1]

In Indonesia, mining enterprises typically conduct mining operations under the authority of a Mining Business Permit (IUP) or a Special Mining Business Permit (IUPK). Mining Business License (IUP) or Special Mining Business License (IUPK). The inquiry pertains to the status of former mining land, specifically regarding applying a Mining Business Permit (IUP) for operations that have concluded or are no longer subject to extension. This eludes the attention of legal scholars; it is not an issue if the exploration land area is limited, but it becomes problematic if the former mining land is extensive, raising questions about the land's status—whether it is an asset owned by the local government or state-owned land.[2]

The inquiry holds significant weight, as there are numerous instances in which the company ceases its IUP activities. For instance, the previously mined territory held by PT Koba Tin in the Bangka Belitung Province, which was engaged in tin extraction, has undergone a significant transformation. Following 2013, the tin mining IUPK associated with PT Koba Tin was not renewed, resulting in a situation where the 41,680.30 hectares situated in the Central Bangka and South Bangka districts of the former PT Koba Tin mine now present ambiguity regarding its legal ownership status.[3]

In the context of Article 99 Paragraph (4) of Law Number 3 of 2020 regarding Mineral and Coal Mining, it stipulates that 'Holders of IUP or IUPK are mandated to transfer land that has undergone reclamation and/or post-mining to the appropriate party via the Minister, in alignment with the established legal provisions.' The stages of reclamation activities undertaken by PT Timah Tbk and PT Kobatin, whose work contracts concluded in 2013, encompass the identification of the area and location designated for reclamation, the organization of the land in anticipation of the planting process, the planting of cover crops, the establishment of central plants, and subsequent maintenance efforts.[4] Landscaping endeavors meticulously consider the original color of the land designated

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1 Z. Miao and R. Marrs, 'Ecological Restoration and Land Reclamation in Open-Cast Mines in Shanxi Province, China', *Journal of Environmental Management*, 59.3 (2000), 205–15 <https://doi.org/10.1006/jema.2000.0353>.

2 FX. Hastowo Broto Laksito, Aji Bawono, and Afridah Ikrimah, 'Reducing Community Participation in the Preparation of Environmental Impact Assessments (EIA): Evidence from Indonesia', *Journal of Law, Environmental and Justice*, 2.2 (2024), 137–61 <https://doi.org/10.62264/jlej.v2i2.101>.

3 Willy Naresta Hanum, Tran Thi Dieu Ha, and Nilam Firmandayu, 'Eliminating Ecological Damage in Geothermal Energy Extraction : Fulfillment of Ecological Rights by Proposing Permits Standardization', *Journal of Law, Environmental and Justice*, 2.2 (2024), 205–28 <https://doi.org/10.62264/jlej.v2i2.105>.

4 Muhammad Bagus Adi Wicaksono and Wiwit Rahmawati, 'Ecological Justice-Based Reclamation and Post- Mining Regulations in Indonesia : Legal Uncertainty and Solutions', *Journal of Law, Environmental and Justice*, 2.2 (2024), 109–36 <https://doi.org/10.62264/jlej.v2i2.103>.

for reclamation, which involves stockpiling and leveling the accumulated soil. To enhance the organic content of the nutrient-deficient stockpile, one can achieve this by disseminating a particular variety of plants that is notably simple to cultivate, specifically a legume known as a cover crop plant. In technical design for primary crop cultivation, a pivotal phase involves the application of topsoil and the incorporation of compost, utilizing a planting hole of approximately 0.5 meters to mitigate soil acidity.[5]

The diverse and fruitful varieties of reclamation plants that can yield results within 5-6 years predominantly include woody species such as Rubber, Cashew, Mahogany, Sengon, Acacia, Gaharu, and Local Durian. In the interim, the restoration of additional former mining sites can be achieved by enhancing soil nutrients.[6] At the recent exhibition focused on rehabilitating former mining lands, the Head of the Research and Development Centre for Agricultural Land Resources for Tin Mine in Central Bangka Regency articulated that the cornerstone of effective rehabilitation lies in incorporating organic carbon material. This is particularly crucial given that the topsoil of previously mined areas exhibits a significantly diminished organic carbon content, necessitating the infusion of nutrients to restore ecological balance.[7]

Implementing the PT Koba Tin ex-mining land development model in Indonesia, which synergizes with agricultural commodities and livestock, represents a viable policy recommendation for consideration. Beyond enhancing soil fertility, its development by the community can yield significant financial benefits. The sole contentious issue that also presents a degree of ambiguity is the one-sided assertion by various factions in several districts of Bangka Belitung Province, which contends that specific locations within the PT Koba Tin ex-mining area are owned by or constitute assets of the district. Nonetheless, the National Land Agency of Bangka Belitung Province has yet to formalize the claim, owing to ambiguities in the legal framework concerning the status of post-mining land within the national legal system.[8]

In China, mine land reclamation initiatives tend to engage a diverse array of

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5 Januar Rahadian Mahendra, Rizal Akbar Aldyan, and Silas Oghenemaro Emovwodo, 'Examining Indonesian Government Policies in Tackling Deforestation: Balancing Economy and Environment', *Journal of Law, Environmental and Justice*, 2.1 (2024), 42–62 <https://doi.org/10.62264/jlej.v2i1.93>.

6 Rachmawaty Rachmawaty, Matthew Marcellinno Gunawan, and Novi Nurviani, 'Judicial Perspectives on the Equitable Resolution of Anti-SLAPP Cases: Insights from Indonesia', *Journal of Law, Environmental and Justice*, 2.1 (2024), 18–41 <https://doi.org/10.62264/jlej.v2i1.88>.

7 Yahman Yahman and Azis Setyagama, 'Government Policy in Regulating the Environment for Development of Sustainable Environment in Indonesia', *Environment, Development and Sustainability*, 25.11 (2023), 12829–40 <https://doi.org/10.1007/s10668-022-02591-1>.

8 Hilaire Tegnan and others, 'Mining Corruption and Environmental Degradation in Indonesia: Critical Legal Issues', *Bestuur*, 9.2 (2021), 90–100 <https://doi.org/10.20961/bestuur.v9i2.55219>.

stakeholders, encompassing not only mining enterprises, local communities, and governmental bodies in the regions of mining operations but also extending to sectors such as agriculture, forestry, water management, environmental conservation, finance, taxation, and technological research. In current mining operations, bonds may be accrued per tonne or through a comprehensive deduction related to the sales value. Conversely, bonds must be stipulated and incorporated in the prospective projects' mining license application process.[9]

The process of land reclamation in mining regions represents a significant aspect of ecological and civilizational advancement in China. Coal constitutes approximately 70% of China's primary energy requirements, encompassing its consumption framework, and it is poised to retain its strategic significance within China's energy sector for the forthcoming three decades. Nonetheless, while coal mining has facilitated economic advancement, it has also inflicted considerable harm on both land and ecological systems; the expanse of cultivable land has significantly diminished, and there is a wealth of media discourse surrounding the detrimental impacts of mining activities. The 2019 China Remote Sensing Monitoring Survey indicates that China has undertaken 3,610,500 reclamations of land adversely affected by mining activities. Nevertheless, the typical annual area dedicated to ecological restoration in mining regions of China is approximately 44,800 hectares, whereas the average annual area subjected to damage is around 82,600 hectares.[10]

The author identified several relevant publications in this paper, including "Reducing emissions from land use change in Indonesia: An overview." The findings in this publication indicate that "The objectives of the Paris Agreement on Climate Change cannot be realised without a substantial decrease in emissions from forests." Emissions reductions from land use, especially forests, represent one-fourth of the reductions committed in the Nationally Determined Contributions (NDCs) submitted by Parties to the UNFCCC. This Special Issue on Forest Policy and Economics presents contributions to examining the design and implementation of NDCs and REDD+, focusing on reducing emissions from forests in Indonesia. Following Brazil, Indonesia ranks as the second-highest emitter of greenhouse gases from forests; nevertheless, it becomes the foremost

[9] Zico Junius Fernando and others, *Deep Anti-Corruption Blueprint Mining, Mineral, and Coal Sector in Indonesia*, *Cogent Social Sciences*, 2023, IX <https://doi.org/10.1080/23311886.2023.2187737>.

[10] Wu Xiao and others, 'The "Golden Ten Years": Underground Coal Mining and Its Impacts on Land Use and Subsequent Social Problems: A Case Study on the Jining City Region, China', *International Journal of Mining and Mineral Engineering*, 8.1 (2017), 19–34 <https://doi.org/10.1504/IJMME.2017.082681>.

emitter during years marked by substantial forest and peat fires".[11]

The subsequent study is titled "Mining as a Temporary Land Use: A Global Stocktake of Post-Mining Transitions and Repurposing." The findings indicated that post-mining land use and related economies have emerged as a critical concern in mine lifecycle planning for numerous big corporations. Restoring the post-mining landscape to a safe and stable condition is typically the primary aim of mine closure, but accomplishing this is frequently challenging. The impetus for industry to exceed mere rehabilitation is also increasing. A primary factor contributing to this forecast is the extensive size of mines, with numerous mining leases spanning thousands of hectares. Certain portions of this land may be repurposed with minimal intervention. Restoring the mine footprint to its original state is frequently impractical; however, innovative repurposing of mine characteristics and infrastructure may be viable. Simultaneously, these extensive mines employ hundreds, occasionally thousands of individuals, and the industry is increasingly anticipated to address economic transitions for mining workforces, particularly local dependent populations, following closure, as employment is frequently regarded as central to development. This article reconceptualizes mining as a transient land utilization. This methodology integrates post-mining land use as fundamental to the mine lifecycle, encompassing the planning and operational stages. We established a comprehensive global database of repurposing cases utilizing the S&P Global Market Intelligence database, pertinent literature, and other publically accessible information. This document summarizes the findings and trends from a global repurposing database comprising 141 examples. Our results encompass Our overarching views on the research process, an examination of prevalent land use repurposing, determinants affecting repurposing, encompassing both internal and external variables to the organization, and preliminary insights into industry methodologies for repurposing. We contend that redefining mine 'closure' and the related mining legacies is a crucial operational transformation that the extractive industry, preeminent corporations, must undertake to align with societal and local community expectations.[12]

The subsequent article is titled "Conceptual Framework to Assist in the Decision-Making Process When Planning for Post-Mining Land Uses." The findings indicated that significant industrial economies are being urged to reduce their reliance on coal-fired power generation to avert climate calamity. Due to decarbonization demands, numerous

[11] Luca Tacconi and Muhammad Zahrul Muttaqin, 'Reducing Emissions from Land Use Change in Indonesia: An Overview', *Forest Policy and Economics*, 108 (2019), 101979 <https://doi.org/https://doi.org/10.1016/j.forpol.2019.101979>.

[12] Julia Keenan and Sarah Holcombe, 'Mining as a Temporary Land Use: A Global Stocktake of Post-Mining Transitions and Repurposing', *The Extractive Industries and Society*, 8.3 (2021), 100924 <https://doi.org/https://doi.org/10.1016/j.exis.2021.100924>.

coal mining locations face the likelihood of mine closures globally. Nevertheless, limited practical planning tools exist to evaluate prospective post-mining alternatives and improve regional transition. To enhance transition outcomes and increase stakeholder acceptance, procedures integrating input from various stakeholders and disciplinary viewpoints are essential at a regional level. These processes must process ostensibly diverse forms of multidisciplinary and multiscale data in a robust, cohesive, and transparent manner. This paper introduces a conceptual mixed-method framework for post-mining land-use planning incorporating stakeholder engagement, GIS, multi-criteria decision-making, and fuzzy logic. The framework employs environmental and socio-technical data to facilitate the decision-making process. This endeavor is motivated by the imperative to provide transitioning mining regions with a framework for preparing their post-mining futures. The suggested framework is based on existing literature. It can assist various institutions and experts in advancing the post-mining planning process in mining-dependent areas towards a low-carbon future.[13]

Drawing from the three aforementioned publications, the author posits that this paper is innovative in examining and critiquing whether the practices and regulations governing post-mining land in China and Indonesia are grounded in principles of ecological justice. Examining the realities of post-mining reclamation practices in China and Indonesia reveals intriguing insights into the purposes for which reclamation and post-mining lands are utilized in these two nations. The inquiry into whether the application and utilization of reclaimed and post-mining lands in these two nations are grounded in principles of ecological justice raises further questions. Specifically, it prompts an examination of whether these practices adequately consider non-human elements in managing post-mining reclaimed lands. It is essential to provide a detailed examination of these aspects.

2. Research Methods

This research is a normative legal study to analyze Indonesian national legislation's status concerning contemporary reclamation and post-mining regulations.[14] The normative testing results will determine whether the existing reclamation and post-mining practices in Indonesia align with the ecological justice principles and assess their implementation feasibility. This research employs a statutory approach, a conceptual approach, and a

[13] A Arratia-Solar and others, 'Conceptual Framework to Assist in the Decision-Making Process When Planning for Post-Mining Land-Uses', *The Extractive Industries and Society*, 10 (2022), 101083 <https://doi.org/https://doi.org/10.1016/j.exis.2022.101083>.

[14] Rian Saputra, M Zaid, and Devi Triasari, 'Executability of the Constitutional Court ' s Formal Testing Decision : Indonesia ' s Omnibus Law Review', *Journal of Law, Environmental and Justice*, 1.3 (2023), 244–58 <https://doi.org/10.62264/jlej.v1i3.18>.

comparative legal approach.[15] The statutory approach involves analyzing all legal provisions relevant to the presented legal issues, including Law Number 3 of 2020 on Mineral and Coal Mining, Law Number 32 of 2009 on Environmental Protection and Management, and Government Regulation Number 78 of 2010 on Reclamation and Post-mining.[16] This research employs a conceptual framework wherein the author delineates and examines the regulation and implementation of post-mining land use in Indonesia, articulating an argument regarding ecological justice and interrogating whether the practices of post-mining land use in Indonesia adhere to the principles of ecological justice. This research aims to elucidate the regulation and practice of post-mining land use in China and then analyze it to reveal elements of ecological justice within this context. Moreover, insights gained from China serve as a foundation for establishing the legislation framework and implementing post-mining land use in Indonesia moving forward.

3. Results and Discussion

China's Coal Post-Mining Land Use Regulations and Practices

The initial land reclamation efforts in China's mining sector commenced in the 1950s and were characterized by a fragmented, localized, and voluntary approach. In the early 1980s, implementing the open-door policy, coupled with the rising demand for mineral resources, catalyzed the swift expansion of the national economy. The growth of township and village enterprises, mainly small-scale coal mines, was remarkable during this period. In the pursuit of generating essential energy, these mines have encountered numerous challenges, such as unauthorized and illogical extraction practices, suboptimal recovery rates, inadequate safety measures, and considerable environmental degradation. The environmental repercussions are often the most pervasive and enduring, particularly affecting agricultural and pastoral lands.[17]

The reclamation of mined land, recognized as a crucial tool for managing land resources, has garnered heightened national focus. The extensive and methodical initiative undertaken in recent years nationwide to eliminate illegal, irrational, and severely polluting TVCMs, prompted by an oversupply of coal, has markedly underscored the pressing necessity for

[15] M Yazid Fathoni and Acasio Fernandez, 'Establishment of Land Court in Indonesia : An Effort to Realise Justice Based on Pancasila', *Journal of Law, Environmental and Justice*, 1.2 (2023), 86–104 <https://doi.org/10.62264/jlej.v1i2.6>.

[16] L. Yes Esty Pratiwi and others, 'In-Depth Review : Legal Review on Human Rights Enforcement in the ASEAN and EU Context', *Journal of Law, Environmental and Justice*, 1.3 (2023), 202–24 <https://doi.org/10.62264/jlej.v1i3.16>.

[17] Jiaxin Guo, Zhenqi Hu, and Yusheng Liang, 'Causes and Countermeasures for the Failure of Mining Land Use Policy Reform: Practice Analysis from China', *Land*, 11.9 (2022), 1–19 <https://doi.org/10.3390/land11091391>.

mine land reclamation in China. The introduction of the regulations on land reclamation (RLR) in 1988 signified the commencement of the legal framework and standardization of mine land reclamation initiatives in China. This marks the inaugural regulatory framework explicitly crafted for the restoration of degraded terrains, encompassing areas affected by mining activities. Land reclamation is characterized as an endeavor to restore land compromised by extraction, subsidence, and reoccupation during production and construction activities, thereby returning it to a state suitable for reuse through specific interventions.[18]

The RLR delineates the responsibilities and obligations of industry authorities, mining companies, and individuals regarding restoring disturbed land and the relevant funding sources. A broad focus on the reclamation and restoration of mined land is similarly reflected in various legislative frameworks, including the Land Administration Law (LAL), the Mineral Resources Law (MRL), the Environmental Protection Law, the Coal Law, the Water Resources Law, the Soil Conservation Law, the Forestry Law, and the Grasslands Law. In conjunction with the Technical Criteria for Land Reclamation (for pilot implementation, 1995), the laws above are anticipated to aid the RLR in regulating land reclamation endeavors.[19]

Article 32 in Chapter 4 of the MRL, enacted in 1986 and revised in 1996, mandates that mining companies implement suitable measures tailored to local conditions for the reclamation and rehabilitation of all agricultural, grassland, and forestry lands affected by mining activities, utilizing vegetation or other viable methods. China has historically employed a singular approach to the reclamation of land adversely affected by state activities, with expenses distributed between the government and mining enterprises while excluding TVCM or privately owned mines. Individuals unable to engage in reclamation or who do not meet the necessary reclamation criteria are mandated to contribute a land reclamation fee, which shall be designated as a reclamation fund by Article 31 of the Mineral Resources Law.[20]

The National People's Congress (NPC), which is the highest authority in China, includes the Environment and Resources Protection Commission (ERPC), which oversees environmental concerns within its structure. The State Council, positioned as the second tier within the governmental framework, serves as the paramount executive body of state

[18] Yang Chen and others, 'Assessment and Effect of Mining Subsidence on Farmland in Coal–Crop Overlapped Areas: A Case of Shandong Province, China', *Agriculture (Switzerland)*, 12.8 (2022) <https://doi.org/10.3390/agriculture12081235>.

[19] Liping Zhang and others, 'Prioritizing Abandoned Mine Lands Rehabilitation: Combining Landscape Connectivity and Pattern Indices with Scenario Analysis Using Land-Use Modeling', *ISPRS International Journal of Geo-Information*, 7.8 (2018) <https://doi.org/10.3390/ijgi7080305>.

[20] Adator Stephanie Worlanyo and Li Jiangfeng, 'Evaluating the Environmental and Economic Impact of Mining for Post-Mined Land Restoration and Land-Use: A Review', *Journal of Environmental Management*, 279.xxxx (2021), 111623 <https://doi.org/10.1016/j.jenvman.2020.111623>.

authority and the foremost institution of state administration. It is bolstered by ministries, ministerial-level entities, and other significant governmental agencies under its jurisdiction. This layer encompasses the Ministry of Land and Resources (MLR) and the State Environmental Protection Agency (SEPA). The EPRC, MLR, and SEPA are subsequently mirrored across all three tiers of government: provinces or autonomous regions, local municipalities, and districts, albeit under different designations.[21]

The responsibility for overseeing mine land reclamation rests chiefly with the MLR. This entity was formed through the amalgamation of the Ministry of Geology and Mineral Resources and the Bureau of Land Administration during the significant structural reforms of 1998. It possesses the authority to assume responsibility for cohesive land administration, mineral extraction, water resource management, and environmental stewardship. In a vertical structure, each province is equipped with a Bureau of Land and Resources (BLR), which encompasses local land bureaus, geological and mineral bureaus, and various other sections pertinent to mineral resources. To put it differently, institutions at the national level need a direct connection to oversee administration at the regional and local tiers. Regarding land use and protection, provincial, municipal, and district administrations possess the authority to establish their organization and responsibilities in alignment with the relevant provisions of the State Council as outlined in Article 5, LAL. An Overall Land Use Plan must be developed through a hierarchical process at the subnational level and subsequently approved for their territories in alignment with the directives established in the pertinent higher-level plans outlined in Articles 17 and 18, LAL.[22]

At the same level, land units, environmental protection agencies, and industrial administrative units are all mandated to execute the national reclamation policy. The ERPC, SEPA, and MLR, along with their subordinate entities, are all engaged in environmental protection regulation. The primary roles of the ERPC and its subdivisions encompass the examination of environmental protection policies and legislation, oversight of the execution of pertinent policies and regulations, deliberation on outstanding environmental matters, and the formulation of proposals grounded in systematic monitoring. Nonetheless, SEPA and MLR establish environmental criteria for land pollution and conduct inspections. Notably, the former predominantly emphasizes water, air, and other ecological pollutants. In contrast, the latter primarily oversees the planning, administration, protection, and judicious utilization of

[21] Xueyi Yu, Chi Mu, and Dongdong Zhang, 'Assessment of Land Reclamation Benefits in Mining Areas Using Fuzzy Comprehensive Evaluation', *Sustainability (Switzerland)*, 12.5 (2020), 1–20 <https://doi.org/10.3390/su12052015>.

[22] Xiaoyan Chang and others, 'Scenario Simulation of Land Use and Land Cover Change in Mining Area', *Scientific Reports*, 11.1 (2021), 1–12 <https://doi.org/10.1038/s41598-021-92299-5>.

land, mineral, and marine resources.[23]

Mined land reclamation initiatives in China are poised to engage diverse entities. This includes not only mining enterprises, local communities, and governmental bodies in the regions of mining operations but also extends to sectors encompassing agriculture, forestry, water management, environmental conservation, finance, taxation, and technological research. In established mining operations, bonds may be accrued per tonne or through a comprehensive deduction relative to the sales value. Conversely, bonds must be stipulated and incorporated within the mining license application for prospective projects. The appropriate authorities must meticulously and judiciously assess the magnitude or quantity, guaranteeing that it adequately addresses current damage and encompasses expenses for prolonged remediation (such as in cases of acid drainage); concurrently, it should not be huge to deter prospective investment.[24]

Within China's positive law framework, SEPA is the principal authority overseeing the comprehensive reclamation efforts. A dedicated reclamation office comprising representatives from the Ministry of Land Resources, the Ministries of Agriculture and Forestry, the mining sector, technical agencies, and local communities could serve as a comprehensive resource for all regulatory, administrative, and service-related needs regarding reclamation activities. A structured decision-making framework is suggested, wherein the principal considerations of economic advancement about environmental expenditures are comprehensively articulated and weighed, ensuring that the perspectives of both governmental ministries and environmental agencies are harmonized in pursuit of the most efficient mitigation strategies.[25]

The expenses associated with actual reclamation activities exhibit considerable variability, necessitating the establishment of a scientific, rational, and highly interoperable framework of measurement methods that address the fundamental causes of discrepancies in reclamation costs. The expense associated with reclamation is contingent upon the nature and extent of the land's degradation, which is intricately linked to mining parameters, including the depth at which coal seams are situated, their incline, the thickness of the extraction, and the prevailing natural environmental factors such as topography and

[23] R. Hattingh, D. J. Williams, and G. Corder, 'Applying a Regional Land Use Approach to Mine Closure: Opportunities for Restoring and Regenerating Mine-Disturbed Regional Landscapes', *Proceedings of the International Conference on Mine Closure*, 2019-Septe.Hancox 2016 (2019), 951–67 <https://doi.org/10.36487/ACG_rep/1915_75_Hattingh>.

[24] Zhen Shi and others, 'Dynamic Linkages among Mining Production and Land Rehabilitation Efficiency in China', *Land*, 9.3 (2020) <https://doi.org/10.3390/land9030076>.

[25] Margarita Ignatyeva, Vera Yurak, and Natalia Pustokhina, 'Recultivation of Post-Mining Disturbed Land: Review of Content and Comparative Law and Feasibility Study', *Resources*, 9.6 (2020) <https://doi.org/10.3390/RESOURCES9060073>.

landscape features. Consequently, the extent of reclamation expenses is fundamentally influenced by the various elements contributing to land degradation in the mining region.[26]

The system of mineral resource ownership implemented in many foreign nations is distinct from land ownership. The mining land framework encompasses a range of legal and social complexities, particularly concerning the legal mechanisms for defining mining land. The process for mining companies seeking to acquire overseas mining land is notably intricate, with legal stipulations imposing stringent criteria on applications. The approval system and its implementation mechanisms demonstrate a higher level of efficacy.[27]

Nevertheless, there exists a near consensus among nations regarding the necessity of obtaining landowner consent as a prerequisite for companies seeking to apply for mining licenses. The timeframe for land lease applications for the company is explicitly defined in the legislation, and failure to reclaim or return the land within the stipulated period outlined in the license will result in substantial penalties for the mining company. Two fundamental patterns characterized the land system in China: 'state-owned land' and 'rural collective land.' Mini.' enterprises requiring land for their operations must utilize statutory state-owned territories, acquiring concessions in exchange for a specified financial remuneration. [28]

If rural collective land is utilized, it must be transformed into state-owned property via state expropriation. Subsequently, land use rights must be acquired through compensated means, such as transfer. The survey indicates that collective land farmers own 46.2% of land in China. Nonetheless, a significant portion of the land designated for mineral resource extraction comprises peasant collective land. Once the mineral resources are extracted, the mining company effectively depletes the intrinsic value of the mining land. While corporations retain the authority to use the land, they need more motivation to engage in reclamation efforts, leading to delayed restoration, prolonged degradation, and neglect of the land. Consequently, the existing singular method of land supply for mining imposes certain limitations on the sustainable use of land.[29]

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[26] K. Fogarty, M. E. Kragt, and B. White, 'Pre- And Post-Mine Land-Use Trends across the New South Wales and Queensland Coal Industry', *Proceedings of the International Conference on Mine Closure*, 2019-Septe (2019), 937–50 <https://doi.org/10.36487/ACG_rep/1915_74_Fogarty>.

[27] Poppy S. Winanti and Rachael Diprose, 'Reordering the Extractive Political Settlement: Resource Nationalism, Domestic Ownership and Transnational Bargains in Indonesia', *Extractive Industries and Society*, 7.4 (2020), 1534–46 <https://doi.org/10.1016/j.exis.2020.08.015>.

[28] Markus Gastauer and others, 'Mine Land Rehabilitation in Brazil: Goals and Techniques in the Context of Legal Requirements', *Ambio*, 48.1 (2019), 74–88 <https://doi.org/10.1007/s13280-018-1053-8>.

[29] Eve Bratman and Cristiane Benà Dias, 'Development Blind Spots and Environmental Impact Assessment: Tensions between Policy, Law and Practice in Brazil's Xingu River Basin', *Environmental Impact Assessment Review*, 70.March 2017 (2018), 1–10 <https://doi.org/10.1016/j.eiar.2018.02.001>.

National authorities are diligently investigating innovative methods to allocate mining land. In 2005, the erstwhile Ministry of Land and Resources, known as the 'Ministry of Natural Resources,' sanctioned the Guangxi Branch of the China Aluminium Company to undertake a pilot reform concerning the temporary land allocation for open pit mining in Pingguo County. This initiative involves the company leasing land from agriculturalists, executing land reclamation post-mining, and ultimately reverting the land to the original farmers.[30]

In 2012, the pilot project for land use reform concerning bauxite mining in Pingguo County, spanning seven years, was officially accepted, as documented in the acceptance summary provided by the Ministry of Land and Resources. This new model for mining land has comprehensively considered the interests of farmers, enterprises, government, and other stakeholders, effectively addressing the conflict between optimal land use and achieving sustainable resource utilization. It fosters a harmonious relationship between mining land and the local economy and society, representing a significant innovation and breakthrough in the reform of mining land supply. 2010 China's Ministry of Land and Resources (MLR) expanded the pilot reform concerning mining land use methodologies. This initiative resulted in the approval for the allocation of temporary land use, encompassing a total area of 37,944,727 hm2 across 19 prefecture-level cities, including Ordos in Inner Mongolia, Shuozhou in Shanxi, Kunming in Yunnan, Hezhou in Guangxi, and Fushun in Liaoning.[31]

The modifications to the land policy governing mining operations have transformed the approach to requesting the utilization of state-owned land. This new framework embraces a methodology characterized by 'phased implementation, phased provision, and the return of land upon the conclusion of the designated term.' It also incorporates farmers' collective land as temporary land for five years or more. While this represents a progressive development, it is noteworthy that, thus far, most coal mining enterprises have struggled to execute land reclamation and return per the established timelines. A significant 96.36% of companies have successfully restored their land to arable status for farmers, while farmers prefer compensation over crop cultivation. Even though the quality of reclaimed land adheres to established standards, farmers still need to be more hesitant to use it. This situation arises from the inherent quality, as farmers tend to favor a significantly higher compensation income, stemming from a limited comprehension of the quality associated with the reclaimed

30 Chang and others.

31 Suping Peng and Yinli Bi, 'Properties of Ecological Environment Damage and Their Mechanism of Restoration in Arid and Semi-Arid Coal Mining Area of Western China; [西部干旱半干旱煤矿区生态环境损伤特征及修复机制]', *Meitan Xuebao/Journal of the China Coal Society*, 49.1 (2024), 57 – 64 <https://doi.org/10.13225/j.cnki.jccs.YH24.0156>.

land.[32]

The character of mining land is profoundly influenced by its local context. The foundation of the State's land policy is rooted in the notion that land occupation must adhere to the principles governing mining land. Consequently, China's land policy aims to guarantee the efficacy of mining-related licensing activities. Mining enterprises approach county-level natural resource authorities to seek temporary land allocations while preparing comprehensive mine site plans, land use strategies, and land reclamation proposals, among other necessary documentation. The authorities responsible for natural resources at the county level meticulously assess the relevant conditions of mining land, including its coverage and the execution of land reclamation plans. They facilitate the engagement of local rural collectives in formalizing land agreements and compensation arrangements with enterprises guided by provisional land use plans. Furthermore, they oversee the disbursement of fees related to land reclamation, taxes for the occupation of arable land, and the transfer of compensation funds to rural collectives.[33]

The departments at the district level provide pertinent supporting documentation to the municipal authorities for evaluation and endorsement, which the appropriate departments across all tiers subsequently review until it reaches the Ministry of Natural Resources for recording and auditing, as well as the municipalities for the issuance of land use licenses about mining activities. The company is subsequently informed regarding the land use permit, adhering to the fundamental tenet of 'phased implementation, phased land supply, and restitution upon expiry,' thereby guaranteeing 'timely implementation, timely land supply, and timely restitution.' Simultaneously, it is essential to enhance the pertinent legal framework while also delineating the obligations of enterprises in fulfilling their reclamation responsibilities.[34]

The Chinese government ought to facilitate the coordination of inter-party relations between corporate interests and agricultural stakeholders, primarily to safeguard the interests of all parties involved and uphold farmers' rights and entitlements. The utilization of land for mining operations ought to establish a standardized compensation fee, which should be determined by the duration of mining activities and land reclamation, alongside the

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[32] Yachao Guo and others, 'Study on the Influence of Mining Disturbance on the Variation Characteristics of Vegetation Index: A Case Study of Lingwu Mining Area', *Environmental Development*, 45 (2023) <https://doi.org/10.1016/j.envdev.2023.100811>.

[33] Feng Cui and others, 'Study on the Law of Fracture Evolution under Repeated Mining of Close-Distance Coal Seams', *Energies*, 13.22 (2020) <https://doi.org/10.3390/en13226064>.

[34] Zhang Dong-sheng and others, 'Harmony of Large-Scale Underground Mining and Surface Ecological Environment Protection in Desert District - a Case Study in Shendong Mining Area, Northwest of China', in *Procedia Earth and Planetary Science*, 2009, I, 1114 – 1120 <https://doi.org/10.1016/j.proeps.2009.09.171>.

average annual value of the land, in order to formulate an appropriate compensation package. Concurrently, within the organizational cohesion and coordination framework established by local governments, enterprises, and rural collective organizations ought to formalize compensation agreements grounded in equitable dialogue, ensuring that compensation is dispensed as stipulated. One may also explore the various multi-modal compensation strategies, including providing employment opportunities, developing new agricultural land, and alternative non-monetary compensation methods to address the challenges surrounding farmers' future livelihoods and the redevelopment process.[35]

Mining companies must prioritize the formulation of land reclamation plans. The unit responsible for preparing the land reclamation plan must adhere rigorously to national laws and regulations, established preparation standards, and normative requirements. It should align closely with the specific priorities of the mine during the plan's development, ensuring that the reclamation plan is coherent across all its stages. This approach will maximize the plan's efficacy, particularly at the critical juncture where mining operations intersect with reclamation efforts. During the mining phase, it is essential to implement topsoil stripping and judicious retention practices to facilitate the subsequent recovery of reclaimed land. Secondly, by the principle of 'phased implementation and phased land supply,' the selection of the topsoil disposal site must be conducted with scientific rigor to prioritize restoration during the mining process. Currently, the environmental protection framework in China mandates that the waste produced from mining activities, after land allocation, must undergo appropriate treatment. Consequently, the waste produced during each stage must be backfilled into the pit following a two-year treatment period, and the waste disposal arising from each phase requires appropriate treatment.[36]

Upon reaching the designated elevation, the backfill effectively obscures the mined topsoil beneath the accumulation of waste rock. Ultimately, the waste rock piles and stage I topsoil will be meticulously backfilled to their final state, followed by the construction of the pit and drainage facilities, all designed to adhere to the established final acceptance standards. Upon the conclusion of mining activities, enterprises must finalize land reclamation within the designated timeframe, and governmental bodies must ensure prompt acceptance following the reclamation process. In the context of agricultural land reclamation, particularly following the restoration of arable land to its original use, the criteria for acceptance must encompass the area of reclaimed land, the thickness of the surface cover, the slope of the land, and its drainage capabilities. Additionally, the physical and chemical

[35] Zhang and others.

[36] Thiago Lima Klautau de Araújo and others, 'Brazilian Amazônia, Deforestation and Environmental Degradation: Analyzing the Process Using Game, Deterrence and Rational Choice Theories', *Environmental Science and Policy*, 117.January (2021), 46–51 <https://doi.org/10.1016/j.envsci.2020.12.010>.

properties of the soil must conform to the quality standards established for arable land. The reclamation shall only be deemed acceptable if these acceptance criteria are met. During the acceptance process, mining companies submit applications to the natural resources departments within the respective districts and cities responsible for conducting preliminary inspections. Following their eligibility determination in the preliminary inspection phase, they subsequently provide reports to the department overseeing the organization of reclaimed land quality experts for field acceptance, which are then documented for the Ministry of Natural Resources.[37]

Upon the completion of land reclamation and subsequent approval of standards, the land is transferred to the rural collective organization, followed by the signing of the land return agreement; after that, the government department reimburses all previously deposited land reclamation fees by the enterprise. The retraction of mining territories ought to be executed upon a solid scientific foundation, considering all stakeholders' interests and striving for a societal equilibrium between immediate and enduring concerns. The regulation of mining land withdrawal ought to be governed by national legislation, accompanied by establishing a scientifically grounded withdrawal mechanism. This approach aims to safeguard arable land, facilitate the economic circulation of land, and actualize the ecological value inherent in mining land.

Coal Post-Mining Land Use Practices in Indonesia

The practices surrounding post-mining land use for coal in Indonesia present significant challenges, viewed through ecological and economic lenses. The coal mining sector in Indonesia has played a pivotal role in bolstering the national economy; however, the adverse consequences resulting from mining operations frequently overshadow these benefits, particularly concerning the disturbed soils that necessitate substantial remediation efforts to restore their utility.[38] The soils resulting from post-coal mining activities are typically characterized by significant degradation, stemming from processes such as soil stripping, coal extraction, and the application of toxic chemicals. This process frequently leads to significant alterations in soil structure, diminishes fertility, and disrupts existing ecosystems, thereby complicating efforts to revert the land to its initial state. Moreover, compromised soils frequently harbor detrimental elements, including heavy metals, which risk contaminating

[37] Laurens Bakker, 'Custom and Violence in Indonesia's Protracted Land Conflict', *Social Sciences & Humanities Open*, 8.1 (2023), 100624 <https://doi.org/https://doi.org/10.1016/j.ssaho.2023.100624>.

[38] Ahmad Redi and Luthfi Marfungah, 'Perkembangan Kebijakan Hukum Pertambangan Mineral Dan Batubara Di Indonesia', *Undang: Jurnal Hukum*, 4.2 (2021), 473–506 <https://doi.org/10.22437/ujh.4.2.473-506>.

groundwater and various natural resources.[39]

Nonetheless, a diverse array of initiatives exists to oversee the management of post-mining land, facilitating its repurposing for various objectives, whether for the rehabilitation of ecosystems or economic endeavors, including agriculture, plantations, or even residential developments. A prevalent method involves reclamation, which seeks to enhance soil conditions following the conclusion of mining operations. The reclamation process frequently entails reforestation, which includes planting cover crops or trees that contribute to the restoration of soil fertility and the enhancement of overall environmental quality.[40]

Nevertheless, current reclamation practices frequently need to catch up to their intended goals, as they tend to be implemented purely technically, neglecting the social and economic dimensions pertinent to the communities surrounding mining regions. Mining enterprises prioritize the completion of administrative duties, often paying attention to the engagement of local communities in the planning and land restoration phases. Indeed, the engagement of the community holds significant importance, as their local knowledge can offer diverse perspectives on land restoration initiatives, ensuring that the reclamation outcomes yield tangible benefits for them.[41] Innovations in post-mining land use are emerging, emphasizing land use for economic activities following the reclamation's completion. An illustrative case currently under development involves the application of post-mining land to advance sustainable agricultural practices. Certain enterprises have embraced agroforestry farming paradigms on land previously subjected to mining activities, cultivating trees alongside crops to enhance soil fertility and support the livelihoods of local communities.

Nonetheless, the foremost challenge in post-mining land use is guaranteeing that the policies governing reclamation and subsequent land utilization are both economically advantageous and environmentally sustainable. Many policies need to exhibit more rigor in supervising reclamation practices, resulting in enduring detrimental environmental consequences, including soil erosion, degradation of water quality, and a decline in biodiversity. Consequently, we must implement more stringent regulations and enhance transparency in oversight throughout all phases of mining operations, particularly concerning the reuse of land following mining activities. An approach grounded in ecological

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[39] C. D. Tiemann and others, 'Mine Relinquishment Policy in Australia', *Proceedings of the International Conference on Mine Closure*, 2019-Septe.2016 (2019), 1451–60 <https://doi.org/10.36487/ACG_rep/1915_113_Tiemann>.

[40] Rian Saputra, Albertus Usada, and Muhammad Saiful Islam, 'Ecological Justice in Environmental Criminal Sanctions for Corporations in Indonesia: Problems and Solution', *Journal of Law, Environmental and Justice*, 2.1 (2024), 1–17 <https://doi.org/10.62264/jlej.v2i1.19>.

[41] Miriam Matejova, 'Silver Linings: Environmental Disasters as Critical Junctures in Global Governance', *Environment*, 65.1 (2023), 4–14 <https://doi.org/10.1080/00139157.2023.2146943>.

justice is crucial to guarantee that all stakeholders—corporations, governmental entities, and communities—derive equitable benefits from the recovery and utilization of land following mining activities. This encompasses creating opportunities for communities to engage in decisions concerning land use in their vicinity.[42]

In summary, the practices surrounding post-mining land use for coal in Indonesia necessitate substantial enhancements in policy formulation and execution. Reclamation initiatives should transcend mere compliance with obligations; they should engage all stakeholders and prioritize sustainable development that preserves the natural environment and supports the well-being of local communities. The practices surrounding land use following coal mining in Indonesia are emerging as a critical concern in light of the country's expansive coal mining sector's growth. Indonesia ranks among the foremost coal-producing nations globally, generating around 400 million tonnes of coal each year, most of which are directed towards international markets. Nevertheless, the rigorous pursuit of coal mining engenders significant ecological degradation, particularly affecting the terrain excavated and ravaged. The land degradation resulting from mining activities, if inadequately managed, can inflict enduring harm on ecosystems, public health, and local economies.[43]

Soils that have undergone post-coal mining frequently experience declining fertility and structural integrity due to topsoil removal, desiccation, and contamination from heavy metals associated with coal processing, including arsenic, mercury, and lead. This process adversely affects the soil and compromises groundwater quality, which frequently becomes contaminated by deleterious substances. For instance, numerous mining regions in Kalimantan and Sumatra are witnessing a deterioration in water quality, jeopardizing the sustainability of local communities' livelihoods and agricultural practices. The issue is further intensified by soil erosion and the loss of vegetation resulting from open-pit mining operations that lack effective soil management practices.[44]

Reclamation policies fundamentally seek to reinstate the condition of land following mining activities, facilitating its subsequent use for ecological and economic objectives. In Indonesia, the reclamation processes necessitate that mining companies undertake environmental enhancements post-mining, which include the establishment of ground cover

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[42] Rohana Ria and others, 'Analysis of Factors of Land and Builing Tax Revenue in Muara Lakitan District Musi Rawas Regency', *Proceedings International Conference on Business, Economics & Management*, 1, 2023, 68–72 <https://doi.org/10.47747/icbem.v1i1.1299>.

[43] Diana Yusyanti, 'Aspek Perizinan Di Bidang Hukum Pertambangan Mineral Dan Batubara Pada Era Otonomi Daerah', *Jurnal Penelitian Hukum De Jure*, 16.3 (2016), 309–21.

[44] Agung Basuki and others, 'Establishing Ecological Justice in the Governance of Land Inventory , Ownership , and Utilisation in Indonesia', *Journal of Law, Environmental and Justice*, 18.2 (2023), 137–54 <https://doi.org/10.62264/jlej.v1i2.12>.

vegetation, reforestation of the mined areas, and ameliorating soil quality. While mining companies are mandated by law to conduct reclamation, the execution in practice frequently needs to catch up to ideal standards. According to information from the Ministry of Energy and Mineral Resources (ESDM), as of 2021, merely approximately 60% of land affected by mining had been subject to reclamation efforts, and among these, many were executed solely for administrative purposes, lacking consideration for ecological integrity.[45]

A significant challenge in post-mining land reclamation practices lies in the disparity between legal obligations and ecological responsibilities. Many mining enterprises prioritize the fulfillment of administrative duties, often at the expense of integrating sustainability principles into their operations. In certain instances, reclamation is executed merely as a symbolic gesture, such as planting specific tree species, without thoroughly assessing their compatibility with the degraded soil conditions. With a well-conceived strategy and thorough research, such reclamation efforts can yield meaningful outcomes in reinstating the ecological integrity of the land.[46]

Moreover, it is common for corporations to exclude local communities from participation in the reclamation process. Indeed, communities possess significant local knowledge and insights regarding land management. Community engagement in reclamation planning can enhance the efficacy of ecosystem restoration initiatives and facilitate the restoration of socioeconomic advantages for individuals impacted by mining operations. Specific reclamation initiatives that engage local communities have demonstrated superior outcomes, exemplified by establishing agroforestry systems and implementing sustainable agriculture practices on land previously subjected to mining activities. Nonetheless, the prospective application of post-mining terrain for economic endeavors, including agriculture and plantations, encounters many challenges. Once land experiences degradation, restoring its fertility demands considerable time and substantial effort. Several enterprises have endeavored to repurpose land post-mining for agricultural use; however, the subpar quality of the soil frequently constrains the potential yields that can be realized. Nevertheless, certain advancements, such as bioremediation technology—where microorganisms are employed to decompose detrimental contaminants in the soil—are beginning to be regarded as viable solutions for enhancing soil conditions.[47]

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[45] Indah Dwi Qurbani, Ilham Dwi Rafiqi, and Ilham Dwi Rafiqi, 'Prospective Green Constitution in New and Renewable Energy Regulation', *Legality: Jurnal Ilmiah Hukum*, 30.1 (2022), 68–87 <https://doi.org/10.22219/ljih.v30i1.18289>.

[46] Matejova.

[47] Barid Hardiyanto, 'Politics of Land Policies in Indonesia in the Era of President Susilo Bambang Yudhoyono', *Land Use Policy*, 101 (2021), 105134 <https://doi.org/https://doi.org/10.1016/j.landusepol.2020.105134>.

According to data from the Ministry of Environment and Forestry (MoEF), Indonesia possesses approximately 2.5 million hectares of land degraded due to mining activities, particularly coal mining. As recovery efforts persist, there is a pressing need for a more refined and methodical implementation of reclamation techniques to restore these lands to productive utility. Certain regions have demonstrated notable achievements, particularly in East Kalimantan, where mining enterprises have initiated the implementation of scientifically informed reclamation techniques and have involved local communities in the stewardship of former mining sites, fostering a more sustainable approach to land management.[48]

Nonetheless, attaining optimal outcomes in post-coal land utilization necessitates enhanced cooperation among governmental bodies, corporations, and local communities. The government ought to enhance regulations and oversight concerning the execution of reclamation projects and offer incentives to companies that effectively implement reclamation initiatives. Furthermore, it is imperative that a more cohesive policy framework that considers the principles of social justice and environmental sustainability be established as a paramount concern. Without a thorough and inclusive strategy, initiatives to convert post-mining landscapes into viable and ecologically sustainable regions will persistently encounter numerous challenges.[49]

In summary, the practices surrounding post-mining land use for coal in Indonesia necessitate considerable enhancements in policy, execution, and cooperation among stakeholders. Strategies centered on sustainability, ecological equity, and the empowerment of local communities are essential for mitigating the adverse effects of coal mining while optimizing the advantages of post-mining land for the benefit of future generations. Nonetheless, in light of the challenges associated with post-mining reclamation in Indonesia. The issues indicate that post-mining land use in Indonesia fails to embody ecological justice and continues to adopt an anthropocentric perspective.[50]

It is established that in Indonesia, once the permit for the utilization and use of land for mining and reclamation activities is finalized, the legal relationship between the holders of IUP, IPR, or IUPK ceases to exist, resulting in the automatic transition of land status to state control. This indicates that it transitions into State ownership. Thus, if an individual or legal

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48 Dina Oktavia and others, 'Dynamics of Land Use and Land Cover in the Belitung Island, Indonesia', *Heliyon*, 10.12 (2024), e33291 <https://doi.org/https://doi.org/10.1016/j.heliyon.2024.e33291>.

49 Syamsul Bachri and others, 'Land Use Change Simulation Model Using a Land Change Modeler in Anticipation of the Impact of the Semeru Volcano Eruption Disaster in Indonesia', *Environmental Challenges*, 14 (2024), 100862 <https://doi.org/https://doi.org/10.1016/j.envc.2024.100862>.

50 Abdul Kodir and others, 'Integrated Post Mining Landscape for Sustainable Land Use: A Case Study in South Sumatera, Indonesia', *Sustainable Environment Research*, 27.4 (2017), 203–13 <https://doi.org/https://doi.org/10.1016/j.serj.2017.03.003>.

entity, including governmental bodies, requires access to the land, the procedure for acquiring and formalizing rights mirrors that of free State land. The process of acquiring land through compensation differs in that, prior to its utilization for mining activities, it must first be designated as State land. Upon the conclusion of mining and reclamation activities, the status of the land reverts to that of State land.[51]

In the context of Article 99 of Law Number 3 of 2020 regarding Mineral and Coal Mining, it is stated that:

1. Holders of IUP or IUPK must develop and present a Reclamation plan and/or Post-mining plan.
2. The execution of Reclamation and post-mining activities is conducted in alignment with the designated purpose of post-mining land.
3. In the execution of Reclamation undertaken across the various phases of the Mining Business, holders of IUP or IUPK are required to: a. ensure a balance between the land designated for clearance and the land that has undergone Reclamation; and b. manage the final ex-mining pits within the broadest parameters stipulated by legal regulations.
4. In accordance with legal provisions, IUP or IUPK holders are required to transfer land that has been reclaimed and/or post-mining to the rightful party through the Minister.

The stipulations outlined in Article 99 of Law No. 03/2020, which serve as the foundation for assessing the status of post-mining land, exhibit deficiencies concerning the treatment of such land, as there appears to be an absence of statutory provisions addressing the mechanism for the transfer of post-mining land. Upon further examination of the stipulations outlined in Article 47 of Government Regulation of the Republic of Indonesia Number 78 of 2010, which pertains to Reclamation and Post-mining, it becomes evident that: Firstly, holders of IUP and IUPK are mandated to transfer reclaimed land to the appropriate party by legal provisions, facilitated by the Minister, governor, or regent/mayor within their respective jurisdictions; Secondly, these holders are permitted to request a deferral of the land transfer as mentioned in paragraph (1), either in part or in full, to the Minister, governor, or regent/mayor, contingent upon the continued necessity of the reclaimed land for mining activities.

Moreover, Article 48 of Government Regulation Number 78 of 2010 regarding Reclamation and Post-mining stipulates that: 'Holders of Production Operation IUP and Production Operation IUPK who have fulfilled post-mining obligations are required to transfer post-mining land to the appropriate party by statutory regulations through the Minister, governor, or regent/mayor, as per their respective authority.' Article 49 of

[51] I Made Ronyastra, Lip Huat Saw, and Foon Siang Low, 'Monte Carlo Simulation-Based Financial Risk Identification for Industrial Estate as Post-Mining Land Usage in Indonesia', *Resources Policy*, 89 (2024), 104639 <https://doi.org/https://doi.org/10.1016/j.resourpol.2024.104639>.

Government Regulation of the Republic of Indonesia Number 78 of 2010 concerning Reclamation and Post-mining articulates that: 'Further provisions regarding the procedures for the transfer of land that has undergone reclamation and land that has been post-mined are governed by Ministerial Regulation.'

According to the stipulations outlined in PP No 78/2010, it is evident that the process for the transfer of land resulting from post-mining reclamation is contingent upon ministerial regulations. However, to date, there has been an absence of any derivative regulation in the form of a ministerial decree, as required by PP No 78/2010. This absence has resulted in a legal vacuum concerning the governance of state land derived from reclamation and post-mining activities within the national legal field. Upon examining the legal framework established in the Mineral and Coal Mining Laws, one cannot help but notice the pronounced anthropocentric emphasis on post-mining land use. The lands that emerge from reclamation and post-mining processes are ultimately transferred to various stakeholders via the Minister, Governor, or Regent/Mayor.

It is essential that the Mineral and Coal Mining Law articulates with clarity and conviction that lands reclaimed from mining activities, particularly those that were once forested, must undergo extensive post-mining reclamation efforts to restore their original environmental functions effectively.[52] The evaluation of the success of environmental function restoration following reclamation and post-mining activities is conducted by a specialized institution. Mitigating the likelihood of continued environmental degradation to the land stemming from reclamation and post-mining activities is crucial.

Regulating land reclamation and post-mining in Indonesia to achieve ecological justice

The discourse surrounding ecological justice within the framework of the national legal system is firmly established, particularly when one examines the national constitution, specifically the 1945 Constitution (UUD 1945), which references the concept of a 'green constitution.' The concept of a 'green constitution' within the framework of Indonesian state administration, at both practical and scholarly dimensions, represents an undeniably novel phenomenon for individuals unfamiliar with it. Even the experts in constitutional law have yet to encounter the term 'green constitution.' The phrase' green constitution' emerged in Indonesia in 2008, articulated by members of the Constitutional Court during their engagement with the leadership of the House of Regional Representatives (DPD) in August of

[52] John F McCarthy and others, 'Land Reform Rationalities and Their Governance Effects in Indonesia: Provoking Land Politics or Addressing Adverse Formalisation?', *Geoforum*, 132 (2022), 92–102 <https://doi.org/https://doi.org/10.1016/j.geoforum.2022.04.008>.

that year.[53] The discussion surrounding the concept of a 'green constitution' was initially brought forth by Prof. Dr. Achmad Sodiki, S.H., as a reaction to the proposal of a potential fifth amendment to the 1945 Constitution. He emphasized the necessity of thorough examination before adopting a 'green constitution.'

The concept of a 'green constitution' within the context of cross-border state administration, particularly among nations globally, is, in fact, not a novel idea. Undeniably, the 'green constitution' concept has only recently emerged in discourse in the Indonesian context. Nevertheless, the term' green constitution' will undoubtedly resonate as familiar for individuals exploring contemporary legal thought and state practices through scholarly journals, recent publications, or online resources. Within the Indonesian framework, the principles of an environmentally conscious constitution are articulated in Article 28H paragraph (1) and Article 33 paragraph (4) of the 1945 Constitution. The entitlement to a sound and healthy environment and access to quality health services is recognized as a fundamental human right. Consequently, the 1945 Constitution demonstrates a solid commitment to environmental protection, warranting its designation as a green constitution.[54]

The concept of ecological constitution represents the author's innovative approach to the term green constitution, with both terms conveying a similar meaning. The term ecology is derived from the Greek words oikos, signifying dwelling, and logos, denoting science. Ecology encompasses examining the intricate relationships and interactions among organisms and between these organisms and their surrounding environment. As a nascent discipline within biology, ecology assumes significant importance as a field of study once humans develop an awareness of their environment and recognize themselves as integral components.[55]

The discussion surrounding the notions of the green constitution, constitutional ecology, and democracy within the Indonesian constitution is mirrored in the principles of power, human rights, and the framework of economic democracy as articulated in the 1945 Constitution. This indicates that the nation subscribes to a green constitution predicated on the belief that ultimate authority resides with the populace. This is evident in recognizing human rights to a sound and healthy environment, as articulated in Article 28H paragraph (1) of the 1945 Constitution. Furthermore, it is mirrored in the democratic principles

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[53] Joan Martinez-Alier, 'Mining Conflicts, Environmental Justice, and Valuation', *Journal of Hazardous Materials*, 86.1 (2001), 153–70 <https://doi.org/https://doi.org/10.1016/S0304-3894(01)00252-7>.

[54] Zachary R Anderson and others, 'Green Growth Rhetoric versus Reality: Insights from Indonesia', *Global Environmental Change*, 38 (2016), 30–40 <https://doi.org/https://doi.org/10.1016/j.gloenvcha.2016.02.008>.

[55] Henner Busch and others, 'Mining Coal While Digging for Justice: Investigating Justice Claims against a Coal-Phase out in Five Countries', *The Extractive Industries and Society*, 15 (2023), 101275 <https://doi.org/https://doi.org/10.1016/j.exis.2023.101275>.

associated with sustainable development and environmental awareness, as underscored in Article 33 paragraph (4) of the 1945 Constitution, thereby demonstrating that this concept has been integrated into the framework of the Indonesian constitution.[56]

The discussion surrounding ecological justice pertains to the equitable treatment of human interactions with non-human entities, encompassing nature, flora, and fauna. This perspective posits that numerous natural beings warrant consideration and fairness. Humans are fundamentally intertwined with the natural world, existing within its confines and drawing sustenance from it. This intricate interplay between humanity and nature has cultivated a symbiotic relationship that necessitates careful stewardship to avert potential calamities for both the environment and humankind.[57]

According to Article 99 of Law Number 3 of 2020 regarding Mineral and Coal Mining, it states that:

1. Holders of IUP or IUPK are mandated to develop and present a Reclamation plan and/or Post-mining plan.
2. Reclamation and post-mining activities are executed in alignment with the designated purpose of the post-mining land.
3. In the execution of Reclamation undertaken across the various phases of the Mining Business, holders of IUP or IUPK are required to: a. ensure a harmonious balance between the land designated for clearing and the land that has undergone Reclamation; and b. implement the management of final ex-mining pits within the broadest parameters stipulated by legal regulations.
4. Per legal stipulations, IUP or IUPK holders must transfer land that has been reclaimed and/or post-mining to the rightful party through the Minister.

The stipulations outlined in Article 99 of Law No. 03/2020, which serve as the foundation for assessing the status of post-mining land, exhibit certain deficiencies concerning the classification of such land, as there appears to be an absence of statutory regulations addressing the procedure for the transfer of post-mining land. Upon further examination of the stipulations outlined in Article 47 of Government Regulation of the Republic of Indonesia Number 78 of 2010 regarding Reclamation and Post-mining, it becomes evident that: Firstly, holders of IUP and IUPK are mandated to transfer reclaimed land to the appropriate party by

[56] Tessa Toumbourou and others, 'Political Ecologies of the Post-Mining Landscape: Activism, Resistance, and Legal Struggles over Kalimantan's Coal Mines', *Energy Research & Social Science*, 65 (2020), 101476 <https://doi.org/https://doi.org/10.1016/j.erss.2020.101476>.

[57] Arpad Todor and others, 'Policies to Bring about Social-Ecological Tipping Points in Coal and Carbon Intensive Regions', *Global Environmental Change*, 90 (2025), 102952 <https://doi.org/https://doi.org/10.1016/j.gloenvcha.2024.102952>.

legal provisions, facilitated through the Minister, governor, or regent/mayor, as per their designated authority; Secondly, these holders are permitted to request a deferral of the land transfer, as indicated in paragraph (1), either in part or in full, to the Minister, governor, or regent/mayor, contingent upon the continued necessity of the reclaimed land for mining activities.[58]

Moreover, Article 48 of Government Regulation Number 78 of 2010, which pertains to Reclamation and Post-mining, stipulates that: 'Holders of Production Operation IUPs and Production Operation IUPKs who have fulfilled post-mining obligations are required to transfer post-mining land to the appropriate party in accordance with statutory regulations, facilitated by the Minister, governor, or regent/mayor, as per their respective authority.' Article 49 of Government Regulation of the Republic of Indonesia Number 78 of 2010 concerning Reclamation and Post-mining articulates that: 'Further provisions regarding the procedures for the transfer of land that has undergone reclamation and land that has been post-mined are governed by Ministerial Regulation.'

According to the stipulations outlined in PP No 78/2010, it is evident that the framework for transferring post-mining reclaimed land is contingent upon ministerial regulations. However, the absence of any derivative regulation in the form of a ministerial decree, as required by PP No 78/2010, has resulted in a legal vacuum regarding the governance of state land reclamation and post-mining outcomes within the national legal framework.

In an ideal scenario, the regulation governing the utilization and transfer of post-mining state land, grounded in the principles of ecological justice, should carefully consider the surrounding area's environmental and socioeconomic dimensions.[59] The author posits that such regulation need not be excessively stringent; instead, it should maintain flexibility while remaining attuned to the prevailing environmental conditions. For instance, if the land that has undergone mining was originally a forest and intends to be restored to its natural state or repurposed as agricultural land for the community following reclamation, this aligns with established guidelines and poses no issues.[60]

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[58] Agung Dwi Sutrisno, Chun-Hung Lee, and I Wayan Koko Suryawan, 'Examining Community Desire to Change for Adaptive Transition in Post-Mining Ecological Sustainability: Community Transition in Post-Mining Sustainability', *The Extractive Industries and Society*, 20 (2024), 101537 <https://doi.org/https://doi.org/10.1016/j.exis.2024.101537>.

[59] Jia Yen Lai, Sam Staddon, and Alistair Hamilton, 'Technical Experts' Perspectives of Justice-Related Norms: Lessons from Everyday Environmental Practices in Indonesia', *Land Use Policy*, 102 (2021), 105234 <https://doi.org/https://doi.org/10.1016/j.landusepol.2020.105234>.

[60] Paul K Gellert and Sarah D'Onofrio, 'Flex Commodities and Intertwining World-Ecologies: Indonesian Palm Waste as an Environmental Fix in the New Zealand Dairy Industry', *Political Geography*, 108 (2024), 103038 <https://doi.org/https://doi.org/10.1016/j.polgeo.2023.103038>.

The mechanisms governing the utilization and transfer of post-mining state land can be elucidated through a range of examples from different countries, as articulated by the author at the outset of this chapter. For instance, by examining China's approach to post-mining public land, we can identify several exemplary practices that can be adopted for the utilization of such land: Farmland, meadows and grazing areas, woodlands, ecosystems for wildlife, crops for biofuel, and land designated for various forms of development including industrial, commercial, and residential purposes. Moreover, the nation grounds its utilization of post-mining state land on the requirements and environmental considerations, encompassing ecological, social, and economic dimensions. It is noteworthy that when the decision is made to convert post-mining state land into agricultural land, following its declaration of feasibility by local authorities in China—whether by the local government or the central government—the transfer is executed to rural communities collectively or in proximity to the post-mining area, which is subsequently managed as agricultural land for the benefit of the community.

4. Conclusion

Research and discussions reveal that Indonesia needs legal regulations concerning utilizing post-mining land. The Indonesian Mineral and Coal Mining Law and related regulations exclusively govern the transfer of post-mining land from companies to eligible parties via the Minister, Governor, or Regent/Mayor. These provisions indicate that post-mining land use in Indonesia continues to adopt an anthropocentric approach and has not been founded on ecological justice. In China, post-mining land is utilized to accommodate ecological, social, and economic requirements, with applications including agricultural land, hay fields, grasslands, forests, wildlife habitats, biofuel crops, and areas designated for industrial, commercial, and residential development. Notably, when the decision is made to convert post-mining state land into agricultural land, following its feasibility declaration by local authorities in China (either the local government or the central government), the transfer is executed to rural communities collectively or in proximity to the post-mining area for subsequent management as agricultural land.

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