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Mineral and Coal Mining Regulatory Reform in Indonesia

Irsan Rahman [a] ✉, **Basrawi Basrawi** [a], **Anis Widyawati** [b], **Leony Sondang Suryani** [c], **Iyan Nurdiyan Haris** [d]

[a] Faculty of Law, Universitas Sembilanbelas November Kolaka, Indonesia
[b] Faculty of Law, Universitas Negeri Semarang, Indonesia
[c] SHAPE-SEA, The Institute of Human Rights and Peace Studies, Mahidol University, Thailand
[d] Faculty of Teacher Training and Education, Universitas Sembilanbelas November Kolaka, Indonesia

✉ corresponding email: irsanrahman@usn.ac.id

Abstract

Mining in Indonesia is a vital sector that contributes significantly to the economy. However, current regulations still reveals a number of weaknesses that impact environmental sustainability and community welfare. These include weak law enforcement, lack of transparency and public participation at all stages of mining activities, inadequate mechanisms to ensure corporate social responsibility and environmental and post-mining reclamation, provisions that are not responsive to changing social and environmental conditions, further exacerbating the situation. This research uses a normative legal research method with an analytical approach to the provisions of laws and regulations based on facts obtained from secondary sources by paying attention to the credibility of these secondary sources. The main findings of the research reveal that environmental problems arise due to misalignment between mining laws and environmental laws. Environmental laws are not positioned as a command to mitigate the environmental impact of mining, and issues are further compounded by overlapping regulations on mining reclamation. The welfare of the community remains an unfulfilled promise, as environmental economic rights are increasingly eroded by the provisions in Article 162 of Law No. 3 of

2020. The rampant illegal mining activities further harm state finances, exacerbated by the absence of sophisticated infrastructure to monitor mining areas and potential sites in real time using satellite imagery. Additionally, inadequate distribution of corporate social responsibility (CSR) funds has left mining and affected areas without proper support, highlighting the urgent need for CSR regulations in the future be regulated at the legislative level. Furthermore, regulatory efforts to adopt green technology remain insufficient, with a lack of fiscal incentives and investment protection for companies committed to sustainable practices. The situation is further worsened by the lack of transparency in the mining sector, further exacerbates the situation as there is still no clear mechanism to ensure accountability or provide the public with access to crucial mining operation data. Based on the complex mining problems from multi-sectors, the regulatory reform framework must involve authorized government institutions and involve public participation in regulatory reform and the outcomes of the rules formed can accommodate the protection of public participation and protection of public rights in mining, respond to effective law enforcement and provide great contribution to the state, society, and global collaboration.

Keywords
Reform, Regulation, Mining, Mineral and Coal, Mining Regulation.

Introduction

Based on the results of the United States Geological Survey (USGS) reported that Indonesia is ranked sixth as a mining producing country in the world.[1] Natural resource reserves of metal, non-metal, oil and gas extraction are managed on the basis of benefits for prosperity and pay attention to environmental wisdom and sustainability. Mining natural resource reserves are non-renewable state assets so that their management relies on more optimal goals. Additionally, foreign control (foreign capital) should be minimized by maximizing added value in finished goods products (downstream industry) not just the acquisition

[1] Abdul Kadir and Eka Suaib, "Mining in Southeast Sulawesi and Central Sulawesi: Shadow Economy and Environmental Damage Regional Autonomy Era in Indonesia," in *International Conference on Social Studies and Environmental Issues (ICOSSEI 2019)* (Atlantis Press, 2020), 20–27, https://doi.org/10.2991/assehr.k.200214.004.

of raw materials alone and its implementation supports the domestic private sector.

Natural resource management tries to be more careful when paying attention to the supply of mining resource reserves in the bowels of the earth as if tomorrow will run out. Many countries have run out of natural resources which caused the country's economy to collapse. Nauru relies on the primary sector of phosphate mining, while Mali lost gold reserves so it relies on seasonal agriculture. Additionally, Venezuela relies on 90% of the country's income from petroleum mining after the world oil price fell, its economy also fell.[2] Based on the events in these countries, two things become a concern in the management of natural resource reserves, which is to maximize the economic contribution of the mining extraction industry while minimizing the impact of environmental losses. Last but not least, the government is not rash in mining, as it is more selective in issuing mining permits by prioritizing the national interest in estimating long-term reserve stocks. Natural resource reserves remain sustainable and their contribution is long-term, as a solution the state does not rely on the primary sector but economic diversification as a powerful strategy by developing human resources and mastering science and technology. For this reason, temporary economic contributions from mining extraction can be converted into strengthening human resources by carrying out development in the fields of infrastructure, education, research, culture, agriculture, plantations, and other social institutions in this case democracy, politics, law, security and national defense.

Converting the economic revenue contribution of mining extraction to development in all fields requires strengthening governance and law enforcement, which requires regulations that are able to face social challenges and current events. Good governance comes from good regulations, which can accommodate the objectives of the mining philosophy in Indonesia. Regulation-based mining is a consequence of the legal system in Indonesia which is characterized by written law (provisions of laws and regulations) or patterns of the continental European legal system.

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[2] Lynda Hasibuan, "Dulu Tajir Melintir, 7 Negara Ini Sekarang Jatuh Miskin!" (CNBC Indonesia, 2022).

Efforts to convert economic contributions (state revenues) from mining extraction into development capital in Indonesia face challenges, especially in regulations that do not support environmental sustainability, community welfare, law enforcement systems, lack of transparency, closed licensing, inadequate mechanisms to ensure corporate social responsibility, and low community involvement.

Responding to the issue of mining challenges above, concretely and tangibly there are still many regulations that do not fully ensure the application of sustainability principles, as a result environmental violations and damage occur and are recoverable and require expensive costs. Mining activities that have a direct impact on the environment must fulfil administrative requirements and environmental feasibility documents. In reality, they still leave environmental problems as the mandated sustainable development principles have not been implemented optimally. A concrete indicator is the number of Mining Business Permits (MBP) that still have non-clear and clean (CnC) status.[3] Interestingly, after the regime of Law Number 3 of 2020, it is almost impossible to find mining business licenses revoked due to environmental feasibility test issues. However, only mining business licenses are revoked due to activity operation problems as recorded. In 2024, 2,078 licenses were revoked, 122 were given warnings, 60 will be facilitated, and the remaining 64 will be evaluated. This can be confirmed by the chronological background that as many as 2,343 mining business permits have no activities, of which most, with a total of 2,078 did not implement the workplan and budget (WB/RKAB).[4] The data reveals that the central government prioritizes production and investment interests alone when compared to data from the Law No. 4/2009 regime. Many mining business permits (MBP/IUP) were revoked due to environmental issues and community pressure on local governments as Law No. 4/2009 Jo. Law No. 32/2004, which still upholds a hierarchical system of central and local governments. Under the concept of

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[3] Syofiarti Syofiarti et al., "Implementation of Sustainable Development Principles in Mineral and Coal Mining Policy," *Linguistics and Culture Review* 5, no. S3 (2021): 268–76, https://doi.org/10.21744/lingcure.v5nS3.1526.

[4] Firda Dwi Muliawati, "Heboh Bahlil Cabut Izin Tambang, Begini Kronologinya," 2024.

implementing regional autonomy, the governance of mining natural resources is delegated to local governments.[5]

Apart from environmental issues, community welfare in mining communities is a crucial issue and is often debated, particularly among stakeholders, including the government, the community and the company.[6] Disputes frequently arise due to the uneven distribution of benefits, leading to protests and social unrest.[7] Mining is expected to fulfil the needs of the community; however, its effectiveness remains questionable, as it often fails to foster self-reliance. While economic contributions are expected to drive social change towards self-reliance, their actual impact remains uncertain.[8] The social effects of mining can provide economic benefits to communities even if they are short-term. However, it makes communities vulnerable to economic shocks. particularly when mine closes, including stock-outs.[9] Overall, the contribution of mining to the well-being of local communities remains a complex issue that requires careful consideration on the basis of benefits and risks.

Looking at the law enforcement system in some countries such as China, mining is often weak due to various factors including a culture of corruption, bureaucratic inefficiency, and conflicts between various

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5 Irsan Rahman et al., "Socialisation of Legal Sources and Core Provisions of Mining Implementation in Indonesia," *Abdimas Galuh* 6, no. 2 (2024): 2121–35, http://dx.doi.org/10.25157/ag.v6i2.15921.

6 Laila Kholid Alfirdaus, Dzunuwwanus Ghulam Manar, and Teguh Yuwono, "Welfare Logic: Government vs Community in Mining Development Conflict," in *Proceedings of the 6th International Conference on Social and Political Enquiries, ICISPE 2021, 14-15 September 2021, Semarang, Indonesia*, 2022, https://doi.org/10.4108/eai.14-9-2021.2321408.

7 Punam Chuhan-Pole, Andrew L Dabalen, and Bryan Christopher Land, *Mining in Africa: Are Local Communities Better Off?* (World Bank Publications, 2017), https://doi.org/10.1596/978-1-4648-0819-7.

8 Deepankar Sharma and Priya Bhatnagar, "Corporate Social Responsibility of Mining Industries," International Journal of Law and Management 57, no. 5 (2015): 367–72, https://doi.org/10.2139/ssrn.2407014.

9 Nhi Nguyen, Bryan Boruff, and Matthew Tonts, "Fool's Gold: Understanding Social, Economic and Environmental Impacts from Gold Mining in Quang Nam Province, Vietnam," *Sustainability* 10, no. 5 (2018): 1355, https://doi.org/10.3390/SU10051355.

levels of government.[10] In Peru, conflict and lack of collaboration among government agencies and inadequate resource allocation.[11] In the country of Siera Leone, there are weaknesses due to the asymmetrical relationship between government and corporate power between global companies.[12] Various reports from research from various countries highlight the need for Indonesia to take concrete steps towards real change, particularly due to the recurring issues of more specific problems, including norms conflicts, ineffective bureaucratic reform, and weak law enforcement, especially in *pro justisia* cases within judicial institutions. Recently, a tin corruption case resulting in a state financial loss of 300 Trillion rupiah led to a mere 6.5-years prison sentence[13]—a verdict that legal experts have deemed illogical.[14]

Problems in the provisions of legislation remain inadequate in ensuring transparency in the mining sector, especially in the decision-making process for mining permits which often fails to consider the economic rights of communities that have occupied the land for generations. This is especially evident in the conversion of agricultural land and plantations, despite the existence of clear mechanism prohibiting such conversions. However, conflicts frequently arise between mining companies and surrounding communities. Additionally, mining activities can disrupt the environmental carrying capacity and affect the fertility of agricultural land. Therefore, aspects of future economic rights must be taken into account by involving the

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[10] Xiuyun Yang and Qiuping Chen, "Mining Violations, Rent-Seeking, and Resource Governance in China: Evidence from Central Environmental Protection Inspection," *The Extractive Industries and Society* 13 (2023): 101218, https://doi.org/10.1016/j.exis.2023.101218.

[11] Johanna Espin and Stephen Perz, "Environmental Crimes in Extractive Activities: Explanations for Low Enforcement Effectiveness in the Case of Illegal Gold Mining in Madre de Dios, Peru," The Extractive Industries and Society 8, no. 1 (2021): 331–39, hhttps://doi.org/10.1016/j.exis.2020.12.009.

[12] Fenda A Akiwumi, "Global Incorporation and Local Conflict: Sierra Leonean Mining Regions," *Antipode* 44, no. 3 (2012): 581–600, https://doi.org/10.1111/J.1467-8330.2011.00945.X.

[13] "Profil Eko Aryanto, Hakim Yang Vonis Harvey Moeis Cuma 6,5 Tahun Bui" (cnnindonesia.com, 2024).

[14] "Tanggapi Vonis 6,5 Tahun Harvey Moeis Di Kasus Timah, Mahfud MD: Tak Logis" (tempo.co, 2024).

community in decision-making process. Transparency must be more comprehensive, especially the adequacy of mechanisms regarding the distribution of social responsibility, tax, royalties and dividends. The workplan and budget (WB/RKAB) is the initial document as an indicator of transparency, but public access must be more open with support for the fulfilment of the right to know the public through the means contained in the regulations. Transparency is a major issue, especially in developing countries such as Zambia and Tanzania, revealing ineffective revenue-sharing mechanisms and low government revenues from mining, for which there needs to be a strong and balanced fiscal design, strengthened tax administration, and solid political will.[15] Ghana suffers from transparency barriers due to inadequate access to information and ineffective dissemination channels.[16] The problem is that Sub-Saharan African countries often fail to comprehensively address health impacts and experience low levels of public disclosure.[17] These issues are problems in developing countries including Indonesia, with many Indonesian elites stating that if mining resources are managed optimally, they will contribute to the economic growth and progress of the nation.

One of the factors of mining problems in Indonesia occurs because the process of granting mining business permits (MBP/IUP) is vulnerable to abuse of authority and corrupt practices, as the process of issuing permits is still closed.[18] Regime change of Law Number 4 Year

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[15] Olav Lundstøl, Gaël Raballand, and Fuvya Nyirongo, "Low Government Revenue from the Mining Sector in Zambia and Tanzania: Fiscal Design, Technical Capacity or Political Will?," *Technical Capacity or Political Will*, 2013, https://doi.org/10.2139/ssrn.2411451.

[16] Päivi Lujala, Christa Brunnschweiler, and Ishmael Edjekumhene, "Transparent for Whom? Dissemination of Information on Ghana's Petroleum and Mining Revenue Management," *The Journal of Development Studies* 56, no. 12 (2020): 2135–53, https://doi.org/10.1080/00220388.2020.1746276.

[17] Dominik Dietler et al., "Inclusion of Health in Impact Assessment: A Review of Current Practice in Sub-Saharan Africa," *International Journal of Environmental Research and Public Health* 17, no. 11 (2020): 4155, https://doi.org/10.3390/ijerph17114155.

[18] Oheo K Haris, T S Djamiati, and J S Adiansyah, "Good Mining Practices toward a Good Mine Management: A Case of Mining Business Permit Issuance," in *IOP*

2009 Jo. Law No. 32 of 2004 to Law No. 3 of 2020 Jo. Law No. 23 of 2024 centralized the authority to issue mining business permit (MBP/IUP) to the central government does not eliminate the threat of bribery, but rather weakens transparency.[19] Concretely, the problems due to closed licensing can be revealed in a study on the case of one of the companies in Indonesia, PT Aneka Tambang, Tbk. The production business license for production operations was issued without fulfilling technical requirements, resulting in overlapping licenses with other companies, mining business licenses located in Mandiodo block, Southeast Sulawesi.[20]

Mining issues in Indonesia also highlight the adequacy of corporate social responsibility mechanisms, as mining companies often implement them as a formality, prioritizing profit over real community development. Evaluation of CSR programs in Indonesia needs to have mechanisms for environmental, economic and social aspects, with space for improvement and community participation.[21] The government needs to introduce a mechanism that ensures the CSR budget as stated in the workplan and budget (WB/RKAB) is transparent and accountable.[22]

Based on the description above, this research highlights the urgent issue of the reform of mineral and coal mining regulations in Indonesia

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Conference Series: Earth and Environmental Science, vol. 413 (IOP Publishing, 2020), 12029, https://doi.org/10.1088/1755-1315/413/1/012029.

19 Elsa Ardhilia Putri et al., "Penguatan Prinsip Transparansi Dalam Sentralisasi Izin Usaha Pertambangan Minerba Guna Meminimalisir Korupsi," *Arena Hukum* 16, no. 3 (2023), https://doi.org/10.21776/ub.arenahukum.2023.01603.6.

20 Ahmad Rustan, Ju Lan Hsieh, and Wahyudi Umar, "Maladministration on Mining Business Licenses: Case Study 'Mining Business License Production Operation PT. Aneka Tambang, Tbk.,'" *Varia Justicia* 17, no. 3 (2021): 246–57, https://doi.org/10.31603/variajusticia.v17i3.6265.

21 Akhmad Zamroni, Wahyu Endah Christiani Putri, and Saurina Tua Sagala, "Evaluation of Corporate Social Responsibility Programs for Local Communities around Mining Companies in Kalimantan, Indonesia: Environmental, Economic, and Social Perspectives," *Sustinere: Journal of Environment and Sustainability* 6, no. 1 (2022): 66–78, https://doi.org/10.22515/sustinerejes.v6i1.195.

22 Charles Dziro, "Community Development and Corporate Social Responsibility: A Case Study of Mining Companies in Zvishavane and Mutoko in Zimbabwe," *IOSR Journal of Humanities and Social Science* 19, no. 1 (2014): 61–70, https://doi.org/10.9790/0837-19166170.

from various kinds of problems. It proposes solutions to problems with conceptual and theoretical approaches which in legal science are normative and doctrinal legal research. However, this study focuses on more technical norm reconstruction issues, as the researchers intend to further explore the issue of norm reconstruction in the future research.

Method

This research is a normative legal research.[23] It refers to normative research that analyses the weaknesses of laws with real events. These events are obtained from secondary sources, allowing this research concretely sees the reality of mining problems from credible mass media, research journal articles, statements from parties who know mining problems, namely mining experts and mining law experts. Reality from secondary sources is analyzed into the provisions of laws and regulations, if a condition is not regulated, regulated but weak in substance, or even there are rules that should not exist, then the comparison of the reality of events and the reality of norms can be interpreted that there are weaknesses in regulation so that conceptual ideas of norms are needed regarding the urgency of mining regulatory reform in Indonesia. To strengthen our argument, we also analyzed comparative smart practices between Australia and Indonesia and other countries. The secondary data collection method uses technological media in the form of directly recorded sources in the form of information and news, questions to mining experts and mining law experts through google form media. Secondary data sources include previously published materials and government databases,[24] while information from government media databases, companies, and NGOs mass media is no longer confirmed to the owner of the source as the data has already been publicly disclosed. This method is well-known due to the advancement in the use of

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[23] Salim Ibrahim Ali, Zuryati Mohamed Yusoff, and Zainal Amin Ayub, "Legal Research of Doctrinal and Non-Doctrinal," *International Journal of Trend in Research and Development* 4, no. 1 (2017): 493–95.

[24] Syeda Ayeman Mazhar et al., "Methods of Data Collection: A Fundamental Tool of Research," *Journal of Integrated Community Health (ISSN 2319-9113)* 10, no. 1 (2021): 6–10, https://doi.org/10.24321/2319.9113.202101.

technology, making a large amount of data accessible.[25] Secondary data analysis involves using existing data to answer research questions or analyze previous findings.[26] The results of secondary data analysis are presented in qualitative descriptive form. This research describes a reality of events but is obtained from secondary sources. While primary data is included, we underline that it is only used to reinforce arguments, as the study remains fundamentally normative legal research.[27]

Result and Discussion

A. The Reality of Mining Problems in Indonesia

Mining activities in Indonesia pose significant environmental challenges, requiring strong policies and company commitment to ensure environmental sustainability. Environmental and mining laws need to be synchronized to maintain ecological balance and preserve environmental function.[28] It is important to implement spatial planning based on environmental sustainability in mining areas to prevent pollution and environmental damage.[29]

While certain mining companies in Indonesia demonstrate environmental commitment through sustainability reporting, focusing on aspects such as biodiversity, energy management, and waste

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[25] Melissa P Johnston, "Secondary Data Analysis: A Method of Which the Time Has Come," *Qualitative and Quantitative Methods in Libraries* 3, no. 3 (2014): 619–26.

[26] Russell K Schutt, "Secondary Data Analysis," *The Blackwell Encyclopedia of Sociology*, 2007, https://doi.org/10.1002/9781405165518.wbeoss060.

[27] Peter Mahmud Marzuki, "Penelitian Hukum (Cetakan 15)," *Jakarta: Kencana*, 2021.

[28] Muh Jufri Dewa, "Synchronization Of Enviromental Law To Mining Law In Sustainable Enviromental Mining Governance In Indonesias Legal System," *International Journal of Advanced Research*, 2023, https://doi.org/10.21474/ijar01/16235.

[29] Luthfi Marfungah et al., "Implementing Spatial Planning Based on Environmental Sustainability in the Mining Area," *International Journal Of Humanities Education and Social Sciences* 3, no. 4 (2024), https://doi.org/10.55227/ijhess.v3i4.935.

management, some mining companies in Indonesia do not demonstrate environmental commitment through sustainability reporting.[30]

Mining activities, especially in tin and bauxite mining, have caused significant environmental damage to soil properties, such as what happened in Bangka Belitung Province. Tin mining has caused soil damage, changes in texture, loss of organic matter led to the loss of soil fertility.[31] Similarly, bauxite mining on Kas Island has caused an increase in bulk density, a decrease in porosity and essential nutrients such as C-organic, nitrogen and phosphorus;[32] depletable soil elements such as K, Mg, and Ca that are highly susceptible to water abrasion.[33] Apart from the decline in soil quality caused by a decrease in nutrients from both organic and inorganic elements, there is also a decline in soil quality caused by reduced microbial activity.[34] Reduced soil fertility is an important issue affecting agriculture and natural ecosystems; topsoil erosion caused by loss of protective vegetation, leads to nutrient depletion and soil quality degradation.[35] This will disrupt agricultural productivity and even lead to additional costs of agricultural production

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30 Kurnia Ekasari et al., "Corporate Commitment of Environment: Evidence from Sustainability Reports of Mining Companies in Indonesia," *Indonesian Journal of Sustainability Accounting and Management* 5, no. 1 (2021): 1–10, https://doi.org/10.28992/IJSAM.V5I1.164.

31 Sukarman Sukarman, Rachmat Abdul Gani, and Asmarhansyah Asmarhansyah, "Tin Mining Process and Its Effects on Soils in Bangka Belitung Islands Province, Indonesia," *Sains Tanah-Journal of Soil Science and Agroclimatology* 17, no. 2 (2020): 180–89, https://doi.org/10.20961/STJSSA.V17I2.37606.

32 Basuki Wasis, "Impact of Bauxite Mine to Natural Forest Biomass and Soil Properties in Kas Island, Riau Island Province in Indonesia," *Archives of Agriculture and Environmental Science* 3, no. 3 (2018): 264–69, https://doi.org/10.26832/24566632.2018.030309.

33 Patrizia Guidi et al., "Relating Loss of Soil Fertility to Water Aggregate Stability and Nutrient Availability in Mountain Agricultural Calcaric Soils," *EQA-International Journal of Environmental Quality* 11 (2013): 1–16, https://doi.org/10.6092/ISSN.2281-4485/4063.

34 Albert K Mensah, "Role of Revegetation in Restoring Fertility of Degraded Mined Soils in Ghana: A Review," *International Journal of Biodiversity and Conservation* 7, no. 2 (2015): 57–80, https://doi.org/10.5897/IJBC2014.0775.

35 Elspeth Huxley, "The Menace of Soil Erosion," *Journal of the Royal African Society* 36, no. 144 (1937): 357–70, https://doi.org/10.1093/OXFORDJOURNALS.AFRAF.A101460.

as farmers with reduced soil quality will make efforts to invest in additional agricultural technology and fertilizer to increase soil nutrients.

Environmental pollution with indicators of soil contamination due to mining activities, especially heavy metal contamination, poses a significant threat to the environment and public health. Studies have revealed that mining-derived waste containing arsenic, lead, cadmium, and zinc, among others, can contaminate soil as higher concentrations are found in areas close to tailings piles.[36] These heavy metals can remain in the soil, changing the physico-chemical characteristics of the soil and making it unfavorable for plant growth.[37] With its negative effects on food safety, plant growth, and soil organisms, heavy metal contamination in soil has become a subject of worldwide concern. The problem has been exacerbated by human activities, which can increase the risk of accumulation through the food chain. To address this problem, various remediation techniques have been developed and applied, including physical, chemical, and biological techniques.[38]

Significant water pollution in Indonesia, particularly in Kalimantan, is caused by Acid Mine Drainage (AMD) generated by coal mining activities. In some areas of Samarinda, East Kalimantan, there is a high risk of AMD pollution, impacting both surface water and groundwater.[39] Coal characteristics, especially high Sulphur content, are

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[36] Soraya Puga et al., "Contaminación Por Metales Pesados En Suelo Provocada Por La Industria Minera: Heavy Metals Pollution in Soils Damaged by Mining Industry," *Ecología Aplicada* 5, no. 1–2 (2006): 149–55, https://doi.org/10.21704/REA.V5I1-2.329.

[37] Ambika Asati, Mohnish Pichhode, and Kumar Nikhil, "Effect of Heavy Metals on Plants: An Overview," *International Journal of Application or Innovation in Engineering & Management* 5, no. 3 (2016): 56–66.

[38] L Shukla and N Jain, "A Review on Soil Heavy Metals Contamination: Effects, Sources and Remedies," *TIDEE: TERI Information Digest on Energy and Environment* 21, no. 1 (2022): 83, https://doi.org/10.5958/0974-4150.2020.00058.9.

[39] Astrid Damayanti and Tito Latif Indra, "GIS and RS-Based Analysis of Water Pollution Potential Caused by Acid Mine Drainage in Samarinda, Indonesia," *Journal of Settlements and Spatial Planning* 9, no. 2 (2021): 5–13, https://doi.org/10.24193/jsspsi.02.wswmmss.

related to the formation of AMD.[40] To solve this problem, some mining companies recycle AMD and turn it into clean water for operations.[41] However, research on the Sangkalami River in North Kalimantan showed the impact of AMD on the surrounding water bodies.[42] Results reveal that effective AMD management strategies are needed in coal mining areas in Indonesia.

River siltation caused by mining activities in Indonesia is a major environmental problem. Studies conducted in various regions, including Sorong, Papua, and West Aceh, show that mining operations cause river sedimentation and turbidity to increase.[43] Mining by excavation class C alone in Indonesia exacerbates the situation as sand mining, both manual and mechanized, affects river morphology and water quality; mechanized mining has a more severe effect.[44] Sand mining in the Progo River has caused physico-chemical changes, such as a decrease in pH and an increase in Total Dissolved Solids (TDS).[45] These changes can impact the quality of water used for irrigation and drinking water. Pollution index (PI) method have indicated that mining activities cause relatively low

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[40] Sri Widayati Amy et al., "The Forming of Acid Mine Drainage Based on Characteristics of Coal Mining, East Kalimantan, Indonesia," *Journal of Ecological Engineering* 24, no. 7 (2023), https://doi.org/10.12911/22998993/162551.

[41] Rozzaq Al hanif Islamudin et al., "Utilisation Of Coal Mining Wastewater As Sanitation Water At Pt Putra Perkasa Abadi Site Borneo Indobara," *Riwayat: Educational Journal of History and Humanities* 6, no. 3 (2023): 850–58, https://doi.org/10.11159/icesa23.128.

[42] T A Cahyadi et al., "Water Quality Assesment Based on Government Regulation Standard in Sangkalami River, North Kalimantan, Indonesia.," in *IOP Conference Series: Earth and Environmental Science*, vol. 1242 (IOP Publishing, 2023), 12020, https://doi.org/10.1088/1755-1315/1242/1/012020.

[43] S S Putra et al., "Overview of Watershed Development and River Sedimentation Condition in Sorong, Papua, Indonesia," in *IOP Conference Series: Earth and Environmental Science*, vol. 1343 (IOP Publishing, 2024), 12029, https://doi.org/10.1088/1755-1315/1343/1/012029.

[44] Sahidatun Fahima et al., "Kajian Dampak Penambangan Pasir Terhadap Kualitas Air Sungai Untuk Irigasi Di Indonesia," *Jurnal Teknologi Lingkungan Lahan Basah* 12, no. 1 (2024): 284–93, https://doi.org/10.26418/jtllb.v12i1.74581.

[45] P T Trisnaning et al., "Quality of Surface Water Due to Sand Mining Activity: A Case Study from the Progo River, Daerah Istimewa Yogyakarta Province, Indonesia," in *IOP Conference Series: Earth and Environmental Science*, vol. 1098 (IOP Publishing, 2022), 12031, https://doi.org/10.1088/1755-1315/1098/1/012031.

pollution in some rivers.[46] For this reason, sustainable management of water resources in mining-affected areas remains essential through monitoring and technical erosion protection measures but must also be supported by appropriate regulations. In addition to water pollution, air pollution is a significant environmental problem in Indonesia, with major sources including industrial and mining activities.[47]

Mining in Indonesia has caused deforestation with the disappearance of many protected forests in Indonesia.[48] Mining in protected areas violates the law and adversely affects the environment. Despite regulations prohibiting mining in these areas, many companies are still operating due to legal disputes, causing significant economic and ecological losses. Deforestation rates in Indonesia are alarming at 1.1 million hectares per year with mining activities being the dominant cause in many provinces in Indonesia.[49] The result of mining has led to a significant decline in forest cover, with primary forests shrinking significantly. As a result, Indonesia's ecosystems are in danger.[50] The data reveals that deforestation and degradation continue to occur. Collectively, these studies highlight the critical importance of protecting Indonesia's forest resources.

Mining problems in Indonesia not only have a negative impact on the environment but also have a negative impact on the welfare of the community which causes economic inequality and the distribution of

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[46] H Meilina and I Ramli, "Water Quality Index and the Sediment Criteria Due to Anthropogenic Activity in West Aceh District, Indonesia," in *IOP Conference Series: Earth and Environmental Science*, vol. 922 (IOP Publishing, 2021), 12042, https://doi.org/10.1088/1755-1315/922/1/012042.

[47] Sri Juari Santosa, Tomoaki Okuda, and Shigeru Tanaka, "Air Pollution and Urban Air Quality Management in Indonesia," CLEAN–Soil, Air, Water 36, no. 5-6 (2008): 466–75, https://doi.org/10.1002/CLEN.200800038.

[48] Dimas Bagus Triatmojo, Warah Atikah, and Nurul Laili Fadhilah, "Revisiting the Land Conversion of the Protected Forest for the Mining Industry in Tumpang Pitu, Banyuwangi," *Indon. JLS* 1 (2020): 37, https://doi.org/10.19184/IJLS.V1I1.16761.

[49] I Putu Gede Ardhana, "Kajian Kerusakan Sumberdaya Hutan Akibat Kegiatan Pertambangan," *Ecotrophic* 6, no. 2 (2011): 375494.

[50] Douglas Fuller J Miettinen Erik Meijaard, "Deforestation, Degrradation, And Forest Regrowth In Indonesia's Protected Areas From 2000-2010," *Indonesian Journal of Conservation* 2, no. 1 (2013).

profits that are only enjoyed by some people. From various sources of literature, natural resources have not been fully implemented for the welfare of the community evenly, especially for those who live around the mining area.[51] The mining sector has shown a negative impact on economic growth and has not significantly reduced poverty and income inequality.[52] Meanwhile, it is confirmed by the study that the increase in regional income inequality in areas where large mining industries start operating.[53] These findings highlight the need for careful consideration of the impact of industrialization on income distribution in traditionally agrarian regions.

In Indonesia, the establishment of nickel (Ni) mining has led to water and sanitation problems, nutritional issues, and challenges in health care delivery services.[54] Community welfare is often debated between stakeholders, especially the government and the community, which often leads to conflict. Therefore, local communities often have traditional wisdom in managing natural resources and the environment, but the entry of the mining industry can affect community wisdom, erode culture and have an impact that directly affects the environment which is the object of wisdom. In the Central Halmahera region in Indonesia, mining companies are regarded as a destructive force that pollutes vital water sources, with negative impacts greater than the positive impacts on local communities.[55]

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51 Liana Endah Susanti, "Economic Law Creation Beautiful Global Indonesia," *Bestuur* 7, no. 1 (2019): 47–53, https://doi.org/10.20961/bestuur.v7i1.42701.

52 Rina Indiastuti Sudarlan and Arif Anshory Yusuf, "Impact of Mining Sector to Poverty and Income Inequality in Indonesia: A Panel Data Analysis," *International Journal of Scientific and Technology Research* 4, no. 6 (2015): 195–200.

53 Rustam Abdul Rauf et al., "Industrialization and Regional Income Inequality: Agriculture Transformation," in *IOP Conference Series: Earth and Environmental Science*, vol. 681 (IOP Publishing, 2021), 12088, https://doi.org/10.1088/1755-1315/681/1/012088.

54 Kathryn Robinson, "The Soroako Nickel Project: A Healthy Development?," *International Journal of Health Services* 15, no. 2 (1985): 301–19, https://doi.org/10.2190/LMFK-ARA1-935L-QJMU.

55 M Ridha Ajam et al., "Local Wisdom of Natural Resource Management in Communities Around the Mine in Central Halmahera Regency," *Journal of Social Science* 4, no. 1 (2023): 282–93, https://doi.org/10.46799/jss.v4i1.517.

Apart from the issue of the welfare of communities around mines, agrarian conflict is also a problem in mining in Indonesia. Mining land compensation conflicts in Indonesia are complex, involving multiple stakeholders in both the disputes and their resolution. They arise from competing ideas about land, with relational-traditional views often overshadowed by money-based understandings promoted by mining companies and local elites.[56] Conflicts arise between mining companies, communities and government levels include land tenure and environmental degradation. Overlapping land use plans have increased conflicts as the transformation of agricultural land into mining areas has negatively impacted farmers.[57] Comprehensive conflict resolution is needed to prevent recurring issues, taking into account the local context rather than solely focusing on the legal process. This type of alternative dispute resolution can be used in Indonesia as it can provide a sense of justice while addressing the complex social, economic, and cultural aspects of mining conflicts.[58]

Indonesia's mining problems are also exacerbated by illegal mining practices. Illegal mining is a widespread problem with significant impacts on various aspects. It involves a complex network of actors including miners, politicians, and law enforcement levels.[59] The scale of illegal mining is huge with reports stating that 90% of artisanal mining in Indonesia is illegal, employing up to one million people across 77,000

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[56] Kristina Großmann, "Conflicting Notions of Land in Indonesia," *Society & Natural Resources* 37, no. 5 (2024): 644–59, https://doi.org/10.1080/08941920.2023.2223540.

[57] I Qurbani, "Mining Conflict Resolution: A Case Study of Iron Sand Mining in Lumajang, Indonesia," in *Proceedings of the First Brawijaya International Conference on Social and Political Sciences, BSPACE, 26-28 November, 2019, Malang, East Java, Indonesia*, 2020, https://doi.org/10.4108/eai.26-11-2019.2295155.

[58] Rachmad Safa'at and Indah Dwi Qurbani, "Alternatif Penyelesaian Sengketa Pertambangan (Studi Di Kabupaten Lumajang Provinsi Jawa Timur)," *Jurnal Konstitusi* 14, no. 1 (2017): 150–67, https://doi.org/10.31078/jk1417.

[59] Ongku P Hasibuan, Jann H Tjakraatmadja, and Yos Sunitiyoso, "Illegal Gold Mining in Indonesia: Structure and Causes," *International Journal of Emerging Markets* 17, no. 1 (2022): 177–97, https://doi.org/10.1108/ijoem-11-2019-0964.

sites.[60] Illegal mining occurs due to economic factors, barriers to entry/inadequate permits, availability of resources in the community, political factors and psychosocial elements.

Mining in Indonesia investment capital ownership is still dominated by foreign capital owners. This is confirmed in several research results on mining companies in Indonesia showing a significant foreign influence in capital ownership and investment. Foreign ownership is proven to have a positive effect on the performance of intellectual capital in mining companies.[61] However, it has no significant effect on capital structure.[62] The dominance of foreign investment in Indonesia's natural resources sector, particularly in the oil, gas and gold-copper mining sectors, has had both positive and negative impacts. While contributing to economic development through increased labor absorption and technology transfer, foreign investment has also resulted in environmental damage and health problems for local communities around mining sites.[63] These findings highlight the complex dynamics of foreign investment in Indonesia's mining sector and the need for balanced policies to address economic and social concerns. The government has been pushing for downstream development for a decade, but it has not shown maximum results yet. There is a need for collaboration across government institutions, domestic companies, research institutions and universities to achieve better outcomes.

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[60] Jeffrey Brand-Ballard, *Limits of Legality: The Ethics of Lawless Judging* (Oxford University Press, 2010), https://doi.org/10.1093/ACPROF:OSO/9780195342291.001.0001.

[61] Astian Yosi Meilani et al., "The Effect Of Ownership Structure On The Performance Of Intellectual Capital," *Jurnal Akademi Akuntansi* 4, no. 2 (2021): 229–45, https://doi.org/10.22219/jaa.v4i2.17897.

[62] Hasna Aini Sabrina, Risal Rinofah, and Ratih Kusumawardhani, "Pengaruh Profitabilitas, Likuiditas, Kepemilikan Institusional Dan Kepemilikan Asing Terhadap Struktur Modal Pada Perusahaan Pertambangan Yang Terdaftar Di Bursa Efek Indonesia Periode 2015-2019," *J-MAS (Jurnal Manajemen Dan Sains)* 6, no. 2 (2021): 315–21, https://doi.org/10.33087/jmas.v6i2.292.

[63] Yuli Tri Cahyono et al., "The Hegemony of The Exxonmobil and Freeport Contract in Investing in Indonesia and Also The Abandonment of The Local People's Health Rights.," *Indian Journal of Forensic Medicine & Toxicology* 14, no. 2 (2020), https://doi.org/10.37506/ijfmt.v14i2.3503.

Indonesia's marine and coastal ecosystems face enormous threats from mining activities. In Sulawesi, destructive mining activities have resulted in environmental damage, endangering local communities and marine life.[64] These impacts extend to sensitive habitats such as coral reefs, mangroves and seagrass beds, which are critical for fish production and biodiversity.[65] In Bangka Island, North Sulawesi, mining activities have resulted in irreversible damage to critical terrestrial and marine ecosystems, impacting tourism and fishermen's livelihoods.[66] Despite government efforts to establish marine protected areas and regulations, these measures are often insufficient to protect Indonesia's rich biodiversity from mining-related threats. To address this issue, experts recommend implementing more effective and sustainable mining management policies and finding alternatives to destructive practices in coastal and marine areas.[67] Negative impacts on the environment can undermine the well-being of society.

Mining problems in Indonesia that are no less important are the polemics over post-mining reclamation which has not shown any significant development. In fact, based on the results of various studies, it shows the neglect of post-mining reclamation as we explained previously. Coal mining in Indonesia has left many mine pits, especially in East Kalimantan, which pose significant environmental and safety risks.[68] Failure to implement effective reclamation is due to regulatory

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[64] Ani Susanti, "Mining Policy and Environmental Damage; Case Study in Central Sulawesi," n.d., https://doi.org/10.37500/ijessr.2020.3603.

[65] Daniel Francis Richard Cleary and Lyndon Devantier, "Indonesia: Threats to the Country's Biodiversity," *Encyclopedia of Environmental Health* 1 (2011): 187–97, https://doi.org/10.1016/b978-0-12-409548-9.11762-2.

[66] Flora Pricilla Kalalo, "Revisiting the Mining Controversy of Bangka Island, Minahasa Regency, North Sulawesi, Indonesia," in *ICOMHER 2018: Proceedings of the 1st EAI International Conference on Medical And Health Research, ICoMHER November 13-14th 2018, Padang, West Sumatera, Indonesia* (European Alliance for Innovation, 2019), 134, https://doi.org/10.4108/EAI.30-10-2018.2281478.

[67] Supriharyono Supriharyono, "The Problems of Coastal and Marine Resources Management in Indonesia," *Journal of Coastal Zone Management* 4, no. 1 (2000): 41–49.

[68] Zulfatah Zulfatah, Hidayati Hidayati, and Andi Nur Hidayah, "Application of Eco-Democracy to Environmental Legal Protection Post-Mining Reclamation in

vagueness, weak enforcement, and companies abandoning sites without fulfilling their obligations. To address this, a worst-case scenario guarantee mechanism should be proposed, requiring companies to provide up-front guarantees covering the potential cost of environmental damage.[69] Reclamation efforts in Indonesia are considered less effective due to lack of community participation and lack of application of technology in both reclamation activities and environmental control.[70] While most reclamation programs aim to reforest mining areas, new approaches such as eco-habitats are emerging to optimize social, economic and ecological benefits through collaborative partnerships between stakeholders.[71]

The adoption of green technologies in Indonesia's mining industry faces various challenges, but efforts continue to be made to improve environmental performance. The implementation of green mining involves co-operation between the government, companies, investors and researchers through policy, management, investment and green technology.[72] Research has revealed that certain green accounting-based mining practices to support the use of recycled materials, renewable energy, and allocating green costs, can positively impact environmental performance.[73] However, recent studies have presented that the

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Indonesia," *Jurnal Impresi Indonesia* 3, no. 3 (2024): 224–34, https://doi.org/10.58344/jii.v3i3.4753.

69 Tri Hayati, Conrado M Cornelius, and Andri G Wibisana, "Why Reclamation Bonding Mechanisms Fail in Indonesia," *Journal of Energy & Natural Resources Law* 39, no. 4 (2021): 393–418, https://doi.org/10.1080/02646811.2020.1844962.

70 Misbakhul Munir and R R Diah Nugraheni Setyowati, "Kajian Reklamasi Lahan Pasca Tambang Di Jambi, Bangka, Dan Kalimantan Selatan," *KLOROFIL: Jurnal Ilmu Biologi Dan Terapan* 1, no. 1 (2017): 11–16, https://doi.org/10.30821/kfl:jibt.v1i1.1233.

71 Priyaji Agung Pambudi et al., "Coal Mining Reclamation as an Environmental Recovery Effort: A Review," *Journal of Degraded and Mining Lands Management* 10, no. 4 (2023): 4811–21, https://doi.org/10.15243/jdmlm.2023.104.4811.

72 Asep Saepudin et al., "Indonesia Green Mining Industry," *European Journal of Development Studies* 2, no. 5 (2022): 22–31, https://doi.org/10.24018/ejdevelop.2022.2.5.169.

73 Wahyuni Wahyuni, Inten Meutia, and Syamsurijal Syamsurijal, "The Effect of Green Accounting Implementation on Improving the Environmental Performance

application of renewable energy can have a negative impact on environmental performance, while recycling waste has a positive impact.[74] The mining industry is moving towards digitalization, creating opportunities for cost reduction and safety improvement.[75] Digitization can be maximized by the use of big data in the control and management of environmental systems, as well as comprehensive efforts that are tailored to the needs of the digitization program.

Current mining laws are insufficient to protect against franchised activities and enforcement among various entities. Addressing these issues requires strong regulation, better enforcement in the future, and collaboration among criminal justice agencies.[76]

B. Weaknesses of Indonesia's Mineral and Coal Mining Regulations in Indonesia

Not aligned with the Mining Law and the Environmental Protection and Management Law

Law of environmental protection and management and environmental insights are placed as a forum to be able to mitigate the risk of negative impacts of mining. The law as environmental protection and management as a command of environmental law enforcement includes a strategic step is the implementation of risk management. The risk of the possibility of something arising from an event involves effort to avoid environmental damage, and if environmental damage occurs, steps must be taken to address it.

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of Mining and Energy Companies in Indonesia," *Binus Business Review* 10, no. 2 (2019): 131–37, https://doi.org/10.21512/bbr.v10i2.5767.

74 Fransisca Melenia, Aisa Tri Agustini, and Hendrawan Santosa Putra, "The Effect of Implementing Green Accounting on the Environmental Performance of Cement, Energy, and Mining Companies in Indonesia," *The Indonesian Accounting Review* 13, no. 1 (2023): 49–60, https://doi.org/10.14414/tiar.v13i1.3135.

75 Etika Ariyani, "Green Growth for Achieving Education and Technology Transformation in the Mining Industry," in *IOP Conference Series: Earth and Environmental Science*, vol. 413 (IOP Publishing, 2020), 12018, https://doi.org/10.1088/1755-1315/413/1/012018.

76 Arif Rohman, Hartiwiningsih, and Muhammad Rustamaji, "Illegal Mining in Indonesia: Need for Robust Legislation and Enforcement," *Cogent Social Sciences* 10, no. 1 (2024): 2358158, https://doi.org/10.1080/23311886.2024.2358158.

The reality is that misalignment between environmental and mining laws in Indonesia creates regulatory gaps and weak oversight, particularly in ensuring environmental sustainability in mining areas. Despite the enactment of Law No. 3 of 2020 on Mineral and Coal Mining and Law No. 23 of 2009 on Environmental Protection and Management, corruption and environmental degradation continue to occur. The centralization of mining authority to the government reduces transparency and public participation and its implementation remains problematic. For this reason, harmonization of laws is needed to eliminate overlapping authority and integration of regulations in various sectors of law. An integrated concept of supervision is also needed for sustainable environmental management in the mining sector. By implementing regulations that govern the digitalization of environmental monitoring, the support also ensures that mining companies are responsible for managing environmental data management control in real time.

Provisions in the Law of environmental protection and management require community involvement in the process of preparing an Environmental Impact Assessment (EIA/AMDAL) as per Article 26 of the Law of environmental protection and management. This is in stark contrast to provisions in the minerba law that do not emphasize the role of the community in the process. In addition, the mineral and coal mining law allow mining companies to begin exploration without completing a full Environmental Impact Assessment (EIA). This may violate the environmental precautionary principle stipulated in the law of environmental protection and management. The minerba law should be emphasized more as an administrative requirement that must be fulfilled. For more details, we present a comparison between Law No. 4/2009 and Law No. 3/2020.

Table 1. Comparison of Law 4 of 2009 and Law 3 of 2020, on environmental management

Law Number 4 Year 2009	Law Number 3 of 2020
Article 39 Paragraph 1 letter n This provision clearly emphasizes that exploration mining licenses already require the owner to prepare and have an environmental impact assessment (EIA) determined	Article 39 letter l The process of issuing an IUP has an obligation to prepare an environmental document
Article 39 Paragraph 2 letters j and k The provision requires production operation IUPs to contain environmental and reclamation studies, as well as reclamation and post-mining guarantees	

Source: Author's Analysis

In an environmental perspective Law number 3 of 2020 eliminates many of the values of Law number 4 of 2009. The comparison of the reality of the norms in the provisions of the law is the difference between the obligation to have an Environmental Impact Assessment (EIA) in Law number 4 of 2009 and the obligation to prepare environmental documents in Law number 3 of 2020. The underlying problem is that environmental documents consist of various types, including Environmental impact assessment (EIA), Environmental Management Efforts and Environmental Monitoring Efforts (UKL-UPL), Environmental Management and Monitoring Affordability Statement (SPPL), as contained in Government Regulation Number 22 of 2021 on the Implementation of Environmental Management and Protection. In the preparation of environmental documents, the business classification is adjusted as specified in the Indonesian Standard Business Field Classification (KBLI), for example the KBLI code for nickel ore mining has the code 07295.[77] In the Appendix to Government Regulation Number 22 of 2021 page 287, the provisions of environmental documents for nickel ore mining business activities consist of the obligation to have an environmental impact analysis (EIA) or only

[77] OSS (Online Single Submission), "Klasifikasi Baku Lapangan Usaha Indonesia (KBLI) 2020" (BKPM/Ministry of Investment of the Republic of Indonesia, 2020).

required to have Environmental Management Efforts and Environmental Monitoring Efforts (UKL-UPL). Therefore, it is the intention of Article 39 letter l of Law 3 Number 2020. Based on the above explanation, the mineral mining sector, energy sector, and metals can be divided into the following table:

Table 2. Comparison of Scale/Large that Qualify EIA or Environmental Management Efforts and Environmental Monitoring Efforts (UKL-UPL) in Nickel Ore Mining.

Mineral Mining Energy and Metals Sector	
Scale/Magnitude of the EIA	Scale/Magnitude of UKL-UPL
Land Area ≥ 200 ha	License area < 200 ha (medium high)
Open area for mining ≥ 50 ha (Cumulative per year)	Open area for mining < 50 ha (cumulative per year) (medium high)
Ore production capacity ≥ 300 tons per year	Ore production capacity < 300,000 tons per year (high medium)
Amount of cover material removed ≥ 1,000,0000 bcm per year	Amount of material moved < 1,000,000 bcm per year (medium high)
Hazardous Waste stockpiling activities at a resettlement facility in an ex-mining area	

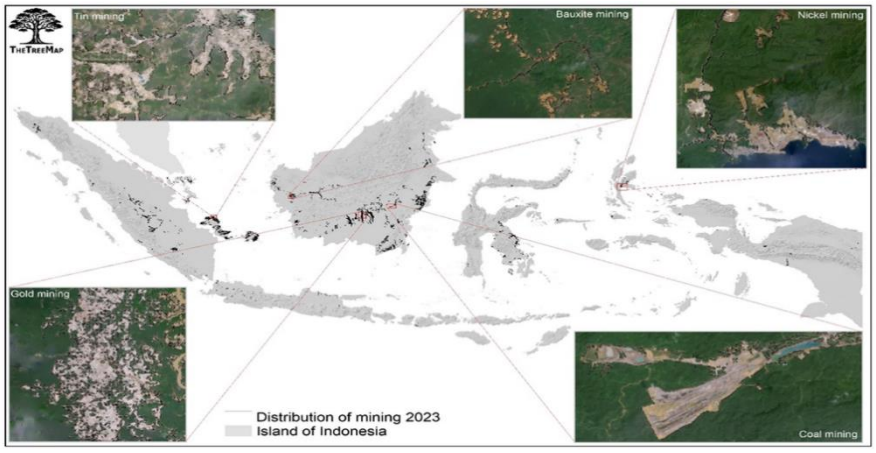
Source: Annex to Presidential Regulation Number 22 of 2021 Page 278

The provisions on environmental impact assessment (EIA) above require partial fulfilment of the conditions, ensuring that if one of the conditions is fulfilled, an Environmental Impact Assessment must be carried out. Furthermore, fulfilment of Environmental Management Efforts and Environmental Monitoring Efforts (UKL-UPL) are cumulative conditions, meaning that it must be fulfilled in their entirety. UKL-UPL serves as an environmental document to fulfil the provisions of Article 39 of Law Number 3 of 2020.

As several cases based on research reports that sand mining, excavation rock mining alone can seriously damage the environment. It becomes the problem of sedimentation in river flows or deep waters or inland waters (rivers, lakes, and ponds) or silt deposits that can interfere with agricultural land, particularly when compared to the nickel ore mining extraction industry. While the land area is less than 200 ha, which

is fulfilled based on the normative requirements in article 39 letter I of Law Number 3 of 2020, it is still very disturbing about serious impacts on the environment, especially since the total distribution of deforested forests in Indonesia based on satellite imagery is 700,000 ha.[78] As it is also known that Indonesia's topographical cover is filled with forest vegetation, resulting in these natural conditions, most mining licenses must fulfil the conditions for the issuance of a Borrow-to-Use Forest Area Permit (IPPKH). The mining area is located in forest vegetation, but ironically the number of mining companies in Indonesia that do not have a forest area borrow-to-use permit is 50%[79] of the total mining companies operating in forest areas.

Figure 1. Indonesia's mining footprint 2001-2023 (black). Generated using high-resolution satellite imagery



Source: data has been processed from the source, kompas.id

The conditions that occur provide reinforcement that the stages of the process of issuing permits and mining management should prioritize environmental insights not only to pursue investment achievement targets. An environmental perspective is needed with global conditions facing climate change and economic uncertainty, not just chasing money but resource needs must be maintained. Therefore, we recommend that

[78] Ahmad Arif, "Deforestasi Citra Satelit Mengungkap, 700.000 Hektar Hutan Di Indonesia Telah Ditebang Untuk Tambang" (kompas.id, 2024).

[79] "Miliki Perusahaan Tambang? Pahami Cara Mengurus Izin Pinjam Pakai Kawasan Hutan" (kliklegal.com, 2022).

Article 39 of Law Number 3 of 2020 be returned as Article 39 of Law Number 4 of 2009.

Natural resource wealth which is controlled by the state in its management should involve the community as a manifestation of people's sovereignty. The right to a good and healthy environment must be legally understood and materialized through legal processes to protect the community and the environment.[80] Concerns about the quality of Environmental Impact Assessment (EIA) documents often arise as a result of the content of the minerba law to simplify the process of preparing an Environmental Impact Assessment (EIA) to support investment. It strongly suggests that environmental impact assessments will be less comprehensive if the focus is on expediting licensing. A more concrete issue is the abolition of the EIA assessment committee.[81] This aims to accelerate the target of investment realization but less to maintain environmental aspects and even the community's economic rights to the environment.

Lack of Public Participation

Regulations governing community participation in mining decision-making in Indonesia have a number of significant normative flaws, both in terms of content, structure and implementation. Existing legal provisions often use generic and polysemous phrases such as "interested community" without providing a clear definition, leaving room for unilateral interpretation by the government or companies. In addition, existing regulations do not provide veto rights to communities, especially indigenous peoples, who are potentially directly affected, nor do they provide special protection to vulnerable groups such as women, children and minorities. In terms of structure, there is overlap between different regulations, such as the Minerals and Coal Law and other laws that are often inconsistent with each other, and focus more on accelerating investment than protecting community rights. Lack of inter-

[80] Siti Sundari Rangkuti, "Hukum Lingkungan Dan Kebijaksanaan Lingkungan" (Surabaya: Airlangga University Press, 2005).

[81] Irja Tobawan Simbiak, "Keterlibatan Masyarakat Pada Proses Amdal: Potensi Permasalahan, Implikasi & Faktor Penyebab," *Jurnal Wilayah, Kota Dan Lingkungan Berkelanjutan* 1, no. 1 (2022): 42–56, https://doi.org/10.58169/jwikal.v1i1.37.

ministerial coordination and the weak legally binding nature of declarative regulations further hamper their implementation. On the other hand, existing legal norms are not based on local values, fail to recognize customary law, and do not empower communities, which should adopt the principle of Free, Prior, and Informed Consent (FPIC) as the main decision-making authority. In addition, weak norm enforcement due to the absence of strict sanctions and legal mechanisms that are difficult to access by the community make it difficult to handle violations in a participatory manner. We present in tabular form the regulatory weaknesses related to the lack of community participation in the current mineral and stone mining law.

Table 3. Regulations on the weaknesses of community participation

Norms	Weaknesses
Article 39 of Law No. 30 of 2020	The simplification of norms from the previous law is considered to accelerate investment. The issuance of IUPs has no explicit requirements involving community participation, nor does it emphasize the rights of indigenous peoples or customary territories or affected communities. Recommendation Analysis: The ruler should not stand alone on behalf of the state, but the attitude of the community must also be understood as an attitude on behalf of the state. The middle way is inclusive economic democracy which is a milestone of the Indonesian economy Article 33 Paragraph 1 of the 1945 Constitution
Article 10 Paragraph 2 of Law No. 3 of 2020	The determination of WP has accommodated the affected communities in an integrated manner with consideration of various ecological, economic, human rights and socio-cultural aspects as well as environmental insights. Analysis: So far there is no mechanism regarding mining companies that conduct mining in mining areas (WP) have /or have not violated aspects of consideration for the formation of WP. The intention is more emphasized if the mining company has violated this aspect to be a means of revocation of IUP in WP administratively

Source: Author's Analysis

Based on the idea of implementing the principle of inclusive economic democracy, as in the table above in row 1 column 1, the community has a stance on behalf of the state so there needs to be a formulation of veto rights to stop the implementation of mining activities.

Lack of Environmental Economic Rights Guarantee for Communities

The community's environmental economic rights are obtained from the carrying capacity of the environment to contribute to the community's economy such as fertile land for agriculture and plantations, customary land, customary forests and community customary rights that have been utilizing the economic carrying potential of the environment for generations. In the future, mining should support all community environmental economic rights inclusively. This situation is very contrary to the goal of sustainable development as it prioritizes temporary economic benefits that can only be enjoyed with state budget (APBN) per year, but negates long-term environmental protection which, if damaged, will burden the multi-year APBN. To overcome this, concrete regulations are needed by reviewing the Minerba Law and to prioritize long-term and sustainable environmental protection. Environmental impact assessments (EIA) are very important to maintain as part of the mining permit decision-making process in which there is community involvement. The obstacles to community involvement are exacerbated by the existence of Article 162 of Law Number 3 of 2020 which stipulates that "Anyone who obstructs or interferes with the mining business activities of the holders of IUP, IUPK, IPR, or SIPB who have fulfilled the conditions as referred to in Article 136 Paragraph (2) shall be punished with a maximum imprisonment of 1 (one) year or a maximum fine of Rp.100,000,000.00 (one hundred million rupiah). The elements of this article with the words disturbing and obstructing can reduce or even limit the community's right to get advocacy for environmental economic rights and civil rights. Even worse, there is no juridical interpretation as stated in the explanation of the mineral and coal law. The interpretation of the words disturbing and obstructing will be based on grammatical interpretation or with other methods of

interpretation, ensuring the debate will cause bias in meaning and the absence of legal certainty. It can be said that these two words "disturbing and obstructing" belong to and are powerful weapons of mining companies not belonging to the community and the state. In particular, the words disturb and obstruct refer to Article 136 Paragraph (2) concerning the settlement of land rights and resolved in stages, community land rights can be possible to be resolved in stages. It means that the community does not have legal certainty, especially regarding the legal certainty of environmental economic rights.

Article 162 of Law Number 3 of 2020 negates economic democracy and the interests of the people as a whole. Even this article opens opportunities for criminalization of communities fighting for land rights and environmental economic rights regarding the existence of mining in their area. It is worsened by the absence of terminology (definition) of community environmental economic rights. There should be community economic rights in Article 1 of the Minerba Law, as an affirmation of the scope of regulation of environmental economic rights to the community.

The environment can be put into two perspectives: the living environment and the economic environment. The living environment as it relates to humans as hydrocarbon biological creatures, need a good environment to live while the economic environment focuses on the carrying capacity of the environment socially providing economic income. A concrete example of beautiful coral reef environment and its biodiversity is able to support the community's economy from various aspects. It is able to revive the tourism industry and other hospitality industries, fishermen and revive the fishing industry and encourage food security.

The negative environmental impacts of mining are able to erode the economic potential of the environment which has an impact on the decline in community welfare. This reality needs conceptual norms to apply specifically to emphasize community advocacy and environmental economic rights that can be empowered.

The Constitutional Court Decision 91/PUU-XVIII/2020 expressly states that Law Number 11 of 2020 on Job Creation is conditionally unconstitutional in which there are inconsistencies in the substance of articles such as in Article 31 which is very contrary to Article

22 of Law Number 22 of 2019 on Sustainable Agricultural Culture Systems. Therefore, we present a very significant contradiction as explained below:

Table 4. Comparison of regulatory inconsistencies between Law No. 11 of 2020 and Law No. 22 of 2019 on Sustainable Agricultural Culture System

Article 31 of Law Number 11 of 2020 on Job Creation	**Article 22 and Article 111 of Law No. 22/2019 on Sustainable Agricultural Culture System**
Paragraph 1: Business Actors using customary rights land that do not conduct deliberations with customary law communities holding customary rights to obtain approval are subject to administrative sanctions in the form of: a. temporary suspension of activities; b. imposition of administrative fines; c. Government coercion; d. suspension of Business Licenses; e. revocation of business license.	Article 22: "In the event that Land use in a certain area as referred to in Article 21 paragraph (1) is carried out by Business Actors on customary rights Land, Business Actors are required to conduct deliberations with customary law communities holding customary rights to obtain approval."
Paragraph 2: Further provisions regarding the criteria, types, amount of fines, and procedures for imposing administrative sanctions as referred to in paragraph (1) shall be regulated in a Government Regulation.	Article 111: Business Actors using customary rights land who do not conduct deliberations with customary law communities holding customary rights to obtain approval as referred to in Article 22, shall be punished with a maximum imprisonment of 7 (seven) years and a maximum fine of Rp5,000,OO0,000.00 (five billion rupiah).

Source: Constitutional Court Decision 91/PUU-XVIII/2020

The petitioners in the constitutional case that examined the law against the constitution or the basic law considered that significant changes reduced the constitutional rights of citizens, especially the rights of indigenous peoples to their customary rights. By changing the substance from criminal sanctions to administrative sanctions, it would certainly lead to a large number of land grabbing that would occur

arbitrarily as a result of the weakening of sanctions applied to changes in the applicable rules.

Based on the two descriptions of the substance of the article that is very contrary to the guarantee of community economic rights contained in Article 162 of Law Number 3 of 2020, it provides enormous access to the law by entrepreneurs who have issued mining business permits (MBP/IUP) through protection schemes that lead to criminalization of the community. On the one hand, Article 31 of the Job Creation Law provides relief to business actors to use customary rights, and if there is no prior deliberation, only administrative sanctions are imposed. This normative fact provides an unbalanced position between economic rights and/or community customary rights with business actors (company owners).

The issue of the lack of guaranteed economic rights to the community may arise due to widespread environmental impacts that can disrupt the comfort of settlements such as flooding, agricultural land areas that cause a deficit in food production in an area or because of agrarian conflicts that directly lead to land disputes.

Related to agrarian conflicts, the One Map Policy (OMP/KSP) needs to be improved and made effective, ensuring that there are no overlapping land use permits. Even though the One Map Policy (KSP) has been released from 2018, there are still many land disputes found, revamping the KSP towards an open and more accommodating to the public is one of the current hopes for overcoming agrarian conflicts in Indonesia. More comprehensive law enforcement is not only the settlement of disputes in court, but better law enforcement is to improve governance as best as possible, ensuring that there are no legal disputes. This matter needs to be addressed by the government, but indeed to carry it out there needs to be infrastructure investment (web one map, land coordinate input application, server, etc.) and also investment in human resources (apparatus that can use infrastructure applications).

The one map policy (KSP) can provide legal certainty and improve the economic investment climate and reduce conflicts among communities, ensuring that the one map policy has a positive impact that has a double effect on improvements in other aspects. For example, mining, agriculture, aquaculture and many more, but what is currently happening is not well integrated from various sectors.

Lack of Illegal Mining Control and Enforcement

Illegal mining is one of the biggest causes of environmental damage, they do not have licenses and are not bound by environmental regulations. Therefore, there is freedom to damage the environment without significant legal consequences. Lack of Law Enforcement on illegal miners as authorities often do not have the resources or courage to crack down on illegal mining. It especially happens if the perpetrators involve powerful individuals. Illegal mining harms ecosystems, pollutes water and soil, and eliminates biodiversity.[82] Here we present data on illegal mining in Indonesia as in the following table:

Table 5. Number of Illegal Mines in Indonesia in the Last 4 Years

No.	Release Date and Year	Unlicensed Mining	Coal Mine	Mineral Mining
1.	October 13, 2021	2,741 Locations [83]	96	2.645
2.	July 12, 2022	2,700 Locations [84]	96	2.645
3.	December 8, 2023	2,741 Locations [85]	-	-
4.	August 28, 2024	2,741 Locations [86]	-	-

Source: Data processed from various sources

The data above reveals the complexity of resolving illegal mining. It is quite static with no dynamics and changes showing no real action. The public is waiting for the government's commitment with an official release every year. Based on data on the number of mining locations over the past four (4) years, the number shows a very large number with an average of 2,731 locations. Many efforts to optimize the eradication of

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[82] Ahmad Redi, "Responsive Law Enforcement in Preventing and Eradicating Illegal Mining in Indonesia," *Journal of Law and Sustainable Development* 11, no. 8 (2023): e1436–e1436, https://doi.org/https://doi.org/10.55908/sdgs.v11i8.1436.

[83] Christine Novita Nababan, "Kementerian ESDM Ungkap 2.741 Lokasi Tambang Ilegal" (CNN Indonesia, 2021).

[84] Biro Komunikasi dan Layanan Informasi Publik, "Siaran Pers Kementrian Energi Dan Sumber Daya Mineral Nomor : 259.Pers/04/SJI/2022," 2022.

[85] HumasMinerba, "Serius Tangani Tambang Ilegal, Ditjen Minerba ESDM Akan Bentuk Satgas!," 2023.

[86] CNBC Indonesia TV, "Ada 2.741 Tambang Ilegal, Penambang: Jangan Cuma Tangkap Yang 'Kecil'" (CNBC Indonesia, 2024).

illegal mining in Indonesia by taking action against those who carry out illegal mining, law enforcement efforts are an effective formula by applying very strict and burdensome sanctions.

There are four categories of illegal mining activities, including mining without a license, expiring permits but still mining, mining outside the coordinate points, mining activities not in accordance with their designation, exploration IUP but used for mining.[87] Efforts to combat illegal mining are certainly based on the category of illegal mining, but what is very urgent is to make digitalization efforts to facilitate supervision and transparency. Besides, that there are formalization efforts that if the mine is from community mining but if it is from a corporation then it should be with legal action. For comprehensive efforts with more comprehensive law enforcement efforts by improving laws, increasing the human resources of law enforcement officials and infrastructure, as well as a strong cross-sector commitment to limit illegal mining practices.

The problem of illegal mining in Indonesia is quite complicated, because this problem is considered to be quite systematic. By combating and controlling must also be systematic or in other words from upstream to downstream. The prosecution is not merely on the subject of miners who are caught while carrying out mining at the location. However, the persons who accommodate illegal mining products must be traced and there is a need for criminal articles for collectors/buyers with the existence of a new term for illegal mining products in the law (*ius constituendum*). These illegal miners are from the surrounding community who, due to their educational and economic background, will carry out illegal mining. The problem is that those who carry out illegal mining will do so because there are collectors/buyers.

Illegal mining with the category of mining that is not in accordance with its designation has a modus operandi that the owner of a mining business permit (MBP/IUP) gives other parties within the IUP coordinates to carry out mining. The parties involved usually are the surrounding community with makeshift tools and inappropriate mining procedures, ensuring the mining results will be obtained easily and at low

[87] Irwandy Arif, "Jalan Terjal Pemberatasan Tambang Ilegal" (CNBC Indonesia, 2024).

cost. The community (illegal miners involved) will sell it to the owner of the mining business permit (MBP/IUP) at a low price as well. This is a form of game that will cause environmental damage due to inappropriate procedures and tools. Besides, it can be detrimental to state financial losses, as it is not carried out by the owner of the production operation IUP which must comply with the workplan and budget (WP/RKAB). If this takes place, the potential for taxes, dividend revenue sharing, and corporate social responsibility (CSR) cannot receive benefits. This issue needs aggravating sanctions, especially for individuals and corporations, both administratively revoking licenses, civil sanctions with unlawful acts with the amount of compensation from the calculation of environmental losses. Therefore, there is a mechanism for confiscating property as collateral for environmental reclamation and added with heavy fines, and criminal sanctions with minimal criminal threat qualifications that are very burdensome.

Related to illegal mining, efforts are needed to strengthen regulations, improve and integrate mining data. Supervision must be optimal by always checking and unannounced inspections for active mines and also if necessary there is a real time satellite technology infrastructure to monitor potential mining areas based on exploration results and satellite images that will be monitored so that there are no land openings for illegal mining. Investment on human resources for law enforcement officials to be more optimal in carrying out law enforcement tasks and welfare benefits because if welfare is not fulfilled. The space for corruption will be open, counseling to provide insight to the surrounding community about the impact of illegal mining and provide information on what has been presented in the environmental impact analysis (EIA), ensuring public control (surrounding community) to implement. The welfare of the surrounding community by providing incentives for education, health and creative economy with micro, small and medium enterprises (MSMEs). Furthermore, the community needs to be optimized for labor absorption in mining company investments with training at the Work Training Center (WTC) carried out by the Regional Government. This effort can certainly be materialized with cross-sector collaboration, although the Ministry of Energy and Human Resources (ESDM) will initiate this collaboration.

The problem of illegal mining in Indonesia is basically not due to weaknesses in the articles in the law but rather the non-implementation of the articles in the law effectively and properly or otherwise the articles in the law are not supported by the existence of law enforcement infrastructure, therefore we present in the following table :

Table 6. Weaknesses in licensing implementation and infrastructure

Type of Norm	Weaknesses of Implementation	Infrastructure Weaknesses
Article 35 of Law 3 of 2020, mining requires licensing	Not all people know the licensing procedures	
Article 158 of Law 3 of 2020, punishment of business actors without a license	Enforcement of this article is often inconsistent and there is intervention from certain parties, many modus operandi with the support of political elites and power	
Article 161 of Law Number 3 of 2020, officials who abuse their authority over the issuance of licenses	Corruption or collusion often weakens the monitoring and prosecution of illegal mining	
Article 36 Paragraph (1) of Law 32 of 2009, activities that have an impact on the environment must have an environmental permit	Illegal mines often operate without environmental permits	
Article 109 Paragraph (1) of Law 32 of 2009, violation of the obligation to have an environmental permit	Environmental law enforcement is often neglected, especially in remote areas	

Article 37 Paragraph (4) of Law No. 26/2007, business activities must be in accordance with spatial planning Jo. Article 9 of Law Number 3 Year 2020 Mining Area	Many illegal mines operate in areas that are not in accordance with their designation	One Map Policy (KSP), open, accommodating, and integrated digital infrastructure from various sectors
Regulation of the minister of Energy and Mineral Resources No. 7/2020, mining business licensing and reporting mechanism.	Bureaucratic complexity and lack of socialization make people reluctant to take care of official permits (the problem lies with the community)	

Source: Author Analysis

Based on the description in the table above, the issue of a valid mining license needs law enforcement in the judicial realm (pro justisia) and dispute resolution in court. Implementation of appropriate norms needs to be supported by collaboration across government agencies of the trias politica (executive, legislative and judiciary). However, the judiciary has a greater role, but the executive and legislature can provide other law enforcement support in the form of judicial welfare budgeting policies and other policies.

Weaknesses in Mining Reclamation Regulations

The improvement aspect of mining in Indonesia continues to be supported to achieve best practices that pay attention to environmental sustainability by regulating post-mining reclamation and post-mining reclamation guarantee funds. Here we present the provisions of post-mining reclamation regulations and post-mining guarantee funds as set out in the following table:

Table 7. Mining Reclamation Regulations in Indonesia

Norm	Provisions and interpretation material
Article 39 letter K	In Chapter IV A, Mineral and Coal Management Plan. It can be interpreted that in mining planning or applying for a Mining Business Permit (MBP/IUP), mining companies must have commitments, reclamation planning documents, reclamation guarantee funds and carry out reclamation. In the provisions of this Article, it does not mention explicitly, but by paying attention to Article 36 Paragraph 1 as a reference to this article, it clearly explains that there are two parts of IUP, which is Exploration IUP and Production Operation IUP, so that the elements of reclamation obligations as in Article 39 letter K are contained as planning, mining implementation, and post-mining
Article 96 letter b	For the sake of implementing good mining engineering principles, it is mandatory for holders of mining business permit (MBP/IUP) or special mining business permit (SMBP/IUPK) to carry out management, environmental monitoring, reclamation and post-mining activities
Article 99	Having an obligation for holders of IUP or IUPK to prepare and submit a reclamation plan and post-mining plan. Implementation of reclamation and post-mining in accordance with the designation of post-mining land. Implementation of reclamation carried out throughout the stages of the mining business must fulfill the balance between the land to be cleared

	and the land to be reclaimed. It must carry out the management of the final ex-mining pit with the most extensive limit, the obligation to hand over land that has been reclaimed and/or post-mining to the entitled party
Article 100	IUP or IUPK holders are required to provide and place reclamation guarantee funds and post-mining guarantee funds, then there is the provision of a reclamation mechanism to third parties, a transfer mechanism to third parties if the IUP or IUPK holder does not carry out reclamation but the responsibility still remains but with the support of funds provided
Article 123 A	A new provision of Law No. 4/2009, IUP and IUPK holders are obliged to carry out reclamation by 100% (one hundred percent) before the return of the Mining Business Permit Area (MBPA/WIUP) or Special Mining Business Permit Area (SMBPA/WIUPK). For former IUP or IUPK holders, they are obliged to carry out reclamation up to 100% (one hundred percent) and place reclamation guarantee funds
Article 161 B	Criminal provisions for holders of IUP or IUPK due to revocation or expiration who do not carry out reclamation, placement of guarantee funds can be punished with qualifying elements of a maximum imprisonment of 5 years and a maximum fine of Rp. 100,000,000,000, as well as additional penalties

Source: mining law and Author's Analysis

There is an ambiguous weakness in the provisions of reclamation regulations as Article 99 of Law Number 3 of 2020 that there is no explicit provision stipulating. The reclamation area or land must be carried out on the affected land area both physically and chemically, or that reclamation is an effort to normalize the impact of mining, not merely or there are restrictions on the land area only that has been stated in the reclamation plan, therefore in our opinion there needs to be regulatory changes that regulate this explicitly in the provisions of the law (*ius constituendum*).

The norms of the provisions of Law Number 3 of 2020 on Mineral and Coal mining which regulate reclamation require a lot of regulation both in terms of governance, technical work, and patent document formats. They can only certainly be contained in the regulations for the implementation of reclamation activities which are hierarchically under the law. This has been emphasized in Article 174 of the Mineral and Coal Law, but until now, its implementing regulations have not been officially published. The reality of this regulation is quite difficult to implement reclamation activities, a legal vacuum can lead to legal uncertainty.

Mining reclamation is a concrete answer to the responsibility of mining companies to restore environmental quality, but the ambiguity of the implementation of reclamation activities will continue as long as there are no guidelines issued as a direct part of Law No. 3 of 2020 with good regulatory substance and relevant to current needs. The Minister of Energy and Mineral Resources Regulation No. 7/2014 on the Implementation of Reclamation and Post-Mining in Mineral and Coal Mining Business Activities was issued from the regime of Law No. 4/2009. In addition, there are many substantial weaknesses including not accommodating the primary objective of reclamation as part of environmental normalization, while the secondary objective is the designation of post-mining environmental areas. However, the provisions in the regulation are far from the principles and definitions and even still deviate by legitimizing the transfer of other designation areas. This can be possible for mining companies to transfer post-mining areas into other forms before reclamation. If it happens, the change in other designation areas obscures the obligation and legal status of post-mining reclamation implementation. Other designation areas may turn into residential areas, mining tourism areas or mining education areas for

the surrounding community, which is a great alibi to negate reclamation obligations. For this reason, any future regulation on mining reclamation should prioritize fulfilling the primary purpose of reclamation, which is restoring environmental conditions to a sustainable state. After that, the secondary purpose should be addressed, such as rehabilitating the land for specific uses like agriculture or forestry. Finally, tertiary purposes, such as allocating reclaimed land for alternative developments like tourism, residential, or industrial areas, can be considered. The primary, secondary and tertiary objectives of mining reclamation are cumulative requirements that must be fulfilled as the community's environmental economic rights to reap environmental economic benefits are needed to support the nation's economy after the stock of mining commodity reserves runs out.

Weaknesses of Mining Green Technology Regulations in Indonesia

Green mining initiatives aim to maintain productivity while addressing environmental concerns. Through green policies, management, investment and technology, governments, industry, investors and researchers can collaborate together.[88] Research has shown that environmentally friendly mining technologies and land reclamation policies have a positive impact on ecosystem stability and mining productivity in Kalimantan.[89] However, regulatory gaps and inefficiencies in mining governance still exist, especially in the management of non-tax revenues. The implementation of e-government systems can improve transparency, accountability and community participation in mining activities.[90] The adoption of green information technology (GIT) in Indonesia's mining sector can help reduce adverse environmental impacts. Although research on GIT in Indonesia has

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88 Saepudin et al., "Indonesia Green Mining Industry."

89 Yunita Sopiana, Rully Fildansyah, and Muhamad Ammar Muhtadi, "Analysis of Land Reclamation Policy and Green Mining Technology on Ecosystem Stability and Mine Productivity in Kalimantan, Indonesia," *West Science Interdisciplinary Studies*, 2024, https://doi.org/10.58812/wsis.v2i06.1032.

90 Rintis Nanda Pramugar and Reny Y Sinaga, "E-Government in Optimizing Non-Tax Revenue of The Mining Sector in Indonesia," *Jaf (Journal of Accounting and Finance)* 5, no. 1 (2021): 36–44, https://doi.org/10.25124/JAF.V5I1.3743.

increased, most studies are limited to a case-based approach, indicating a need for a broader investigation.[91] These findings highlight the potential for enhancing the framework and improving relevant regulations and technology adoption in Indonesia's mining sector.

The public is waiting for government policies to encourage mining innovation by implementing mining green technology, because many mining cases are always problematic with environmental cases, it is hoped that with the adoption of policies that encourage mining green technology, mining companies in Indonesia will gradually implement it. Green technology in mining in Indonesia includes a range of innovations to improve sustainability and reduce environmental impacts. Some of these technologies include efficient waste treatment, such as metal recovery from mine waste and wastewater treatment with advanced filtration technologies. In addition, the use of renewable energy, such as solar and wind power, in mining operations can reduce dependence on fossil fuels and lower the carbon footprint. Mining technologies that minimize environmental impact, such as more efficient underground mining and the use of drones for mapping mine areas, also help to reduce disturbance to ecosystems. The application of green mining concepts is a solution to reduce the negative impacts of mining activities. In addition, dry stack tailings technology in mine waste management is considered safer and more efficient and can reduce negative impacts on the environment. The use of big data to control the mining environment by always taking samples or installing environmental controls such as tools installed in rivers, in the sea to be able to monitor in real time sedimentation and water turbidity, this can control environmental impacts in real terms not just on paper.

For the strengthening of green technology regulations in Indonesia, there are at least four main points that must be met, namely the existence of minimum standards for green technology, the use of technology to reduce carbon emissions, the use of technology to be able

[91] Zahra Nurkarima Budiwati Attori, Udisubakti Ciptomulyono, and Satria Fadil Persada, "Green Information Technology in Indonesia–A Systematic Literature Review," *IPTEK Journal of Proceedings Series*, no. 7 (2021): 78–83, https://doi.org/10.12962/j23546026.y2020i7.9541.

to carry out sustainable resource management, and regulations that encourage innovation and application of green technology.

The application of the minimum standards of green technology regulations in the policy calculates all aspects of the form of mining green technology and then it will be determined how many percent of a mining company has implemented green technology, from this percentage a ranking of companies that implement green technology is given and a green mining certificate is given, besides that the green technology used is certainly the most up-to-date and most efficient innovation measure in its use in each form of technology used; As an example for mineral refining technology between rotary kiln electric furnace (RKEF) compared to hydrometallurgy high pressure acid leaching (HPAL) is considered better, the RKEF system produces greenhouse gas emissions and dust, as well as nickel slag (waste) that has not been processed all, the use of RKEF produces carbon emissions (3) three times that of HPAL, besides the use of RKEF produces liquid waste that must be anticipated by the government,[92] then this becomes additional work. With mining companies implementing HPAL, there is a greener mining production operation, for which there is a good percentage of ratings than from RKEF. Investment in nickel mineral refining with the HPAL method requires more capital, therefore there needs to be a policy to provide a commitment to ease of investment and investment protection, legal certainty, and tax incentives compared to RKEF, and easy access to domestic banking capital.

The explanation between the use of RKEF and HPAL technology is just one example, in this case a policy is needed regarding the classification of green technology and non-green technology; for this reason, it is necessary to formulate the article "Article (X) Paragraph 1. the government determines the latest green/environmentally friendly technology" then Paragraph 2. "Green/environmentally friendly technology is determined by the minister" of all types of green technology that has been determined, the company will implement, and the percentage is measured, the results of the percentage of the use of green/environmentally friendly technology are the basis for granting

[92] Yohanes Paskalis, "Dua Teknologi Smelter Nikel Di Indonesia, Mana Yang Lebih Ramah Lingkungan?" (tempo.co, 2024).

mining companies a green certificate. This kind of regulation is not only a national concern because the world has faced climate change due to increasing carbon emissions while the carrying capacity of the environment to reduce carbon emissions is decreasing with the increasing deforestation in various countries and damage to coral reefs as the earth's engine that sucks carbon dioxide (CO_2), therefore there needs to be awareness at the global level, especially the leaders of countries to commit to global trade in minerals and coal should only accept imports from mining methods that have obtained green certificates, so that with this commitment it can urge mining companies to implement green mining so that the negative impact of mining on damage and pollution can be minimized. It is an effective step if the leaders of the countries sign this cooperation so that the form of cooperation will be ratified in the participating countries and promulgated in each country.

Table 8. Simulation of mining green technology implementation.

No.	Company Name	Galtab			Pmn	
		Tbk	Tbt	Tbp	RKEF	HPAL
1.	Xmetal	√			√	
2.	Li Konawe		√			√

Description :
Galtab : Mining Excavation
Tbk : Open
Tbt : Underground Mining
Tbp : Deep ore zone mine
Pmn : Purification
RKEF : Rotary kiln Electric Furnace
HPAL : Hidrometalurgi Pressure Acid Leaching

Source: Author's Analysis

The table shows at a glance the types of mining technology and the options for using green and non-green methods. From the results of the table above, an example of a Li Konawe company that received a green mining certificate is obtained.

Weaknesses in Mining Transparency Regulations

Transparency issues in Indonesia's mining sector are closely linked to weaknesses in the current licensing system. A key issue is the overlap of mining licenses with forestry and environmental regulations, settlements or customary land, which often leads to conflict and legal uncertainty. Non-transparent licensing processes are also prone to corruption and bribery. Mining licenses are often issued without due process and procedure, and often for the benefit of a few. This worsens the image of the mining sector, which is supposed to be a public resource. In addition, disclosure of production and export data is also very limited, information on production volumes, export values and government revenues from the sector is often difficult to access by the public, this data is very important to ensure that mining companies actually contribute to government revenues. There is a gap between the reported realization of state revenues and the actual potential revenue for the state.

Another issue is the lack of reporting on environmental impacts. Many mining companies do not publicly report on the environmental impacts of their operations/activities, including mitigation measures. Information on post-mining land reclamation and rehabilitation is also often not published, so communities cannot monitor whether companies are fulfilling their obligations to reclaim ex-mining land. In addition, the management of CSR funds by mining companies is also often questioned; the transparency of the allocation and use of these funds is often not in accordance with the expected social objectives, there are even indications that CSR funds are used for political or personal interests, reducing their usefulness for people who really need them.

Mining transparency in Indonesia faces a number of problems despite joining the Extractive Industries Transparency Initiative (EITI) in order to improve mining transparency. Obstacles hindering the implementation of EITI are the lack of public awareness of the right to information and low participation of companies in the provision of required data. Indonesia's mining sector is vulnerable to practices that hinder transparency and accountability due to a lack of public participation and effective transparency mechanisms. Mining transparency is not just a form of voluntarily submitting data and

reports, but rather a mechanical obligation with expanded norms in the law.

Law Number 3 of 2020 on Amendments to Law Number 4 of 2009 concerning Mineral and Coal Mining has a number of weaknesses in terms of transparency that become public concerns. One of them is Article 9 Paragraph 2, which gives the central government the authority to determine mining areas with a closed mechanism without opening public dialogue in the provisions of the law even though Article 10 Paragraph 2 provides a requirement for transparency, but in the next elaboration in Article 11 that "the minister conducts investigations and research in the context of mining area (WP) preparation" the next elaboration is article by article which is interrelated both in Law Number 3 of 2020 and Presidential Regulation Number 25 of 2023 on Mining Areas which contains the rules of Chapter II Mining Area Preparation, Article 4 letter a, Article 7 number 3, Article 8, Article 9 number 2, Article 10 the provisions that have been mentioned one by one are provisions that are related and explain each other, but the point is about research from both domestic and foreign institutions, The research is not related to deepening the aspirations of transparency to the community but purely for exploration as stated in Article 5 Point 1, there is a provision that considers the aspirations of the community Article 14 Point 3 letter e, but does not explain in detail how if in its development the aspirations of the community cannot be fulfilled, The word "consider" means to think carefully to determine (decide, etc.), based on this interpretation, it is not an absolute requirement that must be fulfilled but rather considered as a basis for moral and wisdom policies, so that if it is not fulfilled it is not a mistake that can be sanctioned or legal in the context of law and law enforcement but only as a moral and ethical demand.

Weaknesses in Mining CSR Management Regulations

The mining and coal sector in Indonesia continue to face complex challenges in implementing corporate social responsibility (CSR). Key barriers include CSR programs that do not meet community needs, lack of transparency and accountability, an implementation approach that focuses on benevolence (charity) rather than empowerment to encourage

self-reliance. It also conflicts with local communities due to CSR that cannot be enjoyed as a mere formality, and lack of regulatory oversight and enforcement. In addition, existing CSR regulations such as Article 74 of Law No. 40 of 2007, Presidential Regulation No. 47 of 2012 and other regulations lack clear implementation standards and sanctions that are not in line with contemporary issues. All of this causes CSR programs to be less effective in providing a real impact on society and the environment. While there are international guidelines such as ISO 26000, these are only recommendations, not mandatory requirements. As a result, the outcome of the standard is merely a model or a patron, rather than a certification of implementation. Furthermore, since participation is voluntary, there is no supervision or audit to ensure accountability, which would otherwise lead to strict sanctions.

The distribution of corporate social responsibility (CSR) in Indonesia still contains (3) three schools of thought, carried out directly by mining companies. Corporate social responsibility (CSR) funds are donated to local governments and then recorded as a form of budget revenue and regional expenditure income (APBD). Furthermore, it can also be donated or can be third-party (given) to other non-profit organizations to empower the community. The three schools of thought may be applied, but there needs to be a form of consequential accountability, meaning that any errors will lead to strict sanctions. However, it is also crucial to ensure accountability for improving governance.

CSR accountability, subject to criminal sanctions, is urgently needed at this time. This aligns with the statement made by the Chairman of the MPR RI (2023) Bambang Susatyo, who emphasized that regulation at the legal level is necessary. He pointed out that every year, CSR funds amounting to Rp. 10 trillion to Rp. 15 trillion of CSR funds are not managed optimally. For instance, one mining company in West Nusa Tenggara Province, Indonesia, was reportedly involved in the misuse of CSR funds totaling Rp. 400 billion during the 2018-2022 period. Furthermore, several reports have indicated that misuse of CSR funds has also implicated local government officials.[93] As a consequence

[93] Melalusa Susthira Khalida, "Bamsoet: Diperlukan Aturan Di Level Perundangan Terkait Distribusi CSR" (Jakarta: antaranews.com, 2023).

of the regulation of CSR at the level of the law, the material content of the articles of punishment for misappropriation and abuse of CSR in Indonesia is emphasized. With the regulation of the legal level, punishment can be effectively enforced, as they are currently only governed by provisions at the government regulations level.

In addition to serving as a form of accountability subject to criminal sanctions, CSR regulation can ensure accountable and transparent governance. Public concern has arisen over the distribution of CSR funds, particularly when there are conflicts of interest. One such concern is the timing of CSR fund distribution, which often coincides with regional and legislative elections. This raises suspicions that the funds may be used to support certain candidates favored by mining companies or government affiliates.

The criminalization of misuse and misappropriation of CSR funds can be included as a corruption offense; when considering the public debate whether it is possible because CSR is not state finance; it can happen, if CSR funds become part of public funds. It is important to define "public funds/public finances" to distinguish them from state finances. State finances refer to funds that are recorded in the state budget (APBN), while public funds are not included in the APBN. Both public funds/public finances and state finances are intended for the benefit of the people/public and share elements of social welfare, development, and charity (non-profit). There is no conflict of interest and personal gain involved in either. However, if there is a conflict of interest or personal gain, this constitutes an element of the crime of corruption. This is the same as what was revealed in the Kompas media that regulations on collection and distribution of public funds are inadequate.[94]

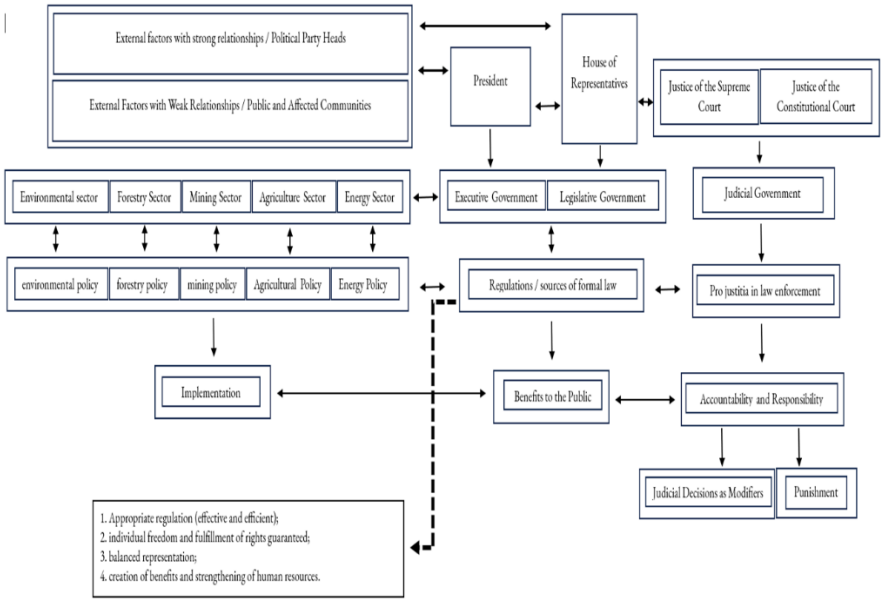
C. Indonesia's Mining Regulatory Reform Framework

From the various realities of mining problems as well as the findings of normative facts about the weaknesses of current regulations, it is necessary to make urgent concrete efforts to reform mining

[94] Ahmad Arif, "Regulasi Tentang Pengumpulan Dan Penyaluran Dana Publik Tidak Memadai" (kompas.id, 2022).

regulations in Indonesia. The purpose of implementing regulatory reform is to eliminate unnecessary regulations, with the fundamental arguments being efficiency, individual freedom and balanced representation.[95] The regulatory reform process will result in effective simplification of regulations, reconceptualization, restructuring of authorized institutions, and strengthening of human resources.[96] Regulatory reform requires many parties collaborating with solid political awareness, while the elites consciously involve the weak parties to be asked for their aspirations. Because the output of regulatory reform gives birth to regulations or provisions of laws and regulations, more clearly we present a chart that illustrates how regulatory reform in the extractive industry sector, especially mineral and coal mining, can be implemented:

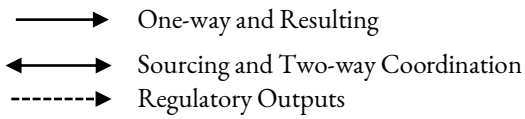
Chart 1. Stages, Implementation and Outputs of Mining Regulatory Reform



[95] Bruce Chapman and John Quinn, "Efficiency, Liberty and Equality: Three Ethical Justifications for Regulatory Reform," *Osgoode Hall LJ* 20 (1982): 512.

[96] Wicipto Setiadi, "The Urgency of Regulatory Reform in Order to Support Indonesia's National Development," *Jurnal Magister Hukum Udayana (Udayana Master Law Journal)* 7, no. 4 (2018): 418–34, https://doi.org/10.24843/JMHU.2018.V07.I04.P01.

Description Connecting Line:



Source: Author's Analysis

The parties involved in mining regulatory reform involve various sectors and ministries both those who will review, determine and participate in implementing the reforms. This includes the mining sector itself as the main sector and supporting sectors such as environment, forestry, energy, and agricultural sector. Additionally, in the context of global trade, trade sector and industrial sectors are also involved. The commitment of mining regulatory reform to create best practices requires national leadership starting from the President who has political, budgetary and implementation powers of the regulation. The role of the House of Representatives (DPR) and the Judiciary to participate in shaping, implementing and evaluating continuously. In the formation and implementation stage, it will involve external factors, including political party leaders whose relationship with power to government power is very strong as they determine the political configuration in the House of Representatives (DPR). However, no less important can consciously involve the community, especially from elements of vulnerable groups, including affected communities and communities who directly intersect their rights if there are mining business operations in their area. To encourage an inclusive economy and the realization of economic democracy, policy makers are voluntarily and openly committed to forming regulations on public involvement and adequate public control in the management of the state, including in mining regulations. Changes in mining laws have been very dynamic, as we present in the following table:

Table 9. Dynamics of Mining Regulatory Change

Types of legislation	Conditions of Enforceability
Law Number 4 of 2009	Amended, repealed/deleted, partially inserted by Law Number 3 of 2020
Law Number 3 of 2020	Amended, Repealed/deleted, partially inserted by Law Number 11 of 2020

Law Number 11 of 2020	Received a response from the public for judicial review at the Constitutional Court
Constitutional Court Decision Number 91/PUU-XVIII/2020	The Court's decision states: 1. Law Number 11 of 2020 is unconstitutional with conditions; 2. Law No. 11/2020 remains in effect temporarily; 3. The consequences if it is not corrected for 2 years will be declared permanently unconstitutional; 4. Prohibition on making strategic policies during the repair period; 5. A rebuke to the omnibus law method.
Government regulation in lieu of law Number 2 Year 2022	Follow-up to Constitutional Court Decision Number 91/PUU-XVIII/2020
Law Number 6 of 2023	The stipulation of government regulations in lieu of laws into laws, which are considered to have accommodated the Constitutional Court's decision and public lawsuit.

Source: Author's Analysis

Rapid changes are marked by the Indonesian government's policy of realizing economic growth, one of which is increasing investment to ensure the flow of capital, goods and labor. This strengthens the flow of export and import trade, ultimately having impact on increasing income. However, Law Number 11 of 2020 (formed by the omnibus law method) appears to have been rushed, from the stages of its formation to its validation. As a result, it has often become the subject of judicial review in the Constitutional Court.

The framework of mining regulatory reform in Indonesia to obtain smart management practices can be compared with various research literature sourced from countries rich in natural resources. Upon that basis, we compare various practices that occur between Indonesia and Australia and several other countries, therefore we do the following literature mapping:

Table 10. Mapping Literature

Authors, Title, Years	Abstract Summary	Main Findings
Sendy Dwiki, Development of Environmental Policy in Indonesia regarding Mining Industry in Comparison with the United States and Australia: The Lesson That Can Be Learned, 2018. (1)	Indonesia, as a developing country and the world's top coal producer, is facing increased mining activity due to the high demand for coal-based energy. This has led to worsening environmental problems. Despite the importance of environmental protection, mining environmental policies in Indonesia are not well integrated due to the lack of experience in dealing with mining pollution. This study aims to analyze the environmental policy situation in Indonesia and suggest improvements by comparing it with policies in the United States and Australia, two developed countries that have successfully managed the environmental impacts of coal mining	Indonesia's unitary system of government tends to be more economically efficient, but its response to environmental issues is slower than federal systems such as in the US and Australia. Despite decentralization, local governments remain weak due to a lack of clarity of authority in the law, coupled with poor coordination between central and local governments Overlapping authority and bureaucratic red tape between ministries fueled regulatory conflicts and poor communication Indonesia's overly generalized and lax environmental standards compared to the US and Australia increase the risk of pollution The lack of comprehensive documentation in Indonesia makes it difficult to identify recurring environmental problems and long-term solutions
Carl Boag, A Comparative Study Of The Legal Frameworks Facilitating Indigenous	Indigenous Land Management (ILM) supports environmental justice by empowering	Australia's Indigenous Land Management (ILM) combines legal centralism with growing recognition

Austrtalia And Indonesia Adat Law, 2016. (2)	communities through legal participation, acknowledging cultural differences, and ensuring equitable distribution of environmental benefits. This paper compares ILM practices in Australia and Indonesia, highlighting their historical, cultural, and legal differences. The study explores the strengths and weaknesses of each country's policies, offering insights into advancing ILM for Indigenous peoples in the Asia-Pacific region. Despite positive developments in both countries, achieving full environmental justice for Indigenous peoples remains a significant challenge	of Indigenous rights. While the Native Title Act 1993 and Indigenous Protected Areas (IPAs) mark progress, their implementation and integration into mainstream legal frameworks remain inconsistent. The Environment Protection and Biodiversity Conservation Act 1999 encourages collaboration but struggles to balance Indigenous practices with conservation objectives Indonesia's approach to Indigenous Land Management (ILM) reflects weak legal pluralism, with Indigenous law coexisting alongside Civil and Sharia law but subordinate to state control. While the 1945 Constitution acknowledges Indigenous rights, these are often overridden by national interests and economic priorities, leading to conflicts and marginalization in forest management. Laws like the Basic Agrarian Law (1960) and Forestry Law (1999) exacerbate this issue, and despite endorsing international Indigenous rights declarations, weak enforcement hinders effective implementation

		Both Australia and Indonesia recognize Indigenous rights, but Australia has advanced further in establishing legal frameworks for Indigenous participation, despite implementation challenges. In contrast, Indonesia struggles with an ideological conflict between economic development and Indigenous law recognition, limiting Indigenous participation. Both countries face difficulties in fully integrating customary knowledge into modern governance
Terry O'Callaghan and Vlado Vivoda, Problems Of Regulatory Governance in The Mining Sector in Asia, 2015(3)	This paper examines foreign mining investment governance in the Asia-Pacific, focusing on China, India, Indonesia, Papua New Guinea, and the Philippines. Key challenges identified include regulatory overlap, lack of independence, impartiality, and transparency, inadequate stakeholder engagement, limited access to regulators, and weak institutional capacity. These issues vary in severity across countries. The paper concludes with policy recommendations to help improve governance in the region's mining sectors	Regulatory overlap in countries like China, India, Indonesia, and the Philippines, driven by decentralization, leads to conflicts and delays. In Indonesia, inconsistencies between the 2009 Mining Law and the 1999 Forestry Law highlight these challenges, causing inter-ministerial conflicts Regulatory agencies in the Asia-Pacific often lack independence, with corruption and favoritism toward domestic companies undermining impartiality. The Philippines and Indonesia face significant challenges, while China demonstrates

	better transparency and merit-based recruitment
	Transparency is limited in countries like the Philippines and Indonesia, where local communities and revenue systems lack access to critical information. In contrast, China presents higher levels of transparency
	Lack of Institutional Capacity: Regulators frequently lack sufficient resources (human and financial) to effectively enforce regulations, leading to delays and ineffective compliance mechanisms. This is especially problematic at the local level in all five countries studied, impacting enforcement and timely processing of applications. Papua New Guinea demonstrates extreme deficiencies in this area
	Indonesia's Weaknesses Compared to Other Countries: While all five countries face challenges, Indonesia has significant weaknesses. It struggles with regulatory overlap, especially between mining and forestry laws, leading to uncertainty for investors. The lack of independence and

		transparency within regulatory agencies, coupled with corruption, creates significant risk. Furthermore, Indonesia's inadequate stakeholder engagement and considerable institutional capacity issues create substantial barriers to foreign investment. While Indonesia has made some efforts to improve the regulatory environment, the implementation and enforcement remain problematic, unlike China's comparatively more transparent and meritocratic system. India also demonstrates comparative strength in investor access compared to Indonesia, Papua New Guinea, and the Philippines. The Philippines struggles with limited access to information for affected communities. Papua New Guinea faces acute challenges in disseminating information due to capacity issues

Source: Author's Analysis, From Various Sources (1)[97] (2)[98] (3)[99]

[97] Sendy Dwiki, "Development of Environmental Policy in Indonesia Regarding Mining Industry in Comparison with the United States and Australia: The Lesson That Can Be Learned," 2018, https://doi.org/10.5109/1936217.

[98] Carly May Boag, "A Comparative Study of the Legal Frameworks Facilitating Indigenous Land Management in Postcolonial Societies: Indigenous Australia and Indonesian Adat Law," *Brawijaya Law Journal* 3, no. 2 (2016): 125–50.

[99] Terry O'Callaghan and Vlado Vivoda, "Problems of Regulatory Governance in the Mining Sector in Asia," *Transnational Corporations* 22, no. 1 (2015): 31–57.

The framework of mining regulatory reform in Indonesia is as far as possible implemented by paying attention to field facts with all the problems consisting of environmental problems, contributions to community welfare, increasing state revenues. In addition, attention must be given to the problem of norms in the applicable law. "Legal norms, in addition to reflecting social interests, also shape social character." Therefore, if mining significantly contributes to the interests of the state and society, the first step is to improve the law in the country. This requires an examination of the norms (article by article) to identify their weaknesses and provide suggestions for improvement. The argument must be strong and comprehensive to ensure that formal legal procedures are followed, involving the authorities, the public, and academic insights from various literatures.

Based on diagram 1, leadership initiatives are necessary due to regulatory reform problems across various sectors. Regulatory problems often arise both during the formation and implementation of regulations, with sectoral conflicts frequently hindering progress. Therefore, regulatory reform initiatives cannot be effectively resolved by the initiative of one particular sector. However, if initiatives come from leaders across all sectors, they can be monitored and evaluated collectively. In practice, regulatory reform requires an academic team and expert formulators to ensure the resolution of problems in each sector.

Regulatory reform must also rest on a legal structure rooted in philosophical, sociological and juridical considerations based on Pancasila. The philosophical basis is needed to harmonise the legal structure with the values and legal principles of Pancasila, thus ensuring that the legal system reflects the philosophical foundation of the nation. The sociological basis is to be able to fulfil the needs and aspirations of the Indonesian people related to legal structures that are integrated and consolidated in legal institutions; while finally, the juridical basis is always updating that the current legal structure is needed to ensure judicial power and the effectiveness of legal institutions.[100]

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[100] Anis Widyawati et al., "Urgency of the Legal Structure Reformation for Law in Execution of Criminal Sanctions," *Lex Scientia Law Review* 6, no. 2 (2022): 327–58.

Conclusion

A. Mining in Indonesia faces various kinds of problems, including environmental problems of deforestation, loss of soil fertility, water pollution and sedimentation, air pollution with environmental damage which causes new problems, the economic burden on the community and environmental recovery that burdens state revenues and expenditures. The issue of community welfare arise around mining areas and affected areas because there are agrarian conflicts, conversion of agricultural land, an environment that does not support agrarian life as before, foreign-dominated investment, as well as labor absorption from local residents who are still small and the role of the government in preparing local labor, law enforcement in the sense of government action that has not been maximized, weak transparency and public participation further exacerbate the situation.

B. Mining problems in Indonesia basically arise due to multidimensional problems, but initial efforts to overcome mining problems can begin with law enforcement by improving regulations as the basis for optimal policy and governance. For this reason, the research findings include several problems, involving environmental problems due to the incompatibility of laws regulating mining with laws governing environmental protection and management, regulations that do not support community involvement, the economic rights of surrounding communities, especially environmental economic rights that are neglected and lack advocacy. There are still many illegal mines operating and lack of control and prosecution of illegal mines, both individuals and corporations. The carrying capacity of the norms of the provisions of the law is lacking to ensure optimal reclamation. Regulations and governance switched to the use of green mining technology are still inadequate. Mining transparency is only limited to submitting reports rather than real actions at every stage of mining activities. What further exacerbates the situation specifically for the company's direct contribution to the community is the mechanism for channeling CSR funds which is still very lacking.

C. The framework for mining regulatory reform in Indonesia is carried out by involving all authorized parties and involving public participation, providing solutions to problems that occur and new

regulatory policies can actually be effectively applied and provide temporary solutions and can span a long time.

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