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The Model of Mining Environment Restoration Regulation Based on Sustainable Development Goals

Abdul Kadir Jaelani,[1*] Reza Octavia Kusumaningtyas,[2] Asron Orsantinutsakul[3]

[1,2] Faculty of Law, Universitas Sebelas Maret, Surakarta, Central Java, 57126, Indonesia

[3]Alhidayah Foundation for Higher Education, Pattani, Thailand

[*] Corresponding author: jaelaniabdulkadir@staff.uns.ac.id

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Abstract

This article aimed to discuss mining environment restoration regulation. The government has established a number of policies concerning reclamation and post-mining. However, the critical question is whether these policies can ensure the rehabilitation of the mining environment in accordance with sustainable development goals, given the numerous unreclaimed and abandoned mining pits that have resulted in several fatalities. The purpose of this study is to examine reclamation and post-mining management standards in order to reduce environmental damage caused by mining activities. This normative legal study gathered data from documents examined qualitatively. The data analysis is descriptive-analytic in nature. The study's findings indicate that environmental law enforcement in the mining sector continues to face significant challenges. There is the need to enhance legislation and systems governing mining management. Standardization of reclamation and post-mining management is necessary to offer rules for implementation that suit the needs of the community. It has no adverse effect on the community surrounding the mining location. Licensing is one policy that can apply to implement standardization. Supervising land management following mining, management of waste, and developing policies promote environmentally friendly mining and conservation activities.

INTRODUCTION

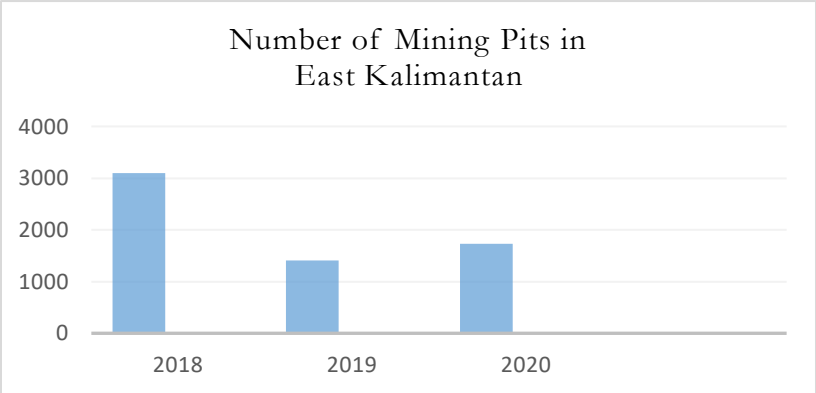
Indonesia is a country endowed with a plethora of natural resources. Mining is a significant and potentially life-saving asset for the Indonesian economy (Ramadhani et al., 2021). The data of the Directorate of Statistical Analysis and Development reported that the export of mining goods would continue to be dominated by coal,

valued at US$ 14.53 billion in 2020. This statistic represents 73.66 percent of the value of overall mining exports (excluding oil and gas). Mining is critical to delivering quality economic growth over the next five years, which will be driven by downstream mining development, sustainable infrastructure development, and service sector transformation. The utilization of natural resources also contributes to the Indonesian economy. However, its use often has a negative impact on the environment.

The impact of mining activities causes not only economic losses but also social unrest that can disturb the community. The focus of the discussion in the mining sector is related to economic issues where the state and large companies can benefit from the process and results of mining activities. On the other hand, many aspects are often neglected in pursuing these economic benefits (Boyd & Ufimtseva, 2021). Mining has a significant environmental impact by destroying forests, contaminating saltwater, causing numerous diseases, and igniting numerous community conflicts within the mining area (Puluhulawa, 2011).

The majority of coal mining in East Kalimantan occurs by open-pit mining (Sasaoka et al., 2015). Open-pit mining has the potential to destabilize the landscape by interfering with subsurface hydrology, surface hydrology, and hydrological cycles, resulting in extensive deforestation (Wang et al., 2021). When mining operations cease, the pits hundreds of meters below the surface are filled with groundwater, rainfall, and runoff. An abandoned mine pit in East Kalimantan contains several hazardous heavy metals. Furthermore, Greenpeace researcher Cut Hilda Meutia found that the hole had high chemicals, including magnesium, iron, aluminum, cadmium, and arsenic. The impact of ingesting or absorbing these chemicals is not immediate, but adverse effects accumulate over time.

Diagram 1. The Number of Mining Holes in East Kalimantan



Source: Mining Advocacy Network, 2021.

According to data from the Mining Advocacy Network (Jatam), there were 3,092 mining holes in East Kalimantan in 2018, and 1735 ex-dug holes in 2020 (Annisa, 2017). Between 2014 and 2018, mining pits claimed the lives of 115 people in East

Kalimantan's former coal mining areas. Then, as mining expansion continued in Samarinda, landslides and flooding became worse. Mining has devoured 70% of the municipal land area in Samarindah (Hidayah & Al-Fatih, 2019). According to JATAM's research with the World Wildlife Fund, the damage is estimated to be around $9 million (Najicha, 2021). Open-pit nickel mining activities, which are preceded by land clearing, topsoil erosion, dredging, and stockpiling, have a severe influence on the environment, resulting in increased eros rates, run-off, sedimentation, and damage to water catchment areas, as well as disruption of stability levels. Additionally, changes to the biodiversity status of indigenous plant species and animal habitats, harm to indigenous natural resources, and a reduction in the quality of the sociocultural environment and public health are also possible consequences.

However, in light of Law No. 32 of 2009 on Environmental Protection and Management and Law No. 24 of 2007 on Disaster Management, the state cannot keep mute on the issue of excessive mining licences that create degradation and result in ecological disasters (Kristanti et al., 2019). It controls the Central Government's authority to compel the person in charge of a firm to carry out environmental restoration as a result of environmental pollution and damage, based on Article 82 of the UUPPLH as revised in the UUCK. Mining has a complicated impact on life, both on the environment and on social life. Development activities frequently result in ecological degradation, lowering the quality of the environment and jeopardizing human survival. The existence of difficulties relating to the impact of mining undoubtedly contributes to community unrest. AMDAL as the legislative foundation for the mining activity licensing system will be critical in ensuring the continued implementation of environmental protection and management in Indonesia (Putra, 2016).

The efforts to conserve the environment necessitate an assessment of environmental consequences with the goal of maintaining environmental conditions that are conducive to sustainable development (Raya & Irwansyah, 2017). Therefore, it is necessary to conduct an in-depth study related to the implementation of environmental restoration from mining activities to optimize environmental management that is sustainable and environmentally sound (Tormos-Aponte et al., 2021). This study is in line with the ecological development pillars of the SDGs, namely the achievement of clean and affordable energy that aims for good health and welfare. Sustainable management of clean and affordable energy is intended to support life. Environmental sustainability is primarily intended so that future generations can feel that sustainable development is a global priority that forms the basis for implementing the goals of community welfare. The accumulation of the impacts of mining activities can influence the public's perception of the mining company's presence (Nurhasanah & Afwa, 2021). Therefore, it is necessary to assess to determine the magnitude of the economic and environmental impact and identify the community's social conditions around the mining area.(Fachlevi et al., 2016).

It is necessary to have a policy made by the government in developing and implementing national procedures and appropriate strategies in the implementation of

environmental management. In addition, it is necessary to carry out monitoring in every performance of mining activities to minimize the resulting impacts and reduce fraud in illegal mining. In addition to improving policies from the Government, business actors are also obliged to pay more attention to environmental and community conditions so that the community's survival can be guaranteed. Based on the data that has been presented shows that there are still many abandoned mining pits that in the reclamation and post-mining implementation do not comply with the rules that the Government has made (Su et al., 2021).

Fitri Ramdhani Harahap's previous research on post-mining land restoration indicated that the damage caused by tin mining has risen, particularly with the advent of unconventional mining. Mine land reclamation is planned and implemented effectively to achieve the best results, while restoration is defined as an attempt to repair or restore the original condition of land that has been destroyed (Harahap, 2016). Meanwhile, Afidah Nur Rizki and Amrie Firmansyah assessed Indonesia's reclamation and post-mining environmental duties. From 2015 to 2018, five mining companies included expenditures associated with ecological responsibilities for reclamation and post-mining in their annual financial statements and notes to their consolidated financial statements (CaLK) (Rizki & Firmansyah, 2021). This research is focused on determining and analyzing the the model of mining environment restoration regulation based on sustainable development goals.

METHOD

This is normative legal research, with a statutory approach and a conceptual approach (Kharisma, 2020) This research found its juridical footing in:

1. The 1945 Constitution of the Republic of Indonesia (UUD NKRI 1945);
2. Law Number 32 of 2009 concerning Environmental Protection and Management
3. Law Number 11 of 2020 concerning Job Creation.
4. Law Number 3 of 2020 concerning Amendment to Law Number 4 of 2OO9.
5. Government Regulation Number 78 of 2010 concerning Reclamation and Post-mining.
6. Government Regulation Number 22 of 2021 concerning Implementation of Environmental Protection and Management.

Data were collected from literature study and document observation. This descriptive research aims to provide a systematic, factual and accurate description of certain features, characteristics, or factors in a particular population or region. It uses a qualitative juridical analysis based on legal interpretation, reasoning and argumentation (Prasetio et al., 2020).

RESULTS AND DISCUSSION

1. The Model of Mining Sector Environmental Law Enforcement

An orderly law must begin with the planning stage and end with the promulgation of the resulting legal product, because the law is a tool for managing

people's behavior in order to better achieve the goals of national development, namely, a just society, and the state is obligated to implement national law development (Luhukay & Jaelani, 2019). Stakeholders play an important role in the supervision of businesses, which results in corporate governance (Warner, 2020). Ecosystem management is a science-based approach to environmental management that focuses on the fundamental structures, functions, processes, and interactions between species and their environment. Ecosystem-based management that is effective in specific locations within the area is a fundamental objective and benchmark when employing this technique. This can be accomplished through the use of a regional environmental management plan and KLHS. The obligation to apply the precautionary approach is also reflected in the requirements that exploration contract applicants must meet. Before the commencement of exploration activities, the contract applicant must submit a preliminary assessment of the possible impacts of the proposed exploration activity (Warner, 2020).

Environmental cases have not been resolved in an environmentally friendly manner. the judge has not paid attention to the victims' environmental components, has not adopted an ecosystem approach, and has not projected initiating activities that may result in environmental pollution and damage (Jaelani et al., 2021). Environmental issues affect everyone, and there should be campaigns to promote awareness among many stakeholders in order to improve environmental circumstances. Numerous activities and businesses that generate trash throughout the manufacturing process undoubtedly have a negative impact on the environment. It is unavoidable that the extraction of natural resources always results in an increase in environmental degradation. Naturally, serious concern may arise if urgent corrective action is not performed (Laurensius Arliman S, 2018).

Law Number 32 of 2009 concerning Environmental Protection and Management explains that natural resources must be in harmony and balanced with environmental functions. In comparison to the previous law, Law Number 32 of 2009 on Environmental Protection and Management establishes more comprehensive rules as a result of the refining of prior environmental management legislation. As a result of this arrangement, a strategy, plan, and program must be developed that is based on a development obligation for environmental preservation with the goal of achieving sustainable development. The source of environmental problems stems from the development that is conducted without regard for ecological balancing considerations, which ultimately results in ecological degradation and pollution (Herlina, 2015).

Environmentally responsible mining management must adhere to sustainable development concepts. Natural resource management is sustainable when wealth and the welfare of the people are considered. In addition, problems also arise from the institutional side and the implementation of laws and regulations. Issues that cause conflicts and disputes lead to losses for the community and damage the quality of Natural Resources and the environment itself (Erina & Yanis, 2020).

Ecological and environmental damage caused by mining cannot be rectified on a small scale (Larondelle & Haase, 2012). Ecological restoration efforts can be

accelerated if the repercussions of mining activities are not adequately addressed. There are substantial obstacles to completing a negative impact assessment in a timely and effective manner in order to make an acceptable ecological restoration decision (Hou et al., 2021). The purpose of global studies of environmental damage assessment is to determine the intensity and spatial distribution of pollution, human activities, and geological dangers (Saedpanah & Amanollahi, 2019). The intensity of ecological and environmental damage in mining areas varies spatially. It is influenced by several factors, including geological hazards and land use types, which have a cumulative effect. Efforts to repair and restore the environment are not as fast as the rate of damage and pollution caused by mining activities (Yang et al., 2019).

Based on mineral and coal mining statistics in East Java Province, IUP recapitulation till March 2017, in East Java Province, there were 251 firms with Clear And Clean (CnC) status and 163 Non-CnC companies. The value of mineral exports in East Java is based on the 2019 Surveyor Report until 2021.

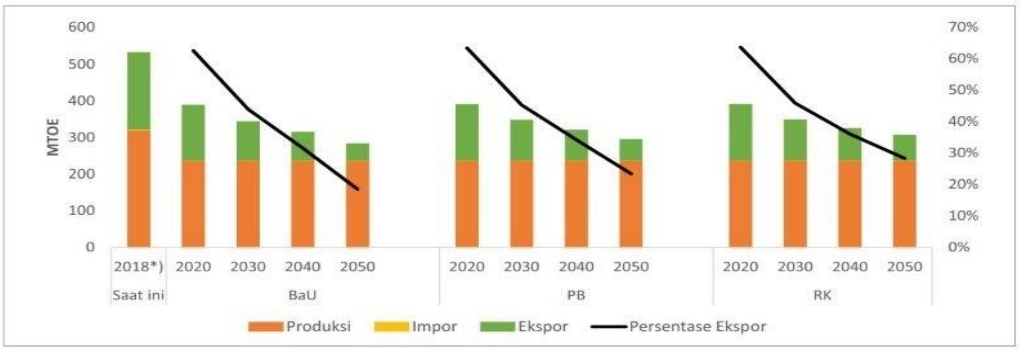
Table 1. The Value of East Java's Mineral Exports

Nilai FOB (USD			Total value FOB (USD)
2019	**2020**	**2021**	
1,276,003.00	5,043,292.00	7,661,441.00	13,980,736.00

Source: Ministry of Energy and Mineral Resources, 2021.

Table 1 indicates that Indonesia's coal exports have increased and exceeded the target set initially. China's most extensive export distribution was at 127.7 million tons, followed by India at 97.5 million tons. Coal exports positively impact economic growth, as indicated by the fact that every one-unit increase in the coal export variable (DLNEB) for the previous one and two periods increases the value of GDP (DLNPDB), which is estimated at 0.125 unit units (Setiawan et al., 2020). However, the Government must examine some factors in addition to the good impact. Excessive coal exports do indeed jeopardize domestic supply. As a result, exports must be reduced to prioritize domestic markets in order to achieve energy independence and security that promotes domestic development.

Figure 1. Coal Supply Projection



Source: Ministry of Energy and Mineral Resources, 2021.

According to the RUEN, the government limits coal output to 400 million tons per year in order to ensure supply and increase consumption of domestic coal, resulting in a drop in coal exports, as illustrated in figure 1. Coal exports are projected to touch 44 million tonnes of oil equivalent (MTOE) (BaU), 55.8 million tonnes of oil equivalent (PB), and 67.6 million tonnes of oil equivalent (RK) in 2050, down from 170.3 million tonnes of oil equivalent in 2018. Similarly, the expected ratio of exports to coal production will decrease, from 64% in 2018 to 18% (BaU), 23% (PB), and 28% (RK) in 2050. Coal is alternative energy at this time which various parties believe. Its role can replace the part of petroleum that is dwindling. Although coal is alternative energy, its nature is still non-renewable. If mining is carried out continuously, of course, over time, the supply will also decrease. Therefore, good management is needed by implementing wise utilization strategies.

Article 472 of Government Regulation No. 22 of 2021 concerning the Implementation of Environmental Protection and Management states that the holder of an environmental approval permit must place a guarantee fund to restore ecological functions. However, the reality presented in the field is that there are still many violations by IUP/IUPK owners in using natural resources that are not following their designation.

IUP/IUPK holders must fulfill obligations in applying good and correct mining engineering principles according to mining rules that assist the government in regional development, mining safety, environmental management, and community empowerment. Environmental management efforts require the existence of policies that will improve every implementation of mining activity. Mining law is a field of science with various dimensions because of the object of mining activity in the environment. In addition to having a function as protection and providing certainty for the community, mining law also functions as a means of development whose role is as an agent of result or change. Law Number 3 of 2020 proves a paradigm shift in state control over mineral and coal mining, which concentrates all authority on the central government, including the power to issue mining permits that have implications for the local government's management (Hakim, 2015).

Mining activities, by virtue of their acts that clear land and alter landscape conditions, can surely alter an area's ecosystem. Mining activities have an impact not only during the mining process, but also after mining is complete, or what is generally referred to as post-mining. When they ceased operations, several mining corporations were not responsible for leaving mining holes in former mining regions, which have the potential to cause long-term environmental damage (Ma'ruf, 2021).

It has been recognized that the mining business has the potential to continue growing swiftly and provide a strong revenue. Along with expanding civilization and human progress, regulation is necessary to encourage the mining sector to maximize its operations while reducing adverse effects to the greatest extent possible. Seeing that local governments continue to have a restricted amount of space in Law Number 3 of 2020 raises numerous legal concerns about the legal benefits of this legal reform. The benefit itself is a legal idea stated in Article 2 of Law No. 4 of 2009. The benefit principle's definition is consistent with Jeremy Bentham's concept of legal benefit, according to which the law must give benefits for individuals. The two rules have similar substance, which frequently causes public worries about overlapping arrangements that adversely affect mining activities and are incapable of providing legal certainty.

Environmental law enforcement efforts aim to organize environmental functions and protect the values of ecosystem carrying capacity. Law enforcement is needed for parties who have not fulfilled reclamation and post-mining following the criteria stated in the legislation. Supervision is a form of law enforcement that must be re-strengthened to monitor IUP/IUPK holders in carrying out their obligations, and there should be no violations.

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Mining with an open pit system is accomplished by removing mining products from the overburden. thus, the overburden in the mining region is removed, leaving only the dug holes. This drilled hole must be filled in as part of reclamation and post-mining efforts. Mining businesses with mining business licenses are required to seal holes dug as a result of their business activity (Joni, 2020). Reclamation obligations for IUP/IUPK holders are governed by the Minerals and Coal Law No. 3 of 2020. Additionally, Government Regulation 78 of 2010 concerning Reclamation and Post-mining regulates the responsibilities to carry out reclamation. In the situation where the IUP/IUPK holder's reclamation does not match the success conditions, the government may appoint a third company to conduct out reclamation or post-mining using taxpayer funds. According to Article 1 of Law 32 of 2009 on Environmental Protection and Management, "environmental protection and management is a systematic and integrated effort undertaken to conserve environmental functions and to prevent pollution and ecological damage caused by environmental degradation."

This includes planning, utilizing, controlling, maintaining, supervising, and enforcing the legislation. Reclamation is a process that involves improving the physical

state of the soil in order to prevent landslides, constructing reservoirs in order to improve the quality of toxic acid mine drainage, and finally revegetating the area. Reclamation and post-mining activities strive to restore environmental conditions to their pre-mining state. To successfully implement reclamation and post-mining, several stages must occur, including the application for a permit to manage the reclamation and post-mining plans, approval of the reclamation and post-mining program's performance, and amendments to the reclamation and post-mining plans. Along with the duty to do reclamation and post-mining activities, mining companies are also required to place guarantee money. However, some corporations believe that establishing a guarantee fund is a waiver of their commitment to do reclamation and post-mining activities (Oktorina, 2018).

The main problem lies in the ex-mining pit area, among others, in environmental changes, including chemical, physical, and biological differences. The impact of mining on the environment mainly comes from the extraction and disposal of rock waste, ore processing, and operations from processing plants. Mining brings considerable change to the environment. Therefore, we need a plan that must be mature and follow the criteria specified in the closure of ex-mining pits. Mine rehabilitation activities must be following the post-mining land use plan and be progressive (Munir & Setyowati, 2017). In 2020, financing for reclamation and post-mining guarantees will be realized at a rate of 93.42 percent for reclamation guarantees and 92.68 percent for post-mining guarantees (Muhjad et al., 2021). Based on the records of the Directorate General of Mineral and Coal at the Ministry of Energy and Mineral Resources, as of June 2018 alone, as many as 60% or around 1,569 IUP (Mining Business Permit) holders of 2,579 IUP holders from PMDN (Domestic Investments) did not provide reclamation guarantee funds. In 2019, the Ministry of Energy and Mineral Resources noted that out of a total of 4,867 companies, 2,966 companies had placed new reclamation guarantees. The rest, as many as 1,901, have not identified a contract. Then, out of 4,867 companies, 4,655 are IUP PMDN companies, of which 2,760 have placed reclamation guarantees, and the remaining 1,895 have not set guarantees (Oktorina, 2019). The Mining Advocacy Network (Jatam) reported in 2020 that 3,092 mine pits remained unreclaimed. Additionally, there are 104 mineral and coal mining concessions scattered throughout Indonesia, covering an area of 1.6 million hectares, roughly half the size of Belgium, and 11 steam power plants (PLTU) (Annisa, 2017). Many companies do not fulfill their obligations to carry out reclamation and post-mining by leaving many mining pits not correctly managed and closed, causing many casualties.

The post-coal mining pit in East Kalimantan resulted in the sinking of the community; between 2011-2018 alone, 32 people died, dominated by children. Nationally, between 2014-2018, 115 people died due to drowning in former mining pits (Murfianti, 2020). Sanctioning mining business operators that fail to comply with their commitments is one of the coercive measures used to handle the issue. This is because the existence of coercive consequences or punishments is a necessary consequence of the legislation' mandate (Prayogo, 2018). As an endeavor to conduct environmental management with an ecological viewpoint, it must be governed by legal

standards while also taking into account the level of public awareness and action in the global environment, as well as relevant international legal instruments. Although a general concept of sound environmental management has developed, it still requires refinement in order to accomplish the aims of environmentally sustainable development. The terminology, principles, scope, and procedure for implementing Social and Environmental Responsibility (TJSL) have not been uniform across numerous laws and regulations. This is due to the fact that numerous terminologies are used to refer to CSR requirements in various regulations (Karjoko et al., 2019).

The corporation is accountable for any adverse effects resulting from mining activity. These duties include environmental degradation, post-mining development, climate change, and the living conditions of affected communities in mining locations. Downstream strategies must be maximized by converting raw materials into a secondary product with a greater added value—mining Indonesia's industry's downstream approach has an impact on the innovative potential for regional prosperity, and the downstream in this industry is the right strategy for the country. In addition, the use of space in sectoral programs includes restoring mining areas after the completion of the mining period so as not to interfere with the level of community welfare and environmental conditions (Ganhammar, 2021). The true issue has existed for a long period of time and frequently manifests itself in the Minerva Law, namely in management. Until 2018, there were 123 mining firms operating in Indonesia with exploration and exploitation permits. Along with corporations that have keys, many mining companies lack tickets (illegal). According to the Ministry of Environment and Forestry (KLHK), about 8,683 locations indicated unlawful mining spanning 500 hectares (Ha) in Indonesia (Tormos-Aponte et al., 2021).

As a result, immediate action is required to resolve these issues. According to the mining strategy, the adverse effects of the mining operation must be mitigated in stages. The presence of previous mines necessitates quick reclamation. Naturally, at this time, AMDAL will be used to control and monitor the system. AMDAL can be used as a guidance when deciding whether to conduct mining activities and as a pre-requisite for getting a business permit. However, in practice, AMDAL's guidelines for environmental feasibility studies may not always produce the best results. The ecological permit system is linked to the obligation to prepare an AMDAL and is required before a business activity permit may be issued (Dian & Jenvitchuwong, 2021). According to the data presented, reclamation and post-mining activities continue to face several challenges and fail to take environmental concerns into account. As a result, the government and numerous stakeholders must take steps to mitigate the harmful consequences of mining activities. In order to achieve sustainable and ecologically friendly development, there must be a balance between management and environmental sustainability. Reclamation and post-mining activities are carried out in accordance with the principles and requirements of safe mining. Apart from the execution difficulties, the placement of reclamation and post-mining guarantee money remains abysmal. Numerous mining corporations continue to violate the order in which guarantee money is distributed. This guarantee fund structure makes sense

because, in practice, compliance with post-mining recovery is low due to inadequate oversight and general mining governance concerns (Korompot et al., 2021).

The state will also suffer losses in terms of company licenses and tax revenue, and illicit mining enterprises can wreak havoc on the environmental ecology. As a result, it is necessary to simplify the license procedure to make it less complicated and burdensome for mining company actors while still adhering to existing standards. Coordination between the central government and local governments in resolving business licensing issues is one of the legal measures that can be adopted. Not least, the central government and local governments must supervise the issuance of permits and the implementation of mining activities. This will later correspond with the government's and mining corporations' openness to the community about data and information. A computerized system is required to convert manual input into digital data kept in a geographical database, allowing for the study of previously overlapping mining permits.

Efforts can be taken to resolve environmental issues in mining areas, particularly those relating to reclamation and post-mining management, one of which can be accomplished by the establishment of a standard for reclamation and post-mining management. According to field data, many abandoned mine pits continue to require a policy bolstering the government's involvement in monitoring, assessing, and evaluating reclamation and post-mining implementation. Standards are required for all decision-making when it comes to environmental management. Environmental standardization must be accompanied by high performance standards and efficient utilization of the data generated by standardization. Standardization will apply to company licensing as well as reclamation and post-mining operations.

The guarantee money will be more transparently handled and allocated in accordance with its purpose. The central government hopes that through standardizing reclamation and post-mining management, it will collaborate with local governments to tighten oversight of guarantee fund placement. It is important to strengthen law enforcement against parties that have not complied with reclamation and post-mining standards outlined in the legislation—related to the supervision mandated by Law No. 3 of 2020, specifically Article 4 paragraph 2 and Article 35 paragraph 4 of Law No. 3 of 2020. According to Article 4 paragraph 2 of Law No. 3 of 2020, the Central Government is responsible for the State Control of Minerals and Coal, as defined in paragraph (1), in accordance with this Law's provisions, while Article 35 paragraph 4 of Law No. 3 of 2020 specifies that the Central Government may delegate the ability to award Business Licensing, as defined in paragraph (2), to the provincial Regional Government in accordance with the legislation's provisions.

To standardize reclamation and post-mining management, it is required to establish regulations governing management practices, management systems, and reporting and oversight of reclamation and post-mining implementation. Standardization will be an improvement over the current practice of setting environmental permits governed by the AMDAL. Land reclamation should be urged to be planned in advance of mining activity, and a reclamation strategy should be in place. The policies can begin with

licensing, oversight of post-mining land management and waste management, and the development of legislation that promote green mining and environmental conservation. Standardization of reclamation and post-mining management is believed to aid in minimizing environmental damage.

CONCLUSION

Based on the results of the discussion, it can be concluded that reclamation is a process that tries to rectify the arrangement of disturbed land caused by mining operations. Mining activities are extremely complex and fraught with danger. Each enterprise is required to implement reclamation and post-mining procedures. However, the evidence given indicates that reclamation and post-mining management are still not optimal. Numerous mining pits remain open, resulting in pollution, land degradation, and even mortality. Additionally, the corporation should establish a fund for reclamation and post-mining guarantees. However, many businesses continue to operate without establishing a guarantee fund. Naturally, this presents a problem for Indonesia in terms of strengthening rules governing the implementation of environmental law in the mining sector. It is required to beef up enforcement against those who do not adhere to the legislation's reclamation and post-mining conditions. Thus, a legal regulation can establish a law for any abuse of authority, violation of company commitments, and excellent environmental management through the implementation of environmentally sound and sustainable mining methods. Standardization can be achieved by a variety of policies, including licensing, supervising post-mining land management, waste management, and developing legislation that promote green mining and environmental conservation.

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