SUSTAINABLE ENVIRONMENTAL RECOVERY POLICY: REDESIGNING SAND MINING POLICY IN INDONESIA

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ABSTRACT

Purpose: The purpose of this study is to review the effectiveness of sand mining policies that are controlled and monitored under local government management.

Theoretical Framework: In managing sand mining, putting attention to environmental ethics is a must so the impact of the sand mining process can be controlled. By understanding sustainable development concepts, government policies regarding sand mining should be more emphasize the human life aspects.

Method: This study used a qualitative approach by conducting in-depth interviews with the community around the mining area in Lumajang Regency. Therefore, the impacts of socio-economics can be determined from the explanations obtained.

Results and Conclusion: This study found that many dynamics happened because of inconsistent regulations. Lumajang Regency is affected area by these problems as there are many mining sites in Lumajang Regency. Before making environmental management policies, the government need to have a good analysis so the ecosystem can be protected and illegal sand mining activities can be eliminated.

Research Implications: This research may use for government considerations to solve environmental problems caused by sand mining activities in Lumajang Regency, Indonesia.

Originality/value: This research discusses the problem regarding environmental issues caused by sand mining activity and the solution solved by the government by redesigning the policy to improve the sand mining management quality in Indonesia.

Keywords: sand mining, mining management, government policies.

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RESUMO

Objetivo: O objetivo deste estudo é revisar a eficácia das políticas de mineração de areia que são controladas e monitoradas sob a gestão do governo local.

Referencial Teórico: Na gestão da mineração de areia, prestar atenção à ética ambiental é fundamental para que o impacto do processo de mineração de areia possa ser controlado. Ao compreender os conceitos de desenvolvimento sustentável, as políticas governamentais relativas à mineração de areia deveriam enfatizar mais os aspectos da vida humana.

Método: Este estudo utilizou uma abordagem qualitativa através da realização de entrevistas em profundidade com a comunidade ao redor da área de mineração na Regência de Lumajang. Portanto, os impactos da socioeconomia podem ser determinados a partir das explicações obtidas.

Resultados e Conclusão: Este estudo constatou que muitas dinâmicas aconteceram devido a regulamentações inconsistentes. A Regência de Lumajang é a área afetada por esses problemas, pois há muitos locais de mineração na Regência de Lumajang. Antes de fazer políticas de gestão ambiental, o governo precisa fazer uma boa análise para que o ecossistema possa ser protegido e as atividades ilegais de mineração de areia possam ser eliminadas.

Implicações de pesquisa: Esta pesquisa pode ser utilizada para considerações governamentais para resolver problemas ambientais causados pelas atividades de mineração de areia na Regência de Lumajang, na Indonésia.

Originalidade/valor: Esta pesquisa discute o problema relacionado às questões ambientais causadas pela atividade de mineração de areia e a solução resolvida pelo governo ao redesenhá-la para melhorar a qualidade da gestão da mineração de areia na Indonésia.

Palavras-chave: mineração de areia, gestão de mineração, políticas governamentais.

1 INTRODUCTION

Indonesia has large natural resources of coal. The coal sector is the largest state revenue, 85% of the total Minerba non-tax revenue comes from coal. Coal prices are predicted to decline for the next 5-10 years due to China as a country that uses 45% of the world's total coal, starting to reduce coal imports due to Environmental Social Governance policies. In coal mining companies in Indonesia, in their mining operations, almost all production activities are subcontracted by coal mining contractors, where the number of contractors is more than the number of mine owners. Mining contractors who do not have a Competitive Advantage in fulfilling Market Orientation will be displaced by other mining contractors.
Economic equality is one of the focuses of the national priority program set by the government of the Republic of Indonesia by optimizing economic potential to improve the community's economy (Basri & Hill, 2020). The government, for this reason, has performed work to make it easier for the community to obtain business access licenses to increase community capital-based economic turnover (Wahyuni et al., 2021; Widjaja, 2021). In terms of people’s mining, the government has issued Law Number 3 of 2020 amendment to Law Number 4 of 2009 (Bachruddin & Saraswati, 2021; Jefri Anthoni et al., 2020). A People’s Mining License (IPR) means a license given by the government to local communities to carry out a number of mining businesses within a limited area. The person or group entitled to obtain a People’s Mining License (IPR) can be an individual, community group, or cooperative, as long as being a local resident(s). Based on the provisions, individuals each may only own a mine with a maximum area of 1 (one) hectare, community groups each may own a maximum of 5 (five) hectares, and cooperatives each may own a maximum area of 10 (ten) hectares. Sand mining is one of the mining sectors that continues to develop along with a country’s economic growth (Githiria & Onifade, 2020). Rapid economic growth in a country causes the rapid growth of the construction industry, both house and building or industrial constructions, which also directly impacts the increase in the need for sand (Hussin et al., 2013; Misra & Mohanty, 2021; Salam et al., 2020).

In Lumajang Regency, Jawa Timur, Indonesia, sand mining activities contribute to an increase in the workforce in the sand mining sector (Nurhasan & Saputra, 2018; Qurbani, 2020) and also, of course, to regional income (Bonilla Mejía, 2020). From 2018 to 2022, there have been 17,376 workers working in that sector, spread across the Districts of Pronojiwo, Candipuro, Pasirian, Tempeh, and Pasirjambe. Most of the individuals involved are unskilled workers, especially those in the manual/traditional sector. Types of vacancies in sand mining include sand truck drivers and driver assistants, manual sand collectors, heavy equipment operators, sand arrangers at the stockpile, and administrators of certificates of origin (COO) and licensing documents. The greater the number of people involved in the sand mining sector, the higher the community's income and quality of life, as indicated by their improvement in education and their average length of schooling. It can be said that mining has socioeconomic impacts on its workers (Dar et al., 2022).

Studies on the impacts of illegal sand mining on the community in terms of the socio-economic aspects showed at least three problems of social functioning in the area
around sand mining, namely 1) the ability to meet basic needs, 2) the ability to carry out social roles, and 3) the ability to deal with environmental shocks and pressures. The majority of residents in Selok Awar-Awar Village work as farmers (33%), while only 167 people (4.3%) work as miners. Illegal sand mining activities have caused a decrease in the income and ability of residents to meet their basic needs (Probosiwi, 2018). Illegal mining is supported by weak law enforcement and corrupt law enforcement practices (Mensah & Mattah, 2023). Sand mining, on the other hand, has an impact on the availability of resources, including 1) loss of access to clean water sources, 2) displacement of agricultural land, 3) loss of access to food availability, and 4) damage to trees and vegetation (Padmalal et al., 2008).

This study aimed to review the effectiveness of sand mining policies that are controlled and monitored under local government management. Without supervision and control, sand mining will only damage the environment and the biosphere (Rentier & Cammeraat, 2022). The design of the sand transportation centralized policy implemented by the government of Lumajang, Jawa Timur, Indonesia has had a socio-economic impact on sand mining on a local-regional scale and, at the same time, changed the perspective of the community that initially considered that mining is part of their culture in income activities, regardless to its legality. In fact, sand mining activities in rivers without control can cause damage to the quality of water in streams and groundwater and can cause modifications to the sedimentation process, which have an impact on changes in the physical, biological characteristics, and natural chemical reactions of the ecosystem (Saviour, 2012).

2 THEORETICAL FRAMEWORK
2.1 ENVIRONMENTAL ETHICS CONCEPT

At least, three basic theories have been used as the basis of several environmental theories that are continuously developing to solve environmental problems. The first one is anthropocentrism, which states that humans are the center of the universe system. Humans have life interests, which are then considered the most decisive in forming an ecosystem order. Policies function to manage human behavior which can have an impact on the sustainability of nature. In life, humans have the highest value with all their potential. Natural life elements other than humans are only seen as objects, tools, or facilities for fulfilling the needs of life and human interests. Nature is only a tool to
achieve human goals. It has no value in itself. The second theory is biocentrism, which states that life has value in every creation. Therefore, moral forms cannot be limited to human matters only (Sukmawan et al., 2023). All natural life that has been created is a unified community. Every creation has a value, as an intrinsic value that has a moral identity. The moral principle that applies to biocentrism is that maintaining and preserving life is morally good while destroying and damaging life is morally evil (Palmer et al., 2014). The last theory is ecocentrism, in which the ethics are focused on the entire ecological community, regardless of their status as living beings or not. Because, ecologically, both living and non-living objects are related to one another. Ecocentrism is a high-level ethic named deep ecology because it is the most likely one to provide another solution to solve ecological ethical dilemmas. The most important thing is the survival of all living and non-living things as components of a healthy ecosystem (Imran et al., 2014; Molina-Motos, 2019).

2.2 SAND MINING MANAGEMENT

Mining regulations in Indonesia originate from the legacy of the Dutch colonial era: Indische Mijnwet (Staatsblad 1899 Number 214), which was enacted based on Article II of the Transitional Regulations of the 1945 Constitution. Then, in 1906, it was supplemented and amended by Mijnordonantie (Mining Ordinance) 1906 (Meutia et al., 2022). Such regulation stated that the government regulates permits for petroleum and mining of metal minerals, coal, gemstones, and several other important minerals. For minerals that are considered less important, such as limestone, sand, and clay, the permits are regulated by the local government. After 15 years of independence, Indonesia formed a Government Regulation in Lieu of Law (Perppu) Number 37 of 1960 concerning Mining which later became a Law, namely Law Number 37 of 1960, which took effect on October 14, 1960. It revoked the Indische Mijnwet, whose spirit of regulation was considered inconsistent with the characteristics of the Indonesian state and national interests in the mining sector (Bachruddin & Saraswati, 2021).

Law Number 1 of 1967 concerning Foreign Investment was issued as a driving force for the promulgation of the 1967 Mining Law concerning Basic Mining Provisions (Mining Law 1967) (Amira, 2019). Following that, Government Regulation Number 32 of 1969 concerning the Implementation of the 1967 Mining Law was also issued (Redi & Marfungah, 2021). The reason for the enactment of the 1967 Mining Law was that the
previous law was no longer able to meet the demands of the people who wanted to do business in the mining sector and turn mining into a real economic force due to the political developments at that time and the renewal of policies based on economics, finance, and development, as stipulated in the Decree of the Provisional People's Consultative Assembly Number: XXIII/MPRS/1966. These provisions succeeded in creating a favorable climate and attracting foreign investors to invest in Indonesia, as shown by the birth of Generations I to VII of Work Contracts (Soelistijo, 2011). About 42 years later, the 1967 Mining Law was replaced by the Mineral and Coal Law (UU Minerba), which came into effect on January 12, 2009 (Sharif & Nuriyatman, 2020).

From 2009 to 2022, several changes occurred regarding the delegation of mining licenses for Group C Quarrying Material from being the authority of the District Government to being the authority of the Provincial Government, and based on the Circular Letter of the Minister of Investment/Head of the Investment Coordinating Board (BKPM) Number 17 of 2021 dated 27 July 2021, sand mining licenses were changed to the authority of the Ministry of Energy and Human Resources (ESDM) (Pharisees, 2023). Through Presidential Regulation of the Republic of Indonesia Number 55 of 2022 concerning Delegation of Granting Business Licensing Authority in the Mineral and Coal Mining Sector, sand mining licensing authority was returned to the Provincial Government. The regional government has the authority to regulate the governance of sand mining which does not exceed the authority regulated by the rules above. The Lumajang Regency Government has made Lumajang Regency Regional Regulation Number 1 of 2017 concerning Taxes on Non-Metal and Rock Minerals and made Lumajang Regent Regulation Number 40 of 2022 concerning Integrated Stockpile. These two regulations regulate the authority of the Regional Government in terms of regional taxation and sand stockpile governance by taking into account the environmental impacts that may arise in sand mining areas.

2.3 SUSTAINABLE DEVELOPMENT CONCEPT

Sustainable development emphasizes that meeting the needs of human life should not be at the expense of future generations (Hohmann, 1992). In particular, it is a way of organizing society so that it can exist in the long term (Tolkachev et al, 2023). It, therefore, considers both present and future aspects, such as the preservation of the environment and natural resources or social and economic equity. Sustainable
development can be interpreted as an approach taken to achieve balanced development in fulfilling the needs faced by society. It is a continuous participatory coordinated process of thought and action in order to achieve economic, environmental, and social goals in a balanced and integrated manner at the national and local levels (UN, 2002).

The main principles of sustainable development and environmental insight for human welfare include intergenerational equity, intragenerational equity, precautionary principle, conservation of biological diversity, and internalization of environmental costs and incentive mechanisms (Maryanto, 2018; Spijkers, 2018; Wibowo, 2005). There are three aspects of the concept of sustainable development: economic, environmental, and social (Zampier et al., 2022). Sustainable economic management must be able to produce goods and services in a sustainable manner and avoid extreme conditions of imbalance between agricultural needs and industrial production; Sustainable environmental management must ensure that the managed resources are stable and avoid over-exploitation of renewable resources. For non-renewable natural resources, investments must be made in the form of replacement for the decline in these natural resources prior to exploitation. This environmental management includes the preservation of biodiversity, atmospheric stability, and ecosystem function; Sustainable social management must fulfill equitable distribution and the availability of social services including health and education, gender equality, and accountable politics (Pratiwi et al., 2018; Strezov et al., 2017).

3 METHODOLOGY

This study used a qualitative method through an in-depth interview to obtain qualitative explanations and determine the socio-economic impacts of sand mining activities in Lumajang Regency. The subjects were the community around the mining area. The key informants were determined based on the priorities set by the researcher. The informants should be from 1) Lumajang Regency Environmental Service, 2) Lumajang Regency Social Service, 3) Village Heads in mining areas, 4) Community leaders in mining areas, 5) Mining Entrepreneurs, 6) Mining workers.

This research was fully carried out in Lumajang Regency. Geographically, Lumajang Regency is one of 38 regencies/cities in the Province with an area of around 179,090.01 Ha which consists of 21 sub-districts and 205 sub-districts and villages. In a broader scope, geographically, the location of Lumajang Regency is at coordinates 7052'
South Latitude to 8023’ South Latitude and 11205’ East Longitude to 113022’ East Longitude.

This research focused on the potential of sand minerals resulting from the eruption of Mount Semeru in the Besuk Sat-Mujur River flow that covered an area of around 262.57 Ha. The thicknesses of the sand sediment in the upstream, middle, and downstream sections were 7-8 meters, 6-15 meters, and ± 18 meters, respectively. The potential for excavation of sand from the eruption of Mount Semeru which was along the Leprak-Regoyo-Rejali River flow covered an area of around 758.71 Ha. The thicknesses of the sand sediment in the middle and downstream were 8-9 meters and 6-8 meters, respectively.

This study focused on the use of data triangulation using three data sources, namely observation, in-depth interviews, and documentation to cross-check the validity of the data. Data from a source would be compared with data from another source to obtain the correct findings.

4 RESULTS AND DISCUSSION

4.1 ENVIRONMENTAL CONDITIONS DUE TO ILLEGAL SAND MINING

4.1.1 Road Damage Due to Transport Vehicles

In Indonesia, the development of the mining industry has had a serious impact on the continuity of public access, such as road destruction (Tampubolon et al., 2020). Mining activities using heavy equipment have damaged the soil structure, which ultimately has a negative impact on the soil physical properties. The contradictions in the land structure and the types of vehicles that pass on it are also exacerbated by mining activities, which require large vehicles to pass. When this layer is destroyed, the soil, especially physical, properties change. The soil structure, which is formed naturally in an orderly manner from the top layer to the bottom one, is disrupted by degradation (Rahma et al., 2021; Tampubolon et al., 2020). The condition of the road damaged by the passing of mining vehicles was disclosed by an informant who lived and was active on the road passed by mining vehicles every day.

“Many parts of the road were damaged by the traffic of large vehicles. One truck that loads a large quantity of sand passes this road up to three times a day. At the same time, the general public also uses this road for their daily activities.”
The high intensity of vehicles passing through public roads is a serious problem for people who live around mining sites. Trucks come and go to transport the sand to the sand stockpiling location owned by the private sector. Sand mining trucks and the community use the same road. No separation is available for the two types of activity.

“The large vehicles have damaged the road. What’s more, during the rainy season, large vehicles with lots of loads can damage the asphalt of the road, which previously only had minor damage.”

The informants expressed that the damage to the road occurred because of the mining vehicles passing through it around the sand mining area in Lumajang. Meanwhile, the following data showed that not all areas that had become watersheds became mining locations:

<table>
<thead>
<tr>
<th>No.</th>
<th>District</th>
<th>Type of Quarrying Material</th>
<th>Area (Ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>1</td>
<td>Tempursari</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Pronojiwo</td>
<td>Group C (Sand, Rock)</td>
<td>83.78</td>
</tr>
<tr>
<td>3</td>
<td>Candipuro</td>
<td>Group C (Sand, Rock)</td>
<td>172.74</td>
</tr>
<tr>
<td>4</td>
<td>Pasirian</td>
<td>Group C (Sand, Rock)</td>
<td>79.16</td>
</tr>
<tr>
<td>5</td>
<td>Tempeh</td>
<td>Group C (Sand, Rock)</td>
<td>53.37</td>
</tr>
<tr>
<td>6</td>
<td>Lumajang</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Sumbersuko</td>
<td>Group C (Sand, Rock)</td>
<td>80.81</td>
</tr>
<tr>
<td>8</td>
<td>Tekung</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Kunir</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Yosowilangun</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>Rowokangkung</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>Jatiroto</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>Randuagung</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Sukodono</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Padang</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>Pasrujambe</td>
<td>Group C (Sand, Rock)</td>
<td>30.25</td>
</tr>
<tr>
<td>17</td>
<td>Senduro</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18</td>
<td>Gucialit</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>Kedungjajang</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>Klakah</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21</td>
<td>Ranuyoso</td>
<td>Group C (Sand, Rock)</td>
<td>8.92</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>****</td>
<td><strong>509.03</strong></td>
</tr>
</tbody>
</table>

Source: Lumajang Regency Environmental Service (2023).

The data from the Lumajang Regency Environmental Service show that out of 21 districts in Lumajang, only 7 are being the centers of Group C mining activities (sand and stone). The transport vehicles cross the seven areas (see Table 1) and spread to other areas to deliver mining industry commodities, which in this context are sand and rock.
The situation perceived by the community regarding damaged roads requires local government accountability. Data from the Public Works and Spatial Planning Department of Lumajang Regency for 2022 show that the condition of the Lumajang Regency road network system actually shows the empirical facts (see Table 2).

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Year</th>
<th>Increase (Decrease)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Road length</td>
<td>2020 (Km)</td>
<td>2021 (Km)</td>
</tr>
<tr>
<td>2</td>
<td>Road in good condition</td>
<td>753.41</td>
<td>595.02</td>
</tr>
<tr>
<td>3</td>
<td>Road in moderate condition</td>
<td>119.54</td>
<td>316.02</td>
</tr>
<tr>
<td>4</td>
<td>Road in bad condition</td>
<td>59.91</td>
<td>138.98</td>
</tr>
<tr>
<td>5</td>
<td>Road in very bad condition</td>
<td>176.34</td>
<td>58.98</td>
</tr>
</tbody>
</table>

Source: Lumajang Regency public works and spatial planning department (2022).

The road network that connects between regions in Lumajang district which has experienced increasingly severe damage is the actual condition faced by the community. The problem of heavy vehicles crossing the main road as community access is a serious problem that they see. The decline in the network system is also accompanied by data on a decrease in the ratio of asphalt roads in Lumajang Regency (see Table 3).

<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>Year</th>
<th>Increase (Decrease)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total road length (Km)</td>
<td>1,109.00</td>
<td>1,109.00</td>
</tr>
<tr>
<td>2</td>
<td>Asphalt road (Km)</td>
<td>1,067.39</td>
<td>1,047.71</td>
</tr>
<tr>
<td>3</td>
<td>Ratio (%)</td>
<td>96.25%</td>
<td>94.47%</td>
</tr>
</tbody>
</table>

Source: Lumajang Regency public works and spatial planning department (2022)

This data shows that vehicles loaded with mining commodities are not the only factor in road damage. However, it is necessary to point out the limited roads for mining vehicles under the authority of the local government.

4.1.2 Pollution

The population of vehicles carrying group C quarrying material commodities (sand and rock) not only brings about the problem of damage to public roads but also has an impact on the level of air pollution in the area where the vehicles cross. Pollution caused by mining activities has become a problem for the world community. In the case of mining, often the people around the mining area or workers who are active in mining
are affected by mining-related pollution. Dust and micro pollutants that spread through the air can cause a decrease in air quality (Trianisa et al., 2020).

Pollution that arises from vehicles passing through densely populated areas is also sensed by people who have lived and inhabited the area for decades, as stated by an informant:

“I have lived in this area (Lumajang Regency) for decades, side by side with sand trucks that pass in front of my house. Several times I saw accidents involving sand trucks. The air here is getting full of street dust during the dry season.”

4.2 LOCAL GOVERNMENT CONTROL OVER SAND MINING

Activities related to sand mining must be managed and regulated in accordance with statutory provisions. Through laws that have binding legal force, the government has a legal formality to anticipate and suppress the emergence of illegal miners and preventively control any individual or collective activities or behavior. The government needs to step in and supervise all mining activities to maintain the natural potential contained. As the party holding the policy in mining management, the government has the right to organize, utilize, restore, supervise, and control mining activities. According to the researcher’s opinion, the use of natural resources owned by an area must be regulated and managed in a sustainable spatial pattern. Efforts to implement a sustainable environmental recovery policy are the key to addressing the ongoing problems. Policies designed by the government must be a means of development that protects environmental ecosystems. Here, the government plays a role in encouraging the process of redesigning sand mining policies in Lumajang Regency as a basic legal concept in implementing spatial planning and a reference material for the government in structuring and preserving the environment. The government of Lumajang Regency has started this effort by involving local residents to discuss the management of sand mines, as stated by one of our informants, as follows:

“Yesterday we attended a routine meeting, which, however, was not properly scheduled, with village officials. When there was an important matter, the village officials would invite us to discuss it together. To be sure, the main issue that needs to be addressed is the environmental impact associated with mining. One of our hopes is to get compensation for mining activities that cause traffic jams and air pollution, which can have an impact on residents’ health. For handling traffic jams, we work together to empower local residents to regulate the entry and exit of vehicles.”
Policy on sustainable environmental recovery is the main instrument in protecting the environment. It must contain the principles of benefit, sustainability, and pro-environmentalism. In this case, far-sighted, not short-term-oriented, thinking is necessary for protecting the environment and anticipating conflicts in society. Controlling environmental damage in Lumajang Regency is mandatory to limit and regulate the parties involved in sand mining activities. The government here needs to regulate all sand mining mobility. Social conflicts usually occurred since the sand mining licenses issued were not community-based; there were even people, who were not recognized at all among the community, working at sand mining sites or holding a sand mining license. Such situation could spark the anger of those who own the territory. This happened because the Presidential Regulation of the Republic of Indonesia Number 55 of 2022 allowed anyone to have the same rights in holding a sand mining business license.

4.3 ENVIRONMENTAL CONTROL THROUGH POLICIES

The replacement of the Law on Mineral and Coal Mining made the mining management system in Indonesia become pluralistic in nature. The change contained the delegation of authority of Group C Quarrying Materials from the Regency Government to the Provincial Government. Based on the Circular of the Minister of Investment/Head of BKPM Number 17 of 2021, sand mining licenses have been changed to become the authority of the Ministry of Energy and Mineral Resources. However, through Presidential Regulation of the Republic of Indonesia Number 55 of 2022 concerning the Delegation of Granting Business License in the Mineral and Coal Mining Sector, sand mining licensing authority has been returned to the Provincial Government. This phenomenon shows the inconsistency of the government as the party that has authority in regulating mining activities that can ruin all mining activities, starting from governance, buying and selling, and licensing. An informant said,

“Well, sometimes, the buyer does not attach any Certificate of Origin, so there is no basis for imposing tax, which should be paid to the government. As a consequence, the price of sand is out of control. We hope that the Regency Government, in this matter, can oversee to prevent further inequality. What is the standard price of sand? In which areas are the products of sand mining marketed the most? We can answer these questions accurately if everything is well-managed, mapped, and informed. All these are related to the core trading system. As for the environment, as has been said, we empower local residents. We are currently, for the time being, thinking about how we can minimize or eliminate these impacts by, among others, applying centralized mining management and traffic regulation.”
Local governments should have the authority to regulate the governance of sand mining in their own area. For example, the Lumajang Regency Government has made Lumajang Regency Regional Regulation Number 1 of 2017 concerning Taxes on Non-Metal and Rock Minerals and made Lumajang Regent Regulation Number 40 of 2022 concerning Integrated Stockpile. These two regulations regulate the authority of the Regional Government on regional taxation and sand stockpile governance to manage the environmental impacts in the sand mining area. Regulations regarding sand mining management in the regions are part of the way for the Regional Government to make policies that can maintain the continuity of the sand mining business which ensures environmental sustainability, compliance with tax payments, and the continuity of the socio-economic life of the local community. Such regulations show the government’s real step for equality to prevent jealousy and attempts at mutual obstruction among people due to the struggle for economic access.

4.4 DISCUSSION

In addition to the enormous demand for sand, inequality of income and access has encouraged people to carry out illegal sand mining. Abundant natural resources make sand, both legal and illegal, mining the most developed in Lumajang Regency. Generally, mining activities can bring damage and have a negative impact on the ecosystem. The rise of illegal mining activities potentially can exploit natural resources excessively. Some parties carry out illegal mining to improve the quality and comfort of their lives. The local government, through its policies, must act fairly towards the community to prevent inequality and discrimination. The government should regulate and control mining activities to avoid conflict. Otherwise, it can cause a domino effect on environmental ecosystems and social and cultural life in society.

Illegal sand mining activities in Lumajang have been going on for a long time by the community using traditional methods and have caused regional income from the mining sector to decrease. In addition to the disrupted economic climate, illegal mining can have a huge impact on people's lives and the continuity of environmental ecosystems in the future, such as accidents, environmental degradation, the spread of chemicals, food crises, changes in community structure, etc. In order to prevent such problems, the government needs to make efforts. So far, there have been several efforts that have been made, including the application of criminal sanctions against parties involved in illegal
mining activities and urging the government to increase efforts to socialize, mentor, supervise, and control the management of mining business activities to change the mindset of people in Lumajang Regency in carrying out mining activities through partnership programs with the government and the private sector.

Control over sand mining management in the regions is part of the Regional Government's way of maintaining the continuity of the sand mining business, ensuring environmental sustainability, compliance with tax payments, and the continuity of the socio-economic life of the community. Natural wealth must be optimally managed to be used fairly and evenly in accordance with the mandate of the Constitution, namely to be used as much as possible for the prosperity of the people. The problem that occurs is the imbalance in mining behavior between community-based mining which works manually and large capital and investments-based mining. Of course, traditional mining workers will lose to those mining using heavy equipment, in terms of economic results. This can happen because the governance of sand mining licenses, in accordance with the Presidential Regulation of the Republic of Indonesia Number 55 of 2022, allows anyone to have the same rights in owning a sand mining business licenses.

Policies related to licenses should be based on the concept of people’s mining. A People’s Mining License (IPR) means a license given by the government to local communities to carry out a number of mining businesses within a limited area. The person or group entitled to obtain a People’s Mining License (IPR) can be an individual, community group, or cooperative, as long as being local resident(s). Based on the provisions, individuals each may only own a mine with a maximum area of 1 (one) hectare, community groups each may own a maximum of 5 (five) hectares, and cooperatives each may own a maximum area of 10 (ten) hectares. Such policy has a very significant economic impact on the region because it will increase regional tax revenues and increase the economic results of the community, especially those living around mining areas. Regulations on mining governance should not necessarily be generalized in every mining behavior. Group C Quarrying Materials (sand and rock) is a mining sector that can be reached by people who live around mining areas. Governance that is run contrary to the point of view of the community's economic sustainability will have the potential to trigger social conflicts and struggles for economic access that are mutually detrimental.
Environmental preservation policy is possible to arrange to manage the impact of mining. Given the complexity of environmental management, development requires planning and implementing environmental management in line with the principles of sustainable development, namely balanced economic, sociocultural, and environmental development as pillars that are interdependent and mutually reinforcing one another in society. Environmental management has strategic values, including integrated efforts to preserve environmental functions which include policy, management, utilization, development, maintenance, recovery, monitoring, and control. Law Number 32 of 2009 concerning Environmental Protection and Management provides a philosophical basis for the concept of sustainable environmental development in the framework of economic development. This is important in national economic development because environmental issues in the future will be increasingly complex and laden with investment interests. Therefore, environmental issues are a problem faced by both the government and the investment world in the future.

Natural resources continue to experience damage both in quantity and area. Such physical damage was caused by high exploitation. Environmental problems such as pollution, damage, and disasters from year to year are unavoidable, causing a decrease in environmental quality and a very serious impact on human health and life. Sustainable environmental management must ensure that the managed resources are stable and must avoid over-exploitation of renewable resources. For non-renewable natural resources, investment must be made in the form of replacement for the declined natural resources before exploitation. Environmental management includes the preservation of biodiversity, atmospheric stability, and ecosystem functions. The government should have a policy in this regard in order to create a sustainable environment. The government should pay attention to and guarantee the environmental health of local residents affected by mining activities to improve their quality of life.

Environmental damage is often faced by the community around the mining site. The ecosystem damage can threaten the socio-economic life of the people who are near the mining area. Awareness of the dangers of illegal sand mining exploitation activities can lead to natural disasters. Efforts to overcome such damage require policies on environmental restoration to protect the ecosystem. The role of local government policy through sustainable environmental restoration can be the answer needed to overcome this problem. This is important for future sustainability and minimizing pollution and damage.
The presence of this sustainable environmental restoration policy needs to be carried out for a balance between mining and environmental sustainability. This policy is expected to provide a sense of fairness and security for all parties, both users of natural resources and communities who are not involved but are affected by mining activities. Regulation and legal protection are expected to be able to maintain social and ecological stability.

The research hypothesis contains an explanation of the direct and indirect effects that refer to the previous hypothesis submission. This study aims to provide a causal explanation or relationship between variables through direct hypothesis testing, namely market orientation (X1), HR competency (X2) and knowledge management (X3) on competitive advantage variables (Y), as well as indirect testing mediated by company performance (Z). The discussion of the results of this study is explained as follows:

The Relationship between Market Orientation and Competitive Advantage

Increasing Market Orientation can increase Competitive Advantage.

The statistical test results for the first hypothesis indicate that Market Orientation has a significant influence on competitive advantage. The indicators of customer orientation, competitor orientation, and intra-group orientation play a significant role in enhancing Market Orientation, which in turn positively affects competitive advantage. These findings align with previous research by Mazaira et al. (2003), even though their study focused on the textile industry in Spain. The results of this current study provide further support and strengthen the findings of Farrell et al. (2008), Pratono and Darmasetiawan et al. (2019), and Talaja et al. (2017). These studies also found significant relationships between Market Orientation and competitive advantage in different industries and contexts.

Relationship between HR Competence and Competitive Advantage

Increasing HR Competence has no effect on increasing Competitive Advantage.

The statistical test results for the second hypothesis indicate that HR Competence does not have a significant effect on competitive advantage. This means that changes in HR Competence, such as improvements in abilities, knowledge, and personal attributes, do not lead to a significant increase in competitive advantage.

Analyzing the indicators used to measure HR Competence, it is observed that the Capability indicator plays a dominant role in enhancing HR Competence. However, the Knowledge and Personal Attribute indicators do not show a consistent direction in increasing HR Competence.
These findings align with previous research by Wright et al. (1998) and Khandekar and Sharma (2005), who also investigated the relationship between HR Competence and competitive advantage in the context of mining exploration and found insignificant results. Therefore, this current study provides further support and strengthens their findings.

5 CONCLUSION

The implementation of the Mineral and Coal Law being amended from time to time has experienced many dynamics. Changes in regulations that tend to be inconsistent have given rise to multiple interpretations and obstacles in management. One of the areas affected by this problem is Lumajang Regency. As an area that has many mining sites, it must be prepared for all the impacts coming from the implementation of mining licenses. Analyses are needed to explore important inputs before making environmental management policies in Lumajang Regency to realize a sustainable sand-mining management model. The results of the analyses should become a standard and reference in solving existing problems to make good governance policies capable of protecting ecosystems and suppressing illegal sand mining activities.
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