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Reclamation and Post-Mining Management at PT. XYZ East Kalimantan Province

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ABSTRACT
East Kalimantan Province is one of the largest coal producers in Indonesia. Mining activities often have a negative impact on the environment, making it important to manage reclamation effectively. The purpose of this study is to understand and analyze the management of reclamation and post-mining at PT XYZ to minimize the negative impacts of mining activities. This research uses a case study method with a qualitative descriptive approach. Data was collected through interviews, observation and documentation. The informants involved were purposively selected to gain an in-depth understanding of reclamation practices. The results show that PT XYZ routinely conducts reclamation and post-mining activities. However, the implementation has not been fully optimized due to various constraints, including the lack of a good reclamation plan, adequate funding and the involvement of all relevant parties. To minimize the negative impacts of mining activities, a strong commitment from the company, community and government is needed to create sustainable and environmentally friendly mining operations. This study provides important insights into reclamation practices and managerial approaches that can be adopted by other companies.

INTRODUCTION

The mining sector is one of the biggest drivers of the economy and national development for Indonesia, including coal. Most coal production is exported, with 75% of total coal production exported to countries such as Japan, Taiwan, South Korea and Europe. This shows Indonesia's contribution in supplying coal to the international market (Oktorina, 2018). Coal mining in Indonesia is generally carried out with an open pit mining system, which has disrupted and destroyed ecological functions and natural balance, causing negative impacts, namely environmental damage. So that environmentally sound development is important for every nation and country that wants to preserve natural resources (Gumanti et al., 2024). Therefore, natural resources need to be preserved and maintained for the survival of humans today, as well as for future generations. Humans are the key cause of environmental (ecosystem) damage. With the increase in human population, the needs of life also increase, resulting in an increase in demand for land such as for housing, agriculture and mining.

East Kalimantan Province is one of the largest coal contributors in Indonesia. Of the various natural resources available in East Kalimantan, coal is the main contributor to the province's economy. Most districts/cities in East Kalimantan have coal deposits, except for Balikpapan City and Bontang City (BPPMD, 2013). According to data from the Ministry of Energy and Mineral Resources, by the end of 2022 Indonesia had verified coal reserves of 33.37 billion tons. About 41% of the total reserves are located in East Kalimantan, while the remaining 59% are spread across 14 other provinces. The following is a complete list of provinces that have verified coal reserves as of December 2022:

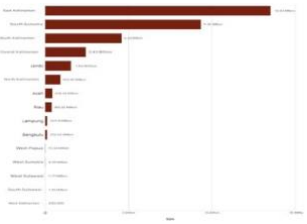

Figure 1. Largest Coal Reserves in 2022

Based on the graph above, on the other hand, the government targets to phase out the operation of several coal-fired power plants by 2040 in order to reduce greenhouse gas emissions. Mining greatly affects the natural environment and local communities. Economic gains usually come at a cost to local interests and environmental costs around the mining area. Economic, social and environmental balance is central to sustainable development (Bargawa, 2017). Environmentally sound development is an important requirement for every nation and state that wants to preserve natural resources. Therefore, natural resources need to be preserved and maintained for human survival now, as well as for future generations.

In this case, buyer loyalty is the level of customer commitment and loyalty to a company or brand (Arizona, 2020). This is reflected in their tendency to continuously choose and use products or services from that company, loyal customers have a strong relationship with the company, feel satisfied with their experience, and have trust and confidence in the quality of the product or service provided (Christiarini, 2023). Loyalty has a high strategic value for companies, because it can increase customer retention, generate additional revenue, promote brands organically, and reduce marketing costs to acquire new customers (Pratama et al., 2023). In a competitive business world, building and maintaining customer loyalty is a key factor in achieving long-term success.

The important thing needed to create a sustainable relationship is customer loyalty. However, customer loyalty depends on how much satisfaction comes from the service organization or output (Zusrony, 2021). Customers who are satisfied or dissatisfied may tell people about their experience. Customer satisfaction is one of the business goals, which can be achieved through understanding the market needs for products, and providing products that meet customer needs will further increase customer satisfaction, build and maintain profitable long-term relationships with market needs for products.

However, in carrying out activities experiencing problems in this case efforts to create customer satisfaction in increasing buyer loyalty, this is indicated by the amount of coal production. Data regarding the decline can be shown in Table 1.

Table 1. Decline in Coal Production

No.	Company Type	2018	2019	2020	2021
1	PKP2B Company	12,789,002.09	17,345,965.01	21,447,164.00	3,959,294.46
2	IUP Company	01,929,583.78	5,807,903.93	4,583,158.65	10,293,507.22
	Total Coal Production	14,718,585.87	13,153,868.94	06,030,322.65	14,252,801.68

Table 1. shows that there is a tendency to show a decrease for production in 2028-2021, a condition that is important to evaluate related to efforts to improve quality and value in an effort to increase buyer loyalty. The occurrence of this decline is indicated because it is felt that it is not in accordance with expectations.

Based on this, reclamation plans are land management activities that include improving the physical condition of the soil to prevent landslides, creating reservoirs to improve the quality of toxic acid mine drainage, followed by revegetation activities. Reclamation activities are important to improve ex-mining land (Widayati, 2023). Reclamation based on the regulation of Law No. 3 of 2020 is an activity carried out throughout the stages of the Mining Business to organize, restore and improve the quality of the environment and ecosystem so that it can function again according to its designation. The principle of reclamation activities is that reclamation activities must be considered as a holistic unit of mining activities and reclamation activities must be carried out as early as possible and do not have to wait for the entire mining process to be completed.

Environmentally sound development is an important requirement for every nation and country that wants to preserve natural resources (Putri et al., 2023). One of the activities to complete mining activities is reclamation or efforts to rearrange ex-mining land so that it can be useful and useful (Jatmiko et al., 2023). The rearrangement of ex-mining land is also accompanied by replanting the land with designated plants or tree species. Reclamation of ex-mining land aims to restore the benefits of the forest in accordance with its function (Hirfan, 2018). With this reclamation, the condition of the land that has been replanted with certain plants or tree species is expected to become an ecosystem that is close to the initial hue of the land condition before being utilized.

In this study, the PDCA (Plan-Do-Check-Act) management approach is applied as a framework to analyze and manage reclamation and post-mining activities at PT XYZ, East Kalimantan Province. PDCA management was chosen due to its iterative nature, which enables continuous problem identification and resolution. By integrating the PDCA cycle, this research seeks to formulate a more systematic and effective strategy for managing the environmental impacts of mining activities. The main difference between this research and previous studies is the application of the PDCA method, which has not been explicitly used in the context of post-mining reclamation. Most previous studies tend to focus on descriptive aspects without providing a clear managerial framework for sustainable management. Thus, this study not only makes an empirical contribution to the understanding of reclamation practices, but also offers a managerial approach that can be adopted by other mining companies to improve effectiveness and efficiency in implementing reclamation activities. The novelty of this research lies in the application of the PDCA method that provides practical and measurable guidance in reclamation management, as well as the emphasis on collaboration between various stakeholders, including government, local communities and environmental experts. Through this approach, this research is expected to provide a more comprehensive and sustainable solution in addressing the negative impacts of mining activities, as well as raising awareness of the importance of environmental sustainability.

This research utilizes PDCA management, a management method that uses iterative cycles to fix problems, improve processes, and achieve company goals. PDCA stands for Plan-Do-Check-Act, which in Indonesian means planning, doing, checking, and acting. PDCA has several advantages, including: Easy to understand and implement, Able to detect potential problems early on, Continuous Helps optimize the use of resources, Helps organizations deal with change and uncertainty. PDCA is also at the core of many ISO standards, including ISO 9001 (quality management) and ISO 14001 (environmental management). Based on the above explanation, the title of this research is "Reclamation and Post-Mining Management at PT XYZ in East Kalimantan Province". Based on the formulation of the problem above, the purpose of this study is to determine and analyze the reclamation and post-mining management at PT XYZ Group in East Kalimantan Province in an effort to minimize the negative impact of mining activities on the environment.

This research has significant theoretical and practical benefits. From a theoretical perspective, this research provides empirical evidence on reclamation and post-mining management at PT XYZ in East Kalimantan Province, and serves as input for decision-makers regarding reclamation and post-mining management at the company. Meanwhile, the practical benefit is to provide insight to readers about the importance of reclamation and post-mining management at PT XYZ, to increase awareness of the need for good management in the mining industry.

RESEARCH METHOD

Type of Research

The research method used in this research is a case study. According to Robert (2014), a case study is an empirical inquiry that investigates phenomena in the context of real life, where the boundaries between phenomena and context do not appear clearly or clearly and uses various sources or multiple sources of evidence. Case studies allow researchers to maintain the holistic and meaningful characteristics of real-life events such as a person's life cycle, organizational and managerial processes, and changes in the social environment, international relations, and the maturity of industries.

The type of research used in this research is descriptive study research with a qualitative approach that is carried out by examining literature, official data from institutions and interviews with related parties in this study. A qualitative approach is an approach that focuses on scientific research activities by describing and understanding the social phenomena it observes. Descriptive research is research that is directed at providing symptoms, facts or events systematically and accurately, regarding the properties of certain populations or regions. In descriptive research tends not to need to look for or explain interrelationships and test hypotheses.

Place and Time of Research

The research site is a place where the study process used to obtain research problem solving takes place. The place of this research was conducted at the Coal Company in East Kalimantan Province. The research time that the author conducted lasted for approximately from June 2024 to September 2024 for 4 months.

Data Collection Technique

In terms of data collection techniques, qualitative research prioritizes the use of interviews and observations. Data collection methods are

techniques or ways that researchers can use to collect data and data collection instruments are tools selected and used by researchers in their activities to collect data so that these activities become systematic and easier. The instruments in data collection in this study are:

1. Observation

Observation is a condition where direct observation is carried out by the researcher in order to better understand the context of the data in the overall social situation so that a holistic (comprehensive) view can be obtained. Observations in this study were carried out at PT. XYZ in East Kalimantan Province.

2. Interview

An interview is an oral question and answer between two or more people directly or a conversation with a specific purpose. Two parties carry out the conversation, namely the interviewer (interviewer) who asks questions and the interviewee (interviewer) who provides answers to those questions. Interviews in this study were conducted in a structured manner, and then in this study, researchers asked several questions verbally to informants about reclamation and post-mining management at PT XYZ in East Kalimantan Province.

3. Documentation

Documentation is the collection of records of events that have taken place in the form of writings, pictures/photos or monumental works of a person/agency. The documentation in this study is about reclamation and post-mining activities at PT XYZ in East Kalimantan Province.

Informant Selection Technique

The technique of determining informants in this study using purposive sampling technique. This sampling is based on certain considerations. This consideration is in the form of selecting people who are considered to know best about what is expected. So that later the research carried out can run more easily. In selecting informants related to reclamation and post-mining management, the researchers set informants in the internal PT XYZ Group in East Kalimantan Province.

Data Analysis Technique

Data analysis is the process of systematically searching and compiling data obtained from interviews, field notes, and other materials, so that it can be easily understood, and the findings can be informed to others. Data analysis is carried out by organizing data, breaking it down into units, synthesizing, arranging into patterns, selecting what is important and what will be studied, and making conclusions that can be told to others. According to Miles and Huberman, it is divided into three streams of activities that occur simultaneously. The three streams are:

1. Data Display

An organized set of information that gives the possibility of drawing conclusions and taking action. The most commonly used presentation of qualitative data in the past was the form of narrative text. In qualitative research, data presentation can be done in the form of brief descriptions, charts, relationships between categories, flowcharts and the like. By displaying data, it will make it easier to understand what is happening, plan further work based on what has been understood. Furthermore, in presenting precise and measurable data, it requires accurate data. Data itself is something that does not yet have meaning for the recipient and still requires processing. In order to get accurate and reliable data, it is necessary to maximize data collection.

2. Data Reduction

Data in qualitative research is generally in the form of qualitative descriptive narratives. There is no statistical data analysis in qualitative research. The analysis is qualitative narrative, looking for similarities and differences in information. Data reduction takes place continuously throughout the research has not been terminated. The product of data reduction is a summary of field notes, both from initial notes, extensions, and additions.

Data reduction is part of the analysis that sharpens, classifies, directs, discards unnecessary, and organizes data in such a way that conclusions can be drawn and verified. With data reduction, qualitative data can be simplified and transformed in various ways through rigorous selection. Through summary or brief description, categorizing them in a broader pattern, and so on.

3. Conclusion drawing and Verification

The third step of qualitative data analysis is conclusion drawing and verification. Conclusions are the essence of research findings that describe the final opinions based on previous descriptions or, decisions obtained based on inductive or deductive thinking methods. The conclusions made must be relevant to the research focus, research objectives and research findings that have been interpreted and discussed. Remember the research conclusions are not a summary of the research.

In this study using data reduction, qualitative research is generally in the form of qualitative descriptive narratives. There is no statistical data analysis in qualitative research. The analysis is qualitative narrative, looking for similarities and differences in information. Data reduction takes place continuously throughout the research has not been terminated. The product of data reduction is a summary of field notes, both from initial notes, extensions, and additions.

Data Validity Technique

1. Source Triangulation. ; Source triangulation to test the credibility of data is done by checking the data that has been obtained from various data sources such as interviews, archives, and other documents
2. Triangulation Technique ; Triangulation of techniques to test the credibility of data is done by checking the data that has been obtained from the same source using different techniques. For example, data obtained from observation, and then checked by interview.
3. Time Triangulation ; Time can affect the credibility of data. Data obtained by interview techniques in the morning when the source is still fresh will usually produce more valid data. For this reason, testing the credibility of data must be carried out with observation, interviews and documentation at different times or situations until obtaining credible data.

In this study, researchers used source-only triangulation as a data validity technique. Researchers interviewed more than one informant who was considered to have a different point of view. The researcher will check the informant's answer whether it is in accordance with the data that has been collected through literature studies and related documents or not. Source triangulation is considered appropriate for this research because researchers can explore deeper data through different sources and perspectives, then researchers will compare information from different informants to find out whether there is a match between what they say.

RESULTS AND DISCUSSION

Research Results

Reclamation plans are land management activities that include improving the physical condition of the land to prevent landslides, creating reservoirs to improve the quality of toxic acid mine drainage, followed by revegetation activities. Reclamation activities are important to improve ex-mining land (Widayati, 2023). Reclamation based on the regulation of Law No. 3 of 2020 is an activity carried out throughout the stages of the Mining Business to organize, restore and improve the quality of the environment and ecosystem so that it can function again according to its designation. The principle of reclamation activities is that reclamation activities must be considered as a holistic unit of mining activities and reclamation activities must be carried out as early as possible and do not have to wait for the entire mining process to be completed.

Environmentally sound development is an important requirement for every nation and country that wants to preserve natural resources (Putri et al., 2023). One of the activities to complete mining activities is reclamation or efforts to rearrange ex-mining land so that it can be useful and useful (Jatmiko et al., 2023). The rearrangement of ex-mining land is also accompanied by replanting the land with designated plants or tree species. Reclamation of ex-mining land aims to restore the benefits of the forest in accordance with its function (Hirfan, 2018). With this reclamation, the condition of the land that has been replanted with certain plants or tree species is expected to become an ecosystem that is close to the initial hue of the land condition before being utilized.

Based on the results of interviews regarding the existence of the WALHI movement in East Kalimantan Province, this interview with Handayani as Supervisor, said that:

"The Existence and Role of WALHI in East Kalimantan, Environmental Advocacy WALHI East Kalimantan actively advocates for issues of environmental damage caused by mining and plantation activities. This region is one of the areas with a high level of exploitation of natural resources, so WALHI is often at the forefront in fighting for ecological justice."

Furthermore, he said that:

"WALHI Monitoring and Awareness often conducts research, studies, and publications related to environmental impacts in East Kalimantan. They also educate local communities about the importance of environmental conservation, especially in areas exposed to the negative impacts of large-scale economic activities."

Another interview conducted with Subowo as President Director, said that:

"Not related to WALHI, the Environmental Agency is a strategic partner that can help remind companies to run operations sustainably."

This is reinforced, the results of an interview conducted by Ramli as Field Supervisor, said that:

"Lack of understanding regarding what WALHI is".

Based on the results of the above interviews, the researcher concluded that the Regional Rescue Campaign Several major issues that are of concern to WALHI in East Kalimantan, which include:

1. Coal mine damage; East Kalimantan is known as one of the largest coal producers in Indonesia. However, the environmental impacts of this activity, such as abandoned mine pits without reclamation, are the focus of WALHI's advocacy.
2. Deforestation and land degradation; Oil palm plantations are often the main cause of deforestation, which threatens biodiversity and disrupts the livelihoods of indigenous communities.
3. IKN Development; WALHI criticized the Nusantara Capital City development project which is considered to trigger environmental damage, ranging from deforestation to potential threats to conservation areas.
4. Strengthening Local Communities ; WALHI works with indigenous peoples and local communities to protect their rights to land and natural resources. They support community efforts to maintain local wisdom and prevent land grabbing.
5. Networking and Collaboration ; WALHI East Kalimantan collaborates with other environmental organizations, at the local, national and international levels, to strengthen advocacy and pressure on policies that do not favor the environment.

Based on the results of interviews regarding reclamation and post-mining management at PT XYZ Group, this interview with Handayani as Supervisor, said that:

"BBS is committed to reclamation and post-mining management regulated through the Ministry of Energy and Mineral Resources regulations, such as the Minister of Energy and Mineral Resources Decree No. 1827K/30/MEM/2018, which requires mining companies to restore mining areas according to approved reclamation plans. If PT XYZ follows this regulation, they are obliged to revegetate, rehabilitate the land, and restore its ecological function."

Another interview conducted with Subowo as President Director, said that:

"Focus on the implementation of the strategic plan in accordance with the Minister of Energy and Mineral Resources Decree No. 1827K/30/MEM/2018 and the Reclamation Plan Document."

This is reinforced, the results of an interview conducted by Ramli as Field Supervisor, said that:

"Trying to carry out reclamation work as expected by the leadership, especially in accordance with the Minister of Energy and Mineral Resources Decree No. 1827K/30/MEM/2018."

Based on the interviews above, we conclude that reclamation and post-mining management is regulated through Ministry of Energy and Mineral Resources regulations, such as Minister of Energy and Mineral Resources Decree No. 1827K/30/MEM/2018, which requires mining companies to restore mining areas according to approved reclamation plans.

Based on the results of interviews regarding supporting factors in reclamation and post-mining management at PT XYZ Group, this interview with Handayani as Supervisor, said that:

"Reclamation and post-mining management in mining companies such as PT XYZ Group depends on various supporting factors including technical, regulatory and social aspects."

Another interview conducted with Subowo as President Director, said that:

"Management commitment in providing budget".

This is reinforced, the results of an interview conducted by Ramli as Field Supervisor, said that:

"Land availability and management in providing budget, availability of adequate funds to support reclamation activities, such as revegetation, waste management, and land rehabilitation".

Based on the results of the above interviews, researchers concluded that the main factors that usually support the success of reclamation and post-mining management:

1. Regulatory Compliance ; Government Regulation: Reclamation and post-mining must comply with Minister of Energy and Mineral Resources Regulation No. 1827 K/30/MEM/2018 on Guidelines for the Implementation of Reclamation and Post-mining in Mining Business Activities. Approved Reclamation Plan: A reclamation plan that has been approved by the government is the main guide for companies to carry out land restoration.
2. Human Resources ; The company needs a team of experts, such as geologists, environmental engineers and reclamation experts, to design and implement reclamation strategies and provide training to operational staff to understand effective reclamation techniques.
3. Reclamation Technology and Methods ; The use of modern technology, for example, the use of heavy equipment and drone technology to map the mining area. Revegetation methods of replanting with local plant species to restore native ecosystems. Water and soil management, drainage systems and waste management to prevent erosion and pollution.
4. Company Commitment ; Implementation of ISO Standards, PT XYZ is noted to have obtained ISO 9001:2015 certification, which shows commitment to quality management, including in environmental aspects. Budget allocation, Availability of adequate funds to support reclamation activities, such as revegetation, waste management, and land rehabilitation.
5. Collaboration with Stakeholders ; Collaboration with the Government to comply with regulations and obtain renewed operating licenses. Local community engagement involving surrounding communities in reclamation activities to increase social acceptance.
6. Monitoring and Evaluation ; Environmental Audit which conducts regular audits to ensure reclamation plans are on schedule and post-mining monitoring to ensure ecosystem sustainability after mine closure, such as checking revegetation success and water quality.
7. Environmental Awareness ; CSR (Corporate Social Responsibility) programs that provide social responsibility programs that focus on the environment, such as reforestation or conservation of forest areas.

These factors support each other to create sustainable and environmentally and socially responsible reclamation and post-mining management. More detailed information on specific implementation by PT XYZ can be obtained through the company's official sustainability report or environmental audit.

Based on the results of interviews regarding inhibiting factors in reclamation and post-mining management at PT XYZ Group, this interview with Handayani as Supervisor, said that:

"Regulatory aspects, technical constraints, economic factors, social factors, lack of environmental commitment and further environmental impacts".

Another interview conducted with Subowo as President Director, said that:

"Pressure from shareholders who want budget efficiency, frequent regulatory changes".

This is reinforced, the results of an interview conducted by Ramli as Field Supervisor, said that:

"Skilled labor, difficulty in procurement of goods & seeds is very long".

Based on the results of the above interviews, researchers concluded that the factors that inhibit the success of reclamation and post-mining management are:

1. Regulatory Aspects ; Inconsistent compliance, mining companies often face difficulties in meeting all regulatory requirements, especially if previously submitted reclamation plans are not adapted to changing field conditions. Weak supervision, sometimes, a lack of supervision from the authorities leads to reclamation implementation not going according to MODI standards.
2. Technical Constraints ; Land Conditions: Reclamation of large mining areas with extreme topographic conditions or highly degraded land requires expensive and complex technical efforts. Soil quality: Ex-mined soils are usually deprived of essential nutrients, making successful revegetation difficult.
3. Economic Factors ; Budget constraints, high reclamation costs are often a burden for companies, especially if the required reclamation fund reserves are insufficient. Prioritization of profits, some companies focus more on mine operations than investment in reclamation and post-mining.
4. Social Factors ; Lack of support from local communities, If reclamation does not involve local communities or does not provide direct benefits, communities may show resistance. Conflicts of interest, disagreements between companies, local governments and local communities over the use of mined land can slow down the reclamation process.
5. Lack of Environmental Commitment ; Lack of long-term vision, reclamation is often considered an administrative obligation rather than part of a long-term commitment to sustainability. Lack of transparency, information on reclamation progress is often not clearly published, making external oversight difficult.
6. Advanced Environmental Impacts ; Water and air pollution, poorly managed mine waste can contaminate surrounding natural resources, making reclamation more difficult. Slow revegetation, revegetation failure often occurs if the plant species used are not suitable for the land conditions.

Based on this, to overcome these barriers, mining companies such as PT XYZ need to ensure there is a well-thought-out reclamation plan, adequate funding and the involvement of all relevant parties, including government, communities and environmental experts. Regular audits and transparency in sustainability reports can also help reduce these barriers.

Based on the results of interviews regarding efforts to minimize the negative impact of mining activities on the environment, this interview with Handayani as Supervisor, said that:

"Minimizing the negative environmental impacts of mining activities requires a comprehensive approach that includes technical, regulatory, social and management measures".

Another interview conducted with Subowo as President Director, said that:

"Allocate CSR funds specifically for environmental programs".

This is different from the results of the interview conducted by Ramli as Field Supervisor, saying that:

"Reclamation and replanting of ex-mining land."

Based on the results of the interview above, the researcher concluded that several efforts can be made, namely:

1. Land Reclamation and Rehabilitation

- Revegetation: Replanting native plants to restore the ecological function of the mined area.
- Soil Rehabilitation: Adding a layer of fertile soil to mined land to improve soil quality.
- Ecosystem Restoration: Restoring native habitats for affected flora and fauna.

2. Waste Management
   - Acid Mine Drainage (AAT) Management: Controlling the pH of mine water to prevent contamination of water sources.
   - Hazardous and toxic material (B3) management: Ensure mine waste is properly treated before disposal.
   - Drainage System: Construct systems that prevent flooding and erosion.
3. Utilization of Environmentally Friendly Technology
   - Digital Environmental Monitoring: Using drone technology and GIS (Geographic Information System) to monitor mine impacts in real-time.
   - Use of Energy Efficient Heavy Equipment: Reduce carbon emissions during the mining process.
4. Regulatory Compliance
   - Comply with Government Regulations: Such as Minister of Energy and Mineral Resources Regulation No. 1827 K/30/MEM/2018 on reclamation and post-mining.
   - Periodic Environmental Audits: Identify emerging environmental issues and implement corrective actions
5. CSR Program Development
   a. Involving local communities in conservation activities
   b. Provide training for sustainable new skills after mine closure
6. Law Enforcement
   - Sanctions for Violations: Impose fines or license revocation on mining companies that do not fulfill their environmental obligations.
   - Monitoring by government and NGOs: Involves third parties to ensure mine management is up to standard.
7. Education and Awareness
   - Community Education: Educating the community around the mine on the importance of environmental conservation
   - Internal Company Training: Equip employees with good environmental management knowledge
8. Collaboration with Stakeholders

   Inviting government, indigenous peoples, academics, and environmental organizations to engage in environmental management planning and implementation.

Based on this, this effort needs to be supported by a strong commitment from the company, community and government to create sustainable and environmentally friendly mining activities. With this approach, negative impacts on the environment can be effectively minimized.

Based on the results of interviews regarding socialization in providing an understanding of the importance of natural balance to the community, this is an interview with Handayani as the Supervisor, saying that:

"Socializing the importance of nature balance to the community is a key step in increasing their awareness and participation in environmental conservation".

Another interview conducted with Subowo as President Director, said that:

"Held during public consultations, government or environmental organizations can visit villages to give talks or discussions".

Based on the results of the interview above, the researcher concluded that several approaches that can be used in this socialization include:

1. Education Through Community Programs
   - Training and Workshops: Organize training for communities on environmentally friendly practices, such as recycling, tree planting, or waste management.
   - Environmental School: Establish an environmental education program for students and teachers to build awareness from an early age.
   - Field Simulations: Inviting communities to ecosystem restoration projects or reclamation activities to demonstrate the direct impacts of conservation activities.

2. Public Campaign
   - Social Media: Using social media platforms to spread information about the importance of ecosystem balance through infographics, educational videos, or inspirational stories.
   - Field Extension: Extension teams from government or environmental organizations can visit villages to give talks or discussions .
   - Environment Day: Organize public events on occasions such as Earth Day or World Environment Day to attract public attention.
3. Collaboration with Local Communities
   - Empowerment of Indigenous Peoples: Involving indigenous communities, who often have local wisdom in natural resource management, to become real examples of conservation practices.
   - Company CSR Programs: Encourage companies operating in the region to fund environmental education programs for the community.
4. Increased Participation
   - Volunteer Program: Invites the community to get directly involved in environmental conservation projects, such as reforestation or beach cleanups.
   - Competitions and Incentives: Organize competitions such as greening competitions or reward programs for people who are active in protecting the environment.
5. Dissemination of Information Through Traditional and Digital Media
   - Pamphlets and Posters: Distribute information in a simple form in strategic places such as markets, village offices, and schools.
   - Local Radio: Using local radio stations to reach out to communities that do not have internet access
6. Cultural Approach
   - Tradition and Art: Utilize local arts such as theater, traditional music, or murals to convey environmental messages

- Inspirational Stories: Using a storytelling approach based on experiences or success stories from other regions that have succeeded in preserving the environment.

7. Continuous Mentoring
   - Monitoring and Evaluation: Provide assistance to the community to ensure the implementation of the knowledge provided.
   - Provision of Facilities and Infrastructure: Supporting communities with tools or facilities that support eco-friendly lifestyles, such as recycling bins or plant seeds.

Based on this, this approach needs to be carried out consistently and involve various parties, including the government, NGOs, local communities and the private sector. With participatory and inclusive methods, it is easier for people to understand the importance of nature balance and be moved to actively contribute.

Based on the results of interviews regarding how to provide environmental education to the community to understand the importance of natural balance, this interview with Handayani as Supervisor, said that.

"Environmental education to the community aims to raise awareness of the importance of natural balance and encourage their active participation in environmental conservation".

Another interview conducted with Subowo as President Director, said that:

"Implemented during public consultation".

Based on the results of the interview above, the researcher concluded that effective ways to implement environmental education, namely:

1. Training and Extension Program
   - Practical Training: Teaching techniques such as waste management, composting, or reforestation directly on the ground
   - Direct Outreach: Extension teams from the government or environmental organizations can visit communities to provide information on local environmental issues, such as deforestation or water pollution.
2. Formal Education Curriculum
   - Integration into Schools: Add environmental materials to the school curriculum to build awareness from an early age.
   - School Environment Project: Involving students in activities such as greening the school area or cleaning competitions.
3. Technology and Media Utilization
   - Educational Video: Create simple and engaging video content for dissemination through social media or other digital platforms.
   - Interactive Apps: Develop apps that teach people how to keep nature in balance, such as recycling guides or carbon footprint calculators.
4. Public Campaigns and Community Activities
   - Mass Greening: Organizing tree planting activities with the community.
   - Awareness Campaign: Use environmental days, such as Earth Day, to organize environmental education events or discussions.
   - Recycling Market: Motivate the community with activities such as bartering plastic waste for household needs.
5. Education Based on Local Wisdom
   - Traditional Approach: Using local arts such as wayang, folklore, or traditional songs to convey environmental messages.
   - Collaboration with traditional leaders: Integrate existing local wisdom as part of environmental conservation.
6. Participatory Approach
   - Volunteer Program: Encourages communities to get directly involved in conservation projects, such as forest restoration or beach cleanups.
   - Discussion Forum: Engage the community in open dialog about local environmental issues and shared solutions.
7. Incentives and Rewards
   - Environmental Awards: Recognizes individuals or groups that make a significant contribution to protecting the environment.
   - Economic Incentives: Providing direct benefits, such as free seedlings or fertilizer subsidies for participants in educational programs.
8. Provision of Facilities and Infrastructure
   - Eco-Facilities: Provide recycling bins, access to clean water, or greening areas in the community.
   - Environmental Information Center: Open a center that provides information and training on environmental conservation.

Based on this, this approach requires cooperation between the government, non-governmental organizations, academia and the private sector. By involving communities directly and using methods that are relevant to local needs, environmental education can be effective and sustainable.

Based on the results of interviews regarding solutions in overcoming environmental damage due to mining, this interview with Handayani as Supervisor, said that:

"Addressing environmental damage caused by mining requires comprehensive measures, including land remediation, waste management, and collaboration between various parties."

Another interview conducted with Subowo as President Director, said that:

"Manage the environmental impacts that will arise according to the quality standards according to the applicable law.

This is different from the results of the interview conducted by Ramli as Field Supervisor, saying that:

"Conduct reclamation and close mining pits".

Based on the results of the interview above, the researcher concluded that the main solution to overcome this problem, namely:

1. Land Reclamation and Rehabilitation
   - Revegetation: Replanting of native vegetation to restore ecosystem functions. The type of plants used must be suitable for the condition of the mined land.
   - Ecosystem Restoration: Restoring natural habitats by involving ecologists to monitor the sustainability of flora and fauna in the area.
   - Topographic Restoration: Restoring land contours to a more stable condition to prevent erosion and landslides.
2. Waste Management
   - Acid Mine Drainage (AAT) Treatment: Controls pH levels and treats wastewater before it is released into the environment.

- Good Drainage System: Build a drainage system to manage rainwater runoff so that it does not pollute the surrounding environment.
- Mine Material Recycling: Processing mining waste for reuse in other industries.

3. Application of Environmentally Friendly Technology
   - Remediation Technology: Using bioremediation or phytoremediation to treat polluted land by utilizing certain microorganisms or plants.
   - Digital Monitoring: Utilizing drone or sensor technology to monitor the impact of mining activities in real-time.
   - Sustainable Mine Design: Adopting more environmentally friendly mining methods, such as underground mines that minimize surface impacts.
4. Regulation and Law Enforcement
   - Regulatory Compliance: Ensure mining companies comply with reclamation and post-mining regulations in accordance with Minister of Energy and Mineral Resources Regulation No. 1827 K/30/MEM/2018.
   - Strict Monitoring: The government should conduct regular inspections to ensure environmental obligations are met.
   - Strict Sanctions: Punish companies that do not fulfill reclamation obligations and cause environmental damage.
5. Community Engagement
   - Education and Awareness: Educating the public about the importance of conserving the environment and how they can get involved.
   - Partnership Program: Involving local communities in reclamation projects to create a sense of shared responsibility.
6. Collaboration with Stakeholders
   - Cooperation with NGOs: Non-governmental organizations can assist in advocacy, research, or implementation of recovery projects.
   - Private Sector Funding: Using corporate social responsibility (CSR) funds to support environmental conservation projects.
7. Green Infrastructure Development
   - Urban Forest Development: Developing green spaces in former mining areas to improve air quality and sequester carbon.
   - Creation of Retention Ponds: Helps manage mine wastewater and prevent flooding.
8. Long-term Monitoring and Evaluation
   - Continuous Monitoring: Conduct regular monitoring of the reclaimed area to ensure effective recovery.
   - Environmental Audit: Assessing the impacts of mining activities and determining necessary mitigation measures

Based on this, the approach should be integrated, involving governments, mining companies, local communities and environmental organizations to create more sustainable and environmentally friendly mining.

Discussion

Based on the results of the research above, that the campaign to save the area of several major issues of concern to WALHI in East Kalimantan, namely damage caused by coal mining East Kalimantan is known as one of the largest coal producers in Indonesia. However, the environmental impacts of this activity, such as abandoned mine pits without reclamation, are the focus of WALHI's advocacy. Deforestation and land degradation Oil palm plantations are often the main cause of deforestation, which threatens biodiversity and disrupts the livelihoods of indigenous communities. IKN Development WALHI criticizes the Nusantara Capital City development project which is considered to trigger environmental damage, ranging from deforestation to potential threats to conservation areas (Aristiphano et al., n.d.). Strengthening Local Communities WALHI works with indigenous peoples and local communities to protect their rights to land and natural resources. They support community efforts to maintain local wisdom and prevent land grabbing. Networking and Collaboration WALHI East Kalimantan collaborates with other environmental organizations, both at the local, national, and international levels, to strengthen advocacy and pressure on policies that do not favor the environment (Lenes, 2014).

Then the main factors that usually support successful reclamation and post-mining management are supporting each other to create sustainable and environmentally and socially responsible reclamation and post-mining management. More detailed information on specific implementation by PT XYZ can be obtained through the company's sustainability report or official environmental audit. Meanwhile, factors that hinder the success of reclamation and post-mining management are that mining companies such as PT XYZ need to ensure there are a well-thought-out reclamation plan, adequate funding, and the involvement of all relevant parties, including government, communities and environmental experts. Regular audits and transparency in sustainability reports can also help reduce these barriers.

There are several efforts to minimize the negative impacts of mining activities on the environment; these efforts need to be supported by a strong commitment from companies, communities and governments to create sustainable and environmentally friendly mining activities. With this approach, negative impacts on the environment can be effectively minimized. Meanwhile, socialization in providing an understanding of the importance of natural balance to the community needs to be carried out consistently and involve various parties, including the government, NGOs, local communities and the private sector. With participatory and inclusive methods, it is easier for people to understand the importance of natural balance and be moved to actively contribute.

Providing environmental education to communities to understand the importance of nature's balance requires cooperation between the government, non-governmental organizations, academia, and the private sector (Alshaer et al., 2017; Harangozó & Zilahy, 2015; Lewis et al., 2020). By involving the community directly and using methods that are relevant to local needs, environmental education can be effective and sustainable. Meanwhile, solutions to environmental damage caused by mining must be carried out in an integrated manner, involving the government, mining companies, local communities and environmental organizations to create more sustainable and environmentally friendly mining.

Indonesia has various types of energy derived from abundant natural resources, we can see this with the abundance of mining minerals, including: minerals, coal, oil and gas, gold, silver, and copper.1 these natural resources in their utilization must aim to improve the welfare of the people. This is stated in the 4th paragraph of the 1945 Constitution of the Republic of Indonesia (hereinafter abbreviated as the 1945 Constitution), in which there is one of the state's objectives, namely promoting general welfare. Related to the achievement of these goals, one of them is through the management of natural resources. In the constitution, this has been regulated in Article 33 Paragraph (3) of the 1945 Constitution, namely:

"The earth, water, and natural resources contained therein shall be under the control of the state and shall be used to the greatest extent for the prosperity of the people".

The article also has a deep meaning that should be obeyed by state administrators in managing natural resources, including coal mining management. Ideally, reclamation activities should be carried out as early as possible, without having to wait for mining activities to be completed. In order to prevent environmental problems that will be caused and harm the wider community. In this regard, the regulations have been regulated in the Law. In essence, for every stakeholder who does not carry out reclamation and causes environmental damage, sanctions will be imposed, both administrative sanctions and criminal sanctions.

CONCLUSION

Post-mining reclamation activities are an obligation that must be carried out by every mining company, including PT Berkah Bara Sejahtera, to maintain the environmental ecosystem in accordance with Law Number 3 of 2020 concerning Mineral and Coal Mining. Although PT XYZ routinely carries out reclamation activities, the implementation has not been optimal due to various inhibiting factors, such as the need for a mature reclamation plan, adequate funding, and the involvement of related parties, including the government and the community. To minimize negative impacts on the environment, a strong commitment from all parties and consistent socialization of the importance of natural balance are required.

To achieve reclamation effectiveness, PT XYZ is expected to carry out activities in accordance with the plan that has been submitted to the government, considering that the document must be a reference in achieving annual targets. Reclamation implementation should be carried out a maximum of 30 days after mining activities are stopped, with supervision from mine inspectors. In addition, it is important to have regular follow-up and supervision, as well as awareness from the government to enforce administrative sanctions against violations that occur. For future research, it is recommended to explore more innovative management approaches in reclamation, such as the application of environmentally friendly technologies and active community participation, and conduct comparative studies with other companies that have better reclamation practices. This could provide greater insight into the factors that influence the success of post-mining reclamation.

BIBLIOGRAPHY

Alshaer, I. M. A., Al Shobaki, M. J., & Abu Naser, S. S. (2017). Governance of public universities and their role in promoting partnership with non-governmental institutions. *International Journal of Engineering and Information Systems*, *1*(9), 214–238.

Aristiphano, T. E. S. A. N., Nindia, N. S. A., & Wijaya, E. P. B. A. (n.d.). *Environmental Geostrategic Analysis in the Development of the Archipelago's Capital City*.

Arizona, A. (2020). Pengaruh Kepercayaan Merek, Pengalaman Merek Dan Komitmen Terhadap Loyalitas Konsumen (Studi Kasus Pada Pengguna Telkomsel Di Grapari Telkomsel Margocity Depok). *Abiwara: Jurnal Vokasi Administrasi Bisnis*, *2*(1), 59–66.

Bargawa, W. S. (2017). Reklamasi dan Pascatambang. *Edisi Ketiga. UPN Veteran Yogyakarta*.

Christiarini, R. (2023). Peran Csr Produk Kosmetik Terhadap Loyalitas Pelanggan Kota Batam. *JWM (Jurnal Wawasan Manajemen)*, *11*(1), 26–41.

Gumanti, R., Pudiansa, P., Melian, M., Reflis, R., & Utama, S. P. (2024). Pelaksanaan Reklamasi Lahan Pasca Tambang PT Rekasindo Guriang Tandang di Bengkulu. *INSOLOGI: Jurnal Sains Dan Teknologi*, *3*(2), 199–205. https://doi.org/10.55123/insologi.v3i2.3434

Harangozó, G., & Zilahy, G. (2015). Cooperation between business and non-governmental organizations to promote sustainable development. *Journal of Cleaner Production*, *89*, 18–31. 10.1016/j.jclepro.2014.10.092

Hirfan, H. (2018). *Strategi Reklamasi Lahan Pasca Tambang. PENA TEKNIK: Jurnal Ilmiah Ilmu-Ilmu Teknik, 1 (1), 101*.

Jatmiko, N. R. R., Lukito, H., Kristanto, W. A. D., & Yudono, A. R. A. (2023). Arahan Reklamasi Lahan Pascatambang Tanah Liat (Clay) PT X Desa Temandang Kecamatan Merakurak Kabupaten Tuban Jawa Timur. *Jurnal Lingkungan Kebumian Indonesia*, *1*(1), 9. https://doi.org/10.47134/kebumian.v1i1.2060

Lenes, J. T. (2014). *Understanding the Making of REDD and the Kalimantan Forest and Climate Partnership (KFCP) in Central Kalimantan through Different Modes of Engagement*.

Lewis, D., Kanji, N., & Themudo, N. S. (2020). *Non-governmental organizations and development*. Routledge. 10.4324/9780429434518

Oktorina, S. (2018). Kebijakan reklamasi dan revegetasi lahan bekas tambang: Studi kasus tambang batubara Indonesia. *Al-Ard: Jurnal Teknik Lingkungan*, *4*(1), 16–20.

Pratama, Y., Fachrurazi, F., Sani, I., Abdullah, M. A. F., Noviany, H., Narulita, S., Hapsara, O., Zulkarnain, I., Fermayani, R., & Sembiring, R. S. R. (2023). *Prinsip Dasar Manajemen Pemasaran: Analisis dan Strategi Di Era Digital*. CV. Eureka Media Aksara.

Putri, P. K. S., Trisna, N., & Effida, D. Q. (2023). Tanggung Jawab Pelaksanaan Reklamasi Dan Pasca Tambang Perusahaan Pemegang Iup Operasi Produksi Batubara Berdasarkan Prinsip Good Mining Practice. *Jurnal Hukum Samudra Keadilan*, *18*(1), 108–120.

Widayati, S. (2023). Rencana Teknis dan Ekonomis Reklamasi PT Tonia Mitra Sejahtera Site Lengora Pantai. *Jurnal Riset Teknik Pertambangan*, 55–62.

Zusrony, E. (2021). Perilaku Konsumen Di Era Modern. *Penerbit Yayasan Prima Agus Teknik*, 1–159.