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COMMUNITY ASSISTANCE FOR SAND AND STONE MINERS IN MITIGATING ENVIRONMENTAL IMPACTS THROUGH A GREENING PROGRAM IN GLAGAH VILLAGE, PAKUNIRAN DISTRICT

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Abstract:

Sand and roock miningis a significants economic activity for the community in Glagah Village, Pkuniran District, Probolinggo Regency. However, this activity has detrimental envirolmental impacts, including ecosystem damage, soil erosion, diminished water quality, and biodiviersity loss. To counteract these negarive impacts, a reforestation – focused greening program. This reforestation programs aims to improve the environmental condition damaged by sand and rock mining. Revorestation will involve palnting various tree speciess suitable for the local conditions to improve soil stucture, prevent erosion, and restore the hydorologicial functionsof the land and . the program will also include intensive community engagement with miners to raise awareness about environmental conservation and provide training on effective reforestation techniques. Furt hermore, this program has the potential to enhace the villagers by creating new opportunities in agriculture, tourism, and sustainable natural resource mangement. This integrated reforestation and greening program is expected to not only mitigate the negative impacts of mining but also provide long-term benefits for the comunity in Glagah Village, particularly in creating a healthier and more sustainable environment

Keywords: *Community Assistance, sand and stone mining, ovrcoming environmental impacts, greening program*

INTRODUCTION

Sand and stone mining activities often have a significant impact on the surrounding environment. In Glagah Village, Pakuniran District, these negative effects are becoming more evident due to ecosystem damage caused by mining activities. To address this issue, concrete actions are needed to restore the damaged environment. One approach that can be implemented is a reforestation program that actively involves local residents (Zikri, et al., 2024). The sand and stone mining activities in Glagah Village have caused several serious environmental issues. This practice leads to soil degradation, water source pollution, and a decline in air quality. Additionally, mining can result in land erosion, landslides, and flooding. This situation not only threatens environmental sustainability but also negatively impacts the lives of local residents, such as reduced agricultural yields and the emergence of various diseases. Reforestation is a conscious effort to preserve the environment by replanting vegetation in barren or damaged areas. The reforestation program offers various benefits, including improved soil quality, erosion prevention, rainwater retention, and increased oxygen levels in the atmosphere. Additionally, the presence of green plants can enhance the beauty of the environment and the aesthetic value of an area (Arfani, 2022).

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Community participation in the reforestation program plays a crucial role in ensuring its success. By involving communities engaged in mining activities, this initiative not only focuses on environmental restoration but also aims to raise public awareness about the importance of preserving nature. Additionally, active community involvement can strengthen the sense of ownership and responsibility for the environment. The mentoring program for mining communities in the reforestation initiative in Glagah Village aims to support residents in addressing the negative impacts of mining activities. Specifically, this program seeks to enhance residents' knowledge of proper planting techniques, the selection of plant species suitable for local conditions, and effective plant care. Furthermore, the mentoring program aims to build collective awareness of environmental conservation and develop sustainable environmental management practices (Fahmi, 2020).

Community assistance in the sand and stone mining sector is becoming increasingly important as awareness grows about the environmental impacts of these activities. Poorly managed mining can lead to ecosystem destruction, soil degradation, and air pollution. Therefore, greening programs serve as an effective solution to mitigate these negative effects. The greening program aims to restore degraded land, improve environmental quality, and restore ecosystem balance. Through mentorship, mining communities can be empowered to actively participate in greening activities such as tree planting, creating community gardens, and maintaining green areas. Glagah Village has great potential to become a model for successful environmental rehabilitation. With support from various stakeholders, including the government, the private sector, and the local community, this greening program can become a historic step toward sustainable development in the region. Through intensive guidance, it is hoped that mining communities can actively contribute to environmental conservation and improve the overall quality of life (Reifani, 2021).

This mentorship program focuses not only on environmental aspects but also on raising public awareness about the importance of environmental aspirations and responsibilities. By involving the community in this process, it is expected to create a sense of ownership and shared responsibility for the environment and reduce destructive mining practices. The greening program is not just about planting trees, but also a holistic effort to repair the damaged ecosystem. By involving the surrounding community of Glagah Village, Nyato Hamlet, in this activity, it is hoped that the program can raise awareness about the importance of environmental conservation. In addition, greening can also provide additional economic benefits to the community through the development of forest-based products. Sand and rock extraction activities in Glagah Village, Pakuniran District, although providing economic benefits, also have a negative impact on the environment. Land use change, erosion problems, and declining water quality are some of the important issues facing the surrounding community. To address these issues, serious action is needed to rehabilitate the damaged environment. One strategy that can be implemented is to conduct a greening program.

The greening program aims to raise public awareness of the importance of nature conservation and improve environmental quality by planting trees that can reduce erosion, increase soil moisture, and supply oxygen. More than just an

environmental movement, this program is a fascinating case study of how collaborative approaches can lead to sustainable solutions. Through intensive and continuous mentorship, the mining community is encouraged to understand the environmental impact of their activities and play an active role in mitigation. This success story is not only relevant to Glagah Village, but can also inspire other areas facing similar challenges in balancing economic development with environmental conservation.

METHOD

The research method used is a qualitative descriptive study with a phenomenological approach. The data collection techniques include observation, interviews, and document studies. The data analysis techniques involve data reduction, data display, and conclusion drawing (verification). The conclusions are as follows:

1. environmental impact of sand mining along the Glagah River, the research findings indicate at least five environmental impacts of sand mining along the Glagah River: Air pollution, decline in water quality, road damage, river sedimentation, increased dust levels
2. Social impact of sand mining along the Glagah River, based on the interviews conducted, the social impacts of sand mining along the Glagah River include: Increasing community income, creating job opportunities, enhancing community creativity (Firdaus, 2019).

Results And Discussion

1. Images and Location of CV. Dwi Jaya (Sand and Stone Milling)

In Nyato Hamlet, Glagah Village, Pakuniran District, there is a mining operation, namely CV. Dwi Jaya (Sand and Stone Mill). The geographical location of the stone and sand mining is in front of the Cahaya Sholawat Nurul Qodim 04 Foundation. The 1-hectare area is part of the entire CV Dwi Jaya mining site. The sand and stone mill is located in Nyato Hamlet, RT 02 RW 02. CV Dwi Jaya was established in 2010. In 2019, the COVID-19 pandemic occurred, resulting in the cessation of raw material production (stone and sand) and depletion of raw materials found in the Glagah River. A year later, production resumed because CV Dwi Jaya

received a demand for raw materials (stone and sand) needed for the ongoing toll road construction project, which continues to this day (Maolani, 2021).

Sand and stone mining is one of the resource extraction activities commonly carried out in various regions, especially in areas with rivers, mountains, or open-pit mines. The primary purpose of this activity is to meet the demand for building materials such as concrete, asphalt, and other construction materials. The sand and stone obtained from the mining process are used in various infrastructure projects, including highways, buildings, and bridges.

In the mining process, various methods are applied depending on the location and the type of material to be extracted. For sand mining in rivers, dredging is usually carried out using heavy equipment such as excavators or dredger ships. Meanwhile, stone mining often involves blasting in hilly or mountainous areas to break large rocks before further processing (Wardana et al.,, 2020).

However, mining activities have a significant environmental impact. One of the most common effects is erosion and land degradation. The large-scale extraction of sand from rivers can alter the river flow patterns, affecting aquatic ecosystems and threatening the habitat of fish and other living organisms. On the other hand, the exploitation of rocks in hilly areas can trigger landslides and cause forest destruction.

From a social and economic perspective, sand and rock mining also has a complex impact on local communities. On one hand, this activity can create jobs and boost the local economy, as many residents rely on this sector as their primary source of livelihood. Government regulations and policies play a crucial role in controlling sand and rock mining activities. The government often issues mining permits to ensure that these activities are carried out legally and in compliance with established environmental standards. Additionally, there are regulations regarding land reclamation of former mining sites to minimize negative impacts on the ecosystem.

In an effort to reduce the negative impacts of mining, several modern technologies have been implemented. For example, the use of environmentally friendly mining methods such as controlled dredging and more effective waste management systems. Through tree planting, the reforestation program carried out

by the KKN Glagah 37 group helps the CV. Dwi Jaya team in tackling pollution in the surrounding area.

2. First Observation and Interview Regarding CV. Dwi Jaya

The background of CV Dwi Jaya, located in Nyato Hamlet, Pakuniran District, is that it is a company engaged in the production and distribution of daily necessities. It has a vision to provide high-quality products at affordable prices for local residents, especially for customers who highly need sand and rocks, such as for toll road projects and other construction developments. During the observation, the condition of the furniture that was monitored showed that CV Dwi Jaya's production facilities appeared to be very adequate. There is a large and well-organized production area. The machines used in the production process look modern and well-maintained, giving the company a professional impression.

CV Dwi Jaya's production process operates within an efficient system. The workers are skilled and experienced in performing their tasks. Observations indicate that the company applies strict quality standards to ensure that all produced products meet consumer expectations. The workers there are mostly residents of Nyato Hamlet itself, but some come from outside areas, such as Pajarakan, who are experts in sand and rock milling.

The first interview was conducted to investigate further information about the vision, mission, and challenges of CV DWI Jaya. The interviewed speaker was the production manager who understands the company's insights.

In an interview, the manager stated the vision of CV DWI Jaya as the market leader in daily essentials. "Our mission is to provide our customers with high-quality products with the best service." Challenges are also related to resources and present several difficulties, such as increasing competition and rising raw material prices due to other companies. This drives CV DWI Jaya to remain innovative and improve efficiency. In the interview, we also discussed the marketing strategies implemented by CV DWI Jaya. The manager explained that they rely on a combination of traditional and digital marketing to reach more customers. Each ton of raw material (stone) sold costs around 123,000.

CV DWI Jaya is also actively involved in community participation. They often provide raw material assistance for construction projects, such as the construction of a mosque located right in front of CV DWI Jaya. Additionally, there is a kindergarten and elementary school under the direct supervision of the chairman of the Nurul Qodim Foundation, Gus Hakiem Noer. Not only that, but the construction of a cemetery perimeter fence is also currently being carried out directly by CV DWI Jaya as an expression of their strong social commitment to the surrounding community. This initiative. The initial observations and interviews at CV DWI Jaya provided valuable insights into the mining industry (sand and stone milling) and the company's vision. With a strong commitment to quality and the community, CV DWI Jaya has the potential to grow further (Setyarso, 2014).

3. Observing the Trees Around the Mining Area

The observation of trees that we conducted around the mining site in Glagah Village is an important step in monitoring environmental impacts, evaluating the success of the reforestation program, and identifying areas that require more coverage. With accurate data and comprehensive analysis, we can provide appropriate recommendations to enhance the program's effectiveness and support the environmental sustainability of Glagah Village.

The trees around the sand and stone mining area play a crucial role in maintaining ecosystem balance, and their presence is an important aspect to consider in efforts to mitigate these negative impacts. Based on the results of our observations, we recommend a reforestation program to improve the environmental quality around the sand and stone mining area in Glagah Village, Pakuniran District. This program can be implemented by: Tree planting, planting trees that are resistant to harsh environmental conditions, such as banyan trees and bamboo. Garden development, creating gardens around the mining area to enhance aesthetics and environmental quality. Waste management, managing waste generated by mining activities to reduce environmental pollution.

The reforestation program can provide several benefits, such as: Improving environmental quality, the reforestation program can enhance the environmental quality around the sand and stone mining area. Reducing pollution, the reforestation program can help reduce air and noise pollution caused by mining activities. Enhancing community well-being, the reforestation program can improve the well-being of the community around the sand and stone mining area.

After observing the trees around this mining area, we have taken the initiative to implement a reforestation program (tree planting). The trees here play a crucial role in reducing the impact of mining activities. They can significantly help mitigate the negative effects of mining, such as: Absorbing air pollution, trees can absorb air pollution generated by mining activities. Reducing soil erosion, trees help reduce soil erosion by holding the soil in place and preventing it from being washed away by water. Improving water quality, trees can enhance water quality by absorbing water pollutants and producing oxygen. Thus, the reforestation program can be one of the solutions to mitigate the environmental impacts caused by sand and stone mining activities in Glagah Village, Pakuniran District (Rohman, et al., 2022).

4. Conducting Planting (Reforestation)

Sand and stone mining in this area often becomes a dilemma. On one hand, it provides significant economic benefits for the local community, but on the other hand, its negative impacts on the environment—such as ecosystem damage, air

quality degradation, and soil erosion—cannot be ignored. Glagah Village, Pakuniran District.

The discussion results show that the greening program in Glagah Village is effective in reducing the environmental impact of sand and stone mining. This improvement in environmental quality contributes to increased awareness and participation from the community. Government support and active community participation are the keys to the program's success. This study also reveals several obstacles that need to be addressed for the program's sustainability, such as funding limitations and the impact of climate change. Therefore, a more comprehensive and sustainable strategy is needed to ensure the long-term success of the greening program.

The selection of plant species is not only a matter of aesthetics but also of ecological and economic functions. The criteria for selecting plant species include (Hasibuan, 2006): Resistance to extreme conditions, selecting plant species that can withstand environmental conditions such as drought and erosion. For example, jackfruit trees, which grow quickly and are resistant to extreme conditions, can be an initial choice for reforestation. Economic value, plants with economic value, such as fruit-bearing trees, can provide incentives for the community to care for and protect them. This will enhance the sustainability of the reforestation program. Ecological value, selecting plant species that can improve soil quality, prevent erosion, and support biodiversity. For example, jackfruit trees can help control erosion and reduce the risk of flooding. Seed availability, ensuring the availability of selected plant seeds in sufficient quantities and of good quality. The seeds must be healthy, free from pests and diseases, and sourced from trusted suppliers (Ismail, 2007).

Reforestation is not just about planting trees; it is about building a sustainable future. The results of reforestation can be utilized for various purposes, such as a source of timber, fruit, or conservation areas. Sustainable utilization of reforestation yields will ensure the continuity of the program and provide economic benefits to the community. Another benefit of reforestation is the restoration of habitats for flora and fauna that were previously disturbed by mining activities. By planting native trees that are suited to the surrounding ecosystem, we are not only restoring the environment but also supporting biodiversity, which is essential for maintaining ecological balance.

In addition to ecological benefits, greening also has a positive impact on reducing air pollution and dust, which are typically generated by mining activities. Plants with dense foliage can filter dust and reduce air pollution, which can be harmful to the health of local communities and wildlife around the mining area. Furthermore, reforestation plays a role in regulating water management, preventing floods, and improving groundwater quality, which is essential for the local community.

From a social perspective, the reforestation program provides an opportunity for the community, especially mining workers, to become more aware of the sustainability of nature and their surrounding environment. By actively participating in the greening process, they will gain a deeper understanding of the importance of maintaining ecological balance, which in turn can support a more sustainable social and economic life.

Conclusion

Community assistance in the sand and stone mining sector in Glagah Village is a strategic effort to mitigate environmental degradation through a reforestation program. This initiative not only restores damaged ecosystems but also promotes sustainable livelihoods by involving local communities, especially miners, in environmentally friendly practices. The success of this program depends on strong collaboration among stakeholders, adequate funding, technological support, and continuous education to build environmental awareness especially among the younger generation. With integrated efforts, Glagah Village can serve as a model for balancing natural resource utilization and environmental conservation.

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