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THE IMPACT OF THE PRESENCE OF LIMESTONE MINING COMPANIES ON THE COMMUNITIES AROUND SOUTH MANOKWARI

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ABSTRACT

A collaborative effort between SDIC Indonesia, ESDM, and the Environmental Service has seen a group of lecturers from the Postgraduate Program engaging in community service activities. The activities carried out were to provide socialisation on the impact of the presence of the Indonesian SDIC mining company on the communities around South Manokwari-West Papua. The activity was carried out at the Maruni District Center, with the objectives of the socialisation being 1) Describe the impact of limestone companies on the environment around the affected locations; 2) Describe the supporting and inhibiting factors for the existence of limestone mining companies. Socialisation and service activities are the direct methods of visiting Maruni District directly. The mining industry has several beneficial effects, such as generating employment opportunities for residents and meeting the country's domestic market needs through increased mining production. Negative impact: Exploitation of limestone mines carried out for years has impacted the environment in Maruni, South Manokwari. Inhibiting factors are the existence of limestone mining companies and the processes of coordinating institutions in endeavours to regulate environmental harm. Erosi dapat terjadi di daerah yang telah menjadi area pertambangan. The environment can also be contaminated by waste produced during mining operations. Many groups are trying to enhance the community's well-being, especially those in mining areas. Supporting factors to control environmental damage include prevention, mitigation and recovery. In response, socialisation activities were carried out to provide the community with an understanding of the positive impacts. The presence of limestone mining in South Manokwari has had a direct impact on the residents of the recipient community in improving the economic level of the community.

Keywords: Mining, Limestone, Socialisation, Maruni, Affected

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1. INTRODUCTION

The Postgraduate Program at the University of Papua (UNIPA), in realising its mission of community service based across disciplines and developing collaboration with related institutions in implementing service activities, is responsible for diffusing the results of research and the results of appropriate technological work to the user community so that it can create community independence as a whole sustainable. Various forms of community development can be realised through community assistance, community service camps, or villages selected as target areas. Choosing a target village is very important for a university, where the diffusion of research or technology results can be provided through a continuous learning process. The aim of the learning process is for the community to change behaviour, increase business productivity, increase community income and change community welfare. Individuals adhering to an effective learning methodology will progressively acquire authority, resilience, or valuable skills in exercising autonomous judgment. According to Sumodiningrat (2000), achieving community empowerment through a process that promotes independence is essential.

The community residing near the limestone mining in South Manokwari experiences positive and negative consequences. The mining industry has several advantages, one being the generation of employment opportunities for the local population. Additionally, mining activities meet national and international market needs by producing valuable resources. Enhancing the exportation of mined resources is crucial to boosting the nation's revenue and promoting economic development. The mining sector has the potential to draw foreign investments and encourage them to invest in Indonesia as well.

On the flip side, the mining sector also poses a detrimental effect, specifically in causing environmental harm. Mining in certain areas will cause erosion, which can result in the area's erosion. The mining process can also cause environmental pollution through the waste it produces. Industrial mining activities that utilise energy from fossil fuels emit carbon dioxide (CO_2), which can trigger climate change and global warming (Patimah et al., 2021). Mining activities are often associated with ecosystem damage. The presence and number of species in mining areas disrupt the distribution and amount of biodiversity around the area (Patimah et al., 2022). The interaction between humans and nature becomes disharmonious because humans carry out exploitation that exceeds nature's capacity or carrying capacity, which results in pollution or damage to the ecological system in the ecosystem around the mining area (Patimah et al., 2023).

Manokwari is one of the autonomous regions that has received investment in limestone mining in Maruni, South Manokwari District, Manokwari Regency, West Papua Province. "Mining is an activity to extract excavated materials which is carried out either manually or mechanically, from stripping layers, extracting mining materials, loading, to transporting" (Rosmika, 2014). Limestone or limestone is prevalent in the industrial, construction and agricultural sectors. This mineral is widely used for various purposes, such as building materials, building stones as pavers, and lime addition in agriculture. PT is an abbreviation for Limited Liability Company, which indicates the type of business entity owned by this company. SDIC Indonesia has plans to develop operational support facilities for limestone mining in Maruni Village, South Manokwari District, Manokwari Regency, West Papua Province, with a land area of around 199.65 hectares. They plan

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to conduct mining activities with a production target of 1,500,000 tons per year and implement a CSR program per applicable regulations.

Various parties continue to strive to improve the community's welfare, especially those living in mining areas. In response to this, outreach activities were carried out by the Postgraduate Environmental Science Masters at the University of Papua to provide understanding to the public regarding positive impacts. The presence of limestone mining in South Manokwari has had a direct effect on the residents of the recipient community in improving the economic level of the community. Wisely manage the environment by involving the government, local communities and customary rights owners. For target audiences (miners and communities) in the mining area (Permen ESDM RI. No. 26 of 2018).

2. METHOD

The activity was held on Thursday, April 25 2024, in Maruni District, South Manokwari. The implementation of activities is based on a letter of assignment from the Chair of LP2M UNIPA No. 161a/UN42.15/UN42.15/AM/2024 dated April 24 2024. Activities were carried out in Maruni District involving affected communities around the mining site, namely Maripi Village, Hing Village and Maruni Village. The direct method for socialisation and service activities is to visit the Maruni District directly to coordinate the planned and implemented activities. The location of the socialisation is shown in the following picture.

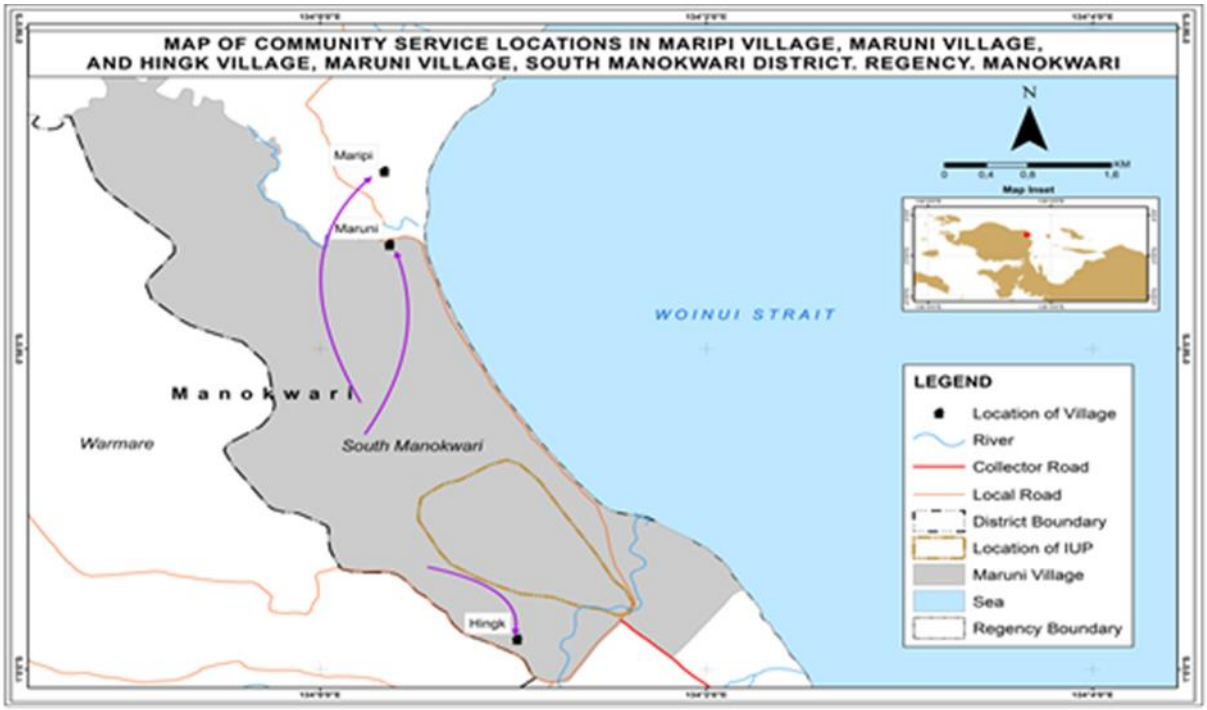

Figure 1: Map of locations for community service outreach
Source: Map creation using ArcGIS

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3. RESULT

Socialisation and service in Maruni District, limestone mines in South Manokwari have potential limestone resources that can be used as raw material for the cement industry. The Maruni limestone has an age from the Early Miocene to the Middle Miocene, as identified by (Boggs, 1992). The Maruni limestone has a low elevation, namely from Open Marine to Lagoon, with a relatively high energy depositional environment with a coral reef environment or Shallow water platform facies in the southern part experiencing neomorphic diagenesis. In line with this, all stakeholders must take action to protect and manage the environment, which must be carried out systematically and in an integrated manner to prevent environmental pollution and damage; the stakeholders in question are the government or the community alone.

From a geological perspective, Indonesia is a region that has extraordinary geological formations due to the formation of several islands and significant shifts in tectonic plates. Apart from that, this region also has abundant mineral resource reserves. Most of the Indonesian archipelago has potential mineral resources such as metals, non-metals, coal and other minerals (Robinson et al., 1990). Instead, the situation hydrogeology of Maruni Limestone Mining occurs due to rock compounds that are easily dissolved and have well-developed secondary porosity. The presence of small holes greatly influences underground water in this area. Infiltration occurs through percolation in the spaces between particles and occurs more often through fractures, cracks and rock gaps created by dissolution.

3.1. The impact of the presence of limestone companies on the environment around the affected locations

Mining companies in South Manokwari have positively and negatively impacted all sub-community life, both in community structure, economy, environment and security of community order. Communities affected by rings one, two and three experienced vertically and horizontally structural changes. Vertical status changes occurred in the promotion of several miners who fought for the environment to the ranks of the village government and the emergence of a specialised working class (heavy equipment operators), both local and foreign miners. Meanwhile, horizontal changes can be observed in the emergence of new jobs for mining workers that previously did not exist.

The mining process, primarily using the open-pit mining method, will directly impact land damage and decrease the number and quality of biota in the land system. This impact occurs because open-pit mining results in various significant changes around the mine site, such as loss of vegetation cover, damage to soil bodies, and changes in topography and hydrological patterns. The effects caused by the mining process occur not only at the mine site but also in the surrounding environment. Environmental pollution can also arise from mining companies operating in residential areas.

Environmental pollution and sustainability are concerned with spatial dimensions, not only local but national and even global. The extent and intensity of environmental change are always greater than planned. In reality, environmental changes are known to have side effects from the development process, which can be positive or negative. All ecological systems (ecosystems) are

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interconnected with each other, either directly or indirectly. Departing from this understanding, an activity carried out on land, even in highlands (mountains), if it harms the environment, will also harm the existence of ecosystems in coastal and marine areas that are not far from the activity (Bengen, 2008; Prihadi et al., 2018).

Extraction mining activities can result in increased turbidity, sedimentation and damage to the bottom of the area where the activity is carried out (reducing productivity, causing the extinction of essential plants, essential organisms and fish stocks), as well as changing the circulation of water masses with the more profound the excavation/dredging is carried out. Apart from endangering human health or even causing death, it reduces or damages the aesthetic value of coastal and marine environments and is socio-economically detrimental (Dahuri, 2004).

Maruni limestone mining creates new jobs for the local community, which also helps give the local community insight into mining. In the long term, the mining industry will reduce unemployment in Indonesia. However, this utilisation must go through a precise, careful, and effective process, starting with investigations, exploration, and mining activities and ending with product and environmental management. These processes must be managed professionally and transparently so that regional and state revenues can provide community welfare.

The exploitation of limestone mines carried out for many years has impacted the environment around the Maruni South Manokwari mining area. Some of these things include, first, damage to ex-mining land due to excessive exploitation without a reclamation process being carried out. Second, the area of protected forests is decreasing. Third, the emergence of air and noise pollution. Air and noise pollution is caused by trucks carrying limestone passing by for 24 hours. This causes more dust in residential areas and smoke from truckloads. Fourth, damage to village roads due to trucks loaded with limestone. Residents experience discomfort when using the road. Fifth, several village springs have dried up due to excessive use of heavy equipment. This situation causes the water discharge to decrease. Therefore, it is necessary to regulate mining environmental management as follows:

1. Exploration with the substance: efficiency of land clearing, preparation of environmental management facilities/facilities before drilling, construction of test wells/trenches and geochemical studies in the context of feasibility studies
2. Construction with substance: preparation of environmental management facilities/facilities before drilling, mining facilities and infrastructure equipped with environmental management facilities (drainage, settling ponds and oil traps)
3. Mining with substance: preparing environmental management facilities/facilities, securing the management of mining zones, safe distance of mining/filling to public facilities, prioritising backfilling
4. Transportation of substances: dust control, leak prevention, prevention and control of hydrocarbon and chemical spills
5. Management/purification with substances: closed circulation working water or outgoing water that meets quality standards, prohibition on using mercury, closed working water circulation and minimum facilities for leaching heaps of ore

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3.2. Supporting and inhibiting factors for the existence of limestone mining companies.

3.2.1. Obstacle Factor

The institutional coordination process is very influential in implementing efforts to control environmental damage due to mining activities in South Manokwari, such as efforts to carry out activities on former mining land. Many are still not compliant and disciplined in implementing mining obligations for IUP holders and reporting company permits on time. This can run well with supervision by the supervising institution. The legal instrument that can be used is the environmental licensing authority, formally recognised in Law Number 32 of 2009.

Through permit instruments, environmental institutions can carry out supervision and, at the same time, enforce the law. Consequently, the appropriate institutional model is in the form of a Regional Service, which, if linked to Law Number 32 of 2009, the terminology is the Regional Environmental Protection and Management Service. Weaknesses in coordination authority can be overcome by requiring environmental permits as a condition for issuing business or activity permits. Thus, other agencies with business licensing authority will always coordinate with environmental institutions with the authority to issue environmental permits before the business permit is issued (Muhtadi et al., 2012).

3.2.2. Supporting Factors

Through community service activities in the Maruni District regarding the impacts of limestone mining, the community has become aware of the dangers of environmental damage caused by mining. Control of environmental damage due to limestone mining activities in Maruni is carried out by several parties, namely the South Manokwari Environmental Service, law enforcement (Police), and community participation, which help implement control. Activities in the form of outreach to the community are an effort to create synergy between the community, companies, and government to work together to advance a better mining industry.

Prevention, mitigation, and recovery are supporting factors in controlling environmental damage due to mining activities in South Manokwari and efforts to prevent ecological damage. Arranging these obligations is not only at the space allocation or licensing administration stage. In implementing permits, Law No. 4 of 2009 regulates the obligation for permit holders to comply with environmental carrying capacity tolerance limits. One is then controlled in more detail by managing mine residue to meet environmental quality standards before being released to the environmental media.

Other obligations in the mining business include carrying out environmental monitoring and post-mining reclamation activities. Even the government must provide technical guidance and security related to environmental management by community mining (Nagara, 2017). Article 33 in the field of Environmental Pollution and Damage Control carries out functions including:

1. Determination of standard criteria for environmental damage
2. Pelaksanaan pemantauan kerusakan lingkungan
3. Implementation of countermeasures (providing information, isolating and stopping) environmental damage
4. Implementation of recovery (cleaning, remediation, rehabilitation and restoration) of environmental damage. Efforts to control environmental damage, both before and after the

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issuance of these regulations, were implemented persuasively through social and cultural approaches and actions in the form of direct control from the community and law enforcement.

4. CONCLUSION

Mining companies in South Manokwari have positively and negatively impacted all sub-community life, both in community structure, economy, environment and security of community order. Communities affected by rings one, two and three experienced vertically and horizontally structural changes. Limestone mining creates new jobs for local communities. This, of course, also helps the local community gain insight into mining. In the long term, the mining industry will reduce unemployment in Indonesia. Exploiting limestone mines for years has impacted the environment in Maruni, South Manokwari. Some of these things include the destruction of ex-mining land, the decreasing area of protected forests, air and noise pollution, and damage to village roads due to trucks loaded with limestone.

Inhibiting factors are the existence of limestone mining companies and institutional coordination processes in efforts to control environmental damage, such as efforts to carry out activities on former mining land. Many still need to comply and be disciplined in implementing mining obligations for IUP holders and reporting company permits on time. The legal instrument that can be used is the environmental licensing authority, formally recognised in Law Number 32 of 2009. Supporting factors for efforts to control environmental damage include prevention, mitigation and restoration. Arranging these obligations is not only at the space allocation or licensing administration stage. Law No. 4 of 2009 generally regulates the obligation for permit holders to comply with environmental carrying capacity tolerance limits when implementing permits.

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