

# The Impact of Andesite Mining at PT Atika Tunggal Mandiri (ATUM) on the Social, Economic, and Environmental Conditions of the Community in Nagari Manggilang, Pangkalan Koto Baru District

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**Abstract:** *This research aims to analyze the impact of andesite mining conducted by PT. Atika Tunggal Mandiri (ATUM) on the social, economic, and environmental conditions of the community in Nagari Manggilang, Pangkalan Koto Baru District. The type of research used is qualitative with a descriptive method. The informants in this study consisted of 20 people, including the Wali Nagari of Manggilang, the owners of the andesite mine, the andesite mine workers, and the local community. The data types required are primary and secondary data, collected using purposive sampling techniques. The data were gathered through observation, interviews, and documentation. The data analysis stages included Data Reduction, Data Presentation, and Conclusion Drawing. The results indicate that, socially, mining activities affect community interaction patterns, with changes in social structure due to labor migration and increased social tensions. Economically, andesite mining provides job opportunities and increases income for some residents, but it also creates economic disparities within the community. The environmental impacts found include ecosystem damage and increased air and water pollution, which affect the quality of life of the surrounding residents. This study suggests that the government and mining companies should pay more attention to sustainability aspects and the balance between economic growth and environmental conservation, while also ensuring the social welfare of the community around the mining area.*

**Keywords:** Andesite mining, social impact, economic impact, environmental impact, Nagari Manggilang, PT. Atika Tunggal Mandiri

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## INTRODUCTION

Indonesia is known as a country rich in natural resources, both renewable and non-renewable. The existence of natural resources plays an important role in human life, particularly in supporting economic activities and fulfilling daily needs. The utilization of natural resources by humans is essentially part of efforts to sustain life; however, it must be carried out wisely and sustainably in accordance with the principles of natural resource management mandated in the constitution (Iswandi & Dewata, 2021; Sachs et al., 2021; Jazuli, 2015). In practice, the utilization of natural resources often presents a dilemma between economic interests and environmental sustainability.

One form of natural resource utilization that significantly contributes to the economy is mining. According to Law Number 4 of 2009, mining encompasses all stages of activities ranging from investigation and exploration to post-mining processes. Meanwhile, the Central Bureau of Statistics (BPS) defines mining as the activity of extracting valuable and economically significant minerals from within the earth, either manually or mechanically. These activities produce important commodities such as petroleum, coal, and metallic and non-metallic minerals that support national development (Lenie Marlinae et al., 2021; Irham et al., 2024; Purba et al., 2025). However, various studies indicate that mining activities not only generate positive economic impacts but also cause negative effects on the environment and the social life of surrounding communities (Bebbington et al., 2018; Risal et al., 2017; Prasetyo et al., 2025).

Andesite stone is one of the mining commodities widely used in the construction sector, such as for building roads, bridges, dams, and housing (Budiman, 2025; Ahmad & Pandjaitan, 2025; Sudrajat, 2013). The high demand for andesite has driven the growth of mining industries in various regions, including rural areas (Andrisno & Rosadi, 2025; Imron et al., 2018; Rande & Mohamad, 2023). For rural communities, the presence of mining activities can provide economic opportunities such as job creation and increased income. However, on the other hand, mining activities also have the potential to cause social changes and environmental

degradation, such as declining soil, water, and air quality (Rukayah et al., 2024; Hilson, 2020). Therefore, it is important to comprehensively examine the impacts of mining on the social, economic, and environmental conditions of communities.

This condition also occurs in Nagari Manggilang, Pangkalan Koto Baru District, Lima Puluh Kota Regency, West Sumatra, which serves as the operational area of PT Atika Tunggal Mandiri (ATUM), an andesite mining company. Since its establishment in 2009 and its transformation into a limited liability company in 2018, the company has conducted mining activities that have affected the surrounding environment and the lives of local communities. These impacts include economic aspects, such as increased income and employment opportunities, as well as social and environmental aspects, such as changes in social interaction patterns and ecological conditions (Bebbington et al., 2018).

Previous studies have generally focused on the economic impacts of mining, such as increased community income or contributions to regional development. However, studies that integrate social, economic, and environmental impacts simultaneously within a specific local context remain limited (Hilson, 2020). In addition, there has been limited research specifically examining the impacts of andesite mining in Nagari Manggilang, highlighting the need for more in-depth research to understand the actual conditions in the field.

The novelty of this study lies in its comprehensive approach, which examines the impacts of andesite mining on three aspects simultaneously: social, economic, and environmental conditions within a specific research location. This study not only assesses economic benefits but also identifies social changes and potential environmental degradation resulting from mining activities. Therefore, the findings are expected to provide a more comprehensive understanding of the impacts of mining on community life.

Based on the above explanation, this study aims to analyze the impact of andesite mining at PT Atika Tunggal Mandiri (ATUM) on the social, economic, and environmental conditions of the community in Nagari Manggilang, Pangkalan Koto Baru District. The results of this study are expected to serve as a basis for more sustainable policy-making in natural resource management and to contribute to the development of social and economic geography studies.

## **METHODS**

This study employs a descriptive qualitative approach aimed at exploring in depth the impacts of andesite mining on the social, economic, and environmental conditions of the community in Nagari Manggilang, Pangkalan Koto Baru District. The research was conducted from July to August 2024, with the local community and related stakeholders within PT Atika Tunggal Mandiri as the research subjects. Informants were selected using purposive sampling, which involves deliberately choosing participants based on specific criteria relevant to the research objectives. The data used consist of primary data obtained directly from the community and secondary data derived from related institutions such as the village office and other official sources.

Data were collected through observation, interviews, and documentation to obtain comprehensive information about field conditions. Data analysis employed an inductive qualitative approach through three main stages: data reduction, data display, and conclusion drawing and verification. The analysis process was conducted interactively and continuously until data saturation was achieved, resulting in findings that comprehensively describe the impacts of mining activities on the community in the study area.

## **RESULT AND DISCUSSION**

The results of the study indicate that andesite mining activities at PT Atika Tunggal Mandiri have complex impacts on the social conditions of the community in Nagari Manggilang. From a positive perspective, the presence of the mining operation has created new job opportunities for local residents, both directly and indirectly through supporting sectors such as trade and services. This has encouraged increased social interaction, cooperation, and solidarity among community members in economic activities. This finding is consistent with the view of Anthony Bebbington (2018), who states that extractive industries can strengthen social dynamics through increased local economic activity.

Furthermore, increased social interaction is reflected in the development of cooperative relationships among mining workers, business owners, and the surrounding community. The growth of economic activities encourages people to depend on and collaborate with one another to meet their daily needs. This condition shows that mining activities not only impact the economic aspect but also strengthen local social networks.

However, from a social perspective, negative impacts were also identified. Mining activities have caused environmental disturbances, such as water becoming turbid, especially during the rainy season, which indirectly affects the comfort and social life of the community. In addition, the shift in livelihoods from traditional sectors

to mining may alter patterns of social interaction. This indicates that social changes resulting from mining are dynamic and not entirely positive.

These changes also have the potential to create social inequality, particularly between those directly involved in mining activities and those who are not. Differences in income levels and access to economic opportunities may lead to disparities in community welfare. This suggests that the social impacts of mining need to be carefully managed to prevent potential social conflicts in the future.

From an economic perspective, the results show an improvement in community welfare following the presence of mining activities. People who previously depended on agriculture with uncertain income now have more stable jobs in the mining sector, enabling them to meet daily needs, support their children's education, and improve their standard of living. This indicates that mining plays a key role in increasing local income. This finding aligns with the study by Gavin Hilson (2020), which states that the mining sector can enhance community welfare through job creation and increased income.

In addition, mining activities also contribute to the regional economy, such as increasing local government revenue (PAD) and fostering the growth of small businesses around the mining area. The rise in economic activities creates new business opportunities, such as food stalls and service businesses, which provide additional benefits for the community. This demonstrates that the economic impact of mining is felt not only at the individual level but also at the regional level.

However, negative economic impacts must also be considered, such as damage to road infrastructure caused by heavy vehicle operations and increased air pollution that may affect public health. Moreover, the community's dependency on the mining sector could become a long-term issue if mining activities decline or cease. Therefore, economic diversification strategies are necessary to reduce reliance on mining.

From an environmental perspective, andesite mining activities have significant impacts, particularly on water and air quality. Mining waste and washing processes cause sedimentation in nearby water bodies, while the use of heavy equipment and transportation activities generate dust that affects air quality. Although the company has implemented mitigation measures such as constructing sediment ponds and regularly watering roads, environmental impacts are still felt by the community, especially under certain weather conditions. This aligns with the view of Jeffrey Sachs (2021), who emphasizes that natural resource exploitation must be balanced with sustainable environmental management.

Overall, the findings of this study indicate that andesite mining in Nagari Manggilang has dual impacts: positive impacts in improving the social and economic conditions of the community, and negative impacts on the environment and certain social aspects. Therefore, sustainable mining management involving multiple stakeholders, including the government, the company, and the community, is necessary to maximize economic benefits without neglecting environmental and social aspects. These findings reinforce previous studies that highlight the importance of balancing economic growth and environmental sustainability in mining activities (Bebbington et al., 2018; Hilson, 2020).

## **CONCLUSION**

Andesite mining by PT Atika Tunggal Mandiri has significant impacts on the social, economic, and environmental aspects of the surrounding community:

1. From a social perspective, mining can cause changes in the dynamics of community life, including social interaction, livelihoods, and dependence on mining activities.
2. Economically, andesite mining has the potential to increase community income through employment opportunities and the growth of the local economy.
3. From an environmental perspective, mining activities tend to generate negative impacts such as ecosystem damage, air and water pollution, and landscape changes that may disrupt environmental balance and threaten the sustainability of local natural resources.

In conclusion, andesite mining brings complex impacts; therefore, wise management is needed to minimize its negative effects and maximize its benefits for the local community.

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