

# POTENTIAL DEVELOPMENT OF GOLD MINES AS A SOURCE OF COMMUNITY INCOME IN MUARASIPONGI DISTRICT, MANDAILING NATAL REGENCY USING THE TRIPLE HELIX MODEL

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**Abstract.** This study aims to analyze the potential of mines in Muarasipongi sub-district. The first village where gold mining was opened by locals was Bandar panjang tuo village which is close to the mountains of this village including remote villages, new villages of aek botung, ranjo batu etc. The source of income in various villages was initially in the agricultural sector, namely rubber, coffee and chocolate plantations, but over time and prices of agricultural products decreased, especially rubber, many farmers were willing Agriculture is declining, especially rubber, many farmers have become miners, where the results of mining can be obtained per day instead of per week or month. This gold mine does not have an official permit from the government or can be called illegal, lack of attention from the government and counseling and public knowledge about licensing and also the mine is mostly opened on land owned by the villagers not government land

**Keywords:** mining; agriculture; source of income

## I. INTRODUCTION

Mining is part or all of the stages of activities in the context of the management and exploitation of minerals or coal, which includes general investigation, exploration, feasibility studies, construction, mining, processing, refining or development, as well as utilization, recognition, and sale, and mining activities. (Aswari, 2022). Indonesia has several mining sectors that drive the economy in various regions. Indonesia ranks among the top 10 gold producers in the world, standing at 8th place in 2023, with a production of 110 tons of pure gold. This figure is a decrease from 2022, which was around 120 tons, a drop of approximately 10%. (Annur, 2024) Indonesia is a maritime country with many islands and natural resources, including mining resources such as PT Freeport Indonesia located on the island of Papua, whose shares are mostly controlled by foreign countries. The mine is very large and has many gold veins, which can last for up to 45 years from the discovery of copper, gold, and silver content by foreign geologists. The Freeport mine has gold reserves of 52.1 million ounces worth 77 billion US dollars. (Erni Yoesry, 2019).

With the vastness of Indonesia and the lack of understanding among the Indonesian population about mining supervision, many people open illegal or unlicensed mining sites without government approval, and there is no supervision for this. This is triggered by the lack of job opportunities and the government's inadequate control over agricultural prices, such as the plummeting market price of rubber, which has caused the residents of the Muarasipongi

sub-district, who rely on rubber for their livelihood, to switch to mining, which is more promising, especially since the land in the Muarasipongi sub-district contains a considerable amount of gold. This is evidenced by the long history of mining in the area, initiated by the elders of the Muarasipongi sub-district. (Agus Triono, 2022) North Sumatra, specifically in a remote village in Mandailing Natal district, also has a gold mine, namely the Martabe gold mine, which has a gold content of 280,000 ounces in 2022. (Wulan Dari & Fajri, 2024). Muarasipongi District has 8 hamlets and 4 neighborhoods, with a population of 13,083 residents. The residents in this district have livelihoods such as trade, agriculture, civil service, and mining. In recent years, the residents of Muarasipongi district, whose main profession for making a living was agriculture, specifically rubber farmers, have now shifted to becoming gold miners. The population density in this sub-district is 99.50/KM<sup>2</sup>. The comparison between farmers, civil servants, miners, and traders is very evident. The community in this sub-district has a permanent job as farmers, but because their income has been decreasing over the years, they have added gold mining to their jobs.

(Kabupaten muarasipongi, 2022). Mining according to Law No. 3 of 2020 is one of the stages in the process of managing and controlling minerals and coal in Indonesia. In the management and control of mining excavations, the government has a role to regulate and supervise so that the results of these mining excavations can be in demand throughout Indonesia and can minimize environmental damage. The definition of mining according to Law No. 3 of 2020 can be concluded that mining operations must be

regulated and supervised by the government during the opening process of the gold mine to minimize environmental damage. (Nugroho, 2020). The mining system in Muarasipongi is not much different from other areas in North Sumatra that only use simple tools and do not have permits, but mining is very much needed to drive and advance the wheels of the economy and the development of society, socio-culture, and local communities.(Parhusip et al., 2022)

The opening of gold mines in rural areas brings both positive and negative impacts. Positive impacts can boost the economy in the surrounding area, create job opportunities, and elevate the social status among the community. The negative impacts include environmental damage, water pollution, loss of animal habitats, death of local flora, and land subsidence. (Melawi et al., 2021)

The mining process in terms of processing gold-containing rock chunks from gold mines uses a ball mill with mercury and silver water, both of which are hard and dangerous substances because the waste from the ball mill water is inevitably dumped into the river. The only river in the village is the large Batang Gadis River, which is used for bathing, washing, and as a latrine. The river is also used for washing dishes. The danger of mercury entering the body, even in small amounts, accumulates over time and can lead to cancer, skin diseases, diarrhea, and other health issues. (Parhusip et al., 2022). This study aims to analyze the potential development of gold mines as a source of community income using the triple helix model. The triple helix model encompasses government, society, and education, which are interconnected, meaning that the research on gold mines in the Muarasipongi district is analyzed through these three aspects. (M.Fajar Amir,2024)

**II. RESEARCH METHOD**

This research uses a qualitative method conducted by delving into phenomena in a natural setting. (Sutan Remy Sjahdeini, 2014). This research uses a qualitative approach because this approach reveals reality as it is or according to the facts in the field with the type of field research, which is research conducted in the field aimed at obtaining information and describing events and occurrences that happen in the field according to the facts found in the field. Meanwhile, the approach used by the researcher is a qualitative approach with descriptive and exploratory analysis. (Nainggolan, 2018). The research locations I conducted were in the mines, market, rolling machine, and villages in the Muara Sipongi district. This location is quite close and the information is easily accessible. At the mine, we can learn about the activities of the miners, how the work system operates, and the condition of the environment. At the market, we can see economic activities taking place due to the buying and selling activities conducted by sellers and buyers. Additionally, at the galondong machine, we can observe the process of crushing coral stones (karangen) to produce gold. Here, we can see how it is done, the activities involved, and the tools used to extract gold from the coral stones. In the village, we can observe the activities and understand the economic development of each

resident. (Pasaribu, 2018). This research also uses the triple helix model, which consists of three aspects: government, society, and education, all of which are interconnected. The scope of the research through interviews includes the village head, the mining boss, and high school teachers, regarding economic perspectives and the impact of gold mining on the economic conditions in the Muarasipongi sub-district. The respondents of this study consist of 3 aspects related to the triple helix model.

**III. RESULT AND DISCUSSION**

Seven respondents aged 35-60 years, consisting of three male informants and three female informants, with the highest education levels being junior high school, senior high school, bachelor's degree, and master's degree. (table 1).

**Table 1. Characteristics of the informant**

Position	Gender	Age	Last education	Type of Respondent
Village Head	Men	51 years	High school	Government
Mine owner	Men	47 years	High school	Community
Mine owner	Men	35 years	High school	Community
Village Resident 1	Women	60 years	High school	Community
Village Resident 2	Women	37 years	High school	Community
Village Resident 1	Women	47 years	Junior High School	Community
High School Teacher	Women	41 years	Master Degree	Education
High School Teacher	Men	40 years	Bachelor's Degree	Education

The potential of gold mines as a source of income for the community in Muarasipongi District. In the past 5 years, many people in Muarasipongi District have switched jobs or taken on additional work in gold mines. The income from the mines is very good, especially if the gold mine is in good condition because miners find large gold veins or stones containing significant amounts of gold. Income can reach tens of millions, and this is evident from the construction or purchase of electronic devices such as motorcycles or cars by the mine owners. (orang yang mempunyai saham di tambang). research analysis and obtaining data from interviewing various sources working in mining such as mine owners, landowners, and members working in the mine. The result of the interview with the government respondent, the head of Bandar Panjang village, a 51-year-old man, is as follows: "The gold mine in this district sometimes yields a lot and sometimes a little, so the potential of this gold mine is about 50:50. The gold mine affects the economic condition in this district because when the gold mine is productive, the income of the traders also increases. The income from the gold mine in a year can reach 30-50 million. However, the gold mine has little impact on development because the gold mine operates on a small-scale mining system, so public development is not affected. The income varies for each person, so those who get a lot can build houses, but only a few people can do that; the others only earn enough for food. "The result of the interview with Mr. Tambang at the Marisi mine, as a respondent from the male community aged 47 years, is as follows:The gold mine located in the village of Bandar Panjang Tuo has been operating for about 3 years. The initial opening of this mine

was carried out by 11 people with a capital of 5 million rupiah, of which 2 million was for renting from the landowner (the person who owns the land or the mining hole) and the remaining 3 million was allocated for mining equipment such as steel, hammers, flashlights, saws, hoes, gloves, hammers, buckets, tents, nails, ropes, carts, etc., as well as for food supplies such as sugar, tea, etc. This gold mine is classified as illegal because it does not have a permit and is not under the supervision of the local government. This happens because the community thinks it will be very difficult to make a living if the government intervenes. From the interviews I conducted, the mine owner as a respondent said that the mining activities carried out since ancient times in the Muarasipongi sub-district are still illegal because the community believes that the mines are opened on land owned by the residents themselves, so they do not need permission from the government. Moreover, the operation of the mines without any permits and government involvement in the Muarasipongi sub-district is very lacking in socializing the importance of government supervision in mining operations. The income that has been achieved from this mine has reached tens of millions. The work system in this marisi mine is done in shifts, divided into 2 mine owners and their groups who can work for 2 days, then descend and be replaced by another group of mine owners. The mine owner is free to bring anyone as their members to enter the mine in their shift. The distribution of the results obtained is 2 parts for the landowner, 2 parts for the mine owner, and 1 part for the participating members, with each member allowed to bring one sack of coral stone per person. The results can vary for each person. This marisi mine can be accessed at a depth of 30 meters, and now its depth has exceeded 100 meters. The mine extends straight down, but there are also shafts that go down for about 25 meters. The miners in this mine, and most of the mining operations, still use manual methods, such as steel, hammers, and chisels, and carry the ore with carts or buckets, using headlamps for illumination.

The average income generated from this mining can reach around 3 million in one round of crushing the coral stones. The income from one sack of coral stones can be processed in three rounds, yielding 3 million. This is what has caused many residents and community members to switch jobs to become miners or take up mining as a side job because people who do not own shares in the mine can enter the mine once they obtain permission from the mine owner. The mine owner also gets a share even though he doesn't enter the hole because he owns shares in the mine, so if the group allowed in by the mine owner, they are obliged to give a share to the mine owner as well as the landowner. Many members of the community participate in singing, especially men who are 18 years old.

The place where buying and selling occurs is in the market, and in the Muara Sipongi sub-district, there is only one, which is located in the Muarasipongi market village. The market in this village only operates every Thursday, once a week. There are many types of traders in this market, such as clothing vendors, staple food sellers, meat, cooked food,

crockery, fruits, and so on. I also interviewed a martabak seller, a 37-year-old male respondent who is the second generation continuing the martabak selling business, the first generation being his parents. His interview results are as follows: "Father started selling martabak helping his parents since he was young, and now he is the one running it." This martabak business started in 1975, with an initial capital of around 2.5 million rupiah, which covered everything like buying flour, sugar, peanuts, bananas, margarine, chocolate, cheese, etc. The profit or turnover every Thursday reaches 4 million rupiah, and if there is a gold mine, the profit can double to 5 million every Thursday. (warga desa 2,37, responden masyarakat).

Traders are also present in every village besides the market, selling cooked or ready-made food. I interviewed one of them, a 47-year-old woman named Yaitun, as a community respondent. The results of the interview are as follows: "I have been selling in front of my house for about 5 years. I sell cooked food like lontong, pecel, and fried snacks. I sell every Monday, Wednesday, and Saturday. The capital I spend on each sale is around 400 thousand per day, and the profit I make from selling lontong per day reaches 300 thousand. If the gold mine in Bingkeh is very influential, my income can reach 400 thousand per day from sales." (warga desa 3,47, responden masyarakat). The opinions of educators, particularly those teachers with broader perspectives, are very much needed, and their wide-ranging views can also be helpful. The results of the interview with a 41-year-old female education respondent are as follows: "Gold mining is a source of income in the Muarasipongi district. In my view, gold mining has the potential to be a source of income if managed well and professionally. However, as we know, gold mining in the Muarasipongi district is illegal without government permits. As an educator in the Muarasipongi district, I can emphasize to future generations about permits and environmental management due to illegal mining, both in forests and rivers." (high school teacher, 41, education respondent).

The results of the interview with a 40-year-old male education respondent are as follows: "Gold mining has the potential to be a source of income because it is where most of the residents of the Muarasipongi district earn their livelihoods, and gold mining has a significant impact on the economy of the Muarasipongi community." In my opinion, even though this gold mine is illegal, it is very suitable to be pursued because it is far from residential areas, and the surrounding natural environment is not damaged due to the opening of the mine. However, I think it would be better if this gold mine had government permission for its management, and I hope the government pays more attention to this underdeveloped district by creating job opportunities. Helping to fund the purchase of more modern and safer equipment for miners. (guru SMA, 40, responden pendidikan). According to Deka Maita Sandi (2018) in the study by Yono and Mubarak (2022), from the economic aspect, illegal gold mining can increase the income of the surrounding

community and change their lives (raising the cost of living) from being in dire straits to a better life. Additionally, illegal gold mining can provide job opportunities and reduce unemployment in the communities around the mining area. (Yono & Mubarak, 2022). In the Islamic concept, a leader is responsible for making decisions that bring about welfare. Based on the principles of fiqh

### تَصَرُّفُ الْإِمَامِ عَلَى الرَّعِيَّةِ مَنُوطٌ بِالْمَصْلَحَةِ

Meaning: The decisions or regulations made by leaders towards their people must bring about welfare. Ideally, a leader making decisions regarding legal subjects or objects under their leadership should ensure that these decisions bring about benefits for the welfare of the community, both worldly and spiritual. The government must be present and available for the people, as it should. The Muara Sipongi sub-district government must be present and guide the people by making decisions about the gold mine that brings benefits; otherwise, it will cause many harms to the community in terms of legal issues and safety in mining. If there is no government oversight, it will be dangerous. (Ahmad Musyahid Idrus, 2021). The conclusion from the interview results is: in social, economic, and educational relations, closely related to the triple helix analysis, it can be concluded that the potential of the gold mine exists as a source of income in the Muarasipongi District because, based on interviews with several informants, their income is greatly affected. When the gold mine is in good condition, their income increases, the economy runs smoothly, the market is bustling with visitors, and it creates job opportunities. However, the gold mine also has negative impacts, such as environmental damage because it is not well-managed, being an illegal mine without official government permits. And leaders must be just in making decisions and overseeing the community so that it brings benefit, not harm

#### IV. CONCLUSIONS

After the author conducted research on the above material, the author concluded that mining in the Muara Sipong district has great potential as a source of income for the local community because, in terms of trade and the functioning of the economy in the Muara Sipong district, the influence of income and earnings from mining is very significant, as the majority of the local population in that district works as miners. This research was conducted using the triple helix model analysis, which has three important aspects: government, society, and education. From the government's perspective, there should be better coordination with district officials to further improve the economy in the Muarasipongi sub-district. From the community's perspective, whether it be mine owners, workers, or traders, they are highly dependent on mining income and can collaborate with local officials to address any shortcomings. From an educational perspective, there should be an increased

awareness of the natural environment and a deeper understanding of the potential of the Muarasipongi district so that in the future, they can contribute to the advancement of their birthplace.

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