



Study on the Impact of Mining Excavation Type C on Income and the Environment in Tegal District

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Abstract. This study aims to identify the impact of Mining on Income and the Environment in the Tegal Regency. This research is a descriptive study using a qualitative approach. Qualitative descriptive analysis in this study provides a review obtained through observations and interviews then analyzed to identify conditions that occur. The analysis results in this study indicate that the impact of excavation type C on income and the environment in Kabupaten Tegal can increase the income of miners, mining sector workers and the community around the mining site. However, mining activities also impact the physical environment, changes in environmental conditions such as changes in soil conditions, disruption of drinking water quality, changes in air conditions, and the level of public health.

Keywords: Excavation type C · Income · Environment

1 Introduction

The mining industry's contribution to state revenues is perceived by, for example, the local government of Tegal Regency. One of the economic sectors with high economic competitiveness in the Tegal Regency is the Mining and Excavation Sector. One form of relatively common mining activity in Indonesia is mining type C minerals and mining activities in the Tegal Regency. According to Badan Pusat Statistika [1], mining activities, especially type C excavation, were located in 7 districts in Tegal Regency, including Kramat District, Bojong District, Margasari District, Slawi District, Pangkah District, Warureja District, and Lebaksiu District. Of the seven districts, the total mining area was around 100 ha, with a total production of around 269,560 m³ and 2,013 employments.

The existence of type C excavation mining in Tegal Regency, especially along the Gung River, also impacts the environmental damage in residential areas. The activity of type C excavation mining in Tegal Regency, especially along the Gung River, is a mining location that has operated for quite some time, and it's a relatively massive environmental exploitation. Environmental exploitation carried out by companies, and the community is particularly worrying for people's lives in Tegal Regency. Although the community has understood the impact of environmental exploitation, exploitation activities were still carried out to fulfil the necessities of life for the family. This study

aims to identify the impact of mining activities, especially type C excavation mining, on the community's income and environment in the Tegal Regency.

The implementation of mining activities, especially type C minerals, is inseparable from problems. The problem is not only in mining activities but also in economic life and the environment around the mining site. Extensive mining activities can divert the function of agricultural land. In addition, increasing population in a sluggish economic condition can also lead to widespread farmers turning agricultural land into mining without paying attention to land conservation. In addition, environmental pollution due to mining activities in the vicinity is also one of the causes of the decline in agricultural production. This condition shows that mining activities and the environment are two inseparable things.

According to Nurkatika [2], mining is an activity that includes prospecting, exploration, evaluation, development, exploitation, and sales/marketing of minerals. Exploitation is a mining business to produce minerals and utilize them. Exploitation is the extraction of natural resources to be used, exploited, or utilized in various human needs to meet their needs [3]. This activity can be distinguished based on the nature of the minerals, namely, solid excavations and liquid and gas excavation minerals. Undang-Undang No. 11 Tahun 1967 [4] that the Basic Mining Provisions for Type C minerals are not strategic or vital excavation minerals because they do not directly require an international market. For example, marble, limestone, clay, sand, as long as it does not contain mineral elements.

Mining can create severe environmental damage in an area/region. The potential for damage depends on various mining activities and environmental factors. Factors in mining activities include mining techniques, processing, et cetera. Meanwhile, environmental factors include geographical and morphological factors, fauna and flora, hydrology, et cetera. Mining activities result in various environmental changes, including changes in the landscape, shifts in flora and fauna habitat, changes in soil structure, changes in surface and groundwater flow patterns, and so forth. These changes impact varying intensity and nature [5].

2 Research Methods

This research is descriptive research using a qualitative approach [6]. Qualitative descriptive analysis in this study provides reviews obtained through observation and interviews with respondents in questions. The data in this study were obtained through observations and interviews with respondents who were mining workers and residents around the mining area (excavation type C) in Tegal Regency. Researchers made direct observations of mining sites to see mining conditions and the environment around the mining sites. Researchers also conducted interviews with respondents who in this study were miners and workers associated with mining activities and residents around the mining site (excavation type C) in Tegal Regency.

The population in this study were residents of Tegal Regency who lived around the mining site along the Gung River. No observations have been made to mining sites in Tegal Regency. The uncertainty of the number of people living in mining locations was the background for sampling in this study. The sampling technique in this study was

purposive sampling with the sample's criteria taken was residents of Tegal Regency who lived around the mining site along the Gung river. Sampling was carried out using the accidental sampling method with a research period of three months, starting from November 2019 to February 2020.

The analytical method in this study started with direct observation of the mining site to determine the condition and environment around the mining site. These observations then formulated the socio-economic impact that may occur due to mining activities, especially Excavation type C (sand). From these observations, a literature review was then carried out to formulate the right questions to ask the respondents. From the review results, tools and methods were developed for later data collection. In this study, the data were collected qualitatively to obtain conclusions on the impact of mining activities, especially excavation type C (sand), on income and the social environment in the Tegal Regency.

3 Results and Discussion

3.1 Sand Mining Activities Alongside the Gung River

Sand mining activities along the Gung river were located in several villages in Tegal Regency, including Kajen Village, Dukuhlo Village and Pendawa Village located in Lebaksiu District. Then Pener Village and Penusupan Village in Pangkah District, and Dukuhsalam Village, Slawi District. Sand mining activities in the Gung river flow started many years ago since there was a demand for some type C excavated mining materials supported by the economic needs of the surrounding population. Even mining activities at this time were not only carried out in rivers, but some landowners provided their land for mining activities.

Sand mining activities in the Gung river flow, both in rivers and on private land owned by individuals, were community mining because they were carried out manually with simple tools and were carried out by individuals independent miners. In collecting the results of their mining materials, the miners were assisted by several loading and unloading workers or what was known as BM to transport the excavated material on vehicles (trucks). The excavated material was then brought directly to consumers, or some of it was collected at agents around the mining area.

Sand mining activities were carried out daily. However, if the weather was unfavourable, especially during heavy rains, some miners stopped their activities. Then, after the weather was deemed favorable, the miners immediately resumed their activities, considering that the available materials got better during the rainy season. This was quite a threat to the safety of the miners because the mining location was an open land; thus, during the rainy season, there was a risk of being hit by lightning flashes and prone to landslides.

The miners did not fully consider the working safety factor. There was no guarantee of work safety from the government because the mining activities were independent. In addition, the equipment used also was not secure, which was still relatively very simple and far from the safety standards for workers. Work accidents that often occurred were minor accidents to the feet or eyes due to lack of safety of work equipment.

3.2 Factor Causing Sand Mining Activities

One of the factors that caused sand mining activities that originated within the community was economic factors. The community previously relied on income from agricultural products, whose income was relatively small and unstable, considering agriculture depended on the weather. This was supported by the demand for mining materials that promised quite large yields. In addition, mining activities rely more on physical strength and do not need special skills; thus, it is easy for people to switch jobs from agriculture to mining.

Based on the interviews with several workers, it can be concluded that being a miner or labor (BM) in mining was more profitable than being a farm laborer. In addition, for the landowner, rather than having the land cultivated but not producing, it was better to sell or rent the land for mining, considering that the yield was exceptionally high and could fulfill life needs. The public's concern was how to meet the needs of daily life by earning income through work that can be expected to produce real results. The long-term sustainability of mining activities is not the concern of the people who work in the mining sector. Some people who understood the environment tried to return to the agricultural sector. However, economic pressures have forced the community to continue to work in sand mining because they could not find other jobs.

Another factor that caused mining activities was the demand for excavated materials. The presence of material in the Gung river flow caused several people from outside the area to continue to place orders that were later accepted by some people who became improvised miners. Promising results caused farmers to turn into miners. Even some residents who previously worked outside the area came to the area around the mine to become miners or laborers (BM).

In addition, the material in the Gung river flow that was continuously extracted may eventually run out. This was the appeal for capital owners to buy land around the river because the texture of the soil looks sandy and rocky therefore has the potential to buy/rent the land to extract the existing mining materials. In addition, some of the owners/tenants were non-natives who could afford to buy or rent land at a high price, thus creating a desire for some people to rent/sell their land to gain economic benefits even without having a sense of concern for the environment.

3.3 Analysis of Sand Mining Activities Impact

The presence of the mining industry has an impact on aspects of income and the natural environment of the people of the Tegal Regency. The shift from agricultural activities to mining carried out by some communities was due to the promising income in the mining sector. However, the results of research and observations show changes in environmental conditions such as changes in soil conditions, disruption of drinking water quality, changes in air conditions, and the level of public health. Changes in soil conditions were the loss of soil organic matter; thus, the soil was infertile, the loss of soil layers thus the land was unproductive, changes in soil structure, the land becomes barren and critical, decreases in infiltration and soil storage capacity, changes in land use, and irregular and hollow land.

There was a change in the water source condition before and after mining. Before mining, the community stated that it was easy to fetch water because the water was available everywhere. Meanwhile, after mining, the water condition was still available but limited; therefore, community access to water sources was classified as moderate. Some people used drinking water from wells, and others used gallon water. Environmental changes also occurred in air conditions. Before mining, the air was deemed comfortable because the air conditions were cool and not dusty. However, after mining activities, the air condition became uncomfortable because the air was hot, dusty, and looked arid.

The following is a description of the impact of mining in Tegal Regency:

3.3.1 Income Impact

The income impact of sand mining activities in Tegal Regency was as follows:

- Improved welfare for miners and workers related to mining activities such as loading and unloading workers (BM), truck drivers and owners, and owners of material agents. However, income from mining activities was decreasing due to the decreasing amount of mining material, both along the Gung river and on privately owned land used as mining and excavation sites.
- Improved welfare for landowners because the rented/sold land for extraction was at a high price, and economically, the profit gained was very high. However, the decreasing condition of mining materials has caused some landowners to abandon ex-mining land. Nevertheless, some landowners tried to shift the function of ex-mining land to the agricultural sector, such as planting corn and cassava.
- Increased income for the village treasury; thus, it gained a sufficient amount of funds due to selling the village crooked land and income from road retribution. The funds were used for the public interest.
- The existence of income from the informal sector, such as the growth of food stalls around the mining site.
- There was financial assistance for development in the public interest, i.e., the construction of village offices, village halls, mosques, gates, street lighting, bulletin boards, et cetera.

3.3.2 Environmental Impact

The environmental impacts of sand mining activities in Tegal Regency were as follows:

- Loss of part of the soil layer due to razed soil before the sand was not stored or segregated but was mixed with existing sand for sale. The loss of soil layers caused disappearing soil fertility; thus, the land was no longer productive and turned into critical land.
- Loss of cover crops and soil protection, which caused the surface flow to increase due to the absence of protective plants, especially during the rainy season.
- There was a change in land use which was previously intended for food crop agriculture to become sand and stone land. The once green land full of plants turned into a barren land full of piles of sand and stones.

- The emergence of groundwater on the surface due to the cut in the ground groove. If this continues, the supply of groundwater for lower places will decrease, especially during the dry season.
- Damage to the village road passed by trucks carrying sand/gravel/stone because the construction of the village road was not specifically made for trucks loaded with sand. Roadwork has been carried out, but the same damage occurred sometime later. Trucks that exceed the tonnage of the road further exacerbate the damage to village roads.
- The occurrence of air pollution in the form of dust around the road where the sand transport truck passed through. Thus, when a truck passes by, pedestrians or motorcycle users choose to pull over to keep their distance from the truck and cover their faces and noses to avoid flying dust.
- The existence of irregular land due to ex sand dug holes that were left unattended without land reclamation. This hollow ground and full of rocks cannot be used for agriculture or plantations. Therefore, it was deserted by the owner.
- The ex-sand mining area's irregular and hollow ground condition made it difficult for people to walk to their agricultural land.
- Reduced comfort for road users because village roads were damaged and dust flew around when trucks passed by. Every time the road was repaired, sometime later it was damaged again.
- Some people complained that the pool water quantity used by the community for bathing and washing was decreasing compared to previous years.

4 Conclusion

Based on the results of the analysis and discussion described previously, it can be concluded that the impact of excavation type C on income and the environment in Tegal Regency can increase the income of miners and mining sector workers (BM) and communities around mining sites. However, mining activities also impact the physical environment, namely changes in environmental conditions such as changes in soil conditions, disruption of drinking water quality, changes in air conditions, and the level of public health.

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