



Public Perception of the Socio-economic and Environmental Impact of Gold Mining in Buru Regency

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Authors' contributions

This work was carried out in collaboration among all authors. The IH author designed the manuscript, analyzed and wrote the results of field studies. MS authors helped design the analysis and improved field study outcomes, while NY and MIZ authors helped improve field studies of the analysis results. All authors read and approved the final manuscript.

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ABSTRACT

The existence of gold mining activities in Buru Regency has a positive and negative impact on socio-economic and environmental conditions in the community. This study used a survey method with 107 respondents. The selection of respondents used purposive sampling techniques. The analysis technique uses a likert scale to see people's perceptions of the socioeconomic and environmental impacts of gold mining activities. The results showed that the community quite agreed with the existence of gold mining activities. This can be seen from the results of the data analysis obtained, where in the category of social impact perception, the total score is 1,099. That is, on the social impact of society as a whole argues in agreement. Further, in the category of economic impact, the number of scores is 1, 740. That is, on the economic impact of society as a whole argues in the agreement. In this category of environmental impact perception, a score of 1,124 was obtained. That is, on the overall environmental impact the community argues disapproval. The policy implication of the results of this study is that the management of gold mining in Buru Regency must minimize negative externalities that occur and carry out programs to strengthen the local economy, and in the long term also reclaim the former mining area.

Keywords: Impact; perception; socio-economy; gold mining.

1. INTRODUCTION

The potential of natural resources and minerals in Indonesia is very large, this is supported by the form of a country in the form of islands so that natural resources and minerals are diverse. Mineral resources are one of the authorized capital in national development, therefore they must be utilized as much as possible for the welfare of the people. This is in accordance with the 1945 Constitution Article 33 paragraph 3, that the use of mineral resources can provide improved welfare to the people.

The mining sector has an important role in economic development because it increases the absorption of labor [1]. Every year the number of labor forces always increases, this is due to an increase in the number of residents. The development of the mining sector will lead to an increase in labor needs, so that the demand for labor in the mining sector will continue to increase. In addition, the mining sector also increases state revenue through the value of mining production, tax revenues, royalties, revenue from the sale of mining products and fixed contribution income [2]. The magnitude of the development potential of the mining sector encourages the government or private sector to extract mineral resources and also invest in the mining sector.

The contribution of the mining and quarrying sector to GDP has always changed, from 2010 to 2014 the contribution of the mining and quarrying sector to GDP has always increased. In 2014 to 2015 there was a decline, then for 2016 it increased again [3]. Although the contribution of the mining and quarrying sector has decreased, this sector has a considerable contribution to GDP compared to other sectors, which is 10.88%. The mining and quarrying sector ranks 3rd after the processing industry sector and the agricultural sector in contribution to the State GDP. This shows that the mining and quarrying sector plays a role in economic development in Indonesia [4].

The mining sector has the potential to be developed due to the abundance of energy and mineral resources, including gold. The potential of these gold resources is spread in various regions [5]. Data on the worldwide supply of gold from 2010 to 2016 changes every year. This change occurs because the value of net gold production that undergoes extreme changes until it reaches negative values occurred in 2010,

2012 and 2013. The decrease in the amount of gold supply is also caused by the amount of gold production in mining activities that are increasingly difficult, where miners have to dig deeper to find gold and the amount obtained is not as much as before because of the fewer gold resource reserves [6]. However, the world's gold supply still increased by 5% in 2016 due to an increase in the global economy which encouraged an increase in gold supply [7].

Gold is a mineral mining item of one type of metal that is of high economic value because it has various privileges compared to other metals [8]. Every year the need and demand for gold will continue to increase. This change in demand occurs due to the increasing utilization of gold. Gold mining activities in Buru Regency have been going on since 2012, but mining is still illegal [9]. According to BPS administratively this gold mining is located in Wamsait Village, Waelata District, Buru Regency, Maluku Province. Geographically, the coordinate point of the mining business location is based on the Mining Business Permit (IUP) of the Wamsait Hills Region Production Operation. Mining activities in Wamasait are called the "Bald Mountain Gold Mine" [10]. Gold mining activities carried out before 2012 only carried out mining activities at one mine site. In 2014 until now, mining activities have expanded the mining area to two mining area locations, namely in the village of Gogorea [11].

The communities around the gold mining area in Buru Regency are communities with homogeneous tendencies in livelihoods. The majority of the people around the mining area have livelihoods as fishermen and farmers. In addition, the community works as a beach tourism manager and also a service provider in the tourist area. This gold mining activity is expected to contribute to the development of the regional economy, especially for the communities around the mining area [12].

Investment capital from gold mining activities will contribute directly in contributing to the regional revenue of Buru Regency, in addition to the existence of gold mining companies that have the potential to absorb local labor. Mining has a positive impact economically with increasing economic activity and increasing the amount of money flow in circulation obtained from mining activity expenditures both locally and regionally, causing an increase in consumption from consumer expenditures such as labor and

business actors. This situation creates an interrelated relationship between one sector and another sector in the wheels of the economy so that there will be a multiplier effect [13].

Mining activities carried out in addition to providing a positive impact certainly also have a negative impact that will be felt by the community around the mining area. Gold mining activities that use excessive water resources can cause people difficulty in obtaining water for consumption and agricultural activities, the existence of mining activities will also make the water around the mining area polluted and suspected economic losses due to a decrease in fishermen's income around the mining area. The social impact that is likely to occur is the potential conflict between the community and companies related to the availability of employment and changes in environmental conditions [14].

Mining activities that have been running in Buru Regency have resulted in several impacts to several sectors, namely on the agricultural and fisheries sectors. The impact felt by farmers is agricultural land that is always inundated by water coming from rivers that are used as irrigation channels for farmers. This river is also used as a dumping ground for liquid waste by mining activities, inadequate river bodies cause unaccompanied water to overflow into agricultural land, thereby reducing the amount of productivity and also resulting in a decrease in farmers' income. The impact felt by the fisheries sector includes a decrease in the number of fish species by fishermen, this is because the mining area located next to the sea causes the marine ecosystem to change. The flow of rivers that are used as liquid waste disposal empties into the sea causing the entry of chemicals into the sea and resulting in changes in seawater conditions that affect marine life.

2. METHODS

The research method used in this study is a quantitative research method to determine the public's perception of the socio-economic impact and environment due to coal mining activities in Buru Regency. Public perceptions are analyzed using the likert scale method. The data used in this study are primary data and secondary data. Primary data was obtained by conducting direct interviews with research samples, namely communities located in four villages around the gold mining area of Buru Regency. The interview conducted was a structured interview using a

questionnaire and an in-depth interview was also conducted with several influential respondents and knew and understood the research topic carried out.

Secondary data were obtained from relevant agencies as well as literature related to the research topic. The population in this study is the community around gold mining activities located around the mining area in Buru Regency. Then the research sample is the community around gold mining activities located in four villages, namely Sanlekao, Masarete, Namlea, and Kaki Air Villages. The determination of the number of samples is carried out using the Slovin formula, with an error rate (e) of 10%. The sampling technique related to the research that will be carried out on the impact of gold mining on the socioeconomic conditions of the community in Buru Regency is to use simple random sampling which is calculated by proportional random sampling technique.

Quantitative descriptive data analysis was carried out to determine the public's perception of gold mining activities in Buru Regency carried out quantitatively by the scoring method. The presentation of data is carried out in the form of a frequency table and correlation results, using SPSS software and Microsoft Excel. Furthermore, data analysis is carried out by giving a score to each answer given to respondents.

3. RESULTS AND DISCUSSION

Table 1 explains in the first indicator that the community statement has a good relationship with mining companies, the majority of respondents are 57 respondents (48.6%). The majority of people think that the company is considered to be very poorly socializing with the local community. This led to a gap between the community and the mining company. In the context of this wholeness then gives rise to stereotypes and prejudices and subsequently causes conflict. As the results of this study Septi [15], that stereotypes and prejudices are a part that often occurs in mining activities. The main cause is the economic gap between local communities and mining companies.

Furthermore, in the second indicator, namely in the statement that mining creates jobs for the community, as many as 88 respondents (82.3%) answered in agreement. Most people think positively because mining creates business

opportunities for some people, namely by opening a business providing goods and services, food stalls, lodging that provides daily necessities both for mining companies and for mining company workers. Moreover, there are workers who greatly benefit from mining activities. In line with these findings, Fauzi [16] said that directly the existence of gold mines provides employment for the community, so it is undeniable that this perceived impact is part of what the community considers to be a positive contribution to them.

The third statement is that there is a change or shift in work that occurs in communities around the mining area, as many as 82 respondents (76.6%) answered in agreement. This finding is in line with Lestiani [17] that job changes occur because people feel that they have gained the benefits gained when compared to previous jobs. People who initially worked as farmers,

fishermen, community building workers switched jobs to mining company workers and opened businesses to provide goods and services for mining activities. Thus, in this category of perception of social impact obtained a total score of 1099. That is, on the social impact of society as a whole argue agrees with the statements given.

In the second category, the perception of economic impact explains how the economic impact occurs in the community with mining activities. Through this perception analysis, it will be known the public's perception of business development by the community, there is an increase in community income due to mining activities, increased regional revenue, changes in community income and also increased infrastructure due to the existence of mining activities.

Table 1. Public perception of the existence of gold mining

No	Indicator	Catalyzing Answers					Score	Information
		SS	S	N	TS	STS		
Social Impact								
1	Good relations between the community and mining companies	1	25	26	52	3	290	Disagree
2	The availability of jobs for local communities	1	88	13	5	0	406	Agree
3	The shift in employment in society	1	82	22	2	0	403	Agree
Sum							1.099	
Economic Impact								
1	The existence of business development by the community due to mining activities	0	95	11	1	0	415	Agree
2	Increase revenue due to mining activities	0	61	3	42	1	338	Agree
3	There is an Increase in Regional Revenue	1	79	25	2	0	344	Agree
4	There is an increase in infrastructure	0	14	12	70	11	234	Disagree
Sum							1.740	
Environmental Impact								
1	Good mining environmental conditions	0	22	9	64	12	225	Disagree
2	The community is not disturbed by mining activities	0	8	35	54	10	255	Agree
3	Environmental and water quality is good	0	8	35	54	10	255	Disagree
4	Good management of waste	0	30	48	29	0	322	Neutral
Sum							1.057	

Source: Primary data (2021)

Table 1 shows that 95 respondents (88.8%) agree with the statement of business development by the community. Business development by the community around the mining area includes food stalls, providers of raw bahan such as minyak water and gasoline, then there is a lodging business for the manpower of mining companies. In addition, the second economic impact statement in the form of an increase in income from mining activities as many as 61 respondents (57.1%) answered in agreement. These findings show that the previously erratic income of mining company labor per month, after becoming a mining company's workforce, has increased and earns a definite salary per month. In addition, it can be explained that for business actors providing goods and services for mining activities, their income has increased due to the increasing number of mining company workers, which has an impact on business unit actors. In line with these findings, Irwan [18] in his research said that the existence of mining activities can be a driver of economic development for communities around mining. Although the social and environmental aspects are still a problem for the community. This is an impact that must be recognized for the results for the community regarding the benefits it gets.

The economic impact on the aspect of increasing regional income as shown in Table 1, shows that the community agrees with the existence of gold mining on regional income. This can be seen from 79 respondents (73.9%) who said they agreed, where this mining activity pays taxes to local governments. This finding is in line with the results of Bin Tahir research [19], which shows that although mining activities in Buru Regency are still relatively small in scale, the tax revenue received is quite significant from several community activities such as trade activities and several other activities. The income obtained by this area is still a discussion that has not received the appropriate results as desired by the local government, but the existence of the mine must be recognized as having a significant impact on regional revenues.

Furthermore, in the aspect of economic impact related to changes in income as revealed by the community that there is a change in opinion. A total of 63 respondents (58.9%) said that the existence of mining activities provided a change in income. This change in income can be seen from the activities of the community who become the company's workforce and business actors

providing goods and services. However, for people who work as fishermen and farmers, they say that there is no change in income, there is a decrease in the income received. In line with these findings, Ikram [20] said that this decrease in income was caused by distant fishing areas because the water area around the bay or what had been used as a fishing ground was contaminated by heavy metals, such as merkuri and cyanide. This condition causes the cost of catching incurred to be unbalanced with the catch obtained. Some people agree because mining activities provide opportunities for people to entrepreneurship but the community still does not feel the development of infrastructure such as roads or public facilities such as schools or places of worship. Thus, in this perception category obtained a score of 1,740. That is, on the overall economic impact of society argues in agreement with the statement given.

In the environmental impact assessment, it shows that community perceptions related to whether the community is disturbed by the mining environment, whether there is air pollution and disturbing the community, whether there is water pollution and disturbing the community can be seen in Table 1 above. The results of this study showed that as many as 64 respondents (59.8%) said they did not agree with the statement of good mining environmental conditions, meaning that the community considered that the mining environmental conditions were still not good and efforts were needed to improve environmental quality. Furthermore, 54 respondents (50.5%) disagreed with the statement that the community was not disturbed by the existence of mining. The community is disturbed by mining activities, one of which is dust, noise and also damage to the main road. This is in line with Fitriyani statement [19], that environmentally, the existence of mining has an impact on the environment, especially on changes in landscape, decreased soil fertility, threats to biodiversity, decreased water quality, decreased air quality and environmental pollution.

The third statement related to environmental impacts is environmental quality and good water, as many as 45 respondents (42.1%) disagreed. This is due to the cloudy and muddy beach conditions. The fourth statement on good management of waste, as many respondents (45%) said quite agreed. Thus, in the category of perception of environmental impact, a score of 1,124 was obtained. That is, on the overall

environmental impact of the community argues disapproving of the statement given. Fitriyani opinion above, in line with this finding that the community stated the quality of the environment due to mining activities such as pollution to water quality, as many as 45 respondents (42.1%) disagreed that mining provides good environmental quality. This is due to the cloudy and muddy condition of the coast. As for another statement, namely good waste management, as many respondents (45%) said quite agreed. Thus, in the category of perception of environmental impact, a score of 1, 124 was obtained. That is, on the overall environmental impact of the community argues disagree with the statements given.

Table 1 also shows the final total assessment of the category of each perception, the table shows that the results of the reponden assessment of the perception of society as a whole are quite agreeable with the total weight of 3,963. The assessment includes the importance of mining existence, social impact, economic impact, and environmental impact of mining existence. To get a clearer picture of the overall perception can be seen on the continuum line in Fig. 1.

The continuum line above shows that the number of scores of 3,963 for the perception of society as a whole score (3,338 - 4,365) falls into the category of quite agreeable. From the social aspect, there is a lack of good relations between

mining companies and the community. From the economic aspect, the existence of mining has a great positive impact on the community. From the environmental aspect, the existence of mining is considered to have a bad influence on the environment of the community around the mining area. This happens because the management of waste is not good, so there are negative externalities received by people living around mining areas such as dust, noise and damage to infrastructure such as roads due to large vehicles passed by mining companies.

The conclusions shown on the continuum line are in accordance with the opinions of society in general. In addition to having a bad impact on the environment, the existence of mining has a great positive impact on the economy of the surrounding community. Thus, the community in the future hopes that mining companies can make positive changes both for the social, environmental, and economic communities. Mining companies are expected to make maximum efforts in tackling environmental problems caused by waste from mining activities. In addition, it is hoped that in the future mining companies can cooperate with the surrounding community. Thus, it will have a positive economic impact on the surrounding community. In the social aspect, mining companies are expected to be more social with the community around the mining area, especially the mine location is very close to community settlements.

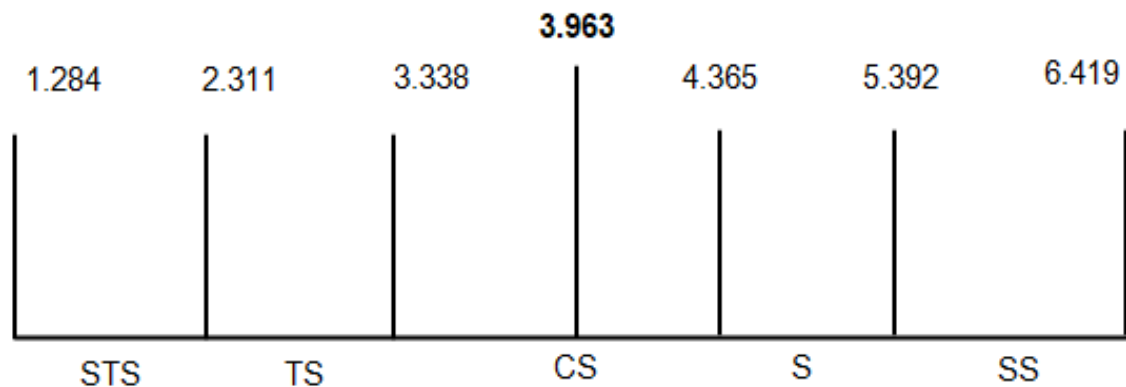


Fig. 1. The continuum line of public perception of the impact of the existence of gold mining
Description
 STS = Strongly Disagree
 TS = Disagree
 CS = Simply Agree
 S = Agree
 SS = Strongly Agree

4. CONCLUSION

The assessment of the community's perception of the existence of mining shows that the community quite agrees with the existence of gold mines in Buru Regency. The existence of gold mines has an economic impact on the surrounding community. From the environmental aspect, the community argues that the existence of mining has a negative impact on the environment, and from the social aspect the existence of mining absorbs labor from the community around the gold mining area in Buru Regency. Gold mining in Buru Regency should minimize negative externalities that occur, empower communities around the affected mining areas, and carry out infrastructure development and prioritize local communities as workers in accordance with the expertise of the community. The results of the study can be used as a consideration for the implementation of mining activities by conducting a program to strengthen the local economy, and for the long term also carry out reclamation of former mining areas.

For the Buru Regency government, it can be used as a reference in making sustainable gold mining management policies. In addition, the government must carry out stricter supervision of the implementation of mining activities, supervision of the implementation of activities in order to solve environmental problems and social responsibility to the surrounding community. Furthermore, it is necessary to conduct further research on the influence of gold mining activities on ecosystem changes, especially marine ecosystems in the area around the mining area.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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