

Effect of Illegal Gold Mining Activities on Social-Economic of Workers and Community Surrounding the Watershed in Kuantan Singingi, Indonesia

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Abstract: *Illegal Gold Mining in Kuantan Singingi (Kuansing) initially carried out by migrants and followed by local villagers because of economic needs. The workers using mercury (Hg), resulting in river water pollution and suspected cause social economic problems for the community surrounding the watersheds. This study aims to determine the effect of illegal gold mining activity on social economy of workers and community surrounding the watershed in Kuantan Singingi. This research uses both quantitative and qualitative exploratory research. The results showed that illegal gold mining activity in Kuantan Singingi has increased economic income of workers, investors and local police officers were involved, but it has been detrimental to the public around the watershed and cause environmental pollution. The river water can no longer be used for daily necessities; the public has difficulties to getting clean water and fish. Illegal gold mining activities often lead conflicts between the perpetrators of illegal miners (workers / owners) with security personnel and sometimes conflict with the surrounding community. Illegal gold mining activity in streams and irrigation dams to be terminated through mutual commitment. The local government, stakeholders, and citizens also the private sector need to prepare a social control program after closing the illegal gold miners by providing jobs for local people in agriculture and plantations, community empowerment, improving skills and people's income, needs to be diversified, and provision of subsidies. Local governments can also use village funds budget for rural development and help provide land, seed, fertilizer, livestock, and other efforts to improve rural communities welfare.*

Keywords: Illegal Gold Mining, Social Economy, Pollution, Social Control

1. Introduction

Industrial and technological development is very rapid today, have a positive impact in form of industrial products and technologies that can be utilized in improving the quality of life, but also have a negative impact of environmental pollution, such as industrial and technology waste. Environmental pollution should be controlled so as not to interfere environment and human health [1].

Since industrial era, mercury becomes an excavation contaminant material, because mercury can be utilized as much as possible. One of environmental pollution due to mercury is the excretion of waste products (tailings) on gold processing by amalgamation (International Agency for research, 1993). Gold mining activities using amalgamation process, in general, will produce a positive impact that is served the gold for the needs of human life but also has a negative impact in form of environmental pollution by Hg vapor. A total of 10% - 30% Hg which used to be lost or released to the environment [2].

Potential impact on social economic sectors can occur as a result of illegal gold mining, both positive and negative. Positive impact on miners society is creating informal employment, especially for rural communities that does not have much choice, business opportunities or working to fulfill the needs of family life, rising incomes and ability to finance their children's education until college. Those conditions at the same time to be a trigger and drive the economy, resulting purchasing power of local communities will stronger because money flow in larger quantities happen

in that region lead by illegal gold mining activities. But, the negative impact also can happen, such as environmental pollution and causes various diseases, increased more medical expenses, the occurrence of social unrest and social conflict [3-5].

Pasaribu's research results [6], stating that gold mining activities have a positive impact on changes of society's socio-economic. For example, from the social aspect, will increase in education and health facilities, from economic, will increase public income to 26.56% from the previous, be a business opportunity for local communities and affect the development of the districts.

Illegal gold mining activities are found in various regions in Indonesia, among others; in Pongkor, Bogor-West Java, Kulo-North Sulawesi, Landak-West Kalimantan, Gunung Mas-Central Kalimantan, Jambi, Sijunjung-West Sumatra. In Riau province is also found in Kampar, Indragiri Hulu, but are most numerous in Kuantan Singingi (Kuansing), flow along the Kuantan River, Singingi River, irrigation dams, creeks and plantation area [7].

Kuansing area is known contain a lot of gold (alluvial), thus attracting the interest of small-scale illegal gold miners who come from outside of the area. Illegal gold miners activity is conducted since 2006, initially by migrants and followed by local villagers. Illegal gold miners number has increased very rapidly from year to year and spread almost in every district and villages close to the river flow. In January 2014 there were approximately 2,103 units and in January 2015 is estimated at more than 3,000 units of illegal miners raft and

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machinery (Dongfeng) equipped with a vacuum, and a unit run by 3 to 4 workers. It is estimated that approximately 9,000 to 12,000 gold miners who actively operate every day, both migrants from outside the region and the local community. There are even some illegal gold miners were using heavy equipment (excavator) to dredge the land optimally. By assuming that one of the perpetrators of illegal gold miners support his four family members, then around 36,000 to 48,000 residents in Kuansing which rely on lives of these illegal gold mining activity results [7].

Eriyati and Rita's research results [8], about the economic and environmental impact of illegal gold mining in Lado Gardens Village, Kuantan District, Kuantan Singingi Region, shows that average income of the illegal gold miners is IDR 2,881,045, - or approximately IDR 1.940.000, until IDR 4.722.000. Economically shows those number is relatively large and increasing illegal gold miner income so they decided to continue to work as illegal gold miners.

The local government is faced two choices, that are to combat the illegal gold mining, which alleged has polluted the environment or to provide employment for the community through gold mining operations. The purpose of this study was to determine the effect of illegal gold mining activity on social economy of illegal gold mining workers and the community surrounding the watershed in Kuantan Singingi.

2. Method

This research method consists of quantitative and qualitative research. Quantitative research is the first step for getting a socio-economic status database of illegal gold miners and community surrounding the watershed in Kuantan Singingi. Then exploratory qualitative research conducted to gather information from informants and strengthen quantitative research results, focusing on representation of social phenomena to obtain a perception of stakeholders on the impact of illegal gold mining activities on socioeconomic conditions of the workers and community surrounding the watershed through questionnaires and in-depth interviews.

This research was conducted in seven districts from 15 districts in Kuantan Singingi. The chosen districts are location with most illegal gold mining activity and dispersed in Kuantan River, Singingi River, Kukok River and irrigation dam that had previously been conducted enforcement efforts by the regional government officers and the Police that are: Singingi Hilir District, Singingi, Kuantan Mudik, Gunung Toar, Hulu Kuantan, Kuantan Tengah, and Sentajo Raya. The research was carried out two years, starting on February 15, 2014, until February 15, 2016.

Population in this study are all illegal gold mining workers spread over 15 districts in Kuantan Singingi, approximately 8,412 until 12,000 people. The amount is obtained based on a number of illegal gold mining rafts, approximately 2,103 until 3,000 units scattered along Kuantan River, Singingi River, and creeks also the irrigation dam. One unit of illegal gold mining run by 3-4 people. Sampling was done based

cluster by quota and accidental sampling; each district was taken a sample of 30 people of workers spread throughout seven districts. The sample was determined using the method of Rapid Assessment Procedure (RAP) which has been jurisprudence by World Health Organization (WHO), as many as 30 respondents for each district, so the sample size is $30 \times 7 = 210$ Illegal miners. Then the people who live in the basin and not involved as perpetrators of illegal miners are also used as a sample (respondents) as many as 210 people.

Further for qualitative research, informants are selected by purposive sampling. The selected informants are Head of Energy and Natural Resources Department, Environmental Agency, Health Department, Plantation Department, Fisheries Department, Agriculture Department, Chief of Police, environmental expert, Chairman of Parliament, Head of The Local District, Chief of The Village, community leaders and perpetrators of illegal gold mining. The number of informants is determined according to the adequacy of the data required. Data collection was discontinued if no longer found the variation information.

3. Result

3.1 Influence of Illegal Gold Mining Activities toward Social Economy of Workers

In Figure 1 below is known that the respondent's income (workers of illegal gold mining) on average has increased. Results of statistical test (t-test) show p-value 0.001, it can be concluded that there is a significant effect or difference between earnings before and after work as illegal gold miners

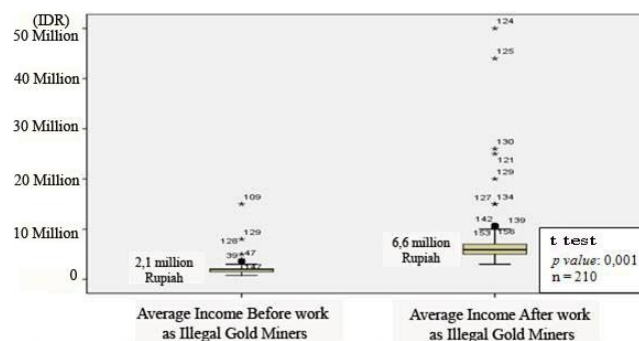


Figure 1. Average Income of Illegal Gold Miners (per Month) Before and After work in Illegal Gold Mining In Kuantan Singingi Region, 2014

Respondents have the perception that illegal gold mining activities have a positive influence on the social economy of workers, such as described in the following figure.

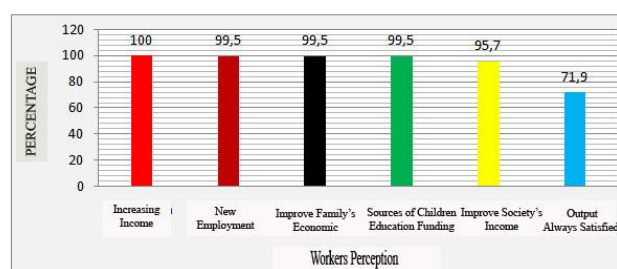


Figure 2. Workers Perception Toward Their Social-Economic Increasing After Illegal Gold Mining Activities in Kuantan Singingi Region, 2014

Questionnaire result in the picture above is supported by in-depth interviews result on workers/owners of illegal gold mining, that their economies income increased from their previous work, they can build and repair houses, making stalls, buying vehicles (motorcycles and cars), as well as help their relatives financially.

Illegal gold miners perpetrator's statement is supported by one of the chief villages who also has 3 units of illegal gold mining, who say that an increase in incomes, even can buy vehicles (motorcycles and cars) as well as helping relatives. However, according to one of the community leaders, that not all perpetrators of these illegal miners succeed, those who do not succeed even increased debt.

Illegal Gold Mining activities also have negative effects for socio-economic of workers conditions, often happen extortion by unscrupulous officers, worried and seriously harmed if carried out an audit, there is a conflict between the security forces with the perpetrators of illegal gold miners and sometimes conflict with the surrounding communities, the perpetrators of illegal gold miners rarely attend social activities in society, and growing need for medical expenses related illegal gold mining activities, as well as the results of questionnaire in the following figure.

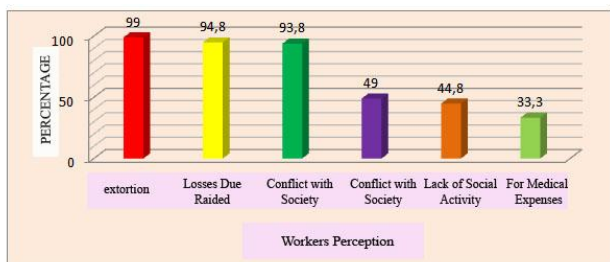


Figure 3. Workers Perception on Their Social Economic Problem related Illegal Gold Mining Activities in Kuantan Singingi Region, 2014

Questionnaire's result in the picture above is supported by interviews with informants, that often occur extortion of security officers, the conflict between the perpetrators of illegal gold miners with security officers, local government officers, and local communities, as well as interviews with the perpetrators/owners of illegal gold miners. Often happen extortion by security officers who allegedly involved in illegal gold mining, supporters and conflict between the security officers with the perpetrators of illegal gold miners and their families, is also justified by other informants such as Head of Environmental Agency, Head of Energy and Mineral Resources Department, Head of Agriculture Department, Head of Health Department and figures community.

3.2 Influence of Illegal Gold Mining Activities Toward Social-Economic of Community Surrounding The Watershed

Income of people living in the watershed before and after illegal gold mining activity in Kuantan Singingi has an average decrease from IDR 3.300.000, - (three million three hundred thousand rupiah) to IDR 3.104.000, - (three million one hundred forty thousand rupiah) per month. Results of

statistical test (t-test) showed p-value 0.001, it can be concluded that there is a significant effect or difference between earnings before work and after work in illegal gold mining, as shown below.



Figure 5. Income of community surrounding watershed (per month) before and after illegal gold mining (PETI) in Kuantan Singingi, 2015

Based on questionnaire's result filled out by respondents (community surrounding the watershed), as many as 81.9% of respondents said that illegal gold mining activities have contributed to the growth of rural development for example contribution build place of worship. However, 99% of respondents said that illegal gold mining activities has negative impact resulted in unrest and conflict between the perpetrator illegal gold miners with security officers and sometimes conflict with the surrounding community. Illegal gold mining activity also affects the user of river water for their daily needs. The river water can not be used as sources of drinking water, for cooking, bathing, and washing clothes (see picture below).

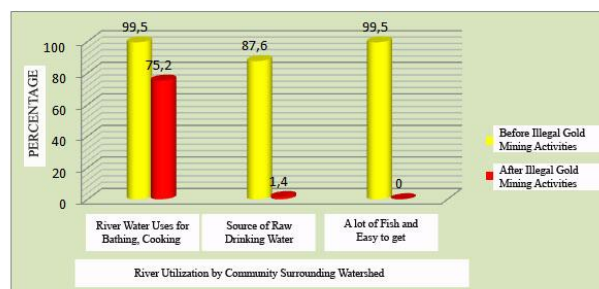


Figure 6. River Utilization by Community Surrounding Watershed Before and After Illegal Gold Mining Activities in Kuantan Singingi, 2015

Data in picture above, is supported by in-depth interviews of Head of Environmental Agency, Head of sub-district and the village head, that illegal gold mining activities negatively affect a decrease in average amount of income of community surrounding the watersheds which is not involved in, so they feel disturbed and harmed as a result of the illegal gold mining activities and having difficulty in getting clean water, community around the watershed can no longer use the water for daily needs, such as for drinking/cooking, bathing, washing clothes, for livestock drinking water, fish farming cages, fish already scarce. The community surrounding the watershed also had trouble getting fish of the river, so they are forced to buy fish from other areas such as on the Kampar Regency and West Sumatra Province. Illegal gold mining activities also often lead to conflict between the perpetrators of illegal gold miners with security officers, the local officials and officers of companies in the form of a war of words, a physical clash, and sometimes to do anarchist/damaging cars of local government officers and burn the warehouse of Duta

Palma Nusantara (PT.DPN) company who participated to curb illegal mining.

4. Discussion

4.1 Effect of Illegal Gold Mining Toward Social Economy of The Workers

Illegal gold mining activities in Kuantan Singingi have a positive effect and also a negative effect on socio-economic of workers/perpetrators of illegal gold miners and their families. The results of this study are consistent with research result of Pasaribu [6], Eriyati and Rita [8], Refles [4] and Irfan [5] which states that illegal gold mining activities have positive impact to miners workers. The positive influence of workers socio-economic in Kuansing is improving their income three times higher than the previous work and exceeding minimum wage of Kuansing district in 2015 (Rp. 1,980,000) per month. Illegal gold mining activities have created new jobs and change jobs from farming (cut rubber) into illegal gold mining, especially for rural communities that do not have much choice other than farm work, farming, gardening, small traders (tavern) and others. Illegal mining has also improved their family economy, able to pay for education or school children began elementary school through college, illegal gold mining have improved the economy and purchasing power of local community due to money flows in larger quantities in that region, the workers can build and repair houses, shop, buy vehicles (motorcycles and cars), purchase of livestock, land, gardens and can help relatives financially.

Although illegal gold mining has a positive impact on socio-economic of workers (such as job creation and increased income), but in the perspective of environmental science can be concluded that illegal gold mining has damaged the environment and aquatic ecosystem of river, thus illegal gold miners should be disciplined (suspended) and look for a solution so that surrounding community more improved, the environment and river waters must be kept, maintained and preserved resulting an eco-development will becoming true.

The results also show that illegal gold mining activities negatively affect social-economy of workers in Kuansing, that is often occurrence of illegal fees from security officers, the conflict between the miners with security officers and the surrounding community. The workers were worried about their family economic circumstances and needs of their children's school fees any demolition of illegal raids conducted by the police. Workers often do not have time to attend social activities (custom events, do'a celebration, weddings, circumcision, the funeral and condolence to the death) in the area were busy working in the illegal gold mining area. Increasing amount of expenses for treatment of various diseases related to illegal gold mining activities.

According to Somantri [3], lack of knowledge and economic ability has led them often be the object of exploitation by investors or financiers so very few of them were able to improve their welfare. Furthermore, this activity often leads them towards degradation of local culture as a result of the

convergence of newcomers miners culture with local communities so that led to conflict between them and increase the potential for crime.

There is a difference with Idroboi's, et al result [9], which states that the rampant of illegal gold mining in Colombia has had a significantly negative impact to increase in violence, judging from a number of killings and massacres victim in Colombia. Conditions that occur in Kuansing only to extent there is a conflict (a war of words and threatened one another, sometimes even resulting in clashes) between the perpetrators of illegal gold miners with security personnel when conducted curbing illegal mining, as well as residents of the surrounding communities who have a family relationship with the perpetrator of illegal gold miners, including with officials security of Duta Palma Nusantara company (PT.DPN), which prohibits illegal gold miners activities in the company area, so that the workers actions damaging, burning one of the company buildings, but situation at the illegal gold mining site ultimately still be controlled by the security forces to go straight to the field.

The results of this study are similar with the opinion of Karl Marx, that social change is only possible because of the existence of material interest conflict. Social conflict and social change become a similar sense because social change comes from the material interest conflict. Therefore, we need to pay attention to education and improve their skills as a foundation for building a new society, open to change and development of the times, as well as organize society with a new paradigm that cares for the environment [10].

According Keraf [11], that anthropocentrism theory that sees man as the center of the universe system; all interests are considered to be most decisive in the ecosystem structure. Everything that exists in the natural environment is only rated and notes the extent to support human interests. The environment and the universe are only seen as objects, a tool, a means for the fulfillment of human needs to achieve their goal. Similarly, illegal gold mining activities that occur in Kuantan Singingi, for the sake of their families economic needs have ignored damage to the surrounding environment. Supposed perpetrators of illegal gold miners, communities and stakeholders are also viewed from Biosentrism and Ecocentrism perspective, that's not true just humans that have value. Nature also has a value, all living creatures and the whole ecological communities both living and dead must be considered, as intertwined with each other so that deserve consideration and moral concern. Therefore, moral obligation and responsibility not only restricted to living beings. The same obligation and moral responsibility also apply to all ecological reality.

4.2 Influence of Illegal Gold Mining Activities Toward Social-Economic of Community Surrounding The Watershed

The results of this study indicate that illegal gold mining activity negatively affect on decrease in average amount of income of community surrounding the watersheds who is not involved in illegal gold miners activities, so they feel disturbed and harmed as a result of illegal gold mining and

having difficulty in getting clean water, community surrounding the watershed cannot longer use the water for daily needs, such as for drinking/cooking, bathing, washing clothes, drinking livestock, fish farming cages, fish the river has been difficult to obtain. Communities around the watershed also had trouble getting fish from the river, so they are forced to buy fish from other areas such as on Kampar regency and West Sumatra Province. Illegal gold mining activities also often lead to conflict between the workers with security officers, local officials and officers of companies in the form of a war of words, a physical clash, and sometimes to do anarchist / damaging local government cars government and burned part of the building company (PT. DPN) which comes to curb illegal mining.

On the other hand, the community surrounding the watershed said that there was an increase in donations to places of worship (mosques and prayer houses) mainly from the workers who successful in financially. The results of this study are consistent with the results of research Mahgfirah et al [12] in Sungai Alah village, Hulu Kuantan district, Kuansing region, stating that the illegal gold mining contribute to the local community in form of aid village activities for the community, providing allocation of funds for activities on build line, help to repair Mushollah, build way to river and support for social activities.

Different with Pasaribu's research result [6] in Batang Toru district, South Tapanuli stating that illegal gold mining activities have a positive impact on the socio-economic improvement of society views from rising incomes (approximately 26.56%) from the previous, increased educational facilities, health facilities and development of districts. Impact on regional development is direct impact and multiplier effect from gold miners activities in that region. Assumed there are difference criteria of respondents and gold mining operation station. In this study, the selected respondents are the communities located in the watershed and are not involved in illegal gold mining activities as well as the status of illegal gold mining operations owned by individuals. While in Pasaribu's research [6] using respondents (villagers) which adjacent to the illegal gold mining company and is not explicitly explain to respondents whether involved or not with the illegal gold mining activities. Very likely the respondent is part of gold miners family or no working relationship with illegal gold mining activities resulted in their income increase.

Research in Kuansing didn't found the influence of illegal gold mining activity to the improvement of education facilities, health facilities and development of the districts as happened in Batang Toru, South Tapanuli. Illegal gold mining activities in Kuansing only benefit investors, workers and some people who were involved in illegal gold mining activities, such as land owners, local police officers who protect, mercury sellers and tools illegal gold mining, illegal gold mining perpetrator's family and those who feel advantaged.

The results of this study are also similar with Mahgfirah's et al studies [12] which states that illegal gold miners activities

in Sungai Alah village, Hulu Kuantan district, Kuansing has negative impact on the surrounding community, particularly to fisherman communities, the decline in the number of fishermen 59% from 2008 to 2013. This is due to reduced amount of revenue the fishermen from time to time and more difficulty in getting the fish in the river due to river water pollution.

According Somantri [3], impact of illegal gold miners activity in West Lombok resulted in a decreased level of school attendance, many students who prefer to mine gold than attended school, cases of theft and robbery increased, many people who ignore religious activities (mosque became deserted), as well as on social activities, such as when the event of death, difficult to find people to take care of the bodies and many more changes habits of the people in the region and the environment polluted. Not supposed to sacrifice the environment, health and future generations because economic reasons have to.

Illegal gold mining activities in various areas, particularly in Kuansing has caused more loss to the community around watershed and issues of river environmental degradation and risk of long-term health problems, both for the State and for the surrounding community when compared to benefits for the perpetrators. The state loses revenue because of illegal gold miners do not pay taxes, royalties, wasted of natural resources, while the environment becomes damaged and disrupted ecosystems, river water is polluted because of the way of mining and processing that does not follow the rules (good mining practice).

The impact of illegal gold mining activity on socioeconomic conditions of workers and the community surrounding the watershed, river environmental pollution, as well as health problems can be described as follows:



Figure 6. Impact of Illegal Gold Mining Activities to Environment, Social-Economic, and Health

Impact of illegal gold mining activities on the environment, are pollution of river water and water irrigation dam in terms of turbidity and levels of Hg, DO, BOD and COD parameter were exceeded threshold resulting in life of various types of biota rivers such as fish, shrimp, shellfish and other disturbed and die, the river water can no longer be used for their daily needs. Influence of illegal gold mining activity of illegal miners on social economy are illegal gold mining improve economic income of workers and financiers, but the illegal gold miners have been detrimental to community surrounding the watersheds, communities have difficulty getting clean water and illegal gold miners often lead to conflicts between perpetrators and with the police, local officials and company officials both be a "war of words", a physical clash, even to

perform anarchist action/damaging car of local government and burn building of company (PT.DPN) who participate in curbing illegal mining. Illegal gold mining activity influence on health, that of illegal workers in Kuansing district experiencing various symptoms of illness, occupational accident, and if left unchecked illegal mining in the long term, it can have an impact on public health issues that accumulate mercury and lose the next generation.

5. Conclusion

Illegal gold mining activities in Kuantan Singingi only benefit investors and local police officers were involved, but it has been detrimental to the public around the watershed and environmental pollution. The river water can no longer be used for daily necessities, public water shortages and fish from the river. Illegal gold mining activity is often a conflict between security personnel with the perpetrators of illegal miners (workers/owners) and sometimes conflict with the surrounding community.

6. Suggestion

Illegal gold mining activity in streams and irrigation dams to be terminated through mutual commitment. The local government, stakeholders, and citizens and also private sector need to prepare social control program post-closure illegal gold mining by providing jobs for local people in agriculture and plantations, community empowerment, improving skills and people's income needs to diversify, to control the price of rubber or subsidization. Local governments can also use village funds budget for rural development and help provide land, seed, fertilizer, livestock, and other efforts for increase rural communities welfare.

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