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Soil Exploitation and Environmental Impacts of Brick Making in Wasur 2 Merauke Regency

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ABSTRACT
Merauke Regency is a coastal area with muddy soil conditions. sand and gravel materials, because of these conditions the community and housing business actors use red bricks as material for development in Merauke district which is currently being carried out in all sectors of life, especially building and housing construction. This research was conducted to determine the process of mining soil for the brick-making process and the impact of mining on the surrounding physical environment. How is the environmental permit granted by the Government for the exploitation of brick-making land and how is the Merauke Regency Government's supervision of mining. From the results of this study, it can be concluded that, the brick mining process carried out by brick craftsmen in Wasur 2 does not have a production permit from the relevant Government Agencies and there is no environmental study from the Merauke Regency Environmental Agency and there is no regular supervision from the Government. and the Environment Agency of Merauke Regency so that land exploitation activities are still ongoing which will have an impact on soil degradation and environmental damage and can cause a decrease in the function of top soil which is rich in nutrients as a function of land cover vegetation which can change the structure of the soil and the area. will become increasingly dry and unproductive.
Keywords: *Soil Exploitation; Environmental Impact;Bricks*

1. Introduction

Environmental management is essentially aimed at the survival of human life on earth. Environmental is need by human. (Safrin Salam, Pide, Patittingi, & Nur, 2021) Humans as environmental rulers on earth play a major role in determining environmental sustainability. Humans as intelligent creatures of God are able to change the face of the world from a simple pattern of life to the modern form of life as it is today. But in reality, what humans do is often not balanced with the thoughts of the future of the next generation. Many advances achieved by humans have a negative impact on the survival of humans and other creatures in their environment. Environmental damage occurs because of actions that cause direct or indirect changes in physical and or biological properties so that the environment no longer functions in supporting sustainable development.

Humans play a very important role in the environment and have an impact on the surrounding environment, especially in the context of humans meeting their needs, both clothing, food and housing/housing and the development of human thought related to technological developments has positive and negative impacts on our environment. Natural phenomena where there are often various natural disasters that occur unexpectedly. Hundreds of thousands of lives and trillions of rupiah in property due to natural disasters, be it volcanic eruptions, earthquakes and floods. All these disasters are sometimes only seen as natural phenomena, even though greedy humans have contributed to the tragedy (Soemarwoto, 2004).

In addition to natural disasters, that humans consciously or unconsciously also create natural disasters that result in social disasters. They not only violate the positive law of the state by robbing the wealth controlled by the state, but also damage the environment. The damage is crash the life of human. (Safrin Salam, 2019a)

Nature becomes unbalanced because its elements have been damaged and resulted in hundreds of humans having to endure prolonged suffering. If this is allowed to continue, the number of victims will increase.

In utilizing the environment, humans must realize that what is in the environment is an inseparable unit. "The environment is a unity with all things space, power, state and living beings, including humans and their behavior, which affect the continuity of our lives and well-being of humans and other living things" (Soeriaatmadja, 2000) Assertions about the environment according to (Salim, 2010) "the environment is defined as any object, condition of the state and the influence of all things contained in the space we occupy and affect all living things including human life. Environment have a source of life for human. (S. Salam et al., 2019)

Natural resources in the environment are generally divided into renewable natural resources (such as forests, fisheries, etc.) and non-renewable natural resources (such as oil, natural gas, coal, gold, etc.) and other minerals). From the point of view of using non-renewable natural resources, they must be used wisely. The results obtained from these natural resources need to be used for renewal and must be managed according to patterns that take into account the sustainability of natural resources. Indonesia is rich in minerals contained in Indonesian soil. Mining activities in Indonesia have clearly opened and developed remote areas.

Mining is one of the economic activities to improve the welfare and prosperity of the community by utilizing natural resources, human resources, and others. With the mine is expected to be able to improve the standard of living of the community. Mining involves various components in order to support the wheels of the mining success. One of these components is the availability of raw materials to be processed into ready-to-use materials. The raw materials to be processed tend to be obtained from nature. The more people in an area, the more advanced the process of a mine to provide goods or services needed by the community. This will also have a direct impact on nature and the environment. One of the needs of the community is the need for a place to live/inhabitable houses. One of the raw materials for houses that are most needed by the community is brick.

Brick (red stone) is one of the raw materials for houses/residential premises produced from clay and water. The process is also very simple, the clay is mixed with water until smooth and soft, then printed on a container to form the desired model, then goes through the drying stage and the last process is burned to strengthen the material. With this simple process, the community tends to exploit land as raw material for the brick (red stone) industry to produce it. The excavated pits as the raw material for the production of bricks are actually a problem for the surrounding environment. One example of the negative impact of this is the reduction of community land for farming, and environmental pollution. Mine smoke also in the production of these bricks tends to pollute the air.

Mining is part or all of the stages of activities in the context of research, management and exploitation of minerals or coal or other natural elements managed to produce goods and services which include general investigations, exploration, feasibility studies, construction, mining, processing and refining, transportation and sales, as well as post-mining activities carried out by community groups in general or by the government (Supardi, 2003) .

The rapid development of new growth in several regions has provided benefits in the development of basic infrastructure, increasing state revenues, and providing employment opportunities. The mining of these minerals is regulated in Law Number 11 of 1967 concerning the main provisions of mining. The explanatory part of Article 3 of Law Number 11 of 1967 states that the distribution of minerals consists of:

1. Group A minerals, namely strategic group minerals. What is meant by strategic is strategic for the defense / security of the State or for the country's economy.
2. Group B minerals, namely vital minerals are those that can guarantee the livelihood of many people.

3. Group C minerals, namely minerals that are not included in groups A and B where clay is included in this group. The classification of minerals based on the type of minerals is regulated in Law Number 4 of 2009 concerning the main provisions of mining.

The classification of minerals focuses more on technical aspects, namely based on groups or types of minerals, namely in four groups. 1). Radioactive mineral mining, 2).Metal mineral mining, 3). One of the non-metallic mineral mining is clay, 4). Rock mining.

The utilization of these excavated materials is contained in the laws and regulations in order to continue to pay attention to the preservation of environmental functions. The regulation, implementation and supervision of these minerals involve the government, businessmen and the community, in line with the thinking of Law Number 23 of 1997 concerning Environmental Management which has been amended to Law of the Republic of Indonesia Number 32 of 2009 concerning Environmental Protection and Management. . Human factors in the mining process that do not pay attention to the environment will certainly have an impact on environmental damage both on social and cultural factors, physical factors and biotic factors. Social and cultural factors that can affect the level of impact of clay mining activities, including the social level of the community, income level, education, occupation and public perception. The socio-cultural impact of mining on the area around the mining area generally lies in the same problem, namely the mining trajectory that must pass through land withprivate property, road buildings as a means of transportation are damaged.

The impact of clay mining on the physical environment that may occur is the level of groundwater quality, changes in land form, changes in agricultural productivity in clay mining areas. The use of non-metallic mineral minerals, namely clay, which is carried out by the community as a basic material in making bricks, has a very high economic value for local governments and communities around mining, especially in this case because brick management efforts must be close to raw materials, namely clay, so that transportation costs are needed in the transportation of raw materials. This mining business demands the awareness of the public and miners in protecting the environment at the mining site for these non-metallic minerals.

Clay, which is used as a raw material and the main ingredient in the process of making bricks, where the location where it is made is also close to the raw material, does not pay attention to environmental sustainability. This public awareness includes understanding all applicable laws and regulations in the field of environment and mining. The lack of public awareness and mining entrepreneurs causes damage to the environment around the mining site. In addition, there are certain parties who simply want to take advantage by ignoring environmental conservation.

From several non-formal small industries in Merauke Regency, there is one industrial business that has economic value, namely the brick-making industry. The emergence of this industrial business is like a mushroom in the rainy season. Grow and even breed in the corner of Merauke City because from time to time the number of businesses continues to grow significantly in line with development developments. The manufacture of bricks, which begins with scaffolding mud, molding, slashing and drying up to the combustion stage, will absorb labor because this type of industry is a labor-intensive business. In addition, it will also lead to other side businesses in the form of transportation and trade.

The presence of this brick industry has existed for a long time as a type of community business carried out by individuals or families, in addition to other businesses such as agriculture. The type of soil found in Merauke Regency consists of organosol, alluvial and gray hydromorphic soils found in swamp and brackish areas. This type of soil is formed from sedimentary artificial parent material that spreads in the districts of Okaba, Merauke and Kimaam. One of the locations for the brick industry center in Merauke City is Wasur.

Of the 4 districts around Merauke City, there are 3 districts with large brick industries, namely Wasur 2 (Merauke District), Semangga (Tanah Miring District), Salor (Kurik District) and Rawa Sari (Kurik District).

However, the author is interested in conducting research in Wasur 2 (Merauke District) considering that this area is the closest to the city center and there are many brick industries and clay contours as the main material for making bricks in this area are considered better than some other places based on the results of surveys, interviews and data obtained by the authors in the field.

From 1996 to 2021, the brick industry in Wasur 2 Village had 150 business units with an average production capacity of 1,000 ± pieces per day. Since the beginning of the production of bricks, craftsmen did not get a permit based on an operating license according to the Mineral and Coal Law (Galian C). Based on article 6 paragraph 1 letter b of Law number 4 of 2009 concerning Minerals and Coal, the government has the authority to form laws and regulations as a form of management. The types of minerals that are currently available in Merauke are included in the classification of minerals C based on the Government Regulation of the Republic of Indonesia Number 27 of 1980 concerning the Classification of Minerals. Article 2 (1) Government Regulation of the Republic of Indonesia Number 27 of 1980 concerning Classification of Minerals "The transfer of minerals from one group to another as referred to in Article 1 shall be stipulated by a Government Regulation".

Mining activities for brick production are increasingly worrying, because mining activities are increasingly widespread and are mostly carried out in productive areas. Continuous excavation of the soil causes the fertile soil layer to decrease, even disappear. After mining, the land is degraded due to exploitation on a large scale. After the excavation, most of the land was left alone without any further management. During the dry season, the ex-mining land will look with holes, while during the rainy season it is full of puddles. In the AMDAL there are two types of limitations on impact: 1). The impact of development on the environment prior to construction and which is expected to occur after construction; 2). The impact of development on the environment is the difference between environmental conditions that are expected to exist without development and those that are expected to exist because of the development (Soemarwoto, 2014) .

The problem with the management of minerals is currently getting out of control, after the issuance of Law Number 23 of 2014 concerning Regional Government which transferred several nomenclatures that were originally the authority of the district to become the authority of the province. One of them, the mining service which was originally located in the district was transferred to the province, so that it lost control over the management of minerals. The second problem is, the excavation site currently being carried out by the community has not been accommodated in the Amdal which should have been issued by the Merauke Regency BLH (Environmental Agency), the excavation site currently being carried out by the community is an inappropriate location. continues to be carried out on the grounds that community mining is the livelihood of the people who live around the location, and is supported by the absence of government regulations to become an alternative to other employment opportunities. The third problem is that the community's need for basic building materials is getting higher. Not only the community, government projects in building infrastructure still use local minerals. The fourth problem, because there is a legal vacuum, the elements carrying out the excavation are out of control. The buying and selling price has become uneven, the quality of the excavation is in doubt. So it becomes necessary to research to become a product of legislation so that the management of minerals in Merauke Regency is controlled again. In addition, the clay processing industry is one of the industrial businesses that must have a permit from the Merauke Regency Government and is also subject to a levy.

This study is intended to determine the clay mining process and the impact of clay mining on the surrounding physical environment. In this study, the impact of clay mining is limited by researchers with various aspects such as the level of groundwater quality, changes in land form, changes in agricultural productivity in the area around clay mining. The focus of this research is, How is the environmental permit granted by the Government for the exploitation of brick-making land and How is the Merauke Regency Government's supervision efforts towards clay mining for brick making. The purpose of this research can be achieved through two objectives, namely analyzing the laws and regulations related to environmental permits and business permits

for the implementation of clay mining into bricks and analyzing the monitoring efforts made by the Government on permits issued for the clay mining and brick making process.

2. Methodology

This research was conducted in Merauke Regency, Papua Province. Considering that Merauke Regency has rapid growth in the residential sector and has a high population growth rate and requires bricks as building materials with the main raw material being clay. The type of research used is Empirical Law research, in addition to studying the law theoretically or normatively, it will also examine the law in its implementation.

The population in this study is the community that owns the brick mining, the Head of the Industrial Development and Development Section of the Cooperative, MSME, Industry, and Trade Office of the Regency. Merauke, Head of Government Section of Rimba Jaya Village, Merauke Regency Environment Agency.

The sample is 14 people, consisting of 10 respondents, namely the mining community and 4 resource persons consisting of the relevant Department. The method of determining the sample is purposive sampling, i.e. taking informants intentionally and the informants used are those who really understand and can be trusted to be a valid source of data and know the problems in depth about the problems being studied (Sutopo, 2006) .

Data collection methods used in this study are a. Interviews by visiting sources and respondents, and conducting direct questions and answers, the types of questions are organized and structured. b. Documentation by collecting data related to this research. Analysis Primary data and secondary data were analyzed qualitatively by using a theoretical basis in explaining existing phenomena, or data from the information obtained were presented descriptively, namely describing, describing, and explaining in accordance with problems that were closely related to research.

3. Result and Discussion

3.1 Merauke Overview Merauke

DistrictDistrict is a geographical area of Merauke Regency which is the southern part of Papua Province. Merauke District is the capital of Merauke Regency. Merauke District is located between 140°060°–140°080° East Longitude and 70°70°–80°40° South Latitude. Merauke District has an area of 640.91 km2 or 3 percent of the total area of Merauke District. Merauke district has 11 sub-districts: Bambu Pemali, Seringgu Jaya, Mandala, Muli, Maro, Karang Indah, Rimba Jaya, Kelapa Lima, Samkai, Kamahedoga, and Kamundu. And 5 villages: Bokem, Nasem, Nggolar, and Wasur. Wasur Village is the largest area, reaching 505.99 km2 or 30.96 percent, while Bambu Pemali Village is the smallest area which only reaches 3.62 km2 or 0.22 percent of the total area of Merauke District.

Merauke district is limited by several districts and neighboring countries. To the north it is bordered by the Sota District, to the east by Papua New Guinea, to the south by the Naukenjerai District, and to the west by the Semangga District. Merauke District is a lowland that has a height of 5 to 20 meters above sea level. The population of Merauke District based on data from the BPS in 2019 was 101,784 people consisting of 51,637 men and 50,147 women. Like the condition of the city in general where the most densely populated residential areas are in the city center. Merauke District is the heart of Merauke Regency and Rimba Jaya Village is the most densely populated residential area with a density of 19,741 people per sq. km. While the lowest density level is in Pemali Bambu Village with a population of 7,955 people per square km.

3.2 Laws and Regulations Related to the Granting of Rock Mining Business Permits

The law exist to enforcement of law. (Safrin Salam, 2019b) Currently, mining activities that are better known are mining for metal mineral commodities, including: gold, copper, nickel, bauxite and coal commodities. In addition to these main mineral commodities and coal, rock commodities have an equally important role, especially

in providing material support for infrastructure development, including: construction of road infrastructure facilities, construction of housing and office buildings. Terminology of group C minerals previously regulated in Law no. 11 of 1967 has been changed based on Law No. 4 of 2009, into rock, so that the use of the term class C minerals is no longer appropriate and has been changed to rock.

Mining activities have started a new phase since the promulgation of the latest Minerba Law, namely Law no. 03 of 2020 concerning Mineral and Coal Mining. Many new things are discussed in this Minerba Law, one of which is about rock mining. In the new Minerba Law, mining businesses are grouped into 2, namely; mineral mining and coal mining.

Mineral mining is classified into 4, namely:

a. Radioactive mineral mining, including: radium, thorium, uranium
b. Metallic mineral mining, including: gold, copper
c. Non-metallic mineral mining, including: diamond, bentonite
d. Rock mining, including: andesite, soil clay, backfill, excavated gravel from hills, river pebbles, backfill sand.

Rock mining in the new Minerba Law is not in the form of a mining business permit (IUP) but in the form of a rock mining permit (SIPB).

Table 1. Differences in rock mining in Law no. 04 of 2009 and Law no. 03 of 2020

NO.	CONTENTS of	COMPARISONAL	
		Law No. 4/2009	**Law no. 3/2020**
1.	Permit Form	IUP Exploration IUP Production Operation	SIPB
2.	Issued by the	Government (Ministers, governors and regents) according to their authority.	local government
3.	Issued to	business entities	enterprises/BUMDES
		Cooperative	private business entityDomestic
		Individual	Cooperative CompanyIndividual
4.	Size of	IUP Exploration 5-5000ha IUP OP 1,000 ha	haMaximum 50
5.	Terms maintenance	administrative requirements, technical, environmental and financial.	Administrative, technical, environmental and financial requirements include coordinates and area.
6.	Can be mined if it	meets the increasing requirements IUP Production Operation IUP exploration to	mine planning documents: reserves -Information -Plan mining environmental -Dokumen
7.	Loading of	IUP load:	DEVSIS contain:
		company name;	name of SIPB holder;
		An area;	tax ID number;
		mining sites;	location and area;

	location of processing and refining, transportation and sales;	working capital;
	investment capital;	Types of mining commodities;
	the validity period of the IUP;	the validity period of SIPB; and the
	duration of the activity stage;	rights and obligations of SIPB holders.
	settlement of land issues;	
	the environment including reclamation and post-mining;	
	reclamation and post-mining guarantee funds;	
	IUP extension;	
	the rights and obligations of the IUP holder;	
	plans for community development and empowerment around mining areas;	
	taxation;	
	PNBP consisting of fixed contributions and production fees;	
	K3	
	utilization of domestic goods, services and technology;	
	application of good economic and mining engineering principles;	

The data was processed by the author in 2021

Based on Law no. 03 of 2020 concerning Mineral and Coal Mining, Article 86A Paragraph:

1) SIPB is granted for the exploitation of certain types of rock mining or for certain purposes.
2) SIPB as referred to in paragraph (1) may be issued to:
    a. Regional-owned enterprises/village-owned enterprises;
    b. Private Business Entities in the context of domestic investment;
    c. cooperative; or
    d. sole proprietorship.
3) Further provisions regarding certain types of rock or for certain purposes as referred to in paragraph (1) shall be regulated by or based on a Government Regulation.
4) The SIPB as referred to in paragraph (1) is given by the Minister based on a request from a regional-owned enterprise/village-owned enterprise, private enterprise for domestic investment, cooperatives, or individual companies, which have met the administrative, technical, environmental, and environmental requirements. and financially.
5) In addition to the administrative, technical, environmental and financial requirements as referred to in paragraph (4), the SIPB application must be accompanied by the coordinates and area of a certain type of rock or for certain purposes requested.

6) SIPB as referred to in paragraph (1) consists of stages of planning, mining, processing, and transportation and sales activities.
7) SIPB holders can start mining immediately after having Mining planning documents.
8) The planning document as referred to in paragraph (1) consists of:
    a. technical documents containing at least information on reserves and mining plans; and
    b. environmental documents.

As explained in Article 86A Paragraph (4), the SIPB as referred to in paragraph (1) is given by the Minister based on a request from a regional-owned enterprise/village-owned enterprise, private enterprise for domestic investment, cooperatives, or individual companies. , which has met the administrative, technical, environmental and financial requirements. Based on the results of an interview with the Head of the Merauke Regency Environmental Agency regarding the rock mining permit (SIPB) issued by the Merauke Regency Environmental Agency for the Brick Industry Business in Wasur 2, Rimba Jaya Village, it was obtained an explanation that the Merauke Regency Environmental Agency had never issued a permit to conduct brick mining in Wasur 2. The permits held by these business owners are mostly only up to the Lurah and Camat levels. This is based on the results of the author's interview with the Head of the Industrial Development and Development Section of the Department of Cooperatives, MSMEs, Industry, and Trade in Merauke Regency; that there are only a few brick industry businesses that obtain direct permission from the Disperindag but the rest of these craftsmen only have business permits at the local level. The Lurah and the Camat don't even have a permit at all or are illegal. The author also obtained the same information from an interview with the Head of the Industrial Development and Development Section of the Merauke Regency Cooperative, MSME, Industry and Trade Office, the Head of the Rimba Jaya Village Government Section, that the average brick craftsman did not have a permit at all. These brick industry business owners only get permission from the land owner and charge a land rental fee of IDR 10,000 each time they produce bricks.

So that brick mining activities do not damage the environment, it is necessary to applygood mining practices. In addition to paying attention to occupational health and safety, they also carry out environmental management in ex-mining areas. Mining is not only for temporary needs, but also must pay attention to environmental sustainability. The former mines will later be passed on to their children and grandchildren, if environmental degradation occurs it will also be inherited. In fact, this clay processing industry is an industrial business that must obtain a permit in order to facilitate the Merauke Regency Government in terms of supervision and is subject to a levy in accordance with the Merauke Regency Regional Regulation Number 12 of 2011 concerning Certain Licensing Retribution.

With the development of this brick industry business, if it is regulated systematically and according to procedural, it can obtain employment opportunities that provide income. Many family heads depend on this industry for their fate, so that the burden of the Merauke Regency Government in providing employment opportunities is also getting easier. With various jobs in producing bricks starting from scaffolding mud, molding, drying, lifting to the combustion process, it will absorb labor, not to mention the connection with consumers which will lead to trading and transportation activities. With this activity, the transportation sector will also be opened to facilitate relations between local residents and other residents.

However, it is not only the profit that comes from this industrial business, the negative impact is also important. It is also important to save topsoil in mining areas. Before mining, residents should take topsoil first and store it. This topsoil is found in the excavation area with a thickness of up to 30 cm. However, in practice most miners do not separate this topsoil, topsoil is also taken for brick making. Land management needs to be done to restore the function of ex-mining land by means of reclamation. The first step is structuring ex-mining land. If it is not stockpiled, it can be done by optimizing the ex-mining excavated land by making it a fish pond or culinary tourism spot that can be a source of income by looking at the natural conditions and scenery around this area which is very suitable as a place to travel.

Based on the phenomena above, it is indicated that: 1. The brick-making industry is still not in an orderly manner in Merauke Regency, so that the surrounding community feels uncomfortable, especially during the brick-burning process, the smoke enters the residential area. This can also be seen by the destruction of the quality and quantity of the land around them so that the land is in crisis due to excessive mining exploitation. 2. Lack of supervision by the Merauke Regency government, this is indicated by the large number of brick-making industry businesses that do not have business permits. So from the description above it is very clear that the brick industry is one of the industries that must have a permit and also be subject to a levy which will go to the Merauke Regency treasury. However, the phenomenon that occurs in the field is that there are still many industrial business owners who do not apply for permits to the Regency Industry and Trade Office and the Amdal issued by the BLH (environmental agency) of Merauke Regency.

4. Conclusion

The mining process of bricks made by craftsmen brick in Wasur 2 does not have a production license from government institutions concerned and not their Environmental studies from the Merauke Regency Environmental Agency. In running their activities, there is no periodic supervision from the Government and the Merauke Regency Environmental Agency so that land exploitation activities are still ongoing which will have an impact on soil degradation and environmental damage and can lead to a decrease in the function of top soil which rich in nutrients as a function of land cover vegetation that can change the soil structure and the area will become drier and unproductive.

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