

# The Impact of Stone Mining Activities in Relation to Environmental Damage in Warembungan Village, Pineleng District, Minahasa Regency

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*Abstrak— The problem in this study is the occurrence of landslides and landscape changes in Warembungan Village, Pineleng District, Minahasa Regency. The purpose of this study is to examine the Impact of Stone Mining Activities concerning Environmental Damage in Warembungan Village. Descriptive qualitative method is used in this research. The population in this study are people who are directly involved in stone mining and those who are affected by stone mining. The technique of collecting the sample is random. Data collection techniques are interviews, observation, and documentation. The place and time of this study were in Warembungan Village in February - March 2017. Data analysis techniques used in this study were qualitative data analysis namely data reduction, data presentation, and conclusion drawing. The results of this research about stone mining activities in Warembungan Village have physical and socio-economic impacts. The physical impact due to stone mining in Warembungan Village is the occurrence of landslides due to cliffs from stone mining activities, changes in landscape shape. Socio-economic impacts are given jobs for the people in the Warembungan village and communities outside the Minahasa area.*

*Keywords: stone mining, environment.*

## I. INTRODUCTION

Human life can not be separated from the environment, whether it is the natural environment and social environment. Humans with their environment have a very close relationship, and they influence one another. The influence of the natural environment is more passive, whereas human influence on nature is more active. Humans can exploit nature, and they can change nature as they wish. So, humans have the responsibility to preserve the natural environment. The development process that continues to grow over time, it will have an influence on the stability of environmental conditions. Humans exploit their

natural wealth by conducting mining activities to meet provide their needs. The mining industry is one of the industries that the Indonesian government has relied on to bring in foreign exchange. In addition to bringing in foreign exchange, the mining industry also provides employment and for districts and cities is a source of genuine regional income. Industrial development in the mining business sector is an attempt by the government to increase the country's foreign exchange, and when It is viewed in terms of community, it is directly related to the increasing demand for goods and services, and the use of energy resources and natural resources. Natural resources are one of the essential assets in national development. Natural resources in Indonesia are vast, and sometimes, they are exploited on a large scale for development needs. One of the activities to exploit the natural resources for development needs is stone mining.

The mining industry brings in foreign exchange and provides employment but is also a cause of environmental destruction. Many mining activities attract the attention of the surrounding community because of environmental destruction, especially mining without permission which in addition to damaging the environment also endanger the lives of miners because of the limited knowledge of the miners and also because there is no supervision from the relevant agencies.

Environmental Protection and Management (PPLH) according to Law Number 32 of 2009 Article 1 paragraph (2) is a systematic and integrated effort undertaken to preserve environmental functions and prevent environmental pollution and damage which includes planning, utilization, control, maintenance of supervision and law enforcement.

Damage to natural resources continues to increase, in the amount and distribution of its territory. Physically the damage is caused by high exploitation is done, not only in production areas that are limited by the carrying capacity of natural resources but also occurs in protected and conservation areas that have been determined previously.

This condition occurs in Minahasa Regency, precisely in the location of stone mining in the village of Warembungan, which is temporarily exploited by its natural resources for stone extraction. According to information from the village head that the mining did not have a permit, so a counter-conflict occurred with the community around the mine. The area that was initially an empty land was dredged with heavy equipment to take the stones and leave the holes of the former mining. The damage was caused by commercial businesses that legally obtained permits and by individuals who did not get permits. Environmental damage due to land exploitation also occurred in Temanggung Regency. The population continues to increase in sluggish economic conditions resulting in the outbreak of hungry farmers who turn agricultural land into mining minerals C (stone) without regard to land conservation. For example, this happened in one of the villages, Warembungan Village, Pineleng District, Minahasa Regency.

Based on the results of the researchers' initial observations, stone mining in the village of Warembungan has been going on since the 80s, and the mining process has reached 60%, the miners themselves are from the village of Warembungan and some are from outside the area. Mining is owned by individuals and the results of mining are sold to various places. Environmental damage occurred in the area of Stone mining in the Warembungan village increased along with the increasingly intensive mining using heavy equipment. With the existence of stone mining activities will change the function of land and landscape shape. Seeing this fact encourages the author to find out how far environmental damage occurs through research with the title: *The Impact of Stone Mining Activities in Relation to Environmental Damage in Warembungan Village, Pineleng District, Minahasa Regency*

Based on the background above, the research problem is formulated as follows: What is the impact of stone mining activities concerning environmental damage in the Warembungan village, Pineleng District, Minahasa Regency? The purpose of this study is to examine the impact of stone mining activities in relation to environmental damage.

## II. RESEARCH METHOD

The method used in this research is the descriptive qualitative method. The qualitative descriptive approach referred to by the researcher is a form of research that reveals facts, circumstances, phenomena, and conditions that occur when the research is ongoing and presents it as it is [1]. Descriptive qualitative research interprets and tells the data concerned with the situation that is happening, attitudes and views that occur in the community, conflicting two conditions / more, relationships between variables, differences between facts, influence on a condition and others [2].

## III. RESULT AND DISCUSSION

This research is located in Pineleng Subdistrict, Minahasa Regency, with the location of South Latitude 01024'09.9 "and East Longitude 124050'44.4". Warembungan Village Pineleng District consists of 15 *Dusun* with regional boundaries

The North: Sea / Pineleng II / Malalayang

The East: Pineleng II / Pineleng Indah

The South: Tinoor Village I and II / Production Forests

The West: Production Forests

Climate is the average weather for a long time and covers a large area. The climate element, especially rainfall, is a destructive force of soil layers and is a cause of erosion that affects surface runoff. To determine the climatic conditions of a place, we need data on average annual weather conditions over a period of 10-30 years, in the form of average annual temperatures. As for the type of climate, climate analysis will be used according to Schmid and Ferguson. For climatic conditions in the study area can be calculated based on data contained at the nearest station.

Warembungan Village has an area of 1,100 ha, and is located at an altitude of 80 to 100 meters above sea level.

### 3.1. Stone Mining

Stone mining is included in the C minerals. Utilization of C minerals as necessary materials is very important to support physical development in the regency/city area. The rapid rate of exploitation and use of this material can / has resulted in some environmental damage problems, where there has not been adherence to wise management practices and lack of post-mining rehabilitation measures.

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### 3.2. Environmental Impacts of Stone Mining Activities

Stone mining, besides providing benefits, also creates problems. Mining activities that use heavy equipment that functions to dredge material that is on the plain or on the cliff wall cause ecological and social problems for the surrounding environment. The environmental impacts of stone mining activities in Warembungan Village can be divided into physical and socio-economic impacts.

#### 3.2.1. Physical Impact

Changes in landscape shape due to mining activities. Changes in the landscape of mining activities, especially stone mining require large amounts of land to carry out mining activities. Inevitably the process of excavating and extracting stones will displace agricultural land, forests and water sources (hydrology). These activities cause local water systems, disaster risks, landslides, and floods. Because the surface is peeled, dug up, into giant holes. Many cases of loss of biodiversity and livelihoods of people, especially those who depend on the forest. More than that, changes in the natural landscape will also change the ecological order that has existed so far. Often people assume that the mountain has no benefits,

even though the mountain serves to reduce and withstand the speed of the wind speed [3].

Land damage due to mining can occur during mining and post-mining activities. The impact will be different on each type of mining, depending on the method and technology used (Directorate of Mineral Resources and Mining, 2010). Most of the land damage that occurs is caused by mining companies that deviate from applicable regulations and the existence of unlicensed mining (PETI) that conducts illegal and environmentally unfriendly mining processes (Ministry of Environment, 2002). The greater the scale of the mining activity, the higher the area of the impact caused. Environmental changes due to mining activities can be permanent or cannot be returned to its original state [4].

Stripping shoots cause changes in topography in the mining area. Changed areas are generally broader than mine pits because they are used to fertilize excavated products (topsoil and overburden) and infrastructure development. This is often a problem for small mining companies because of limited land [3].

Topographic changes that are not regular or form steep slopes. Landscape / topographical conditions that take a long time to form can instantly change due to mining activities and will be challenging to return to their original state.

A landslide is a geological event that occurs due to the movement of stone or soil mass with various types and types such as falling stones or large lumps of soil. In general, landslide events are caused by two factors: driving factors and triggering factors. The driving factors are the factors that influence the condition of the material itself, while the trigger factors are the factors that cause the material to move. Although the leading cause of this incident is gravity which affects a steep slope, there are also other factors that influence [5].

Based on observations the researchers saw that there was a potential for landslides in the stone mining area due to cliffs caused by stone mining activities. This can endanger stone miners in the mining area as happened in 2010 and 2013.

### 3.2.2. Socio-Economic Impact

Stone mining in Warembungan Village provides employment for people in Warembungan Village, not only for Warembungan Village people but for people in other places who come from outside the area to mine in Warembungan Village.

Based on the results of an interview with Mr. Alexander, who stated that there were indeed many residents who became miners in the Warembungan stone quarry, many also came from outside the area. Because to become a miner there are not too many requirements such as a diploma. So it makes it easier for residents to get a job. Furthermore, an interview with one of the miners living in the village of Warembungan, Mr. Rinus, stated that stone mining helps residents to work, of course generating income, which is around 700,000 / week and monthly income of around Rp. 2,800,000 / month.

From the results of research conducted that stone mining activities can have an impact on environmental damage in Warembungan Village, Pineleng District, Minahasa Regency. From the observations of researchers and interviews shows that stone mining activities have an impact on environmental damage. Seen from the physical impact that is the landslide, the change in the shape of the landscape and the socio-economic impact that is generating employment [5].

## IV. CONCLUSION

Based on the results of the research, the data analysis and discussion that has been carried out can be put forward several conclusions, namely the mining activities in the village of Warembungan, Pineleng District, causing physical impacts and socio-economic impacts. The physical impact of stone mining in Warembungan Village is landslides, changes in landscape shape. The socioeconomic impact is generating employment.

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