

Natural Stone Mining Activities on the Foothills of Mount Ungaran in Ethnoecological Perspective

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Abstract

Ndhepo is a stone mining activity in illegal sites carried out by the people of Medono Village. This activity is one of the changes in environment utilization. This study proposes to determine the perception of the people of Medono Village with the existence of stone mining activities around their living environment, to find out the meaning of the Medono Village community regarding their living environment, and to obtain the reasons for the community to carry out stone mining activities. The research method of this study was qualitative. Data analysis used an ethnoecological perspective. The results indicate that the natural environment in Medono Village is a fertile area and saves other natural resources, namely natural mineral resources for excavation C in the form of andesite rocks. Before the *ndhepo* activity, the community used their land for agricultural purposes. However, after realizing that *ndhepo* could provide a higher income than cultivating agricultural land, some people then turned to mine workers. The Medono Village community interprets the environment as a place to meet the needs of life. However, there are other meanings by most people, especially those related to stone mining activities because they have an impact on the surrounding natural environment. Some citizens actually do not approve of the existence of those mining activities.

Keywords

Environment Utilization; Ethnoecology; *Ndhepo*

INTRODUCTION

According to the geological aspect, Indonesia is located at the point of tectonic plate movement. Thus, mountains with rich mineral resources such as mining materials exist. This phenomenon put Indonesia as a prosperous country (Fatonah, 2018). According to Brata (2018), all mineral resources play an important role for Indonesia. They are as prominent as coal, tin, diamond, gold, oil, and gas mining. Asril (2014) says that the state has the right to control mining or excavation materials, including the authority to regulate, manage, and supervise the management or exploitation of minerals, as well as contain

an obligation to be used as much as possible for people's prosperity. This is actually a huge opportunity.

The phenomenon of mining often grabs the attention of the Indonesian people, even each region has a different potential for mining materials according to natural and regional conditions. Medono, a village located in Boja Sub-district, Kendal Regency, is one of the villages taking place at the foot or slope of Mount Ungaran. Besides having natural resources such as coffee, sugar palm, rice, and secondary crops, it also has other resources, namely natural stone mining. Medono is very likely to contain a lot of mineral materials such as

type C minerals. The mining potential possessed by Medono at this time is andesite stone. This type of stone is massively found there and is then used by the surrounding community to meet their needs through the mining process.

According to Clive (2001), there are two types of mining, namely large-scale mining and small-scale mining. Large-scale mining is a mining activity carried out by mining companies legally. Meanwhile, small-scale mining is a mining business managed by people and is often referred to as community mining. Stone mining activities or *ndhepo* carried out by some Medono villagers are still simple and do not use heavy equipment. They only utilize stuff such as crowbars and hammers as the primary tools. The reason for avoiding using heavy equipment is: people want to reduce the environmental damage caused by these stone mining activities. The environment utilization as a new mining area has created a new pattern of behavior for Medono people. At first, the majority made a living as farmers and planters, with a fairly large area of land. Now, some people change professions as stone miners as it considered capable of contributing to the economy in an effort to meet their daily needs. Although mining activities are a new livelihood for them, its intensity is quite often. A new idiom has even appeared in reference to this phenomenon, namely "*suwe-suwe wong mangane watu*", meaning that overtime, people would eventually eat stones. This is because many people have preferred to work as miners rather than become farmers or planters. However, the community is aware that although the stone mining activities around their homes are relatively new, small-scale, and have "just" been going on for the last twenty years, the activities can damage the environment. Therefore, as stated before, the villagers avoid using heavy equipment and do not

allow outside companies to perform stone mining.

Unfortunately, the steps taken by the community are considered not good enough to avoid environmental damage; even though they are aware of impacts caused by the stone mining activity, they still carry out stone mining—which gradually will also bring impacts. This is because according to some people, they are entitled to the land they own. Thus, it can be freely used as agricultural land, plantation land, or mining—depending on their decisions. Some people also think that stone mining is a profession that makes money faster compared, for instance, to be a farmer.

Stone mining activities not only create jobs for stone miners or *pendhepo*, but also provide jobs for *kabe-kabe*, those who transport stones into trucks. However, as stated before, mining activities have also had a negative impact on the environment. Mining activities carried out in rice fields will cause a former mine excavation basin that cannot be covered with soil so that when it rains for a long period, the former excavation becomes a pond because it cannot absorb rainwater absorption. This also causes the water flow to decrease. The former excavations done around the hills can also cause landslides. Environmental problems as described above are the impacts caused by human behavior in exploiting the surrounding natural resources. The problems taken by the authors in this study are the reasons why the people of Medono Village choose stone mining activities, the meaning of the community towards the environment around their residence, and community perceptions of the existence of stone mining activities.

Stone mining activities in Medono Village are one form of environment utilization. The authors used several references in conducting this research, one

of which is a study conducted by Brata (2007). This research discusses the activities performed by the community and various mining companies as a form of strategy in utilizing and preserving the environment and culture. The entry of mining and plantation companies has shifted the social and cultural order in the South Sumatran community. The same thing was conveyed by Brata & Rochana (2017), in their research Cihonje Village people initially worked as farmers and planters by utilizing hilly land. After a survey proved that the hills contained gold, they took advantage of this by carrying out mining activities. Another similar study was conducted by Sari & Brata (2017), in this research, it is revealed that the community interprets its environment, namely the sea, as a natural resource that can provide benefits for life. By using local knowledge and technology, they exploit the natural wealth there. The fishing community of Tasik Agung Village, Rembang Regency uses the *cantrang* nets to meet their daily needs without compromising the preservation of marine ecosystems.

The community knowledge in executing stone mining activities is also influenced by the work culture of the miners. Brata (2014) examined the phenomenon of people working in the oil distribution chain from the location of the people's oil mining to consumers. To find out the mining potential, exploration is needed to dig up information related to the business to be carried out. Silvana and Winoto (2015) argue the traditional gold miners are still lack knowledge in exploring information to find out the development of gold diggers in other areas. The source of information they obtained is through information resources from other miners, as well as their families or relatives. Carreño (2017) also conducted a study that seeks to explore the perspective

of the Andean indigenous peoples on the relationship between mining and the mountains.

In this study, the authors used an ethnoecological perspective as a tool to analyze three problems that had been formulated. As living beings, humans' activities cannot be separated from the process of interaction with the environment. This process then becomes the basis for the development of ecological anthropological studies—currently better known as cultural ecology. The study of cultural ecology was heavily influenced and developed by Steward (1936). In this paper, Steward said that there was an interaction between culture and the environment. Two decades later, Steward (1955) formulated the main elements of the study of cultural ecology. These elements include behavioral patterns that incorporate work and technology achieved in the processing and utilization of the environment. This paradigm explains that culture as knowledge and humans as social beings are used to understand and interpret their environment and experiences, which will indirectly affect their behavior patterns (Poerwanto, 2000). The emphasis in the ethnoecological approach is on disclosing and describing the views of the community under study regarding the natural environment it faces. This is because every adaptation pattern of society is basically the result of a process of recognizing and adapting to natural phenomena that have been going on for a long time.

RESEARCH METHOD

Researchers used qualitative methods. According to Bogdan and Taylor (1990), qualitative research is one of the research procedures that produces descriptive data in the form of speech, writing, and the behavior of people being observed. In this

method, an in-depth exploration of an activity, event, process, or individual is based on extensive data collection (Creswell, 2002). In this research, the authors tried to uncover a problem in mining activities carried out by the Medono Village community. Sources of data in this study were primary and secondary data. Primary data were obtained directly through interviews and observations. Meanwhile, the secondary data were acquired through documents or photos related to events that occur in the field, namely pictures of the condition of rock mining activities, the impacts caused by mining activities, and the environment in Medono Village.

FINDINGS AND DISCUSSION

The Emergence of Stone Mining Activities in Medono Village

Medono Village, which is geographically located under the foot or slope of Mount Ungaran, does not only have agricultural potentials such as sugar palm and coffee. It also has type C minerals mining potential, namely andesite stone. Topographically, Medono is a hill that is currently not only used as agricultural land but also widely used by the community as a rock mining site. People even use rice fields as mining areas. Stone mining there is managed privately by the community. Mining activities have actually existed for a long time—at least the people were quite familiar. Before executed in Medono, some people had worked as stone miners by going abroad to Bangka Belitung. After someone opened a mining site, most miners decided not to return to Bangka Belitung and preferred to become miners in their village. The mining site opening in Medono thus provided new jobs for those who had never worked as miners before. The mining site in Medono was actually first opened by an outsider, namely a businessman from

Gunungpati who deliberately bought land to be used as a mining area. *Ndhepo* is a term given by the community to mining activities. *Ndhepo* is an illegal stone mining activity; it is the process of taking stone (*selo*) from the ground to be broken. The type of stone mined by Medono villagers is andesite, which is commonly also called with several terms such as split stone, hard stone, black stone, mountain stone, and *brontok* stone.

Community Perspective on Stone Mining Activities

Environment is an influenced element by the existence of stone mining activities in Medono Village. In mining business activities, ecological damage is no longer something that can be avoided. Its existence has an impact on the topography of the soil as it has left excavated holes, especially in mining locations that used to be rice fields. Now, the former excavations are filled with water so that they look like a reservoir. In addition, stone mining activities have also resulted in many damaged roads and potholes as they are often passed by large trucks transporting stones. Other impacts are: the destruction of village infrastructure which can indirectly endanger other road users, and the water discharge produced from springs has gradually reduced so that the drought can easily occur when the dry season comes. This is what the community feels in reality, that the water discharge is decreasing day by day as there is no water infiltration in the ground.

Eventually, stone mining activities in Medono do not fully benefit the community. Instead, its existence is only enjoyed by some people, but the impact must be felt by all parts of the community. Therefore, for some people, it is considered that stone mining activities are detrimental to those who do not work in the sector or feel the impact directly.

Reasons for Medono Village People to Work in Stone Mining Sector

Before getting to know *ndhepo*, many people in Medono Village used their land for agricultural purposes. The environmental condition of Medono—which is located at the foot of Mount Ungaran—makes the people choose to become farmers. The land use of each area is different, depending on the interaction of the community and the surrounding forest. These two factors are dynamic and interacting elements in a large ecosystem (Harmia et al., 2017).

The land use in Medono is definitely influenced by the local knowledge people possess and the social changes that occur in their lives. Both can be observed from their activities in utilizing the land. The natural environment there is a fertile area and saves other natural resources, namely mining materials (C) in the form of andesite rocks. After the community realized that they had mining potential, the environment utilization changed. It was then performed by holding stone mining activities. This sector is privately owned by local people. The miners also make use of simple stuff manually—instead of utilizing heavy equipment. However, the mining sector offers attractive benefits to residents—especially since agricultural land is not very productive. For many farmers, their activities tend to be quite slow; they, for example, are more often busy at certain moments such as fertilization and harvest. Therefore, agricultural activities that cannot be carried out by the community every day and cannot provide daily income make stone mining activities one of the notable alternatives to earn greater income. The existence of mining activities raises new patterns of behavior for the community in daily activities and land use patterns.

Stone mining activity or *ndhepo* is a form of land use done by Medono people. Its existence does not only affect the landowner, but also influences anyone who uses it. Prior to the *ndhepo* activity, land owned by the community in Medono was only utilized by the landowner. Mining activities are different; they do not only involve landowners and stone miners, but also other workers such as *kabe-kabe*, namely those who load rocks into trucks to transport.

Community Idea and Knowledge in Utilizing Mining Areas

Humans adapt and interact to develop their culture, resulting in ecosystem changes. Cultural development and ecosystem changes will be seen in the phenomena of the natural and community environment. Overall, these phenomena can be viewed from the historical environment. Thus, humans must adapt to nature. This adaptability is developed by humans through a culture that eventually forms a human civilization. Natural conditions directly or indirectly affect human culture. This situation is also influenced by the social heritage possessed by humans. Nature and culture are two inseparable elements that influence each other (Hilmanto, 2010).

It is the same with stone mining activities in Medono Village, which is also inseparable from the influence of the social heritage owned by the community. Its existence is influenced by the migration culture. The wandering culture has existed for a long time and persists to this day—even though it is not as much as before. People chose to migrate to improve their economic levels. Some of these nomads turned out to be working as stone miners by migrating to Bangka Belitung. Of course, this greatly affected the change in the use of agricultural land in stone mining areas.

Although those who opened mining land for the first time were not natives of Medono Village, the increasing activity of stone mining is also supported by the experience of the community.

Community Knowledge of Stone Mining Activities

Working is a phenomenon inherent in adults in an effort to meet their needs. By working, people can occupy certain social statuses in society (Brata, 2014). In light of this, a work culture is a form of habit developed in society regarding the way a person or parties do their jobs. In this paper, the work culture refers to the habits of Medono villagers who work within the scope of stone mining activities. Once again, the activities are illegal. Brata (2018) explains that illegal activities are activities performed by the community and allowed to continue by government officials, even though they do not obtain permission from the authorities. Automatically, *ndhepo* is an illegal stone mining activity held by Medono villagers. The stone miners are called *pendhepo* and the mining site is called *dhepo*. According to the people, *ndhepo* is a small-scale rock mining activity that is done manually. The utilized equipment is quite simple, and the mining area is considered not extensive and is privately owned land. Thus, the community considers the land as free-to-use.

Environment utilization and management in the community is very dependent on the behavior patterns. These patterns are formed according to the habits carried out by the community. Based on the perspective (paradigm, framework of thought, theoretical framework), the main elements in cultural ecology are behavioral patterns, namely work and technology used in the environment management or utilization (Brata, 2008). Steward (1955) says that there are three basic procedures in

studying cultural ecology. They are 1) linkages between technology, production or exploitation of natural resources, and the environment. This relates to the technology used by the community in meeting their needs, 2) the pattern of community action in exploiting and producing resources with the technology they have, and 3) the next procedure is to analyze the level of influence of behavioral patterns in utilizing the environment on other aspects of culture.

If we take a look at stone mining activities in Medono Village, production technology is related to production activities. This can be seen from the current mining process that still makes use of simple or manual equipment. The activities do not use heavy equipment such as backhoes as they are considered to have a significant impact on the ecology; the surrounding environment can be damaged. Also, stone mining activities in Medono are illegal. This is quite ironic as they should have not been allowed to enter the Medono Village area—considering that it is located under the foot of Mount Ungaran. Eventually, the existence of stone mining activities cannot be separated from the intervention of the village government as it is very clear that the mining is not justified.

However, according to the village government, if mining activities are prohibited, it will cause new problems, namely creating a lot of unemployment. This is because this far, the government has not found a solution to overcome this issue. Hence, mining activities are carried out manually using simple equipment to minimize the impacts. The equipment used by the miners includes hoe, hammer (*bodhem*), placemat, crowbar, *ekrak* (basket), rickshaw, and stone transporting vehicles (commonly trucks). In general, the stone mining process includes the process of extracting, breaking, and collecting stones. Some of these processes are classified by the

Medono villagers in local terms that are commonly used every day.

- a. *Ndhudhuk* (digging), namely the process of digging stones that are still in the ground.
- b. *Mbobok* (perforating), namely the process of chiseling/perforating holes in large stones using a chisel to make them easy to break.
- c. *Mbodhem* (breaking), namely the process of breaking stones according to size using a hammer.
- d. *Nglumpuke* (compiling), namely the process of collecting stones that have been broken down.
- e. *Ngunggahke* (moving), namely the process of lifting up or moving stones into a transport car or truck.
- f. *Ngguruk* (covering), namely the process of (re)covering the former mining areas which are no longer productive.

Ndhepo is the result of the idea possessed by the community regarding environment utilization. Local terms used by the community can be understood as the unique knowledge they have. These local terms become distinctive knowledge because they are different from the knowledge possessed by other regions.

This community pattern is a way to see if the mining process is carried out independently or in groups. Besides, it also looks at the work system carried out in stone mining activities; is it done daily or on a wholesale basis? The wage system received by mining workers is also noticed. The stone mining business in Medono is private. However, in the mining process, usually, the owner of the mining land employs several miners and other workers to load the stones into the transport car.

The miners work in a piece or contract work model, starting from Monday to Saturday (Sundays are off). Sundays are used as holidays because cooperation

activities are usually held in the community such as community service to build roads, repair mosques, and others. Usually, in one stone rite (one load standard), the miners get 100,000.00 IDR. The wages received are also based on the price of stone in the market. Currently, one stone rite costs 450,000.00 IDR. In this case, the owner of the mining area only gets sales of around 100,000 to 150,000.00 IDR. Usually, the owner has to pay for the operations used to pay for village roads of 10,000.00 IDR per trip, as well as paying for roads belonging to others of 25,000.00 IDR per trip. *Kabe-kabe* is a term pinned by Medono people to the workers who transport the stones. The wages received by the *kabe-kabe* are around 50,000.00 IDR—which is received from the stone buyer(s).

Steward (1955) explains that sociocultural integration is used to build processes and types of culture. This means that seeing a group is not only based on one linear change, but also looking at other sides of society such as the origin of the community group and how the community adapts to the environment. The Medono community is an agrarian society whose majority of the population works by cultivating nature as a source of livelihood. These days, some villagers rely their livelihood on mining activities.

Now, the existence of stone mining activities there does not only have an ecological impact, but also the socio-economic ones. For people, land that contains a lot of rock can't actually give maximum results to crop yields. Therefore, it is necessary to overhaul agricultural land by mining the stones in it. The reason the community carried out the renovation was to level the rice fields filled with stones so that they could give better results when they are replanted. Though this is actually not a good way and can damage the

environment, according to the community, this is one way that can provide multiple benefits as the mining products can be sold and help their economic levels.

Luthfi and Wijaya (2011) also explain that the shift in perspective on economic resources and people's livelihoods resulted in a transition in their perception of environmental conservation. The environment or nature that used to be processed for food needs and improving the families' economic levels is now a commodity that produces profits without having to be processed. This also brings people's livelihood systems more diverse.

The Meaning of Environment for Medono Community regarding the Existence of Stone Mining Activities

Knowledge is the output of a learning process, an explanation based on human thought and perception. Behind the knowledge possessed by the community, there are cultural norms and duties that will influence the direction of decisions that have been made, both positively and negatively. In this case, humans can interpret and give meaning to environmental conditions and their surroundings—they then act according to that interpretation (Raharjo, 2011; Yenrizal et al., 2015). This also happens in people of Medono Village, especially the community's views regarding the environment utilization in their village. People have different meanings or interpretations in terms of utilizing the environment. For them, the environment is everything that is very useful in life. However, if the use is carried out excessively and does not see the continuity of life, it will be damaged.

The Medono villagers take advantage of the environment to fulfill their daily needs. One form of environmental utilization is done by using palm trees to take its sap water (*badeg*). It is then processed into palm

sugar. Besides, another form of environment utilization is making use of the potential of their mineral resources, namely andesite stone. This potential is occupied by the Medono community through the mining process and the results are considered very helpful in meeting their needs. Thus, for the community, the natural environment is very influential in human life and is reciprocally related to one another. Humans take advantage of the environment and they maintain and preserve it.

Ndhepo or stone mining activities in Medono Village are not only able to provide new jobs and improve the economy for the community, but also greatly affect the environment in which they live. If we look at the ethnoecological context, this means that in principle the environment will be interpreted and have different meanings by different communities. Therefore, the behavior caused by the same environment, in the end, is interpreted differently between communities. The different meaning lies in the community's understanding of stone mining activities' existence in Medono. On the one hand, stone mining is a profitable activity and is considered to be very helpful—especially for the economic aspect. On the other hand, this activity is considered to be damaging to the environment.

CONCLUSION

The emergence of stone mining activities in Medono Village cannot be separated from the existence of public knowledge about changes in land use as a stone mining site. The local community initially used the land they had for agricultural purposes. However, it turned out that Medono, which is geographically located under the foot of Mount Ungaran, has a lot of potential wealth of natural resources—so that people could take advantage in alternative ways. Mineral type C is one of the potential

natural resources there. The existence of stone mining activities in Medono has changed the pattern of land use. The lands that are now utilized as mining areas used to be rice fields and plantations. *Ndhepo* is a term given by the community to mining activities in Medono Village. Mining sites are private land owned by the community. Stone mining activities have indeed had a positive impact on some communities. However, they also have negative ones, especially concerning the environmental conditions around the mining area. These negative impacts include reduced groundwater discharge, damaged village roads become, landslides-prone areas, and so on.

ACKNOWLEDGEMENT

The researchers would like to thank the Medono Village people who helped to realize this study. We also thank the supervisors who have provided guidance, motivation, and knowledge—with a gentle way of sharing. Special thanks to our families, relatives, and friends who have given support and motivation in conducting the research and writing process.

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