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Utilization of rice fields for brick industries and farmers environmental awareness

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Abstract. This paper discusses how farmers in Garut regency, West Java, convey the maintenance of environment awareness. This is important for the community because their activities in the brick industry have a very close relationship with the conversion of agricultural land. It was indicated by the fact that besides profit, there is also a loss. The existence of the brick industry will lead to the emergence of social problems and environmental problems. This study uses multiple case review methods. The cases consist of brick industry centers in Garut Regency. This study examines how peasants understand about soil maintenance. Interviews and observations are used to collect data. A face-to-face interview with the questionnaire was also developed for this study. The findings of the survey indicate that farmers' societies do not think much about the consequences of their land-based economy. Nevertheless, there are efforts to cultivate the awareness of the farmers both from the government and non-government that can be communicated well to the community because it uses various media both traditional, modern and digital.

1. Introduction

History has noted that industrialization in Indonesia ultimately shifts the economic activities of society, which initially relied on the agricultural sector, then rely on the industrial area. However, there is an awareness that most Indonesians are struggling in agriculture with abundant economic resources in this sector; it has been observed from the beginning that the industrialization process undertaken in Indonesia should involve the agricultural sector [1]. In the sense that the running industrialization should be based on and related to the agricultural sector so that if the industrial sector has overgrown, it does not necessarily turn off the agricultural sector that became the foundation of community life [2]. The industry has played an essential role in supporting economic development programs, particularly in helping to utilize labor surplus from the agricultural sector [3].

Small industry activities and household handicrafts are now available and spread throughout the country, especially in rural areas. It has had certain functions and roles, at very least, in the economic and social life of rural communities. Some are significant in supplementing income, seasonally. Although most of them only mean small economically but has functioned to meet certain needs or improve the welfare of the family [4, 5, 6]. Industrial development in Indonesia at the beginning of the 20th century has been regularly noted. This notice is done in the framework of the implementation

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of the Safety Act. The number of industries has noted that industrial activities are divided into nine groups including Industrial Fabrics of Non-Metallic Materials, including lime, bricks, tiles, marble, clay articles, terrazzo and others [7].

Sindanggalih village is a potential area in raw materials for brick making and as a center for brick production. Eventually, many farming communities moved as a producer of this brick. This can be seen from the data taken from Sindanggalih Village office of 568 farmers and brick maker. There are 132 people from 2008 who until now continue to increase to half of the farmers which is 284 people, many who sell their agricultural lands and the rent the lands that have materials raw brick making, which is clay. For this reason, they get money or profit from the sale of land [8]. But ecological problems also follow. Based on the above description, it is interesting to conduct further research on the conversion of paddy fields into bricks and awareness of farmers in rural communities.

2. Theoretical Framework

Community development is an effort to empower the community through the ability and potential of the community itself. In this regard, the community is the participant as well as the developer of development. Concerning the environment in which they live, community development is rightly seen as the opposite of a top-down development approach that is determined from outside the community. They should be able to determine the development of their environment accompanied by an awareness of its maintenance [5].

The Sindanggalih people have very rational reasons and motives in meeting the necessities of life depending on the transition of this livelihood as a brick industry. Bricks are one kinds of wall-making materials. Bricks are made of clay soils that are burned to reddish color. From there the bricks are identical with red bricks. Red brick is one of the elements of the building in the construction of buildings made of clay plus water with or without other mixtures through several stages of workmanship, such as digging, processing, printing, drying, burning at high temperatures until cooked and discolored, and will harden like a stone after being cooled until it cannot be destroyed again when immersed in water [9].

3. Research Method

This study uses the type of qualitative data. In this regard the data types are divided into words and actions, sources of written data and photographs [10]. This study is intended to provide a description of the ongoing issues. This descriptive research is the accumulation of basic data in a mere description, not necessarily searching or explaining interconnected, testing hypotheses, making predictions, or obtaining meaning and implications, although research aimed at these may include descriptive methods [11].

Data collection techniques for primary data such as village officers and Sindanggalih community is conducted by observations and in-depth interviews [12]. The technique used is qualitative data analysis from Miles and Huberman [13]. It consists of three simultaneous activity paths, data reduction, and conclusion or verification.

This research was conducted in Sindanggalih Village, Karangpawitan Subdistrict, Garut Regency. The reason for determining this location is because the location was once a fertile area full of trees. Now there are many brick production places, so the natural beauty of the village is no longer existed. To this problem we suggest that all stake holders of the village, including the government, the community, and the activists are to communicate each other so that the satisfied formula for regulating and implementing brick-making are enhanced in the community.

4. Findings And Discussion

As it is known that the condition of land in Indonesia is generally fertile where this situation is very possible for the Indonesian population to livelihood in agriculture. As time goes by, internal and external factors affect the typical village life. As a result, there is a shift from agricultural jobs to non-

agricultural. Furthermore, non-agricultural activities such as rural industry became an important source of income after agriculture [14].

The economic condition of the people of Sindanggalih Village before the rise of the brick industry is still unremarkable. The present economic situation has been different from the time economy before the rise of the brick industry (Interview with DK, brick craftsman, 17/8/2017). This activity is generally a secondary work of farmers and villagers who have meaning as an additional source of income and seasonal. Also, small rural industries function to meet some of the consumption needs and production of rural communities and farming communities that partly cultivate local sources. With the development of small industries in rural areas, it is hoped that there will be diversification of livelihoods and products of rural communities [4].

Based on the observation, it is known that the craftsmen of bricks in Sindanggalih Village are mostly farmers who own their garden and paddy fields and some who also rent the land or land to become brick production sites, gradually they move from agriculture to manufacture brick. Renting the land was happy to be able to earn money without having to work (Interview with AN, who rented the land, 18/8/2017).

4.1 Reason for Moving Profession

Based on research obtained from the information society that brick-making activities have long been done by the community Sindanggalih Village. The people of Desa Sindanggalih predict that brick making business has been around since the 1990s. Based on the local community that this effort is passed down to them from generation to generation by their parents to the next generation. It is acknowledged that factors affecting the mindset of the Sindanggalih community in brick industry activities include economic factors, limited capital, availability of raw materials, and employment (Interview with US, village chief Sindanggalih, 18/8/2017).

4.1.1 Increase Family Income

Generally farming activities Sindanggalih Village community around the 70s still uses traditional ways. A farmer is not satisfied with the harvest because the results obtained from farming do not meet the need for example in 2001 until now the wage of farm laborers is only a few days usually per day can Rp. 7,000 now get Rp. 25.000-35.000. It also depends on the area of cultivated land. For the daily expenses and the high cost of necessities now, if hoping from farmers will long get the money, which must wait for the harvest. In contrast to the existence of a brick factory, in a week can get results from work and can meet daily needs. From the beginning, only Rp. 5,000 to now per week get Rp. 500,000 more depending on whether or not work diligently (Interview with AG, farmers, 18/8/2017).

The following is a comparison of income from two jobs between farm laborers and brick workers:

Table 1. Comparison of Income between Farm Laborers and Bricks Workers

Year	Farm laborers' income	Brick Workers's income
2001- 2005	Rp 7.000 per day	Rp 5.000
2006- 2010	Rp 15000- 20.000 per day	Rp 50.000-70.000
2011- 2015	Rp 25.000-35.000 per day	Rp 50.000-100.000

Source: Interview with AG, farmers, 18/8/2017.

Farmers are indeed the most important work in the Sindanggalih area. It was proven by the existence of 2234 (29%) people who worked as farm laborers. The biggest number compared to other jobs. When summed up with farmers who have rice fields, this number increases to 2802 (36%). The following is a table of comparison work in Sindanggalih Village:

Table 2. Job Comparison in Sindanggalih Village

Job	Amount	Percentage
Farmers	568	7
Farm laborers	2234	29
Workers or Private business	255	3
Public Servant	150	2
Craftsmen	132	2
Retailers	235	3
Breeders	173	2
Mechanic	55	1
Nurses	4	0
Midwives	4	0
Others	4037	51
Total	7847	100

Source: Official Document of Desa Sindanggalih, 2017.

As a result of these conditions, the action taken by most of the Sindanggalih community is to develop the natural resource processing industry that is available that is starting to pursue brick-making activities. The brick industry run by the people of Sindanggalih village has contributed greatly to the improvement of the economy and the welfare of their households so that the brick industry activity becomes the next livelihood of the people in addition to agricultural activities.

4.1.2 Capital Limitations

In the craft industry capital, brick is required to purchase brick making equipment, lease land, build cube, pay wages, and other necessities. The brick industry that develops in Sindanggalih Village in its production uses traditional methods, which requires only technology that can be mastered by hand skill. As expressed by a craftsman, "the tool used in production is using simple tools such as brick molds made of wood and tools (a pair of wooden planks)" (Interview with SB, craftsman of bricks, 18 / 8/2017). To save people, people only rely on the skills they have to make their brick-making tool, also for the reason that buying brick-making equipment must be out of Garut region. With these homemade tools, Sindanggalih society can still run the production of bricks as their next livelihood. To increase business capital, brick-making craftsmen, like other entrepreneurs, borrow money from cooperatives in Sindanggalih Village (Interview with AM, Sindanggalih Village Officer, 18/8/2017).

4.1.3 Availability of Raw Materials

The reason underlying the importance of the brick industry in the village of Sindanggalih Karangpawitan Subdistrict of Garut Regency that is because of its natural potential. Sindanggalih area has a number of land in the form of large land and suitable for use as raw material to make bricks. A brick craftsman explains "that the availability of this raw material is only a gift from Allah who gave to me and to all brick craftsmen in Sindanggalih Village. With the fertile soil and can become the main raw material of brick making this is the foundation of life as a livelihood" (Interview with MM, a brick craftsman, 18/8/2017).

4.1.4 Jobs

At the beginning Sindanggalih village community most of the peasants and farm workers as the main job and as well as the support of his life. Over the years Sindanggalih village people have gained new employment as brick makers to earn extra income and very much demand from the community as building materials. So they attempt to replace agriculture into a brick industry and can build new jobs that can provide income (Interview with MM, a brick craftsman, 18/8/2017).

4.2 Impact of Brick Industry

4.2.1 Positive impact

Increase Total Production

In order to increase the amount of production, innovations have been made by using tools in processing or the manufacture of bricks, using a machine with this tool can load many bricks in a single mold that initially one day can make a thousand bricks but by using a stone-making machine bricks can produce as many as five thousand bricks in one day. The more demand for production, brick owners will be much labor absorption in brick making and the addition of large areas for drying and brick making. Thus the number of brick production can increase, and brick owners will get great results from brick sales (Interview with BK, owner of brick industry, 18/8/2017).

The existence of market demand

Brick making business done around the yard of the house causes the availability of the main raw material for the manufacture of bricks cannot be easily met. This also caused the bricklayers in Sindanggalih Village to move the location of brick manufacturing business to a wider area. With a large number of market demand using bricks in the manufacture of housing then the price offered will be high from the price usually from the price of Rp 1000 it will rise to Rp 1200 in sales. As well as brick owners often get market demand from outside the region such as Bandung, Cianjur, Jakarta and even to Central and East Java (Interview with NN, a brick craftsman, 18/8/2017).

Increase revenue

Based on the results of research obtained in the field can be seen that the existing brick industry management in the village of Sindanggalih, in general, is still very simple. The brick drainage process resulted in the number of brick products that could have been produced more, due to the reduced rainy season so that the price of automatic bricks increased due to the decrease in the number of products produced (Interview with UD, brick craftsman, 19/8/2017).

4.2.2 Negative Impact

Air Pollution

The brick making activity that was originally done around the yard of the surrounding houses has resulted in the negative impact of the brick production activities because of its location between the settlements. Also, the socio-economic development of Sindanggalih Village community is increasingly showing that the business of making bricks is considered not good anymore when done around the yard of the house. To overcome this problem is to create new roads that do not enter the public environment to reduce pollution caused by air pollution (Interview with ED, brick craftsman, 19/8/2017).

Air Temperature Increases

With more land being made into a brick industry, the land contributes negatively. Brick should always be burnt, and that means causing the air temperature to heat. Similarly, everything that is already there, especially the trees that become air conditioning will be picked up by the wood and then sold by the landowner and then after that, the temperature of the air gets hotter too. In the rainy season the temperature of the warmer air because the rain that descended in this rainy season makes the moisture on the ground because the water does not immediately absorb but will evaporate. So there is a hot temperature from the environmental damage caused by humans. Environmental damage, especially soil damage, is usually overcome with the conservation of degraded land. However, if it is damaged, all parties must be involved (Interview with DS, environmental activist, 20/8/2017).

Changed Soil Contours

A solution to overcome the problem is the awareness of the brick craftsmen themselves to keep the land to be worthy of return. Although the condition of the land is the responsibility of the contracting of the land, but the craftsmen have begun to take into account that the length of time they contracted the land to make the bricks also adjusted with their ability to rearrange the soil condition to be flat in the sense of traces of excavation pits to make bricks looks conspicuous and is also expected to be used for cultivating or gardening again. As for the former waterlogged excavations can be used for fish ponds (Interview with DS, environmental activist, 20/8/2017). The government, from the village level, sub-district, regency, province, and even the center should try to approach the community to develop a small industry that is not natural exploitation such as the production of bricks. For everything to be controlled, both in terms of community development and environmental conservation, the government should cooperate with other parties to overcome such dilemmas [15].

Thus it is hoped that all efforts will give awareness to the society that the economic activity that destroys nature and cannot return it to its original state must be stopped because the consequence will return to the community itself. They must be communicated well to the public so they can enter their consciousness and then change their behavior into environmentally conscious and sustainable development [16, 17, 18]. Now, the communication problem can be overcome in various ways such as the traditional ways of interpersonal face to face with various devices, modern ways, and digital ways [19]. Similarly, because people who do brick production have experienced modernization, including in communication devices. Here the government can become a leader in the cultivation of community environmental awareness, accompanied by those who are conscious of the importance of sustainable development.

5. Conclusion

Sindanggalih Village societies at the socioeconomic level initially rely on agriculture that is the main livelihood to meet the necessities of life, but as demand increases, they turn to brick crafters as a side job. The results are more promising if they work in the brick industry rather than farmers who grow rice. Factors that affect Sindanggalih Village community because of the great desire in increasing the family's economic income, the capital is not so large, and new jobs for the community that at that time has not worked. The resulting impacts of the brick industry include positive implications for increasing the amount of brick production, market demand, increasing income and the negative effects of existing environmental damage from air pollution, rising air temperatures and changing soil contours. There is an effort to restore nature as before so as not to damage the environment after the land is taken as the main raw material of brick making and replanting so as not to become a critical land that cannot be planted.

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