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Sustainable Livelihood Strategies for Coffee Farmers Post Expansion of Coal MinesIn West Merapi District, Lahat

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Abstract:*This research was carried out in West Merapi District, Lahat Regency, from July to August 2019. This selection of the location was done intentionally (purposive). The consideration of choosing the location is that there should be farmers who had sold their coffee plantation land to coal mining entrepreneurs.. The method used in this study was a survey method. This method was carried out directly to the location of the study and conducted interviews with respondents. The samples were the farmers who sell coffee plantation land. From the total number of farmera, the data for the number of sample farmers is 45 people. The results of this Pearson Correlation, strategy done by the respondents showed a positive relationship with financial asset and natural resource asset. Meanwhile, there was no correlation among the condition of physical, financial, and natural resource assets.*

Keywords*: coffe, livelihood strategies, and correlation*

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I. Introduction

Coffee is one of the priority plantation commodities besides chocolate (cocoa), pepper and oil palm. In terms of exports, Indonesia is the fourth largest coffee producer after Brazil, Vietnam and Colombia (Ministry of Agriculture, 2016).

According to Yahmadi (2007), coffee plants in Indonesia are mainly in Sumatra, Java, Bali, Sulawesi and the Archipelago. One of the leading plantation crops in South Sumatra is coffee which total production is 135,288 tons per year (Plantation Office of South Sumatra Province, 2014).Apart from being a coffee producer, South Sumatra province has 85 percent coal potential of the total national reserves (22.4 billion tons) which are spread in MusiRawas Regency, MusiBanyuasin Regency, Lahat Regency, and MuaraEnim Regency (BPS South Sumatra, 2014).

Lahat Regency Mining Office (2013) stated that it has a potential of 2.9 billion tons. The massive coal potential encourages coal companies to continue coal reserves exploitation so that the coal industry sector in Lahat Regency.

According to Kitula (2006), mining has a number of activity stages, which at each stage has the potential to have a negative impact on the environment, socio-culture, health and safety for mine workers and the community, based on their proximity to mining operations. In many cases that had occurred in Indonesia, several research reports indicate that there is a lot of environmental damage due to water pollution used in mining as in the Bayat Bay of North Sulawesi, Kesepuhan West Java or in West Lombok NTB (Lasut et al, 2009; Soemarwoto and Ellen, 2009; and Prasetyo et al, 2010), in which of the three cases the pollution was caused by community mining without permission (PETI). In the case of tenure, which was previously known to have food self-sufficiency, it is now decreased due to mining activities. As a result, a lot of land abandoned. Plants are often harvested early to adjust to the mining schedule, or not because the owner is preoccupied with mining activities (Soemarwoto and Ellen, 2009).

The impact that occur in the coffee planting land around the coal mine in Lahat Regency, especially in West Merapi District is felt by the farmers and inhabitants. The impacts are dust and pollution from mining activities to the vast decrease of agricultural land especially coffee land area owned by the inhabitant.

Mining activities in Lahat Regency are inseparable from the local government, especially in the policies or regulations referring to the paradigm of mining industry activities that refer to the concept of environmental and sustainable mining and the application of mining areas that provide benefits. Yet related to the existence of mining companies in this area, it not only has a positive impact, but also a negative impact. Some positive impacts include an increase in regional own-source revenue (PAD), an increase of employment, and economic growth while the negative impact are a decrease of coffee plantations lant around the mine area and environmental pollution around the mining activities. Lahat Regency, especially in West Merapi District,

which is a coffee plantation development area, is 630 hectares wide with production of 71.2 tons. The area of coffee plantations has decreased every year. According to Junaidi (2010), South Sumatra Province factually and highly develop the potential of Robusta coffee because most of the farmers cultivate Robusta coffee as a leading commodity. If the potential can be well developed, farmers' income can be increased through efforts to improve the quality and quantity of coffee production.

The average decrease in the area of coffee plantations in West Merapi District from 2012-2016 is around 10% (BPS Lahat Regency, 2016). This negative impact has an effect on the economy and triggers shocks to the livelihood system of coffee farmers' household livelihood in West Merapi District, especially around the mining area. Farmer household livelihood systems are vulnerable due to impacts and challenges of coffee farmers from mining activities that ultimately force the households to use strategies to use five livelihood assets (financial, physical, human, natural and social resources) so that farm households can reduce negative impacts they face.

In addition to the phenomenon of agricultural land conversion, the problem in West Merapi District is a significant decrease in the amount of coffee production, an increase in environmental temperature and dust which adversely affects the growth of coffee plantations, and most importantly some farmers lose their livelihoods which is an economic vulnerability. This is a major problem because it can lead to other problems such as increasing crime and affecting sustainable livelihoods. In order to fight for sustainable livelihoods and overcome the economic vulnerability of farmers, a strategy must be adopted.

The inhabitants' sustainable livelihood strategy is closely related to the character of natural resource management (SDA) actors. Character is the mental, morals that distinguish one person to another, character (Kamisa, 1997). Having character means having character and personality. The character of natural resource management actors has an impact on natural resources and the environment and can be distinguished to preservationists, conservationists, and exploiters (Owen, 2000). Knowledge of the character of these actors is very important especially for the formulation of policies in terms of natural resource management.

Understanding the problems mentioned covering the coffee farmers' household livelihoodneeds to look at the various assets that influence them, including social, human, natural, physical and financial resources that are closely related to household survival. Not only that, developing a livelihood strategy for the sustainability of coffee farmers after the expansion of the coal mining for survival and improving their welfare are also important.

This study aims to analyze the correlation between livelihood strategies and the condition of sustainable livelihood assets of coffee farmers after the expansion of the coal mining in West Merapi District.

II. Materials And Methods

Time and place

This research was conducted in two villages,TanjungTelang and Payo in West Merapi District, LahatRegency from July to August 2019. The selection of the location of this research was done purposively with the consideration that there were farmers in TanjungTelang and Payo who had sold coffee plantation land to coal mining entrepreneurs who were the research sample.

Research Method

The method used in this study is a survey method. Survey method is a research method that takes a sample (sample) part of the population using questionnaires as a means of collecting primary data and interviews with respondents in West MerapiDisctrict, Lahat Regency, South Sumatra. This method was chosen because the researchers aim to conduct thorough observations in order to get the facts of the existing situation and also to find the actual information from the area under investigation..

Determining Location Method

The sampling method used in this research is the method by taking all the population census businesses robusta coffee powder processing industries in the District of North Pagaralam, and the District of South PagaralamPagaralam, South Sumatra. Business operatorsrobusta coffee powder processing industries in the District of North Pagaralam are as many as 11 processors and processing of robusta coffee powder in the District South Pagaralam is as much as 7 Processing. Sample business operators are businesses that have a minimum of 0.36 tons per year and perform processing on an ongoing basis or routine.

Data Collection Method

Types and sources of the data used in this study are primary data and secondary data. Primary data were collected directly by researchers who used questionnaires and interviews without questionnaires.

Secondary data was collected through a variety of literature such as journals, books, and institution data related to village, Department of Mining and Energy, Lahat Regency, Central Sumatra Statistics Agency.

Data Processing Method

To answer the main objective, which was to find out the relationship between the five conditions of livelihood assets and the living strategy using Ms. Excel software and Statistical Product and Service Solutions (SPSS), Pearson correlation test was used. The bases for decision making were:

1. If the significance value <0.05, then it was correlated
2. If the significance value> 0.05, then it was not correlated

Guidelines on the degree of relationship between capital and sustainable livelihood strategies were as follows:

1. Pearson Correlation value of 0.00 to 0.20 = no correlation
2. Pearson Correlation value of 0.21 to 0.40 = weak correlation
3. Pearson Correlation values 0.041 to 0.60 = moderate correlation
4. Pearson Correlation value 0.61 to 0.80 = strong correlation
5. Pearson Correlation values 0.81 to 1.00 = perfect correlation

If the significant value was precisely at 0.05, another alternative can be used, namely comparing the Pearson Correlation value with r tables, with the decision rules:

1. Pearson Correlation Value> r-table = correlated
2. Pearson Correlation Value <r-table = does not correlated

III. Result

Farmer Characteristics

Characteristics of farmer respondents included age, level of education, and number of family members. Characteristics of respondents were shown in Table 1.

Age levels had an effect on productivity in their work. Respondents in this study aged between 36 to 65 years. Farmers' age directly affected thephysical abilities and responses to farming development and in dealing with vulnerability.

Education also affected coffee farmers in their decision to sell land to coal mining companies and run their farms as it can help them to manage the money to release land and determine the direction of livelihood sustainability. In West Merapi District, 66.67 percent of the respondents were elementary graduates. This showed that the level of education of them was still relatively low.

Besides, the number of family members of farm households was also one of the factors that determining activities in livelihood strategies. From the number of family members, it can be seen how many people lived together. Respondents with a large number of family members would have larger potential of family labor compared to those with small family members. The majority of respondents had 3-4 household members with a percentage of 71.11 percent.

Table 1. Characteristics of respondent farmers in West Merapi District

Variable	Category	Farmer Selling Land	
		Number	%
Age	36-47	19	42.22
	48-59	14	31.11
	60-71	12	26.67
Education	SD	24	53.33
	SMP	10	22.22
	SMA	11	24.44
The bumber of family members			
	1-2	6	13.33
	3-4	32	71.11
	5-6	7	15.56

Overview of Coffee Farming

Coffee plantations in West Merapi District generally have a relatively old plant age. Almost every coffee plantation owned by farmers was inherited by the ancestors. The type of coffee cultivated by farmers in West Merapi District was Robusta coffee. However, in recent years coffee production has decreased due to declining coffee plantations. Many farmers had sold coffee plantation land to coal mining entrepreneurs. Not only that, the decreased production was also caused by coal mining activities producing dust and increase

temperatures for coal mining companies were located very close to coffee plantations. According to Pipin (2019), the farmer's decision to sell a large area of coffee plantations, the total income of farmers, the number of family dependents, and the age of the coffee plant have a significant effect on the decision of farmers to sell coffee plantation land to coal mining companies.

Relationship between livelihood strategies and the condition of sustainable livelihood assets

Relationship between livelihood strategies and the condition of financial assets

Financial assets in this study consisted of 3 indicators, namely income, savings and loans. From the research results, different strategies in each farmer income source were obtained. There were farmers who earn a living outside farming, namely trading and working in coal mining companies, farmers also ran other farming such as rice and rubber. The second indicator, savings, was still relatively low. Most farmers did not have savings; farmers spent income to supplement their daily needs. As for farming capital needs, especially farmers who had rice farming, they owe to their neighbors, relatives, and traders.

The condition of financial assets was significantly related to the sustainable livelihood strategy at 5% with a positive influence. Were it seen from the guidelines for the degree of relationship, the results of the Pearson value of 0.408 indicating that the relationship between financial assets and strategies was categorized into the medium category.

Relationship between livelihood strategies and the condition of physical assets

The control of assets was a picture of ease of access in the form of advice and infrastructure supporting households in survival (Scoones, DFID). In this study, the indicators of physical assets were the house, transportation and the village environment. The house indicator was categorized high since indeed most of the respondents spent the money from selling the coffee plantation to a coal mining company to build or repair their house. All land ownership status was personal ownership even though some of them were still parental inheritance.

Another indicator was transportation, according to the results, there were some farmers having no vehicles at all. For motorbikes, however, almost all farmers owned them; motorbikes were used not only as daily transportation but also as the access to the garden / land.

Based on the results of the study, strategies and sustainable livelihood assets there showed no significant relationship. Pearson correlation value of 0.317was higher than r-table (0.294) indicating that the relationship between financial and strategy was categorized as weak. This happened as the existed physical assets were not enough to help in increasing revenue.

Relationship between livelihood strategies and the condition of natural resource assets

Natural resource assets are considered very important because humans cannot live on environmental services and food that come from nature (Carney, 2003). Land ownership, land use and production capability were indicators of natural resources in this study. Ownership of land area that is used greatly affects economic income in the household. Respondents had a high level of land, especially in the strategies they used to do other farming, as well as indicators of land use. In fact, the indicator of production capability was still relatively low. One of them was environmental factor. Good agricultural crops such as coffee, rice fields and rubber were very disturbed. The farmer explained that since there had been a decrease in coal mining activities around coffee plantations, no more coffee had produced fruit and many coffee trees had been affected by the disease. Not only was the impact on coffee plantations, rubber production also decreased. The rubber sap that comes out was no longer as much as prior to the coal mining activities.

The relationship between strategy and the condition of natural resource assets was significant. The result of Pearson value was 0.842 showing that the relationship between natural resources and strategies was perfect and positively correlated. The intensification and extensification strategies were carried out precisely, i.e. the use of existing agricultural land, the use of vacant land and the addition of arable land and in this study, many farmers added rubber and rice plantations.

Relationship between livelihood strategies and the condition of social assets

Social assets in this study consist of organization, social conditions, and kinship. The role of the organization greatly influenced farmers to participate in farming activities and in protecting the environment from coal mining activities. Farmers who were often involved in organizational activities would increase their participation. The involvement of farmers in organizations could add a lot of new knowledge. The organizations could also function as a means of learning, team working and farming. 91.11% of farmers follow the organization.

In terms of social conditions, in West Merapi District, it was classified as good. This was proven by researchers when visiting West Merapi District. Communities and farmers were very good at welcoming and

accepting researchers to conduct research especially in these two villages. Social conditions were also considered to be good according to field interviews with village officials and the local community. There had been no more acts of crime or theft in the last five years since the existence of coal mining companies in the West Merapi District; there were many young people who have worked in mining companies. Similar to social conditions, kinship relations in this sub-district were already close.

Like physical assets, according to the results of the analysis, there was no significant relationship. Pearson value obtained was 0.291 which showed that the relationship between social assets and strategies used by farmers was weak. This happened since there was no changes between before and after the farmers made a strategy.

Relationship between livelihood strategies and the condition of human resource assets

Human resource asset showed someone's ability in obtaining better accees towards life. The assessment of human resource asset included education, the numberr of workers in a family, and health. As in the farmers' characteristics, education in West Merapi District was low and so do the number of wokers in a family. This was because only the husband who worked for the family living. Meanwhile, the indicator of health was considered as good. There was only 31.11% of the farmers suffering from not contagious disease.

Then there was no significant correlation with the result of 0,245 < 0,05. For the degree of the relationship, the value of Pearson Correlation was 0,177 indicating that human resources and strategy were weakly correlated.

Table 2. The Value Of The Correlation Coefficient of the Condition of Sustainable Livelihood Assets with Sustainable Livelihood Strategies in West Merapi Sub-district

Variable	Sign	Correlation
Livelihood strategies and financial assets	0,005	0,408
Livelihood strategies and physical assets	0,034	0,317
Livelihood strategies and natural resource assets	0,000	0,842
Livelihood strategies and social assets	0,052	0,291
Livelihood strategies and human resource assets	0,245	0,177

IV. Conclusion

Based on the result of Pearson Correlation, strategy done by the respondents showed a positive relationship with financial asset and natural resource asset. Meanwhile, there was no correlation among the condition of physical, financial, and natural resource assets.

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