FOOD SECURITY AND POVERTY REDUCTION: STUDY IN LAMONGAN REGENCY EAST JAVA

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Abstract

Realizing food security in Indonesia is facing multidimensional problems and challenges in terms of economic aspects. Meanwhile, the challenges to achieve food security at the macro level are becoming increasingly difficult as the trend of food supply and demand is moving towards the opposite direction. In terms of supply, food supply is predicted to be increasingly difficult due to the physical, economical and environmental constraints on its growth. On the other hand, in terms of demand, it is predicted that food demand will continue to grow in line with the population growth, economic development, and the dynamics of the strategic environment.

East Java has a great potential for supporting national food security due to its relative extent of agricultural land. In addition, the overflow of production factors in the form of land is the capital for East Java to develop the agricultural sector for improving food security. This study aims to describe the potential of food security and its relation to the efforts for reducing poverty in Lamongan. The results showed that rice, corn, and soybean commodities are the main commodities of agricultural food crop sector in Lamongan. These three commodities contribute and generate high productivity, in fact, does not affect the rate of poverty. Despite the various efforts performed, however, the increase in productivity has not been encouraging. Further, the Poverty Depth Index in Lamongan is precisely increasing. Therefore, Adult Equivalent (AE) method was used as a method to equalize child consumption needs with adult population by calculating the economic scale for calculating poverty rate. The results of the AE method revealed that the economic scale in adult categories needs to be prioritized on corn and soybean farmers.

Keywords: food security, poverty

1. INTRODUCTION

The concept of food security continues to grow as the increasing rate of population growth. The concept and approach of food security are not only focused on how food is provided but also include household access to food at affordable price. According to FAO, food security is a situation in which all households have both physical and economic access to obtain food for the whole family, where households are not at risk of losing both (Mulyo & Sugiyarto, 2010).

The three main aspects of forming food security comprise food availability, food access, and food use (Food Security Council, 2009). The similar approach concept is also mentioned by Wijaya, et al (2016) that building food security can be performed through the affordability of food based on the optimal utilization of local resources, the affordability of food in terms of physical and economic aspect of the whole community, and the use of food or food consumption and nutrition for healthy, active and productive life. In East Java, the food supply of paddy commodity is abundant reaching 13,154,967 tons. One area in East Java that has a great contribution in rice production is Lamongan.

Lamongan as one of the largest rice producer in East Java, has a great potential as a food security barn in East Java. In 2018, the rice harvested area in Lamongan reached 21,184 hectares (ha) spread in 23 sub-districts in the local regency with a total production reaching 146,467 tons. The main rice producing areas is located along the banks of the Solo River, such as Babat, Lamongan, Turi, Karanggeneng,

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Kalitengah, Sukodadi, Glagah, Maduran, Laren, Paciran, Kedungpring, Deket, and Sarirejo.

In general, the strong potential in the agricultural sector in Lamongan is due to the large available area of the agricultural land. Fertile land can drive productivity so that the agricultural sector would develop. If the agricultural sector develops well, it would be beneficial for food provision for its population, providing employment opportunities, producing raw materials for other industries and potentially become the largest source of foreign exchange revenues (Silitonga, 1996).

Regarding the potential, the abundant rice production and the increasing rice harvested area should be able to control the poverty rate in Lamongan. According to The Central Beurau of Statistics, the poverty line in Lamongan in 2017 was IDR 335,783. It indicates that the monthly public expenditure in Lamongan was below IDR 335,783 classified as poor. If compared with the poverty line in East Java as the reference, then the value of IDR 335,783 was below the poverty line in East Java of IDR 342,092. However, percentage of poverty population in Lamongan in 2017 was 14% which was higher than the poverty percentage in East Java. It can be said that abundant productivity potential and resource factors have not effectively been able to suppress poverty in Lamongan. Therefore, this study aims to describe the relationship between the potential of food security of Lamongan in efforts to reduce the poverty level of the people and farmers in Lamongan.

2. LITERATURE REVIEW

2.1. Food Security

Food serves as a basic and crucial requirement for a country. Thus, if a country has a strong food security then it will be able to export the food commodities to countries that has deficit in food supply. However, the limited availability of land in the world would not be sufficient for supplying for the increasing number of population. There are 4 main dimensions in the discussion of food security. First, food availability is determined by the level of food production, the inventory levels, and the difference between food exports and imports. Second, food access is measured through physical access (adequate food) and economic access. Economic food access means consumers, especially food-prone communities, have sufficient purchasing power to access the foods. Third, the use of food, is defined as a dimension related to the adequacy of nutrition and food security. The fourth is stability which refers to the stability from the first to the third dimension for all the time (Teng, 2013).

2.2. Poverty

Poverty can be divided into 2 comprising relative poverty and absolute poverty (Central Bureau of Statistics, 2005). Relative poverty is determined based on the ability to reach the living standards of the local people. In other words, relative poverty is a condition where a person is below the poverty line. Individuals or groups that are below the poverty line can be referred to as relative poverty. However, poor justification is not relative or not objective. The concept of the poverty line can be associated as the average of a value. That is, if a value is below the *mean* then the standard of living is less prosperous. However, this concept is not rigid because the standards of relative poverty is changing due to the changes of the level of one's life.

Haughton (2001) suggests that poverty line is considered appropriate in identifying, determining, targeting poor people of a country but considering the country's level of development is also essential. In addition, a country's poverty line indicators cannot be applied universally and can only be used as a standard for determining the poor in a particular country. As an illustration, for instance, 35% of Indonesia's population is included in the poor category with the standard poverty line of US 1 per day per capita. However, this value is only a reference in Indonesia but it is not applicable in America because of the different standards of poverty line.

Next, absolute poverty is the level of poverty assessed based on the inability to meet minimum needs or basic needs. Individuals are classified as absolute poverty if the level of income is below the poverty line and cannot meet such basic needs as food, clothing, and shelter. CBS uses a basic needs value approach or minimum requirement which is translated into units of money value. This absolute poverty line is important for assessing the impact of policies in reducing poverty. World Bank employs poverty line for comparing poverty across the country so that the disbursement of funds/grants can be effective.

Sudaryanto (2009) suggests several contributing factors of poverty comprising the low quality of natural resources, uneven development policies, limited infrastructure, limited productive assets and low HR capacity. Poverty can also occur because of the unsatisfactory contribution of institutions. An illustration of the instance is that there is no access for producers to sell their products even though the products produced are quite abundant (Susilowati, 2010). Thus, the producer is unable to obtain the needed goods and the increase in income is difficult to achieve. Poverty can also occur due to the length of the supply chain so that producers whose products are abundant are also not obtaning the maximum income.

In the context of regional development, poverty is also influenced by geographical factors (the availability of natural resources) such as fertile land and climate. It creates a revenue gap and develops into poverty problems. The findings of Ikhsan's (2001) study indicated that there is a correlation between land ownership and poverty level, where the wider the land, the lower the poverty rate will be. However, if it is not accompanied by an adequate capability of the human resources in managing the land and using technology, the extent of land ownership is not the determinant of the declining poverty.

3. RESEARCH METHODOLOGY

This research is a quick research based on theoretical studies, previous research and field study in Lamongan. Lamongan is one of a national rice barn region as evidenced by its high rice productivity which tends to increase. The high productivity indicates that Lamongan has a great potential related to food security. However, this great potential has not successfully decreased the poverty rate when compared to its reference region (East Java).

This research focuses on food security in terms of food crops and poverty levels. This study involved farmers who have wide scale business, local government, and food institutions. The analysis of this research on food security was started from examining the level of production, processing, storage to trade or the rice trading system and supply chain. Furthermore, the food security will be linked to the level of poverty. In other words, it examined whether the potential for food security from the rice side is able to alleviate farmers' poverty.

3.1. Poverty Level Measurement

According to the World Bank Institute (2005), there are four reasons for measuring poverty indicators. The first is to continuously make poor people as the priority of the agenda. If poverty is not measured, the poor will be neglected easily. Second, identifying the poor is essential in formulating policies for poverty alleviation. The third is to monitor and evaluate government projects or policies directed for the poor. The last is to evaluate the effectiveness of local government in alleviating poverty.

Measuring poverty level in this study was carried out by using adult equivalent and economies of scale in household consumption. The following is the formula of adult equivalent referred as the OECD scale (1982):

$$AE = 1 + 0.7 (N \text{ adult} - 1) + 0.5 N_{children}$$

Where AE is adult equivalent. Score 0.7 reflects economies of scale, if the scale value is smaller, then economies of scale are increasingly important to be considered. Score 0.5 is the weights given to children who are assumed to have a lower expenditure needs (needs for food and shelter). If an adult with 1 household member (household assistant) has an AE of 1. If a household with 2 adult household assistants, it will have AE of 1.7. The equivalence scale shows a measure of the relative income needed by each different household to reach living standards (Cockburn, 2002). The principle of this concept is in equalizing the consumption needs of children with adult population by taking into account the economies of scale to calculate poverty rate (Cowell, 1994).

4. RESULTS

4.1. Food Security Potential of Lamongan

Lamongan regency consists of 27 districts. Data shows that Lamongan's food security potential includes rice, corn and soybeans. The success of the realization of food security in Lamongan is evidenced by the percentage of planting and harvesting achievement of the three main commodities. The percentage of planting and harvesting is at 100% or higher, therefore it can be said that the planting and harvesting target has been reached.

4.2. Food Security Potential and Population Poverty Level

Main commodities as the focus of this research are paddy, corn, and soybeans. The increase in the production of these commodities can be influenced by two factors, namely the increase in harvested area and the increase in productivity. The increase in harvested area is due to the great interest of farmers during the planting season for farming. Based on the results of the field study, corn commodities are spread in Paciran, Gondang Lor and Brondong sub-districts, Lamongan. If detailed, 10% of the corn farmers as the object of the study has their own agricultural land below 0.5 hectares were classified as "small" farmers. While the 80% of corn farmers have land between 0.5 hectares to 2 hectares were classified as "medium" farmers. Finally, the rest 10% of corn farmers, classified as "big" farmers, have land area ranging from 2 hectares to 5 hectares. For rice commodities, all rice farmers selected as the research samples were classified as "small" farmers; likewise also with soybean farmers.

According to Banowati et al (2013), the productivity of farmers in Lamongan based on the structure of land tenure includes "small" farmers who have a land area of 0.25-0.50 hectares; farmers who have agricultural land between 2.0-5.0 hectares, "medium" farmers; and "rich" farmers with agricultural land area over 5.0 hectares. The classification of "small", "medium" and "big" farmers is also closely related to commodity productivity and farmer income. The following is the productivity and income of corn, rice and soybeans farmers.

Based on the field findings, soybean industry does not process its own crop yields since the yields are supplied to collectors for animal feed needs. The selling price is determined by collectors. For soybean farmers to develop their processed crops, a tool is needed to process soybeans into animal feed. To date, the local government provides assistance in the form of diesel and *combine harvester* – a combination of three different operations covering harvesting, shedding and winnowing – has become a series of operations. The machine can save labor and speed up productivity.

Table 1. Harvest Area and Soybean Commodity Production in Lamongan

Year	January-April		May-August		January-December	
	Harvest (ha)	Production (tons)	Harvest (ha)	Production (tons)	Harvest (ha)	Production (tons)
2017	2,202	4,400	8,126	16,218	11,279	22,498
2018	4,173	8,172	4.102	7,753	8,275	15,925

Source: Secondary Data, processed (2018).

Table 2. Harvest Area and Rice Commodity Production in Lamongan

Year	January-April		May-August		January-December	
	Harvest (ha)	Production (tons)	Harvest (ha)	Production (tons)	Harvest (ha)	Production (tons)
2017	69,856	485,979	66,639	457,712	157,679	1,087,900
2018	69,406	494,748	51,299	368,845	120,705	863,593

Source: Secondary Data, processed (2018).

Table 3. Harvest Area and Corn Commodity Production

Year	January-April		May-August		January-December	
	Harvest (ha)	Production (tons)	Harvest (ha)	Production (tons)	Harvest (ha)	Production (tons)
2017	26,919	230,822	23,494	202,683	68,043	571,080
2018	26,119	256,812	1988	197,505	45,407	454,317

Source: Secondary Data, processed (2018).

Based on Table 1, the development of Soybean food crops also increased in January to April in which the production was 4,400 tons while, in the same months of 2018, the production doubled reaching 8,172 tons. However, from January to December 2018, there was a decrease in soybean production compared to the previous year due to uncertain climatic influences and potential pest attacks.

While Table 2 illustrates the commodity of food crops, especially rice commodities based on the development of the harvest area and rice production. Overall, the production development was declining from 1,087,900 tons in 2007 to 863,593 tons at the beginning of 2018 which occurred due to a lack of internal facilities such as irrigation water in each region. Despite the changing climate, the development of corn commodity in terms of harvest area and corn commodity production is presented in Table 3.

Table 3 shows the declining development of corn crop production. At the beginning of 2018, corn production has decreased. In 2018, the production was 26,119 tons while in 2017 production was 26,919 tons. This is due to the influence of climate and the provision of superior seeds that are still not optimal for corn-producing areas in Lamongan. In 2018, especially from January to December, the harvest area of 45,407 Ha and production reaching 454,317,006 tons could make Lamongan as the Center for Corn Partnership Development in East Java Province in 2005 even though in 2018 there was a decrease in production and harvest area compared to previous year. This condition occurs because of weather factors which result in a decrease in the quantity of the crop.

Although food security of Lamongan is less encouraging as the declining productivity, the population poverty rate development data of Lamongan during the last 10 years (2007-2017)

was decreasing. If detailed, the number of poor people in Lamongan has decreased by 126.22 thousand people, from 297.6 thousand people to 171.38 thousand people in 2017. Not only from the number, based on the percentage of poor people in Lamongan during the ten year period, the average annual reduction reached 1,137 percent from 25.79 percent in 2007 to 14.42 percent in 2017.

Poverty is a minimum standard for living needs used to classify the population in two criteria comprising poor and not poor. The poor are those who have an average per capita expenditure per month below the poverty line. Changes in the number of poverty line is influenced by the diet of the people as evidenced by the diversity of food and non-food consumed and the price of people's everyday needs of food and non-food.

The poverty problem is actually not merely about the number and percentage of the poor. However, the level of depth and severity of the occurring poverty needs to be considered. Development policy efforts, especially those aimed at reducing the number of poor people, are expected to reduce the depth and severity level of poverty. An added level of poverty described by the numbers Poverty Depth Index (P1) shows the average size of each expenditure gap of the poor to the poverty threshold. Where the higher the value of this index, the greater the average expenditure gap of the poor towards the poverty line is. In other words, the higher the depth index of poverty shows that the economic life of the poor is getting worse. While the number of Poverty Severity Index (P2) provides an overview of the distribution of expenditure among the poor, and can also be used to determine the intensity of poverty. The higher the index number, the distribution of expenditure among the poor is increasingly imbalance and vice versa.

Table 4. Poverty Depth Index (P1) and Poverty Severity Index (P2) in Lamongan Regency 2012-2017

Year	Poverty Depth Index (P1)	Poverty Depth Index (P1)
2012	1.92	0.36
2013	2.00	0.40
2014	1.78	0.36
2015	2.25	0.58
2016	2.40	0.66
2017	2.53	0.66

Source: Secondary Data, processed (2018).

In the period of 2012-2017, the Poverty Depth Index (P1) in Lamongan and the Poverty Severity Index (P2) tended to increase. The Poverty Depth Index (P1) in 2012 was 1.92 then in 2017 it was 2.53. It indicates that the poor population in Lamongan has an average per capita expenditure level per month which is below the Poverty Line of Lamongan, widening from the Poverty Line (away from the Poverty Line). Furthermore, the Poverty Severity Index (P2) from 0.36 in 2012 increased to 0.66 in 2017. This shows that the variation of the difference in the level of expenditure per capita per month among the poor (which is below the Poverty Line in Lamongan) was wider except in the last one year period from 2016-2017 in which the variation remains the same.

Referring to the increasing Depth Poverty Index in Lamongan in 2017, the funds for reducing the poor population per person in Lamongan need to be increased compared to the previous period. The relatively constant Severity Index of Poverty which shows the heterogeneity of the level of poverty among poor people in Lamongan which remains the same. This difference requires different program formulations according to the character of poverty in the Lamongan community. One program that can be implemented is by focusing on the superior sector in Lamongan.

To illustrate the poverty of farmers, the samples of this research were selected by means of *purposive sampling* using *Adult Equivalent* scale. The equivalence scale shows the size of the relative income needed by each different household to reach the standard of living (Cockburn, 2002). The principle of the concept is in equalizing the consumption needs of children with adult population by taking into account the economies of scale to calculate poverty rates (Cowell, 1994). The indicator is that if the smaller number of weights for *adult* and children, then the economies of scale are increasingly important to consider. The AE scale is presented in Table 5.

Table 5. *Adult Equivalent* Scale of Corn, Rice and Soybean Farmers

FARMERS	AVERAGE OF AE SCALE	Rate of Development for *Adult*	Research Number for Children
CORN	4.12	0.21	0.13
PADI	4.35	0.28	0.5
SOY	4.3	0.21	0.12

Source: Results of interview, processed (2018)

Based on the estimation results of the AE scale, farmers who have the smallest to the largest AE scale are farmers of Corn, Soybeans and Rice respectively. If specified, the value of the weighing figure for *adult* is lower than the AE scale weighing figure in Corn and Soybean farmers. It indicates that the economies of scale in the *adult* category need to be prioritized on corn and soybean farmers. On the other hand, rice farmers have the lowest value of the weighing number for children on the AE scale. It means that the economies of scale in the category of children need to be prioritized on rice farmers. The referred economic scale is being able to utilize the income earned to finance household expenses so that poverty levels can be minimized.

4. CONCLUSION

Lamongan is a rice barn in the East Java. Of 27 sub-districts in Lamongan, all districts are food commodity producers covering rice, soybeans and corn. Therefore, increasing the productivity of the three commodities can sustain the efforts to realize food security. However, the 2018 data shows that the productivity of the three commodities tends to decline. This condition occurs as the results of the decreasing harvest area, but due to weather factors which result in a decrease in the crop quantity. On the other hand, even though food crop productivity has declined, the data on the development of population poverty in Lamongan for the past 10 years (2007 - 2017) has tended to decline.

Although the poverty rate tends to decrease, but the findings of the calculation of the Adult Equivalent scale to equalize the consumption needs of children with the adult population by taking into account the economies of scale reveal that food consumption is still one of the main causing factors of poverty. This is in line with the concept of absolute poverty that poverty rate is assessed based on the inability to meet the minimum needs or basic needs.

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