Sosiohumaniora: Jurnal Ilmu-ilmu Sosial dan Humaniora Vol, 25, No. 2, July 2023: 200-208
ISSN 1411 - 0911 : eISSN: 2443-2660

POVERTY ANALYSIS OF CASSAVA FARMERS IN WONOGIRI REGENCY, INDONESIA

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ABSTRACT. Poverty is a central issue in development programs in Indonesia. Most people still depend on agriculture for their livelihoods with relatively low productivity and business income, so poverty is common in rural areas. Most of the Wonogiri residents work in agriculture, where one of the superior products is cassava, the largest producer in Central Java. Poverty reduction in agriculture is a critical factor in reducing poverty in Indonesia. This study examined the poverty status and determinants affecting the poverty status of cassava farmers in Wonogiri Regency, Indonesia. Purposive sampling techniques were used on 120 cassava farmers in Wonogiri Regency. Primary data were obtained with the aid of well-structured questionnaires and interviews. The data were analyzed using Foster-Greer Thorbecke (FGT) index and logistic regression (logit). The result of Foster Greer-Thorbecke's (FGT) analysis showed that the headcount index (P0) was 0,3417, the poverty gap index (P1) was 0,2092, and the poverty severity index (P2) was 0,1280. The logistic regression (logit) showed that determinants of the poverty status of cassava farmers were education, land area, household size, and farming experience. There needs to be an increase in education, land area, farming experience, and reducing the number of family dependents with family planning government programs.

Keywords: cassava; farmers; Foster-Greer-Thorbecke; logit; poverty

ANALISIS KEMISKINAN PETANI UBI KAYU DI KABUPATEN WONOGIRI, INDONESIA

ABSTRAK. Kemiskinan merupakan isu sentral dalam program pembangunan di Indonesia. Sebagian besar masyarakat masih bergantung pada pertanian untuk mata pencaharian mereka dengan produktivitas dan pendapatan usaha yang relatif rendah, sehingga kemiskinan umumnya terjadi di daerah pedesaan. Sebagian besar penduduk Wonogiri bekerja di bidang pertanian, dimana salah satu produk unggulannya adalah singkong, penghasil terbesar di Jawa Tengah, Indonesia. Pengentasan kemiskinan di bidang pertanian merupakan faktor penting dalam mengurangi kemiskinan di Indonesia. Penelitian ini mengkaji tentang status kemiskinan dan determinan yang mempengaruhi status kemiskinan petani singkong di Kabupaten Wonogiri, Indonesia. Teknik purposive sampling digunakan pada 120 petani singkong di Kabupaten Wonogiri. Data primer diperoleh dengan bantuan kuesioner dan wawancara yang terstruktur dengan baik. Data dianalisis menggunakan indeks Foster-Greer Thorbecke (FGT) dan regresi logistik (logit). Hasil analisis Foster Greer-Thorbecke (FGT) menunjukkan bahwa headcount index (P0) adalah 0,3417, indeks kesenjangan kemiskinan (P1) adalah 0,2092, indeks keparahan kemiskinan (P2) adalah 0,1280. Regresi logistik (logit) menunjukkan bahwa determinan status kemiskinan petani singkong adalah pendidikan, luas lahan, jumlah rumah tangga, dan pengalaman bertani. Perlu adanya peningkatan pendidikan, luas lahan, pengalaman bertani, dan pengurangan jumlah tanggungan keluarga dengan program KB dari pemerintah.

Kata kunci: ubi kayu; Fosteer-Greer-Thorbecke; logit; kemiskinan

INTRODUCTION

The World Bank's goal is to end extreme poverty and achieve shared prosperity. However, the effort is now in decline. Global extreme poverty increased in 2020 for the first time in more than 20 years as the disruption of the COVID-19 pandemic added to the strength of conflict and climate change, which is already slowing progress in poverty reduction. An additional 120 million people live in poverty due to the pandemic, with the total expected to rise to around 150 million by the end of 2021 (World Bank, 2021).

Poverty is also a development problem in Indonesia. According to Suharto (2015), although Indonesia has potential economic resources, it is still closely related to poverty and unemployment. Data from the Central Bureau of Statistics Indonesia (2020) mentions that the number of poor people in March 2020 amounted to 26,42 million people, an increase of 1,63 million people as of September 2019 with a percentage of 9,78% increase 0,56% compared to September 2019. This increase in poverty is caused by the Covid-19 pandemic, which impacts changes in the behavior and economic activity of the population, a decrease in foreign tourist visits, and some essential commodities experiencing an increase in retail activity. The population in poor rural areas is 15,26 million people with a percentage of 12,82%, higher than in urban areas with a population of 11,16 million people (7,38%). In Central Java Province, the percentage of poor people living in urban areas

DOI: https://doi.org/ 10.24198/sosiohumaniora.v25i2.40314
Submited: 28 June 2022, Accepted: 15 February 2023, Publish: 10 July 2023

in September 2019 was 8,99%, rising to 10,09% in March 2020. The percentage of rural poor also rose from 12,26 percent in September 2019 to 12,80 percent in March 2020. It shows that in Central Java, rural poverty rates are also higher than poverty rates in urban areas.

According to Todaro and Smith (2015), valid generalizations related to poverty are not proportionally located in rural areas, especially those involved in agricultural activities and related activities, which tend to be female and children rather than adult men. They are concentrated among ethnic minority groups and indigenous peoples. Most people still depend on their lives from the agricultural sector with relatively low productivity and business income levels, so poverty, unemployment, and food insecurity are widely found in rural areas. Based on Central Bureau of Statistics Indonesia data (2018), the primary income of Indonesians in 73 thousand villages (87%) comes from the agricultural sector. This condition indicates that efforts to alleviate poverty, unemployment, and food insecurity must be made by building agriculture and rural areas (Ministry of Agriculture, 2020). Agricultural development to meet the needs of food and national foreign exchange producers through exports has become a significant factor in rural areas' growth of rural areas.

Indonesia is the country with the third-largest cassava production in the world after Nigeria and Thailand. The following is a table of cassava production of the five largest cassava-producing countries in the world.

Table 1. World's Largest Cassava Production in 2014-2017

	Production (thousand tons)			
Country	2014	2015	2016	2017
Nigeria	56.328	57.643	57.855	55.000
Thailand	30.022	32.358	31.161	30.936
Indonesia	23.436	21.801	20.745	20.330
Brazil	23.254	23.060	23.710	20.110
Ghana	16.524	16.213	17.798	19.139

Source : FAO, 2017

The table above shows that cassava production in Indonesia in 2014-2017 decreased production from 23.436 thousand tons to 20.330 thousand tons. The cassava industry's demand in Asia, namely for ethanol, starch, and animal feed with its lucrative export market, has supported the substantial expansion of cassava crops in the past decade, particularly in Southeast Asia. Unlike the case in Indonesia and the Philippines, cassava is more critical for food security than for the industrial sector with a food diversification program for rice substitutes because Indonesia and the Philippines are still large rice importers (FAO, 2017). Therefore, cassava can be used as a food alternative to support the Indonesian government's food diversification program so that rice imports can be reduced.

Wonogiri residents primarily work in agriculture, where one of its superior products is cassava, the largest producer in Central Java. The amount of cassava production in Central Java Province in 2017 was 3,138,864 tons, decreased in 2018 to 2.556.459 tons, and in 2019 increased to 2.979.780 tons. The most significant cassava production in Central Java Province is in Wonogiri Regency, with a total production of 931.372 tons in 2017, decreased in 2018 to 762.000 tons, and increased in 2019 to 890.438 tons. Cassava production in 2019 in Wonogiri Regency accounted for 29,9% of total production in Central Java Province.

Cassava is an easy-to-cultivate plant and can grow mainly in the tropics in various soil conditions, including marginal lands. Cassava is resistant to pest attacks, so it has high resistance and suitable enough productivity. Maintenance is also not too complicated, so it does not require a large amount of labor. Cassava is divided into two based on its cyanide content: cassava (low cyanide), which is commonly consumed directly, and bitter cassava (high cyanide), processed into tapioca flour where cyanide dissolves in water. According to Estiasih et al., (2017), the quality of cassavas can decrease infection by microorganisms, harvest, storage methods, and harvesting time. Harvesting time too early will cause cassava to low yield, while when it is too late to harvest, cassava becomes fibrous, easily damaged, and less attractive. Root bulbs from the cassava plant can be harvested between 6-24 months after planting, depending on the type and growing conditions.

Cassava is a commodity that is a national need and has export potential. Besides being a food source of carbohydrates, cassava can also be used as animal feed and industrial raw materials. Cassava development is critical in the effort to provide non-rice carbohydrate food, diversify/diversify local food consumption, develop the product processing industry and agro-industry, and as a source of foreign exchange through exports and efforts to support increased food security. Agriculture has an important strategic role in supporting the national economy. The role is to realize food security, increase competitiveness, absorb labor, and reduce poverty. National Medium-Term Development Plan (RPJMN) 2020-2024, the agricultural sector is expected to contribute to quality economic growth

in Indonesia. Poverty reduction in agriculture is a critical factor in reducing poverty in Indonesia. The Indonesian government has carried out various policies to overcome the Covid-19 crisis. Based on Yumna et al., (2020), the program that has been run is a social safety network (JPS) program that includes social assistance, accelerated implementation of Pre-employment Cards, and cuts in electricity bills.

Research on the potential of cassava to build the countryside in the Sustainable Development Goals (SDGs) program as an effort to eradicate poverty was conducted by Widodo (2018) using case study methods, but this study has not addressed poverty in-depth and is more focused on cassava productivity. Determinant analysis affecting the poverty of cassava farmers has been conducted Osuji (2019) the Foster-Greer-Thorbecke (FGT) method and ordered probit model, but the study was conducted in Nigeria, and no one has been researched in Indonesia, especially in Wonogiri Regency. An analysis of cassava farmers in Wonogiri Regency on income distribution with the Gini Index and Lorentz Curve has been conducted by Rahayu et al., (2021), but the study has not analyzed poverty and determinants. The novelty of this study is that it analyzed poverty using the Foster-Greer-Thorbecke index and logit regression to determine the determinants affecting poverty in cassava farmers in Wonogiri Regency. By knowing the determinants that affect poverty, the government can determine the right policy to reduce poverty.

METHOD

The basic method of this research is quantitative descriptive. The method of determining the location in this study is purposive in Wonogiri Regency because it is the largest cassava producer area in Central Java Province. The production of cassavas in Wonogiri Regency is 890.438 tons accounting for 29,9% of total cassava production in Central Java Province. The research location in 3 sub-districts is Ngadirojo, Girimarto, and Jatipurno districts with consideration because it is the largest cassava producing sub-district in Wonogiri Regency. According to (Situmorang et al., 2010), primary data is data collected by individuals / an organization directly from the objects studied and for the benefit of the study that can be in the form of interviews and observations. The primary data in this study was obtained by interviews using a structured questionnaire of 120 cassava farmers in Wonogiri Regency. The primary data obtained is the identity of respondents regarding age, gender, education, land, number of family members, farming experience, and income. Secondary data is data obtained, summarized, and compiled by previous studies or published by various other agencies. Secondary data in this study was done by recording. Secondary data includes data on cassava production, poverty data in the world and Indonesia, and other statistical data obtained from the World Bank, FAO, the Ministry of Agriculture, the Ministry of Health, and the Central Bureau of Statistics Indonesia and Wonogiri Regency.

The method of determining customer respondents in this study used *purposive sampling.* According to Yusuf (2017), *purposive sampling* determines a sample based on a specific purpose or consideration and the retrieval of information sources based on the purpose set earlier. The sample in this study is 120 cassava farmers scattered in Ngadirojo, Girimarto, and Jatipurno districts which are the largest producers of cassavas in Wonogiri Regency with the consideration that cassava farmers there can be represented so as to represent the population of cassava farmers in Wonogiri Regency.

The data analysis methods in this study are using Foster-Greer Thorbecke (FGT) index and logistic regression (logit). The software used in this study is Minitab 18.

1. **Foster-Greer-Thorbecke (FGT)**

Absolute poverty is poverty measured by comparing people's income levels with the level of income needed to meet their basic needs. The minimum income level is a barrier between poor and non-poor or often called the poverty line. Measurements using Foster-Greer Thorbecke analysis were conducted to determine the poverty of cassava farmers based on their income. Foster-Greer-Thorbecke's decomposition model (FGT) is used to estimate the headcount index, poverty gap index, and poverty severity index. The Foster-Greer-Thorbecke Index is widely used in empirical research because it is sensitive to the depth of poverty and severity (Maipita, 2014). The mathematical formulation is as follows.

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{H}\left(\frac{Y_p - Y_i}{Y_p}\right)^\alpha$$

Information:
Pα= index Foster-Greer-Thorbecke (FGT)
N = population (population)
H = the number of people below the poverty line
Yp = amount of income
Yi = poverty line
α= 0, headcount index, % of poor people
α= 1, poverty gap index
α= 2, poverty severity index

If α= 0, this measure is equal to the headcount ratio (H); when α = 1, indicates the poverty gap index (P1), the high P1 means the longer the distance between the average expenditure of the poor and the poverty line. ; and when α= 2, the size is equal to the poverty severity index (P2), the high value of P2 means that the end of the poor is increasingly spread from the average value. The poverty indicator is analyzed using several types of poverty indexes, namely: (a) Headcount ratio, which is a measure that shows the percentage of the number of poor people in the population. (b) Poverty gap ratio (P1) is a measure that describes the difference in the average income of the poor and the poverty line. 3. Sen index poverty (P2) and FGT index (P3), which are measures that show the distribution of income/ expenditure among the poor.

2. **Logistic Regression (logit)**

The logistic model is a non-linear regression model that produces an equation in which dependent variables are categorical (Gujarati, 2003). Model logit *(logistic regression)* is a regression model used to analyze dependent variables with possibilities between 0 and 1 (Winarno, 2011). The analysis used to determine the determinants that affect poverty status is using logistic regression. The purpose of using the logit model is to look for the probability of households with poor status. Logistic regression analysis does not require normal distribution in independent variables (Ghozali, 2018). In this study, the dependent variable Y (poverty status) used category 1, which means poor, and 0 means not poor. The logit model, as adapted from Israel and Hakim (2015) was amended and stated in Olarindo et *al.,* (2020) as follows:

$$W_i = a_0 + \sum_{j=1}^{k} a_k x_{ij} + \varepsilon_i$$

Description:
W_i= the poverty status of the household, which requires (to dummy) 1 for the poor, 0 if otherwise;
j = 1.2, . . . , k = vectors of predictor variables that explain poverty;
$a_{0,} a_k$ = estimation parameter;
ε_i = error
Predictor X_{ij} = socioeconomic variable
The logistic (logit) model in this study is
$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + e$
Information:
Y = poverty status, where 1 is poor and 0 is not poor
a = estimation parameter
X_1 = education
X_2 = land area
X_3 = land ownership
X_4 = household size
X_5 = farming experience
b_1-b_5 = regression coefficient
e = error

Hypothesis Test

a. Wald Test
According to (Ghozali, 2018) the wald(t) test shows how far the influence of partially independent variables influences in explaining dependent variables. To find out the value of the wald test (t-test), the significance level is 5%. As for the decision-making criteria: 1. If $t_{count} < t_{table}$ and p-value > 0,05, then H0 is accepted, meaning that one of the independent variables does not affect the dependent variable. 2. If $t_{count} > t_{table}$ and p-value < 0,05, then H0 is rejected, meaning that one of the independent variables affects the dependent variable.

b. Omnibus Tests of Model Coefficients
Omnibus tests of model coefficients are simultaneous statistical tests (test f). In this study will test whether independent variables simultaneously affect dependent variables (Ghozali, 2018). As for the significance level of 5%, so the decision-making criteria are as follows: 1. If $f_{count} > f_{table}$ and (P-Value) < 0,05, then H0 is rejected and H1 is accepted, meaning that independent variables simultaneously affect dependent variables. 2. If $f_{count} < f_{table}$ and (P-Value) > 0,05, then H0 is accepted and H1 is rejected, meaning that independent variables simultaneously do not affect dependent variables.

RESULTS AND DISCUSSION

1. **General Characteristics and Socio-Economics Characteristics of Cassava Farmers**

Cassava is widely cultivated in Wonogiri Regency. Wonogiri Regency is one of the Central Java districts geographically reviewed located between 110◦ 41’ - 111◦ 18’ East Longitude and 7◦ 32’- 8◦ 15’ South Latitude. Based on the Wonogiri Regency Meteorological Station, the air temperature in Wonogiri Regency during the dry and rainy seasons is a maximum of 36,5◦C and at least 18,26◦C. This indicates that the air temperature in Wonogiri Regency is suitable for cassava growth because the air temperature is above 10 degrees Celsius. According to Candraningsih (2019), rainfall suitable for cassava growth is between 1.500-2.500 mm / year with an air temperature of at least 10 degrees Celsius. Cassava can be developed in almost all regions in

Indonesia, both in wet climates and dry climates, as long as the water is available according to the needs of plants in each growth phase. Food Security Agency Indonesia (2020) cassava has high fiber content and low glycemic index numbers, cassava is rich in vitamins and antioxidants. Therefore, cassava is safe to consume by people with diabetes.

The results show that most of the respondents of cassava farmers in Wonogiri Regency primary school education level are 38,33%. Then, 94,2% of cassava farmers aged 15-64 years are classified as the productive age. Farmers of productive age have a more robust physique for cassava cultivation than non-productive ones. A total of 58,33% of respondent's farmers cultivate cassava on an area of 0,5-1,0 hectares, with an average of 0,64 hectares. Most farmers use an intercropping system that is only planted on the outskirts of the land along with the main crop, namely corn or peanuts. So that the amount of production received is less than when planting with a monoculture system and will affect the income that farmers will obtain. A total of 96,67% of farmers' respondents are farmers who own cultivators. As many as 50% of cassava farmer respondents have a family member of 5-6 people. The majority of cassava farmers (39,17%) have 26-40 years of farming experience. The longer the experience of cassava farmers, the more comprehensive their knowledge and skills in the development of cassava cultivation.

2. Poverty Analysis of Cassava Farmers

The Covid-19 pandemic in Indonesia has an impact on Indonesia's food security (Suwardi, 2021). This is because Covid-19 changed the logistic food system because government policies regarding social distancing and food supply chains were also disrupted, threatening the fulfillment of food needs. However, the pandemic also provides lessons on innovation for urban farming and utilizing yards in villages for crop cultivation. In addition, the government also conducts local food development movements, namely cassava, corn, sago, and other tubers. This is done as an effort to reduce dependence on food that experiences constraints in distribution and also to be able to provide benefits for the community to survive and increase income for the community.

World Health Organization (2021) data that the number of people confirmed positive from the beginning of the emergence of the virus in China at the end of 2019 to November 19, 2021 in 255.324.963 people in the world and Indonesia (Ministry of Health, 2021) is 4.252.705 people. Covid-19 is estimated to have the potential for short-term poverty in developing countries (Sumner et al., 2020). Estimates of the impact of Covid-19 on poverty based on economic growth scenarios in Suryahadi et al., (2020) that the poverty rate in Indonesia will increase from 9,2% in September 2019 to 9,7% by the end of 2020. The implication is that 1,3 million people will be poor, and under the most severe projection, the poverty rate will increase to 12,4%, which means that 8,5 million more people will become poor. In fact, based on the Central Bureau of Statistics Indonesia (2021), the number of poor people in Indonesia increased from September 2019 to September 2020 and in March 2021 decreased.

Before the emergence of covid-19 in Indonesia (September 2019), there was a decrease in the number of poor people from March 2019. However, from September 2019 to September 2020 there was an increase in the number of poor people from 24,79 million people (9,22%) to 27,55 million people (10,19%) who at that time had many cases of Covid-19 affected Indonesian people with various government policies implemented to reduce the rate of Covid-19 transmission. In line with Suryahadi et al., (2020) Covid-19 impacts are increasing poverty in Indonesia. Moreover, data from the Central Bureau of Statistics Indonesia (2021) in March 2021 that the number of poor people in the countryside is 15,37 million people (13,10%) and in urban areas is 12,17 million people (7,89%). This shows that rural poverty is higher than urban poverty. Furthermore, the majority of rural residents work in agriculture as farmers.

Wonogiri regency is one of the areas where the majority of the population works in agriculture. The percentage of people working in agriculture based on data from Central Bureau of Statistics Wonogiri Regency (2020) is 43,59%, in the countryside it still dominates at 50,50%. In contrast to urban areas, the number of people working in agriculture is only 23,84% because the majority work in the field of trade. The results of research Rahayu et al., (2021) show that the income level of cassava farmers in Wonogiri Regency is still low, both income from cassava farming business only and the total household income of cassava farmers. Moreover, the existence of Covid-19 impacts the decline in farmers' household income which leads to an increase in poverty in Wonogiri Regency. (Table. 2)

The number of poor people in Wonogiri Regency is fluctuating. In 2019, the number of poor people decreased from 2018, but in 2020 increased again. This is due to the Covid-19 pandemic that causes unemployment due to the reduction of workers by companies so it has

an impact on increasing poverty. In line with Tarigan et al., (2020) research that the impact of the Covid-19 pandemic, namely income loss due to reduced work time, job loss, and business loss, has a greater influence on poverty. The poverty line has moved less as prices have remained relatively unchanged. But, because income decreases, purchasing power is weakened; moreover, the community needs medical costs and additional vitamin consumption to have an immune body that can survive the influence of Covid-19. In contrast to the farmers, the prices of agricultural inputs continue to soar due to reduced supply and hindered distribution due to social distancing policies. It is not accompanied by an increase in the selling price of farmers so many farmers lose money and experience a decrease in income.

Table 2. Poor people in Wonogiri Regency (2018-2020)

	2018	2019	2020
The poor people (thousands)	102,84	98,28	104,37
Percentage of poor people (%)	10,75	10,25	10,86
Poverty gap index (P1)	1,71	0,82	1,08
Poverty severity index (P2)	0,41	0,11	0,18

Source: Central Bureau of Statistics Wonogiri Regency (2021)

Poverty is a condition caused by a lack of income so that the unmet basic needs or basic needs that make living standards worth are not met. A person belongs to the absolute poor if his income is below the poverty line and not enough to determine the basic needs of his life. In contrast, relative poverty is someone who has been able to meet the basic needs of his life, but still much lower than the circumstances of the surrounding community. The analysis used to measure absolute poverty in this study was Foster Greer Thorbecke's (FGT) index. The poverty line in this study is the poverty line in Wonogiri Regency in 2020 obtained from data from the Central Bureau of Statistics Wonogiri Regency (2021), which amounted to Rp341.643,00/capita/month. The results of the analysis are shown in table 4.

Table 3. Poverty analysis of cassava farmers in Wonogiri Regency

	2020
Headcount index (P0)	0,3417
Poverty Gap Index (P1)	0,2092
Poverty Severity Index (P2)	0,1280

Source : Primary data analysis using FGT index (2020)

The result of Foster Greer-Thorbecke's (FGT) analysis showed that cassava farmers' poverty index (P0) was 0,3417. The poverty index of 0,3417 means that as many as 34,17% of cassava farmers in Wonogiri Regency are poor residents who have income below the poverty line (Rp341.643,00/ capita/month). The number of cassava farmers who have incomes below the poverty line is 41 people out of a total of 120 respondents. The poverty index of cassava farmers is higher than the people of Wonogiri Regency in general, which has a poverty rate of 10,86%, as shown in Table 3. The implication is that poverty still occurs in rural areas, with people who work in agriculture. Rural development is indispensable to supporting poverty alleviation through agriculture. The poverty gap index measures the average income inequality of each poor person against the poverty line. The analysis results showed that the poverty gap index (P1) of cassava farmers was 0,2092. It means that the total gap between all poor cassava farmers to the poverty line was 20,92%. This figure is smaller than the poverty gap index of the entire community of Wonogiri Regency in 2020. The poverty gap index shows that there is a difference between the average income of cassava farmers from the poverty line. The higher the index, the further the average income of poor cassava farmers from the poverty line. The poverty severity index (P2) of cassava farmers was 0,1280 means that inequality among poor cassava farmers is 12,80%. This figure is lower than the poverty severity index of the people in Wonogiri Regency in 2020. The poverty severity index provides information about the picture of income spread among poor cassava farmers. The higher the index, the more lame the income of poor cassava farmers with each other.

3. Determinants that Affect-Poverty Status of Cassava Farmers In Wonogiri Regency

Variables used in logistic (logit) regression are education, land area, land ownership, household size, and farming experience. Logistic (logit) regression is used to identify determinants that affect the poverty status of cassava farmers in the Wonogiri Regency. The analysis results using Minitab 18 software for the test can be seen in Table 5.

The results of the logistic regression (logit) in Table 5 indicate that the model explains 80,91% of the deviance in the Y (poverty status) variable. For these data, the Deviance R^2 value indicates the model provides an excellent fit to the data. The Goodness of Fit test using Hosmer-Lemeshow showed a p-value of 0,944 $\geq$ α (0,05), so it can be concluded that the model is feasible. The logit models in this study are:

Y = 2,41 - 0,363 X1 - 9,52 X2 + 0,51 X3 + 1,250 X4 - 0,1083 X5

Description :

Y = poverty status

X1 = education

X2 = land area

X3 = land ownership

X4 = household size

X5 = farming experience

P-value regression of 0,000 ≤ α (0,05) means that a statistically significant relationship between variables X1, X2, X3, X4, and X5 association to Y (poverty status). P-value X3 (land ownership) of 0,848 ≥ α (0,05) means there is no significant relationship between X3 and Y (poverty status). While p-values X1, X2, X4, and X5 ≤ α (0,05) means that there is a negotiable influence between each variable and Y (poverty status). Coefficients of each variable X1 (education), X2 (land area), and X5 (farming experience) have a negative relationship with poverty status, while X4 (household size) has a positive relationship with poverty status. This indicates that the X1, X2, X5 become less likely as the Y increases, while X4 becomes more likely as the Y increases. The coefficient for X4 is 1,250, which suggests that larger household size is associated with higher probabilities of poverty. The coefficient for variable X1 is -0,363, which means that a decrease in education will increase poverty. Similarly, X2 (land area)-9,52 means that a decrease in the land area will increase poverty. Variable coefficient X5 (farming experience) of -0,1083 is negative means that a decrease in farming experience will increase poverty.

Table 5. The results of logistic (logit) regression

Variable	Coefficient	p-value	Odds ratio
Regression	2,41	0,000	
X1 (education)	-0,363	0,029	0,6955
X2 (land area)	-9,52	0,000	0,0001
X3 (land ownership)	0,51	0,848	1,6597
X4 (household size)	1,250	0,027	3,4895
X5 (farming experience)	-0,1083	0,004	0,8974
Deviance R-sq = 80,91			

Source: Primary data analysis (2020)

Odds ratios greater than 1 indicate that the event is more likely to occur as the predictor increases. Odds ratios that are less than 1 indicate that the event is less likely to occur as the predictor increases. The results showed that the odds ratio of X1 (education) was 0,6955 < 1, meaning that poverty is less likely to occur when X1 (education) increases. The variable odds ratio X2 (land area) is 0,0001 <1, meaning that poverty is less likely to occur when the land area increases. The odds ratio of variable X4 (household size) is 3,4895 > 1, which means that poverty tends to occur at 3,4895 times for small households. The odds ratio of variable X5 (farming experience) is 0,8974 < 1, meaning that as cassava farming experience increases, poverty tends not to occur. The results showed that X1, X2, and X5 have odds ratios of < 1, meaning that poverty tends not to occur when X1 (education), X2 (land area), and X5 (farming experience) increase. In contrast, the odds ratio is> 1, meaning poverty occurs when X4 (household size) increases.

The logistic regression (logit) showed that determinants of the poverty status of cassava farmers were education, land area, household size, and farming experience. Land area affects poverty because farmers with a narrow land area have little production. In line with Sutopo (2017) that land is a support for production which has an impact on the vicious circle of poverty. Head-of-home education tends to be negatively related to household poverty status, meaning an increase in the length of the school year will reduce the chances of households falling into poverty. Education can increase productivity and well-being materially and non-materially. This is in line with Omonona et al., (2006) that years of education influenced household poverty negatively, implying a unit increase of variable will lead to a decrease in household poverty. The land area becomes a determinant of the poverty status of cassava farmers because the more land that is cultivated, the higher the productivity. The land area will increase farmers' income to meet their needs, and eventually, poverty will decrease. The number of family members affects the status of poverty because the more family members, the more family needs will be spent to meet the needs of life, and poverty will increase. This is in line with Falola et al., (2016), Agunbiade and Oke (2019) research that household size positively affected poverty by increasing the farmer's poverty status. The experience of farming for cassava farmers in Wonogiri Regency can affect the status of poverty because the longer farmers do farming, the more comprehensive the knowledge and insights possessed. This is in line with Afolami et al., (2015) research that farming experience is a variable that significantly affects the improvement of cassava cultivation. It will positively impact cassava cultivation to market that income will rise and reduce poverty. Therefore, efforts that can be made to reduce the poverty of cassava farmers are by increasing education, land area, farming experience, and also lowering household size.

The main determinant of the impact of increasing poverty according to Fosteer et al., (2010) is the pattern of sectoral growth. Poverty is mostly

experienced in rural areas, so government policy programs that benefit rural areas are critical in the success of poverty alleviation. The advice and policy implications of the results of this study are that the government can make policies that can improve the education of cassava farmers in Indonesia, especially the education of children, so that when they become adults, they have a better education. A better child's education than his or her parents will have good knowledge and skills. Although adult farmers can not improve their formal education, knowledge can be improved through effective counseling so that they can manage the agribusiness of cassavas that can increase their income that and reduce poverty even out of poverty. The government and farmers are also expected to expand the land used for the production of cassavas so that productivity is high and efficient. This land expansion can be done with a land rental system, both from the government to farmers and from farmers with communities that have unproductive land so that it can be used for the agribusiness of cassava. Farmers can implement a family planning program from BKKBN (National Population and Family Planning Board) that in households have two children better than many children, in this case, related to spending on fewer household needs. Farmers can continue to improve their farming experience to solve problems related to cassava agribusiness and make the best decisions based on their experience. That way, the income of cassava farmers will increase and get out of poverty.

CONCLUSION

Foster Greer-Thorbecke's (FGT) analysis showed that the poverty index (P0) was 0,3417, poverty gap index (P1) was 0,2092, poverty severity index (P2) was 0,1280. The logistic regression (logit) showed that determinants of the poverty status of cassava farmers were education, land area, household size, and farming experience. The need for government policies in improving education for children is a good education program for the future, and for adults can be done with counseling to increase knowledge about agribusiness to increase household income. Land area farmers can be improved by renting a system from the government to farmers and between farmers and communities with unproductive land. Farmers should implement a family planning government program to limit the number of children to two children in one family. Farmers can continue to improve their farming experience to solve problems related to cassava agribusiness and make the best decisions based on their experience.

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