Analysis of Household Poverty in Garangan Village, Wonosamodro District, Boyolali Regency

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Abstract: Household poverty in Garangan Village is relatively higher because the Development Village Index (DVI) value in Garangan Village has the lowest score among other villages in Boyolali District. This study aims to analyze the factors that influence the poverty status of households in Garangan Village, Wonosamodro District, Boyolali Regency. Based on the theory of the poverty vicious circle and the concept of poor households from the Statistics Indonesia, the independent variables were chosen, namely education, employment, health, and gender. This study uses primary data by interviewing 93 household samples in Garangan Village in 2023 and secondary data as supporting for research. The analytical method used in this study is ordinal logistic regression with the help of SPSS 21. The results showed that the coefficient of determination (Nagelkerke R²) was 0.711. The variables of education, employment, and health have a significant effect on the poverty status of households in Garangan Village. However, the gender variable does not affect the poverty status of the households in Garangan Village.

Keywords: Household poverty status, education, employment, health, gender

I. INTRODUCTION

Poverty is a widespread global problem and it occurs in many developing countries (Haushofer & Fehr, 2014). Poverty can be used as a benchmark to see socio-economic conditions in assessing the success of a country's economic development. The problem of poverty is a complex and multidimensional problem involving social, economic, cultural and other aspects. Poverty was initially considered an economic phenomenon and refers to a bad condition where households are unable to meet daily necessities such as food and shelter (Yansui Liu et al., 2017). The poverty of a village can be seen from the value of the Developing Village Index (DVI), a low DVI value can reflect that the village is poor. It can be interpreted that the lower the poverty level, the more advanced the Village (Fasya et al., 2020). Garangan Village has the lowest DVI score among other villages in Boyolali Regency. The DVI value for Garangan Village in 2020 was 0.6013 and in 2021 it was 0.6067, this means that the DVI value has increased. Meanwhile, the number of poor people in Garangan Village has also increased from 2020 to 2021. The number of poor people in Garangan Village in 2020 is 2242 family cards and in 2021 there are 2279 family cards. This is not in line with the initial assumption that the DVI value which has increased will affect reducing the poverty rate. Therefore, this study aims to analyze the factors that influence the poverty status of households in Garangan Village, Wonosamodro District, Boyolali Regency.

Sharp, et al. (in Kuncoro, 2006) identify the causes of poverty from an economic point of view.

a) On a micro level, poverty appears due to inequality in the ownership of each individual's resources, causing inequality in income distribution. Poor people only have resources in limited quantities and low quality.

b) Poverty arises because each individual has a different quality of resources. low quality of resources can mean that production is low, causing low income. The low quality of these resources can be caused by low education, disadvantaged fate, discrimination, or caused by heredity.

c) Poverty arises because each individual has differences in accessing capital.

These three causes of poverty stem from the vicious circle of poverty theory. The vicious cycle of poverty is a strong and interacting link that creates a situation in which a country, especially a developing country, has difficulty achieving higher development. This vicious cycle of poverty theory was put forward by (Nurske, 1953), that "a poor country is poor because it is poor". The theory of human capital states that education is one of the instruments to get out of poverty because the skills and knowledge obtained through education can increase the accumulation of human capital and increase the productivity and income of the community (Tilak, 2002). Low quality education levels have an inadequate impact on poverty alleviation, this is because people with low education tend not to find jobs with high wages (Knight et al., 2010).
Rural communities prefer to work in agriculture, but the potential income received by people who work in the non-agricultural sector is much higher than people who work in agriculture (Yang et al., 2008). It has been observed that most people who depend on rural households can increase the probability of falling into poverty (Wang et al., 2020). Because people's income is low and the welfare system is inadequate for household medical expenses, especially for chronic diseases, it can lead to poverty (Liu et al., 2003). Differences in health insurance rates and access to health facilities exist between less developed and more developed areas. Thus, households in poor rural areas are more likely to be trapped in poverty due to health costs, either because there are no savings or income from agricultural and non-agricultural activities is not sufficient to meet medical and medicinal services (Tang et al., 2022).

Households headed by women have a more consistently high poverty rate than households headed by men (David et al., 2018). According to UN Women (2018), discrimination against gender is common in all dimensions. There are more women than men under the age of 40 who are vulnerable to poverty, with unequal access to and control over resources, coupled with the gender pay gap in the labor market (Women, 2018).

II. RESEARCH METHODOLOGY

2.2. Population and Sample

The population in this study was the head of the household in Garangan Village, Wonsosamodro District, Boyolali Regency. Sampling in this study was carried out using a probability sampling technique, namely stratified random sampling using the slovin formula. According to Sugiyono (2008), probability sampling is a sampling technique that has equal opportunities for each element (member) in a population that is selected as a sample member. While the stratified random sampling technique is used if the sample members from the population are taken by looking at the strata in the population, and the existing strata are taken at random. To determine the size of the research sample from the population, the Slovin formula (Sugiyono, 2012) is used, as follows:

$$ n = \frac{N}{1+Ne^2} $$(2.1)

Information:
- $n$ = sample size
- $N$ = population size
- $e$ = allowance for inaccuracy due to sampling error

With a sampling allowance of 10%, the number of samples in this study can be found as follows:

$$ n = \frac{1300}{1+1300(0.10^2)} = 92,857 \text{ rounded up to } 93 \text{ household heads.}$$

2.2. Data and Data Sources

The primary data used was obtained directly through interviews that had been prepared with respondents, namely the head of the household in Garangan Village, Wonsosamodro District, Boyolali Regency, in the form of the respondent's personal data, education, employment, health, and other supporting data. In addition, interviews were also conducted with employees of the Garangan Village office, Wonsosamodro District, Boyolali Regency as supporting data for this study. Secondary data in this study were obtained from literature studies and previous research studies sourced from Central Java Statistics, Boyolali Regency Statistics, Boyolali Regency Bappeda, Village Information System (SIDesa), Central Java Province and Garangan Village Office, Wonsosamodro District, Boyolali Regency. Then from reference books, journals, the internet, articles and various other literature related to this research.

2.3. Theoretical Framework

The theory of the vicious circle of poverty states that poverty is caused by market imperfections, underdevelopment, and backwardness causing low productivity. Low productivity can lead to low income received. Low income will result in low savings and investment. Low savings and investments will result in underdevelopment.

According to the Statistics Indonesia, poor households can be seen from three characteristics, namely economic characteristics, social characteristics and demographic characteristics. Economic characteristics are categorized into four groups, namely household employment, household income, household consumption expenditure structure, and ownership. Social characteristics consist of three categories, namely health, education, and housing. Demographic characteristics cover three categories, namely household structure and size, dependency ratio, and gender of the head of the household.

Based on the theory of the vicious circle of poverty and the characteristics of poor households put forward by the Statistics Indonesia, independent variables were chosen, namely education, employment, health, and gender. Mathematically this theoretical model can be formulated as follows:

$$ Y = f (PND, PKJ, KES, GENDER) $$(2.2)

- $Y$ = Household poverty status
- $PND$ = Education level
- $PKJ$ = Wages per month
- $KES$ = Ability to seek treatment
- $GENDER$ = Sex of the head of the household

The status of household poverty can be seen from the data from the Boyolali District Monitoring Center for Development (MCD). Poverty status can be seen based on predetermined indicators and each indicator has its own parameter and score. If a household has a final score of ≤40 then the household is categorized as a poor household. If the final score is >40 to ≤60 then it is categorized as a poor-prone household and if the final score is <60 then it is categorized as a wealthy household. Household poverty status is categorized as follows:

1. Poor
2. Prone to Poor
(3) Capable
Equation (2.2) the education level variable as indicated by the length of schooling has a positive relationship to the poverty status of the household. This is supported by research which states that education has a positive and significant effect on household poverty (Tang et al., 2022). This is because the level of education can be a provision for the community to access non-agricultural jobs so that their income will be higher (Tilak, 2002). Household members with high levels of education can help other household members to participate in assisting in the form of education or materials (Ryan, 2004). Educational variables are categorized as follows:
(1) Not attending school or not completing elementary school
(2) Graduated from elementary school or not graduated from junior high school
(3) Graduated from junior high school or not graduated from high school
(4) Graduated from high school
(5) Graduated from higher education

In the agricultural sector, the level of the minimum wage earned by workers will be lower than in other sectors. Based on survey results and interviews with Garangan Village officials, the majority of people in Garangan Village work in the agricultural sector. Therefore, in equation (2.2) a relationship can be drawn that work indicated by monthly wages has a positive relationship to household poverty status. This is reinforced by research which states that the main occupation of the head of the household has an important influence on the poverty status of the household, this is because each type of work has different wages (Nofriza, 2022). Work is measured based on the number of wages earned per month and wages the work variables are categorized as follows:
(1) ≤ IDR 600,000/month
(2) > IDR 600,000 up to ≤ IDR 900,000/month
(3) > IDR 900,000 up to ≤ IDR 2,000,000/month
(4) > IDR 2,000,000 up to ≤ IDR 3,000,000/month
(5) > IDR 3,000,000/month

Health is an investment to increase the productivity and quality of human resources. Equation (2.2) at the level of health as indicated by ability where medical treatment has a positive relationship to household poverty. This is reinforced by research which states that poor people who have been affected by a disease and then fall ill will cause them to be unable to pay for treatment and then fall ill, causing them to be unable to pay for treatment (Adhitya et al., 2022). Health is seen where households can carry out treatment and is categorized as follows:
(1) Cannot afford treatment but can afford treatment
(2) Go to the health center for treatment
(3) Seek treatment at the village midwife
(4) Go to a general practitioner/polyclinic/hospital
(5) Go to a specialist doctor

Based on gender, male education was higher than female during the mid-20th century, although the gender education gap has tightened and even reversed in recent decades (Struffolino & Van Winkle, 2021). However, the advantages of women's education do not translate into advantages in the labor market (England et al., 2012). Men have a higher income than women (Chudnovskaya & Kashyap, 2020). So that women have no way out of poverty, men are more likely to find stable and secure jobs while women do not participate in the labor market (Reid & Rubin, 2003). Equation (2.2) on the variable gender of the head of the household has a positive influence on the poverty status of the household. The economic status of women is relatively lower than that of men, this could be due to differences in productivity or wages received. Gender is categorized as follows:
(1) Female
(2) Boy

2.4. Statistical tools and econometric models

The analysis used in this study is ordinal logistic regression analysis using SPSS 21. The purpose of logistic regression analysis is to test whether the probability of occurrence of the dependent variable can be predicted with the independent variables (Ghozali, 2011). Meanwhile, ordinal logistic regression analysis itself is used to analyze the dependent variable whose measurement uses an ordinal scale and consists of two or more categories. This analysis was conducted to see the effect of education, health work, and gender on the poverty level of households in Garangan Village, Wonosamodro District, Boyolali Regency. The ordinal logistic regression model in this study is as follows:

\[ \text{Li} = \ln \left( \frac{P_i}{1 - P_i} \right) = Z_i = \alpha + \beta_1 \text{PND}_1 + \beta_2 \text{PKJ}_2 + \beta_3 \text{KES}_3 + \beta_4 \text{GENDER}_4 + \mu_i \] .................................(2.3)

Information:
- \( Z_i \) = the dependent variable, namely the poverty status of the household, which is a category of poor households, prone to poverty and non-poor
- \( \text{PND} \) = education, which shows how long the head of the household has had formal education
- \( \text{PKJ} \) = work, which shows how much wages the head of the household receives per month
- \( \text{KES} \) = health, which shows how much you can pay for treatment when you are sick
- \( \text{GENDER} \) = gender indicating the sex of the head of the household according to the family card
- \( B \) = regression coefficient
- \( \mu \) = ERRORS
III. RESULTS AND DISCUSSION

3.1. Descriptive statistics

The sample used in the study was 93. The average dependent variable used in the study was a household with a status prone to poverty. The average sample of the education variable used in this study is the head of a household with an elementary and junior high school education level. The average sample of occupational variables is the head of the household with wages > IDR 600,000 to ≤ IDR 2,000,000/month. The average sample for the health variable is a household that chooses to seek treatment at the public health center and village midwife. And the variable sample of the gender of the average household head is male.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Means</th>
<th>std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household Poverty Status</td>
<td>93</td>
<td>1.00</td>
<td>3.00</td>
<td>1.9032</td>
<td>.78109</td>
</tr>
<tr>
<td>Education</td>
<td>93</td>
<td>1.00</td>
<td>5.00</td>
<td>2.3656</td>
<td>1.21391</td>
</tr>
<tr>
<td>Work</td>
<td>93</td>
<td>1.00</td>
<td>5.00</td>
<td>2.8065</td>
<td>1.34535</td>
</tr>
<tr>
<td>Health</td>
<td>93</td>
<td>1.00</td>
<td>5.00</td>
<td>2.5914</td>
<td>.91172</td>
</tr>
<tr>
<td>Gender</td>
<td>93</td>
<td>1.00</td>
<td>2.00</td>
<td>1.8495</td>
<td>.35954</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>93</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: SPSS Processed Data

3.2. Multicollinearity Test

<table>
<thead>
<tr>
<th>Model</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>tolerance</td>
</tr>
<tr>
<td>Intercept</td>
<td>1,111</td>
<td>.270</td>
<td>.342</td>
</tr>
<tr>
<td>Education</td>
<td>3,624</td>
<td>.000</td>
<td>.366</td>
</tr>
<tr>
<td>Work</td>
<td>2,716</td>
<td>.008</td>
<td>.556</td>
</tr>
<tr>
<td>Health</td>
<td>2,981</td>
<td>.004</td>
<td>.820</td>
</tr>
<tr>
<td>Gender</td>
<td>-.017</td>
<td>.986</td>
<td></td>
</tr>
</tbody>
</table>

Source: SPSS Processed Data

The table shows a tolerance value greater than 0.10 and a Variance Inflation Factor (VIF) value less than 10. This means that the model used in this study did not find any symptoms of multicollinearity, so testing can be continued.

3.3. Logistic Regression Analysis

3.3.1. Assessing Model Entire (Overall Model Fit)

The table shows the decrease between \(-2\log \text{likehood}\) at the beginning and \(-2\log \text{likehood}\) at the end. The initial value is 165.857 and the final value is 73.385, which means that adding independent variables to the model can improve model fit.

<table>
<thead>
<tr>
<th>Model</th>
<th>-2 Log Likelihoods</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>165.857</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final</td>
<td>73.385</td>
<td>4</td>
<td>.000</td>
</tr>
</tbody>
</table>

Source: SPSS Processed Data

3.3.2. Wald's test

<table>
<thead>
<tr>
<th>Estimates</th>
<th>std. Error</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Y = 1.00]</td>
<td>5.871</td>
<td>8.22</td>
<td>13,259</td>
<td>1</td>
</tr>
<tr>
<td>[Y = 2.00]</td>
<td>9.813</td>
<td>1.142</td>
<td>26,935</td>
<td>1</td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X1</td>
<td>1.181</td>
<td>.372</td>
<td>10,078</td>
<td>1</td>
</tr>
<tr>
<td>X2</td>
<td>.708</td>
<td>.297</td>
<td>5,678</td>
<td>1</td>
</tr>
<tr>
<td>X3</td>
<td>1.129</td>
<td>.393</td>
<td>8,242</td>
<td>1</td>
</tr>
<tr>
<td>X4</td>
<td>-.055</td>
<td>.776</td>
<td>.005</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: SPSS Processed Data
The variables education (X1), employment (X2), and health (X3) show a significance value of less than 0.05, this means that these variables affect the household poverty status variable. While the gender variable (X4) has a significance value greater than 0.05 so it can be interpreted that the gender variable does not influence the household poverty status variable.

5.1.1. Coefficient of Determination (Nagelkerke R Square)

<table>
<thead>
<tr>
<th>Coefficient of Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cox and Snell</td>
</tr>
<tr>
<td>Nagelkerke</td>
</tr>
<tr>
<td>McFadden</td>
</tr>
</tbody>
</table>

Nagelkerke R Square value is 0.711 which means the dependent variable can be explained by the independent variable of 71.1 percent. While the remaining 28.9 percent is explained by other variables not included in the model. This means that together the variations of the independent variables, namely education, employment and health, can explain the variations in the dependent variable, namely the poverty status of the household by 71.1 percent.

5.1.2. Assessing Regression Model Feasibility

<table>
<thead>
<tr>
<th>Assessing Regression Model Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
</tr>
<tr>
<td>Pearson's</td>
</tr>
<tr>
<td>Deviance</td>
</tr>
</tbody>
</table>

The table shows the results of Hosmer and Lemeshow's Goodness of Fit Test with a significance value of Pearson 0.677 > 0.05 and a significance value of Deviance 0.652 > 0.05. Thus it can be concluded that the model predicts the observed value or the model fits the observational data so that the model in the study can be used.

5.2. Interpretation of Results

Based on the results of ordinal logistic regression Table 4.7, the following model is obtained:

Logit Y(P_1) = 5.871 + 1.181X_1 + 0.708X_2 + 1.129X_3 - 0.055X_4
Logit Y(P_2) = 9.813 + 1.181X_1 + 0.708X_2 + 1.129X_3 - 0.055X_4

Information:
Y : Household poverty status
P_1 : Poor probability
P_2 : Probability of being poor
X1 : Education
X2 : Work
X3 : Health
X4 : Gender of the head of the household

5.2.1. The Influence of Education on Household Poverty Status

After carrying out the regression analysis it is known that the coefficient value of the education variable is equal to 1.181 and a significance value of 0.002 <0.05 is obtained. So it can be interpreted that the education variable has a positive and significant influence on the household poverty status variable. To find out the probability of the education variable, you can use the following equation:

P_1 = \frac{\exp(5.871 + 1.181)}{1 + \exp(5.871 + 1.181)} = \frac{1155167}{1 + 1155167} = 0.1155167
P_2 = \frac{\exp(9.813 + 1.181)}{1 + \exp(9.813 + 1.181)} = \frac{5951597}{1 + 5951597} = 0.95951597

P_2 = 0.95951597 - 0.1155167 = 0.5836

It can be concluded that a 1 percent increase in the education variable can increase the probability of being poor by 1.155167 percent, increasing the probability of being poor. Exp(1.181) is 3.2576, which means that a 1 percent increase in the education variable (X1) will increase the probability of being able to 3.2576. This research is reinforced by other research which states that the education of the head of the household has an important role in determining poverty status (Tran et al., 2022). Higher education levels can reduce the risk of households falling into poverty in South Africa (Megbowon, 2018), Nigeria (Ataguba et al., 2011), and some European countries (Whelan et al., 2014). Education can increase earning potential and increase the work and geographic mobility of the workforce (Teka et al., 2019).
5.2.2. The Effect of Work on Household Poverty Status

After carrying out the regression analysis it is known that the coefficient value of the work variable is 0.708 and a significance value of 0.017 < 0.05 is obtained. So it can be interpreted that the employment variable has a positive and significant influence on the household poverty status variable. To find out the probability of the job variable, you can use the following equation:

\[ P_1 = \frac{\text{Exp}(5.871 + 0.708)}{1 - \text{Exp}(5.871 + 0.708)} = 0.719,8192 \]

\[ P_1 + P_2 = \frac{1}{1 - \text{Exp}(9,813 + 0.708)} = 0.3708619 \]

\[ \text{SoP}_2 = 37086,19 - 719,8192 = 0.03636 \]

It can be concluded that a 1 percent increase in the employment variable can increase the probability of being poor by 719.8192, increasing the probability of being poor by 0.03636%. The exponential (0.708) is 2.0299, which means that an increase in the job variable (X2) will increase the probability of being able to by 2.0299. This is in line with research which states that income has an important force in alleviating poverty (Ma et al., 2023).

5.2.3. The Influence of Health on Household Poverty Status

After carrying out the regression analysis it is known that the coefficient value of the health variable is 1.129 and a significance value of 0.004 < 0.05 is obtained. So it can be interpreted that the health variable has a positive and significant influence on the household poverty status variable. To find out the probability of the health variable, you can use the following equation:

\[ P_1 = \frac{\text{Exp}(5.871 + 1.129)}{1 - \text{Exp}(5.871 + 1.129)} = 1096,633 \]

\[ P_1 + P_2 = \frac{1}{1 - \text{Exp}(9,813 + 1.129)} = 0.56500,23 \]

\[ \text{SoP}_2 = 56500,23 - 1096,633 = 0.0554 \]

It can be concluded that a 1 percent increase in the health variable can increase the probability of being poor by 1096.633, increasing the probability of being poor by 0.0554%. Exponential (1.129) is 3.0926, which means that an increase in the health variable (X3) will increase the probability of being able to by 3.0926. This research is consistent with research that states that the ability to pay for medical expenses has a significant effect on the poverty status of a household. Poor households cannot pay for treatment, whether at the public health center, polyclinic or hospital (Rasyid et al., 2020). When a person is unable to pay for treatment, it will affect the quality of health. Even though the quality of health has a significant influence on labor productivity. Workers who have quality physical health will be more productive than workers who are unhealthy so that they can affect household income and welfare.

5.2.4. The Effect of Gender on Household Poverty Status

After carrying out the regression analysis it is known that the coefficient value of the gender variable is -0.055 and a significance value of 0.943 > 0.05 is obtained. So it can be interpreted that the gender variable does not influence the poverty status of households in Garangan Village. This is inconsistent with research which states that gender influences poverty, female household heads are considered unable to meet the food needs needed to survive compared to male household heads (Teka et al., 2019).

IV. CONCLUSION

Education has a positive and significant relationship with the poverty status of households in Garangan Village. This can be proven by the Wald test which has been carried out with a significance value of 0.001 < 0.05. Occupation has a positive and significant influence on the poverty status of households in Garangan Village. This can be proven by the Wald test which has been carried out with a significance value of 0.017 < 0.05. Health has a positive and significant influence on the poverty status of households in Garangan Village. This can be proven by the Wald test which has been carried out with a significance value of 0.004 < 0.05. Meanwhile, the gender of the head of the family has no effect on poverty status in Garangan Village.

Reference


