Analysis of Women's Poverty in Maluku Province

Jumerti Daud^{1*}, Dwia Aries T Pulubuhu², Hasniati³

^{1,2}Department of Sociology, Faculty of Social and Political Sciences, Hasanuddin University, Makassar, 90245, Indonesia

³Department of Administrative Science, Faculty of Social and Political Sciences, Hasanuddin University, Makassar, 90245, Indonesia

* Corresponding author, email: titin.daud@gmail.com

Abstract

The Sustainable Development Goals (SDGs) aim to end poverty in all its forms everywhere and provide a gender-sensitive policy framework. Limited access to resources causes women to be more vulnerable to poverty and contributes to economic disadvantages, known as the feminization of poverty. Maluku Province is the fourth poorest province in Indonesia by 2022, with a poverty rate of 15.97 percent. The percentage of poor households headed by women is 7.03 percent, an increase of 0.83 percentage points from 2021. This research identifies the relationship between households headed by women and poverty in the Maluku Province. Secondary data were obtained from the National Socioeconomic Survey 2022 by the Central Bureau of Statistics. The sample size included 822 households headed by women. Binary logistic regression analysis was used in this study. The research found that area of residence, number of household members, education level, and employment sector significantly affected women's poverty status in Maluku. Furthermore, women's poverty was higher among rural residents. The findings highlight that the number of household members with family planning programs, better education, and government policies providing assistance for better agriculture can alleviate household poverty.

Keywords: binary logistic regression, female headed households, poverty, women poverty

1. Introduction

The problem of improving the welfare of people to escape the cycle of poverty is a problem for all countries in the world, and every country is trying to realize the goal of comprehensive poverty alleviation in the sense that no human being is positioned below a decent standard of living. The importance of this action is contained in the Sustainable Development Goals, which is to end poverty in all its forms everywhere and a gender-sensitive policy framework for eradicating extreme poverty and building resilience for persons who are vulnerable to poverty, along with empowering women and girls [1], [2].

In 2022, according to the World Bank, Indonesia and China account for more than 85 percent of the poor population regionally. Indonesia ranks as the 73rd poorest country in the world, with 67 million poor people [3]. When viewed by gender in March 2022, the percentage of poor women was 9.68 percent higher than that of poor men at 9.40 percent [4]. The data explain that women contribute to economic disadvantage or the feminization of poverty (Pearce, 1978) [5], and several studies also state that female-

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headed households are more vulnerable to poverty than male-headed households [1], [2], [6]–[9].

Maluku Province in 2022 is the fourth poorest province in Indonesia, with a percentage of 15.97. The percentage of poor households headed by women is 7.03 percent, an increase of 0.83 percentage points from that in 2021 [10]. In addition to the problem of poverty, Maluku also faces challenges and issues in achieving gender equality in terms of education, health, and economy, as illustrated by the Human Development Index (HDI), where women's HDI with a value of 68.65 with moderate status is still lagging behind men's HDI, which has reached a value of 73.66 with high status [11]. The gap in access to health and employment indicates that worsening economic conditions will cause women to be poor [12]–[15].

According to the explanation provided above, women's social and economic status in poverty refers to the concept of feminization of poverty research developed by Pearce (1978)[5], which states that women's poverty is not only identified through personal characteristics but also through the contribution of female-headed households in influencing poverty status.

One way to alleviate poverty is to identify the factors that contribute to poverty. The relationship between the factors that cause poverty can be determined using a statistical approach that involves the relationship between dependent and independent variables using regression. A collection of statistical techniques known as regression analysis describes the relationship between a dependent variable and one or more independent variables (covariates). A logistic regression model is a regression analysis used to evaluate the connection between one or more categorical independent variables and categorical dependent variables. The three types of logistic regression—binary logistic regression (dichotomous), multinomial regression (polytomous), and ordinal logistic regression are defined by the number of categorizations of the dependent variables [16].

In this research, we used a binary logistic regression model to analyze the socioeconomic and demographic factors of female-headed households, such as area of residence, age, number of household members, education level, and employment sector, on the poverty status of female-headed households or women's poverty status in Maluku Province. A binary logistic regression model was used because women's poverty status, the dependent variable, consists of two categories: poor and non-poor.

2. Research Metodology

The object of study in this research is Maluku Province, with a unit of analysis of female-headed households. The poor status of individuals in both measurement and factual terms depends on other individuals in one household, so one household has the same poor status. This concept refers to the definition of households used in the National Socioeconomic Survey (Susenas), where one household is a unit of consumption management. Poor households if the monthly per capita expenditure is less than or equal

to the poverty line in each regency or municipality. Non-poor households have a monthly per capita expenditure above the poverty line in each regency or municipality [10].

This research was primarily based on secondary data. Data were obtained from the National Socioeconomic Survey (Susenas) conducted by the Central Bureau of Statistics (BPS). This research uses the March 2022 Susenas sample for Maluku Province, which comprises 6.130 households in 11 regencies or municipalities. Of the total households, 822 female-headed households belonging to the sample households constituted the unit of analysis. The sample design of the survey was stratified into two stages. The first stage was stratified according to the classification of residential areas (urban-rural), and the second stage was a list of households that had been registered in each selected area and stratified based on the education level of the head of the household.

The model used in this research was a binary logistic regression analysis. Socioeconomic demographic variables, such as area of residence, age, number of household members, education level, and employment sector, were used as independent variables. The official poverty line was used to classify the poor and non-poor in the dependent variable. The poverty line comes from BPS publications. In the logistic regression analysis, the dependent variable assumed 1 for poor households and 0 for non-poor households. The specific form of the logistic regression model is:

$$\pi(x) = \frac{e^{\beta_0 + \beta_1 X_1 + \dots + \beta_j X_j}}{1 + e^{\beta_0 + \beta_1 X_1 + \dots + \beta_j X_j}}$$
(1)

Logit transformation is defined, in terms of $\pi(x)$, as:

$$Y = \ln\left(\frac{\pi(x)}{1 - \pi(x)}\right) = \beta_0 + \beta_1 x_1 + \dots + \beta_j x_j + e$$
 (2)

The regression model formulated based on the categorization of the independent variables to determine their effect on the poverty status of female-headed households is as follows:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_{51} + \beta_5 x_{52} + e$$
 (3)

Where, Y= poverty status (non poor =0; poor=1); β_0 =intercept; β_1 - β_5 = parameter (coefficient) of regression; x_1 = area of residence (urban=0, rural=1); x_2 = number of household members (≤ 4 people=0, > 4 people=1); x_3 = age (Productive (15-64 years) =0, other=1); x_4 = education level (\geq high school =0, < high school=1);); x_5 = employment sector (non-agricultural=0, agricultural=1, not working=2)

The stages of analysis in binary logistic regression are:

a. Goodness of Fit testing using the Hosmer and Lemeshow test.

H₀: Model is fit H_{1:} Model not fit

Hosmer and Lemeshow test statistics:

$$\hat{C} = \sum_{j=1}^{J} \frac{(o_j - n_j \overline{\pi}_j)^2}{n_j \overline{\pi}_j (1 - \overline{\pi}_j)} \sim \chi^2_{(J-2)},$$
(4)

 H_0 rejected if $\hat{C} > \chi^2_{(\alpha,J-2)}$ or p-value $< \alpha, \alpha = 0.05$ or 0.1

b. Simultaneous Testing using Omnimbus test statistics

H₀: $\beta_1 = \beta_2 = \dots = \beta_j = 0$ (There is no effect of the independent variable on the dependent variable)

 H_1 : At least there is one $\beta_j \neq 0$ (At least there is one independent variable that affects the dependent variable); j=1,2,3,...,j

Omnibus test statistics:

$$G = -2 \ln \frac{L_0}{L_1} = -2 \left[\ln(L_0) - \ln(L_1) - \right] \sim \chi^2_{(j)}$$

$$H_0 \text{ rejected if } G > \chi^2_{(\alpha,j)} \text{ or p-value} < \alpha \text{ , } \alpha = 0.05 \text{ or } 0.1$$
(5)

c. Partial Test using Wald's test statistics

H₀: $\beta_j = 0$ (There is no influence between the jth independent variable on the dependent variable)

 H_1 : $\beta_j \neq 0$ (There is an effect of the jth independent variable on the dependent variable); j=1,2,3,...,j

Wald's test statistics:

$$W = \left(\frac{\widehat{\beta}_{j}}{\operatorname{Se}(\widehat{\beta}_{j})}\right)^{2} \sim \chi^{2}_{(j)}$$

$$H_{0} \text{ rejected if } W > \chi^{2}_{(\alpha,1)} \text{ or p-value} < \alpha \text{ , } \alpha = 0.05 \text{ or } 0.1$$

$$(6)$$

d. Binary logistic regression model interpretation (Odds Ratio)

Odds can be interpreted as the ratio between the probability of success and the probability of failure. Odds ratio is used for parameter interpretation and is denoted by OR. The odds equation formed when x = 1 is $\frac{\pi(1)}{1-\pi(1)}$, while when x = 0 is $\frac{\pi(0)}{1-\pi(0)}$, so the odds ratio equation is as follows:

$$OR = \frac{\frac{\pi(1)}{1 - \pi(1)}}{\frac{\pi(0)}{1 - \pi(0)}}$$
(7)

3. Results and Discussion

3.1 Descriptive Analysis

The Poor female-headed households if the monthly per capita expenditure is less than or equal to the poverty line in each regency/municipality. Non-poor female-headed households have monthly per capita expenditures greater than the poverty line in each regency or municipality. Table 1 shows this study's poverty line by regency/municipality. Buru Selatan Regency had the highest poverty line in the Maluku Province, but Kepulauan Aru Regency had the highest female-headed households with poor status.

Table 1. Poverty Line of Poor People by Regency/Municipality in Maluku Province, 2022

Regency/Municipality	Poverty Line (rupiah/capital/month)*	Poor Female- Headed Households (%)**		
(1)	(2)	(3)		
Kepulauan Tanimbar	546.300	4,69		
Maluku Tenggara	595.041	8,33		
Maluku Tengah	542.782	13,27		
Buru	530.858	5,80		
Kepulauan Aru	562.416	19,12		
Seram Bagian Barat	449.297	12,28		
Seram Bagian Timur	421.902	11,27		
Maluku Barat Daya	586.021	14,55		
Buru Selatan	677.044	2,82		
Ambon	661.016	0,75		
Tual	640.542	16,09		

Source: *BPS-Statistics Indonesia, ** Calculated using data from Susenas 2022

Calculated results of the poverty status of female-headed households in Maluku Province in 2022 show a difference in the number of poor and non-poor female-headed households. In Figure 1, it can be seen that the number of female-headed households with poor status is 9.30 per cent. In comparison, the number of female-headed households with non-poor status is 90.70 per cent, which is 9.8 times greater than those with poor status.

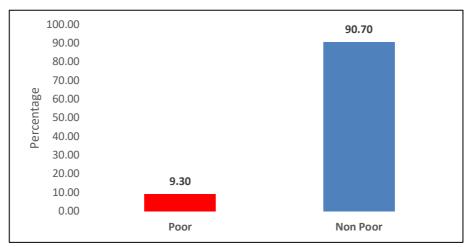


Figure 1. Percentage of Female Headed Households by Poverty Status

The characteristics of female-headed households in Maluku Province in 2022 by independent variables (area of residence, number of people in the household, age, education level, and employment sector) are in Table 2. Female-headed households in Maluku Province in 2022 who are classified as poor have the characteristics of residing in rural areas; the number of household members is more than four; the age of the head of household ranges from 15–64 years, with below-high school education; and working in the agricultural sector.

Table 2. Percentage of Female-Headed Housholds by Socio-economic and Demographic Characteristics in Maluku Province by 2022

Variable	Category	FHH by Poverty Status (%)		
	- 1	Non-Poor	Poor	
1	2	3	4	
Area of residence	Urban	94.72	5.28	
	Rural	87.93	12.07	
Number of household members	<= 4 people	96.32	3.68	
	> 4 people	68.18	31.82	
Age	Produktive (15-64 years)	89.72	10.28	
	Non-Produktive	93.48	6.52	
Education level	≥ High school	95.96	4.04	
	< High school	88.36	11.64	
Employment sector	Working in the non-agricultural	92.82	7.18	
	Working in the agricultural	84.77	15.23	
	Not Working	93.64	6.36	

3.2 Logistic Regression Analysis

Based on the test results, the logistic regression model formed is as follows:

$$\ln\left(\frac{\pi(1)}{1-\pi(1)}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_{51} + \beta_5 X_{52}$$
(8)

If the coefficient value of the regression result is entered, then:

$$\ln\left(\frac{\pi(1)}{1-\pi(1)}\right) = -4.458^* + 0.536X_1^{**} + 2.537X_2^* - 0.412X_3 + 0.867X_4^* + 0.673X_{51}^* - 0.064X_{52}$$

$$(9)$$

Where: *= Significant at α =5%, **= Significant at α =10%

Goodness of Fit test and Simultaneous Test

Table 3. Goodness of Fit Test and Likelihood Ratio Test (Simultaneous Test)

Test	Chi-square	Df	Sig.	
Hosmer and Lemeshow test	8.050	8	0.429	
Omnibus Test	130.956	6	0.000	

The goodness-of-fit test was conducted to ensure that the model used in the study was appropriate for explaining the factors affecting the poverty status of female-headed households, which can be seen from the Hosmer and Lemeshow Test value. Based on Table 3, the p-value of the Hosmer and Lemeshow Test is 0.429, so with a significance level of 10 percent (0.429>0.1), there is not enough evidence to reject H₀, it can be said that with a 90 percent confidence level, the model formed is appropriate in explaining the effect of independent variables on the poverty status of female-headed households in Maluku Province in 2022.

Furthermore, a simultaneous test with the G test was used to determine whether the model could be analyzed further. Based on the output of the likelihood ratio test (Omnibus Test) in Table 3, the value of the G-test statistic is 130.956, with a p-value of 0.000, which is smaller than the 0.10 significance level. Thus, with a significance level of 10 percent, there is sufficient evidence to reject H₀, meaning that at least one jth independent variable will affect the poverty status of female-headed households in Maluku Province in 2022. The results of this study indicate that all socioeconomic demographic variables (type of residence, number of household members, age, education level, and employment sector) jointly influence the poverty status of female-headed households in Maluku Province in 2022.

Partial Wald Test

A partial Wald test was used to observe the effect of independent variables individually (Table 4). Independent variables are said to have a partially significant effect on the poverty status of female-headed households in Maluku Province in 2022 if they

have a Wald test statistical value greater than $\chi^2_{(0,1,1)}$ =2.71 or p-value smaller than 0.1. As shown in Table 4, the variables area of residence, number of household members, education level, and and female-headed households working in the agricultural sector significantly influenced the poverty status of female-headed households. Meanwhile, the Age of female-headed households and female-headed households not working has a p-value greater than 10 percent, which means they fail to reject H₀. It can be concluded that the variables Age of female-headed households and non-working female-headed households do not have a significant relationship with the poverty of female-headed households in Maluku by 2022.

Table 4. Wald's test statictics and variable significance value

Variable	Category	β	Wald	Sig.	Exp(β)
Area of residence	Rural	0.536	2.890	0.089	1.708
Number of household members	>= 4 People	2.537	89.526	0.000	12.638
Age	Non Produktive	-0.412	1.513	0.219	0.662
Education Level	< High school	0.867	5.364	0.021	2.380
Employment sector	Working in the non-agricultural	0.673	4.288	0.038	0.510
	Non-working	-0.064	0.029	0.865	0.938
Constant		-4.458	115.812	0.000	0.012

Odds Ratio

a. Area of Residence

Most female-headed households who were poor lived in rural areas (12.07%) compared to those in urban areas. Table 4 shows that the odds ratio value of the type of residence variable is 1.708. Female-headed households in rural areas tended to be poor, at 1.708 times those in urban areas. It shows that female-headed households in rural areas tend to be poorer than those in urban areas. This study aligns with Todaro (2011)[12], who stated that one-third of the people experiencing poverty come from people living in rural areas [12]. The households in rural areas have a poorer status than those in urban areas. Unequal access to existing resources by all residents has led to many poor people in rural areas [15], [17]–[21]. This study confirms that the geographical dimension approach affects poverty. Geographical position determines the development and decline of society. Areas with characteristics like rural or remote areas are geographically associated with poverty[17], [22]–[25].

b. Number of household members

According to the number of household members, most female-headed households with poor status (31.82%) have more than four household members. Female-headed households with more than four household members tend to be poor 12.638 times

compared to female-headed households with less and equal than four. It means that the greater the number of household members, the tendency of female-headed households to be poor increases. It happens because the large number of household members causes a significant expenditure for living costs that must met. If it is not accompanied by additional income, it will not fulfil daily needs, which will cause the household to be poor [18]–[20], [26]–[28].

c. Education Level

Most poor female-headed households have below high school education, 11.64 percent. The tendency of female-headed households with a below-high school education to be poor is 2.380 times that of those with an above-high school education. This result provides empirical evidence that the higher the education taken, the lower the chance of poor female-headed households. Education is a factor that affects poverty because education will improve the quality and potential of society. High education can increase productivity and can influence mindset in decision-making in choosing the type of work to improve the welfare of the family [19], [20], [26], [27], [29], [30]. In addition, the education of the head of the household has proven to play an essential role in making decisions about children's education; the higher the education of the head of the household, the more they will understand the urgency of education so that efforts to send their children to a higher level will be maximized [31], [32].

d. Employment Sector

Employment status plays a role in meeting household needs and is reflected in the work sector. The results showed that the percentage of female-headed households who work in the agricultural sector is 15.23 percent greater than that of female-headed households who work in the non-agricultural sector and do not work. The tendency of female-headed households that work in the agricultural sector is 0.510 times that of those that work in the non-agricultural sector. Household heads working in the agricultural sector tend to experience poverty more than those working in the nonagricultural sector [17], [27]-[29], [33]. FAO (2019) states that in Indonesia, the agricultural sector is cultivated mainly by family units, and women are often involved in agricultural activities [34]. However, their involvement is often considered an unpaid family contribution, and the agricultural sector provides high employment opportunities for women but with low average wages compared to other sectors [35], [36]. Geertz (1963) stated that poverty in the agricultural sector has been going on for a long time since the introduction of forced cultivation in 1830, namely, taxes on farmers. The poverty rate in the agricultural sector is a buffer for unemployment. Most people in the community live as farmers because of their low education levels and reasons for protection against unemployment. Some people work in the agricultural sector even with minimal time and capacity. Consequently, farmers' incomes cannot meet their daily needs [17], [37].

4. Conclusions

The research and discussion's findings conclude that the characteristics of female-headed households directly affect women's poverty in the Maluku Province. Female-headed households in Maluku Province in 2022, classified as poor, have the characteristics of living in rural areas, the number of household members is more than four people, the age of the head of household ranges from 15-64 years, has below high school education, and works in the agricultural sector. The results showed that the area of residence, number of household members, education level, and employment sector significantly affected women's poverty status in Maluku. Meanwhile, the age of female-headed households did not affect women's poverty in Maluku Province.

The main focus of attention on poverty reduction efforts to break the poverty chain in Maluku Province is to improve the individual characteristics of female-headed households. The findings highlight that the number of household members is the primary determinant significantly influencing Maluku's poverty. Therefore, population control through family planning programs needs to be encouraged and increased again to reduce population growth, and socialization to the broader community regarding the need for mental, physical, and economic readiness before marriage is an essential factor in forming a better and prosperous household. In addition, the government's role in providing and improving the quality of facilities and infrastructure and instilling awareness of the importance of better education and skills are essential factors in breaking the chain of poverty in Maluku Province. In addition, as the number of poor household heads live more in rural areas and work in the agricultural sector, the government's role is needed to ensure equal facilities and infrastructure between rural and urban areas, especially considering the geographical area of Maluku, which is an archipelago, as well as ensuring equality in wages, and the provision of more sophisticated agricultural tools and knowledge and skills in agriculture to increase agricultural productivity.

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