

In Depth Poverty Analysis in East Java From a Multidimensional Perspective

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ABSTRACT

The purpose of this study was to determine the effect of socioeconomic characteristics household on household poverty status with a multidimensional approach in each of the Regional Bakorwil East Java. Not everyone can convert their income for a better life, so measuring poverty only using income is not enough to explain the deprivation experienced by the poor. Using Susenas March 2018 and Podes 2018 East Java, this study found that there are different socio-economic characteristics in each region Bakorwil. Education is still the key to avoiding poverty. Access to credit services and household income has a strong influence on multidimensional poverty status in all Bakorwil areas. The quality of village main roads is an important issue in all regions except in Bakorwil 3, while access to health services such as puskesmas only affects the lives of the poor in Bakorwil 4 Madura. The government can create a poverty alleviation program such as providing low-cost education to a minimum of high school level, providing business credit assistance especially for the poor, special assistance programs for families with disabilities, and building road infrastructure in villages and bringing modern health services closer to the community.

Keywords: *Multidimensional Poverty, Logistic Regression, Susenas, Podes, AF Methods*

1. INTRODUCTION

Poverty is still the biggest challenge faced by countries in the world, especially the problem of poverty in developing countries. Therefore, countries in the world have agreed on a document called Sustainable Development Goals (SDGs) which contains the aim of eradicating poverty anywhere and in any form.

To realize these goals, commitment from the government with aid programs for poverty alleviation is needed. Until now, the government directs poverty alleviation programs using a monetary perspective, meaning that a person is categorized as poor if his income or expenditure is less than the specified value. But the fact is the poverty is multidimensional, not just a matter of income or expenditure [1]. Some cases are still found by someone or household that actually has a decent income but the living conditions are still relatively poor when viewed from a multidimensional perspective, for example: someone who has a high income but his house is still ground floor. This will clearly affect the health of its inhabitants. Thus a multidimensional measurement of poverty is needed to complement monetary measurement of poverty.

In practical terms, multidimensional poverty measurement can help the government in creating poverty alleviation programs in accordance with the deprivation experienced by poor people in an area. Multidimensional measurement of poverty provides concrete directions to help the poor get out of their poverty.

There have been many studies that have examined poverty, but still very rarely research on poverty using a multidimensional perspective. Several studies have been conducted regarding the factors that influence multidimensional poverty, where one of the factors is the influence of household socioeconomic characteristics. The factors of socioeconomic characteristics of households that affect poverty basically do not differ in poverty with different concepts, in this case in monetary poverty and multidimensional poverty [2].

East Java Province covers 38 districts / cities where in 2018 was the Province with the largest number of poor people in Indonesia in absolute terms, amounting to 4,332,590 people (BPS). Pockets of poverty are still around the island of Madura and other horseshoe areas. To support the successful implementation of development programs, especially those related to poverty reduction in East Java Province, a research that is not only using monetary poverty analysis is needed but also using multidimensional poverty analysis methods. The purpose of this study is to look at the influence of household socioeconomic characteristics on household poverty status in a multidimensional manner in each different region. The area in this study is the area of the Regional Coordinating Board (Bakorwil) of East Java Province which is divided into 5 regions (Perda Number 16 Year 2016). Analyzing poverty in each Bakorwil will get different poverty models and different poverty alleviation solutions.

Table 1. Dimension, Indicator, Cut off Deprivation and Weighting in Multidimensional Poverty Measurements

Dimensi	Indikator	Cut off deprivasi atau Rumah tangga terdeprivasi jika...	Weight
Nutrition (1/3)	Calories	Household calories consumption less than 70 percent of AKG (2013)	1/6
	Protein	Household protein consumption less than 80 percent of AKG (2013)	1/6
Education (1/3)	Length of Studying at School	There is no family member who have completed 9 years of education (Secondary School in Minimum)	1/6
	School Participation	There are school-aged children (7-15) who have do not study at school	1/6
Life Standard (1/3)	Improve Water	Does not have access to feasible/improve water	1/18
	Improve Sanitation	Does not have access to improve sanitation	1/18
	Electricity	Does not use electricity	1/18
	Floor Condition	Live in dirt or sand floor	1/18
	Fuel	Uses wood or charcoal as fuel	1/18
	Assets	Does not have car or motorboat and does not have more than one of the following asset, such as motorcycle, cycle, boat, cable television, AC, water heater, 12 kg gay cylinders or more, refrigerator and telephone.	1/18

Source: Alkire Foster Methods, modified.

2. RESEARCH METHODOLOGY

This study uses secondary data from 29,780 household units from the March 2018 National Social Economic Survey (Susenas) East Java, which is used to measure multidimensional poverty. This study also combines (merge data) between the Susenas March 2018 raw data with the 2018 Potential Village Survey (Podes) raw data in East Java.

This study uses a multidimensional poverty measurement approach. Multidimensional poverty measurement refers to the Alkire-Foster Method (AF Methods) with several modifications [3]. Based on this AF Method, a household is defined poor if it experiences poverty deprivation more than equal to 0.33 or 33.33%. The steps for measuring multidimensional poverty are as follows:

Choosing analysis unit. The analysis unit is household.

Choosing poverty dimension

Choosing the indicator from each dimension

Determining cut off deprivation of each indicator

Determining the weight (w_i) of each dimension and indicator.

Calculating deprivation score ($\sum C_i$) experienced by a household

$$\sum C_i = w_i I_1 + w_i I_2 + w_i I_3 + \dots + w_d I_d$$

where $I_1 = 1$ if a household is deprived at indicator of i and $I_1 = 0$ if a household is not deprived at indicator of i .

Determining the poor and not-poor household using total deprivation score. A household is multidimensional poor if the total deprivation score ($\sum C_i$) is more than or equal to 0.33. However, if the score is less than 0.33, then it is defines as not poor and its deprivation score is change by zero (deprivation censor). If a household is deprived in all indicators, then $\sum C_i = 1$, if a household is not deprived in all indicators, then $\sum C_i = 0$.

After obtaining a multidimensional poor status in each household, an analysis of the effect of household socioeconomic characteristics on the poverty status is then performed using the logistic regression method. This logistic regression method is applied in each region of Bakorwil, so as many as 5 logistic regression models will be produced. The dependent variable in this study is multidimensional poor households ($Y = 1$) and non-multidimensionally poor households ($Y = 0$). While the independent variables consist of per capita expenditure, households with disabilities member, household head education, regional topography, access to credit services, village main road conditions, natural disasters frequency in residential areas, and distance to puskesmas with hospitalization. The equation of the logistic regression function is as follows:

$$Y = \text{Ln} \left(\frac{P_i}{1-P_i} \right)$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10}$$

Where,

Y = Household poverty status (multidimensional poor=1, non-multidimensionally poor=0)

X_1 = quintile per capita expenditure (quintil 1 lowest until quintil 5 highest)

X_2 = family with disability (yes=1, no=0)

X_3 = elementary school (yes=1, others=0)

X_4 = secondary and senior high school (yes=1, others=0)

X_5 = University (yes=1, others=0)

X_6 = topography (slope / peak / valley =1, flat land=0)

X_7 = credit access (yes=1, no=0)

X_8 = main village road (asphalt=1, other=0)

X_9 = frequency of natural disaster in 2017 (numerik)

X_{10} = distance to puskesmas with hospitalization (numerik)

Table 2. Results of Logistic Regression Multidimensional Poverty Analysis with Coefficients.

No	Variabel	Logistic Regression Model for Each Bakorwil				
		1	2	3	4	5
		<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>
1	Quintile expenditure	-0,553***	-0,529***	-0,619***	-0,489***	-0,495***
2	Family with disability	0,419***	0,379***	0,373***	-0,083	-0,009
3	Household head education (base: never schooling)					
	- elementary	-0,473***	-0,540***	-0,344***	-0,669***	-0,743***
	- secondary or high school	-1,252***	-1,111***	-0,791***	-1,135***	-2,019***
	- University	-1,232***	-0,648***	-0,724***	-1,043***	-2,602***
7	Topography (peak/slope/valley) base=flat land	0,810***	0,596***	0,415***	0,396**	0,476***
8	Credit access	-0,258***	-0,186**	-0,255***	-0,762***	-0,372***
9	Main village road	-0,552***	-0,265**	-0,007	-0,352**	-0,742***
10	Frequency of Natural Disaster	0,035**	0,014	0,036	-0,043	0,021
11	Distance to Puskesmas with hospitalization	-0,004	0,011	0,009	0,019**	0,003
12	Const.	1,018***	0,283***	0,493**	1,081***	1,713***
Pseudo R Square		0,178	0,128	0,148	0,136	0,190
Numbers of Observation		7317	6288	7196	3117	5862
LR Chi2 (10)		1276,73	629,69	968,71	490,08	1253,91
Prob>Chi2		0,000	0,000	0,000	0,000	0,000

Note: *, **, *** → statistically significant at level 10%, 5%, 1%.

3. RESULT

3.1. Descriptive Research Data

Table 3. Descriptive Sample Data

Variabel	N	%	Poor
Quintile expenditure			
Q5	7133	23,95	489
Q4	6273	21,06	757
Q3	5828	19,57	905
Q2	5365	18,02	1187
Q1	5181	17,40	2408
Family with disability			
Yes	2844	9,55	828
No	26936	90,45	4918
Household Head Education			
Never Schooling	8705	29,23	2868
Elementary School	8972	30,13	1878
Secondary or High School	10029	33,68	881
University	2074	6,96	119
Topography			
Slope / peak / valley	3032	10,18	1021
Flat land	26748	89,82	4725
Credit access			
Yes	9600	32,34	1297
No	20180	67,76	4449
Main road village			
Aspal	28304	95,04	5318
No	1476	4,96	428
Frequency of Natural Disaster		0,65 (mean)	
Distance to Puskesmas		4,33 (mean)	

Sources: Processed by Susenas Maret 2018 dan Podes 2018.

Table 3 presents the distribution of sample data in this study. Table 3 above shows that multidimensional poverty occurs more in quintile 1 and quintil 2 expenditure groups. However, it does not rule out that in multidimensional poverty it also occurs in quintile 4 and quintil 5 household expenditure classes. This shows that not all people high-income can convert well to maximize utility in his life. Multidimensional poverty occurs in many households where the head of his family only has elementary school education and below. Households living in the peak / slope / valley areas in East Java have a small percentage, however, almost half are classified as multidimensional poor household. One third of the total sample in this study were recipients of financial services in the form of credit.

3.2. Logistic Regression Analysis Results

After processing the data using the logistic regression method in each Bakorwil region, the estimated coefficients and their significance are obtained in Table 2 above. There are 5 logit regression equation models, namely Bakorwil 1 multidimensional poverty logistic regression model, Bakorwil 2 multidimensional poverty logistic regression model, Bakorwil 3 multidimensional poverty logistic regression model, Bakorwil 4 multidimensional poverty logistic regression model and Bakorwil 5 multidimensional poverty logistic regression model. The parameter estimation in tihis study use coefficients. Quintile expenditure per capita has a strong and negative relationship between household poverty status. The lower the class of expenditure per capita in a household, the opportunity to experience poverty is also greater, and vice versa [4]. This means that the tendency to experience

multidimensional poverty is higher in the quintile 1 and quintile 2 expenditure groups, but it does not rule out the possibility that in high expenditure classes will experience multidimensional poverty because the ways of converting income for each household are not the same. This result occurred in all Bakorwil regions.

Family with disability variables have a significant and positive effect on multidimensional poverty status. Someone who has functional impairments in vision, hearing, walking, moving, emotions, remembering, speaking, taking care of themselves have bad prospects in terms of education and work [5]. Thus households where there are members of households with disabilities will be more likely to experience poverty in a multidimensional manner. In addition, with the presence of household members with disabilities, existing income resources will be prioritized for maintenance and recovery spending, thereby shifting the budget to other more useful needs. However, this variable is not significant in all regions, but only influences the regions of Bakorwil 1, Bakorwil 2 and Bakorwil 3.

Variable Household Head Education has a very strong and negative influence on the multidimensional poverty status of the household. Household Head with tertiary education have the least tendency to experience poverty compared to Household Head who have lower levels of education. The education variable has strong influence in all regions. Increasing one's capacity through education will open up broad opportunities to have a decent job or business. So it can be said that education is a key factor to avoid multidimensional poverty [6].

Fortunately for households that live in the plain area, not on the top / slope of a mountain or valley. From the results of this study, households that live in the peak / mountain slope and valley areas will be more likely to experience poverty in a multidimensional manner. The peak / slopes of mountains and valleys are areas that are relatively more difficult in terms of access to basic services to the community compared to access to the plain areas [7]. The government is constrained in carrying out development in areas that are classified as difficult and remote not only because it requires a large budget but also difficulty reaching the region because of its isolation. Regional isolation is one that affects the high poverty rate in an area [8]. This variable affects all regions Bakorwil in East Java. A household obtains access to financial services in the form of credit is defined if one of the household members has access to credit from both formal and informal institutions during the past year. This variable has a strong and negative effect on the multidimensional poverty status of households. This means that if the household gets access to credit in the past year, then the opportunity to experience poverty is small. The credit funds obtained can be used for productive ventures, so that the poor can participate in economic activities [9]. This result also disputes that access to credit will only affect monetary poverty only but does not affect multidimensional poverty [6]. The effect of access to credit applies to all Bakorwil areas in East Java, so that poverty alleviation program recommendations can be applied in all region.

The Coefficient of village main road conditions has a negative direction and significantly influences the household's multidimensional poverty status. Good quality road (asphalt / concrete) also reduces the opportunity for households to experience multidimensional poverty. Road construction will bring easy access to basic services such as education and health [10]. The good condition of village roads will reduce travel time and reduce transportation costs, making it easier to get investments and facilitate the mobilization of goods / people in the region and vice versa [11]. This road infrastructure issue affects all Bakorwil areas in East Java except in the Bakorwil 3. Bakorwil 3 is a region of major cities in East Java such as Surabaya, Batu, Malang and Sidoarjo which most likely have no problems with the asphalt road issue.

The natural disaster variable has a strong and positive influence on the multidimensional poverty status in the Bakorwil 1 area only, but it is not significant in other Bakorwil. Natural disasters will worsen a person's welfare condition where previously not poor can become poor and who was already poor will make poverty worse [12]. Interestingly, this variable only significantly influences the multidimensional poverty model in the Bakorwil 1 region only. Natural disasters affect the status of household poverty even though the opportunities are not as big as other variables that both affect household poverty [13]. When a disaster occurs, it will cause students to not be able to go to school, not be able to work for adults and restore the psychological condition of the community to rise after natural disasters is very difficult.

The variable distance to the Puskesmas with hospitalization is significant and has a positive direction on the multidimensional poverty status of households. But the concern is that this variable only has a significant effect in the Bakorwil 4 region, namely the Madura region. The further distance to a health center that has relatively modern facilities will contribute to the high opportunity for households experiencing multidimensional poverty [14]. Long distances to adequate health facilities in the area of residence will shift existing resources for other productive things for health costs. With difficult access to health, households in rural areas may make the decision to seek treatment in an undesirable or unusual place such as going to a non-medical person (shaman) who is closer to their place of residence so that this will worsen the health and poverty situation. .

4. CONCLUSION AND POLICY IMPLICATION

The results of this study indicate that each region has different characteristics of poverty. So that policy making related to poverty alleviation programs also cannot be considered the same. In the Bakorwil 1 area, all variables of household socioeconomic characteristics influence multidimensional poverty status except the distance to the health center with hospitalization. Whereas in the Bakorwil 2 area, only the variable frequency of natural disasters and

the distance to the puskesmas did not have a significant effect. Then in the Bakorwil 3 region, all independent variables are significant except for the village main road conditions, the frequency of natural disasters and the distance to the puskesmas. In the Bakorwil 4 region, all variables have a significant effect except for natural disasters and families with disabilities. In the Bakorwil 5 area all independent variables significantly influence household poverty status except the family with disability variable, the frequency of natural disasters and the distance to the puskesmas with hospitalization.

Not all people with low education experience poverty, but almost all people who experience poverty have low education. The government can help provide cheap and quality educational opportunities to a minimum of high school level. This research also confirms that credit assistance to the poor is a policy that will have an impact on improving their welfare so that the government can provide more productive credit assistance to the community through formal institutions. Asphalt road infrastructure development will also increase the opening of new jobs in residential areas and this is the most concrete way to improve the welfare of the community. Infrastructure development and closer government services in remote areas can be done as an effort so that the community does not pay a lot of costs when they want to meet their needs. In the Bakorwil 1 region it is necessary to pay attention to natural disaster factors, so that the local government can work together with the community to prepare for natural disaster mitigation so as to minimize the risks posed by natural disasters. Specifically for Bakorwil 4 Madura, the government is expected to be able to improve the quality of existing puskesmas from regular puskesmas to puskesmas that can serve inpatients. Households with disabilities also need attention from the government, especially in the Bakorwil 1, 2, and 3. The government can help them with special assistance to families with disabilities to ease the burden of their lives. The last suggestion, it would be nice if the Indonesian government began to use multidimensional poverty measurement as official release poverty rate to complete the analysis of monetary poverty.

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