

The Influence of Geographical Factors On Poverty Alleviation Program

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Abstract— Poverty is one of the problems that must be tackled by integrating all stakeholders. However, criticism also emerged against poverty alleviation programs that have been implemented by the government. This is due to the lack of proper approach used, which tends to use economic approach only and ignores geographical factors. Therefore, this research aims to analyze the influence of geographical factors to the achievement of poverty alleviation program.

In this research, analysis of the influence of geographical factors is processed by multiple regression analysis model that utilizes statistical software. The results of this study indicate that geographical factors have influence on the achievements of poverty alleviation program in the three research areas. These achievements are influenced by different geographical conditions in each region, namely elevation, slope, distance to the sub-district center, and the extent of village.

Keywords: poverty alleviation, geographical factors, multiple regression analysis

I. INTRODUCTION

The problem of poverty is often associated with spatial elements. The results of SMERU (2008) in mapping poverty in Indonesia show that poverty has a pattern that tends to concentrate in certain areas. The differences of natural, economic, social, and population characteristics in each location will create different poverty problems. Maipita (2014) explains that in understanding the problem of poverty, it is necessary to observe where the location of the poor group do their activities and carry out their daily life. Bradshaw (2006) also states that geographical aspect is one of the factors causing poverty.

Trenggalek is one of the regencies in East Java Province that has poverty rate above the provincial and national averages. Data from the Central Bureau of Statistics show that in 2015, the average poverty rate in Trenggalek Regency is 13.37%. As for the average poverty level in East Java Province is 12.28% and the national rate is 11.13%. Poverty problem in Trenggalek Regency spreads in almost of sub-districts. However, if grouped according to the number of poor people in every sub-district, the highest percentage of poverty is found in sub-districts located in hilly areas, then coastal areas are in second position, and lowland areas are in the third position.

The relatively high level of poverty has prompted the government to implement poverty alleviation program as an effort to resolve this problem. This program has been started since 2008 and has been implemented in almost of sub-districts in Trenggalek Regency. However, many experts criticize the implementation of such poverty alleviation programs. This is because of the approach used by the government in tackling poverty problem tends to use economic approach and often ignores the context of the location where the people live. As the criticism from Kusnadi (2003) that the community will be the victims of the less precise approach used in implementing development programs, which the program is only short-term projects. Furthermore, Kusnadi views that it is also important to consider socio-cultural conditions, resource characteristics, and geographical conditions. Bradshaw (2006) states that one of the factors affecting poverty is due to geographic disparities that lead to the concentration of growth in a particular region and cause poverty problems in other areas.

So far, many studies have proved that geographical factors have influence on the poverty phenomenon. However, the research on the linkage between geographical conditions and the achievement of poverty alleviation programs is still needed to prove. Therefore, this study aims to analyze the influence of geographical factors to the achievement of poverty alleviation programs.

II. LITERATURE REVIEW

Barrientos (2010) defines poverty as a condition when individuals or households are in lack of prosperity. Sudarwati (2009) describes that poverty is a condition when people are unable to fulfill their basic needs, such as clothing, food, and houses due to the limited access to meet their basic needs and live their normal lives.

Until now, it is not easy to determine the minimum standards

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of basic needs for each individual. This is due to its flexibility, influenced by certain factors of space, time, and point of view. The standard of poverty in the past may be different from the standard of poverty in the present. Similarly, the standard of poverty that occurs in developed countries is certainly different from the standard of poverty in developing and underdeveloped countries.

Discussion about the theory of poverty geography is needed in order to understand further the causes of poverty in terms of geographical aspects. Robinson (1979) defines economic geography as a science that discusses human ways to survive in terms of spatial aspects, related to the exploration of the earth's natural resources, the production of commodities (raw materials, foodstuffs, and factory goods) then transportation, distribution and consumption. Regarding to the aspects of economic geography study, poverty problems are often associated with spatial elements. Poverty is seen as the impact of the pattern and use of spaces that are unevenly distributed.

Regarding to understand the poverty problem in general, it is important to look at the location where the poor live and in what sector these groups carry out their daily life. The poor who live in coastal areas and agricultural areas will certainly have different perspectives in viewing poverty. Therefore, the understanding of each perspective is very important to be studied in relation to poverty alleviation efforts.

According to Chen, et al (2015) poverty that occurs in rural areas is usually caused by many factors, such as undeveloped economies, weak institutions and policies. In addition, natural conditions also become one of the main factors that cause poverty in rural areas. The case in rural China, the factors affecting poverty in terms of geographical or spatial conditions include: 1) distance to the water resources / rivers; 2) distance to the nearest city center; 3) accessibility / transportation; 4) topographic conditions (slope and altitude of a place); and 5) land resources.

Not much different from the research that has been done by Chen, et al., research conducted by Epprecht et al. (2008) also showed the similar results. Research conducted in Laos country is linking between conditions with the severity of poverty. Based on the results of poverty mapping can be concluded that the higher the elevation of a region, the higher the level of poverty. In addition, the higher the slope of a region, the higher the poverty level. Furthermore, Eprecht et al. also showed that high poverty rates tend to be in location far from the main road.

So far, many studies have proven that the geographical factors have influence on the phenomenon of poverty. However, it still needs to analyze the relationship between the geographic conditions and poverty alleviation programs. Therefore, research related to the proof of whether the factors can affect a poverty alleviation program is needed in the framework of the completion of other theories or findings. Furthermore, these findings will ultimately be able to support the improvement of poverty alleviation programs which are still not optimal.

III. RESEARCH METHOD

Research on the influence of geographical factors on the achievement of poverty alleviation program made use of goal-oriented approach (Goal Oriented Approach). For the first, this research assessed the achievements of poverty alleviation programs. After the achievement of the program has been counted, then it was tested the geographical factors that influenced the achievement through the use of multiple regression analysis.

This research was conducted in three sub-district locations in Trenggalek Regency, East Java Province, representing each desired topographic condition. Dongko sub-district as a representation of hilly areas, Durenan sub-district as a representation of lowland areas, and Watulimo sub-district as a representation of coastal areas.

In this study, the required data consisted of two types, namely primary data and secondary data. Primary data were obtained and found directly from data sources in the field. While the secondary data were obtained from the publications that come from the agencies. This secondary data were used to support the findings from the primary data.

The primary data needed to measure the achievement of the poverty alleviation program include the conditions of infrastructure, the usefulness of facilities, accessibility, increased participation, the ease of conveying aspirations, the ease of accessing capital, the improvement of skills, the improvement of education, and the improvement of health. While the secondary data required were the elevation data, the distance of the village from the sub-district agencies, slope, and the extent of the village.

The data collection technique used for primary data needs was done through questionnaire distribution. The questionnaire used in this study had closed question type, which the respondents only chose one of three answer options that have been provided by the researcher. Each answer had levels from low, medium, to high. The answers of the questionnaire were then converted into the form of numbers, which for the low level = 1, medium = 2, and high = 3. The number of samples required to fill the questionnaire were 90 samples. It was divided equally, which from each sub-district took 30 samples. Before being distributed to the entire samples, it was important to test the validity and reliability of questionnaire. Validity and reliability test of the research instrument aimed to determine whether the questions asked in the questionnaire were in accordance with real conditions. If there were many questions that did not meet the valid and reliable standards, then the question should be replaced.

VALIDITY TEST RESULT ON RESEARCH QUESTIONNAIRE

Infrastructure Program			Non-infrastructure Program		
Question	Score	Status	Question	Score	Status
1	0.753	Valid	1	0.585	Valid
2	0.564	Valid	2	0.711	Valid
3	0.793	Valid	3	0.587	Valid
4	0.910	Valid	4	0.941	Valid
5	0.913	Valid	5	0.916	Valid
6	0.934	Valid	6	0.868	Valid
7	0.922	Valid	7	0.883	Valid

In validity test table can be seen that the whole question in the questionnaire included in the category valid. It can be judged from the result of comparison between *r* arithmetic with *r* table. If *r* arithmetic is greater than *r* table, then the question is valid. From *r* table with 1% significance for the total of 30 respondents, it can be obtained that *r* table value is 0.478. Therefore, the whole question used in the questionnaire are valid because the value is more than 0.478.

RELIABILITY TEST RESULT ON RESEARCH QUESTIONNAIRE

Infrastructure Program		Non-infrastructure Program	
Cronbach's Alpha	0.799	Cronbach's Alpha	0.791
Status	Reliabel	Status	Reliabel

In the table of reliability test result, it can be seen that questions posed in the questionnaire are reliabel. This is because the data can be said reliably if the value of Cronbach's Alpha is more than 0.60. And based on the results of processing on SPSS Cronbach's Alpha value on the question of infrastructure and non infrastructure programs are 0.799 and 0.791, so it can be concluded that the questions on research instruments is reliable.

After the test of validity and reliability, then the questionnaire will be able to provide data that reflect the real field conditions. Once collected, it will be able to calculate the achievement of poverty alleviation programs in each study site. The value of the achievement of this program that will be used as a dependent variable in multiple regression analysis.

The technique of collecting secondary data was done by utilizing official publications that have been published by government agencies. Secondary data required are village elevation data, village distance with sub-district government, slope, and the extent of village. These secondary data were used as independent variables in multiple regression analysis.

After all primary data and secondary data have been collected, then the multiple regression analysis can be done. However, it must be ensured in advance that the data used met the eligibility criteria of the multiple regression model. This eligibility criteria can be obtained by conducting normality test, heteroscedasticity test, multicollinearity test, and autocorrelation test.

IV. FINDING AND DISCUSSION

Achievement Rate of Poverty Alleviation Program Implementation

Based on the results of data processing, it can be seen that the poverty alleviation programs that have been implemented by the government in order to improve the welfare of middle and lower economic communities do not always give the same results in each region. The same applied programs do not always give the same impacts. In the implementation of poverty alleviation in a number of districts in Trenggalek Regency, there are generally two types of programs implemented, namely infrastructure and non infrastructure programs. Viewed from the aspect of its achievement, both types of programs also give different achievements in the three locations, including in the hilly, plains, and also coastal areas. Based on the level of achievement from each locations can be categorized into three, namely from the achievement level of low, medium, to high.

Infrastructure Program

Based on the results of questionnaires distributed to 30 samples in each research location, including hilly, lowland, and coastal area, obtained the raw data related to the opinion of the respondents about the infrastructure development condition that has been done by alleviation program called PNPM-MPd. From the raw data were then processed so that ultimately obtained results comparison of the achievements of PNPM-MPd in each district.

TABLE OF RESPONDENTS' PERCEPTIONS ON INFRASTRUCTURE PROGRAM

Indicators	Hilly Area		Lowland Area		Coastal Area	
	Score	Category	Score	Category	Score	Category
Condition of facilities	48	Low	59	Medium	64	Medium
Usefulness of facilities	81	High	77	High	78	High
Access to other areas	59	Medium	71	High	78	High
Access to governmental agencies	48	Low	67	Medium	68	Medium
Access to educational facilities	51	Medium	74	High	73	High
Access to health facilities	46	Low	68	Medium	61	Medium
Access to economic facilities	71	High	72	High	74	High

Non-Infrastructure Program

One of the objectives of the PNPM-MPd is to increase the capacity of the community, especially the lower middle class. And in this case, several indicators were used that can be benchmarks to assess the capacity of the community. These indicators were participation, conveying aspirations, the ease of accessing business capital, the improvement of skills, health, and also the economy / income. Given these indicators, it can be obtained the perceived impact of the implementation of empowerment in each location, whether it is in accordance with the desired initial target or not. And from the results of research in the field show that in each location has different levels of achievement results due to several factors that affect.

TABLE OF RESPONDENTS' PERCEPTIONS ON NON INFRASTRUCTURE PROGRAM

Indicators	Hilly Area		Lowland Area		Coastal Area	
	Score	Category	Score	Category	Score	Category
Increased participation	71	High	62	Medium	63	Medium
Conveying aspirations	59	Medium	58	Medium	46	Low
Access to business capital	73	High	49	Low	74	High
Skill enhancement	49	Low	62	Medium	71	High
Increase of income	67	Medium	56	Medium	62	Medium
Increase of education	66	Medium	75	High	65	Medium
Increased of health	48	Low	65	Medium	58	Medium

Factors that Influence the Achievement of the National Program for Community Empowerment (PNPM-MPd)

The achievement from the implementation of poverty alleviation programs can not be separated from several factors. In this study, it is proven that this achievement is influenced by geographical factors, namely a) elevation, b) the extent of the village, c) slope, and c) the distance from the village center to the sub-district center.

Based on the result table with multiple linear regression it can be seen that overall the independent variables (distance to sub-district government, the extent of village, and elevation) simultaneously and significantly have influence on the dependent variable (the achievement of poverty alleviation program). It can be seen from the r square value in the summary model table showing the number of 0,624. Thus, it can be said that all independent factors simultaneously affect the achievement of the poverty alleviation program by 62,4%. While the rest of 37,6% is influenced by other factors not included in independent variable.

SUMMARY MODEL TABLE ON MULTIPLE LINEAR REGRESSION PROCESSING

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,790 ^a	,624	,559	4,33741	1,653

a. Predictors: (Constant), Elevation, The Extent of Village, Distance to Sub-district, Slope

b. Dependent Variable: Achievement

Furthermore, partially, all independent variables also have a significant influence on the achievement of poverty alleviation programs. This can be seen from the value of significance in the coefficients table which shows that the overall independent variables have significance of less than 0.05. In addition, it can also be indicated from the comparison between the value of T arithmetic and T table. If the value of T arithmetic is greater than T table, then the independent variable partially has significant effect on the achievement. With the value of T table of 2,080, it can be seen that the overall T arithmetic on each independent variable is greater than T table. Thus, it can be concluded that partially, sub-district distance (X₁), village area (X₂), elevation (X₃), and slope (X₄) have influence on poverty alleviation program achievement.

TABLE COEFFICIENTS ON THE RESULT OF MULTIPLE LINEAR REGRESSION PROCESSING

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	45,414	3,168		14,337	0,000
Distance to Sub-district (X ₁)	-1,028	0,319	-0,500	-3,223	0,004
Extent of Village (X ₂)	-0,774	0,176	-0,905	-4,405	0,000
Elevation (X ₃)	-3,333	0,920	-0,729	-3,624	0,001
Slope (X ₄)	-6,104	1,841	-0,963	-3,316	0,003

a. Dependent Variable: Achievement

Based on the coefficients table, it can be compiled regression equation as follows :

$$Y = 45,414 - 1,028 X_1 - 0,774 X_2 - 3,333 X_3 - 6,104 X_4$$

In the equation, the constant value of 45,414 indicates that if there are no increase or decrease in value of the sub-district distance variable (X₁), the extent of the village (X₂), elevation (X₃), and slope (X₄), then the achievement of the program (Y) is 45,414.

A. Distance Factor from Village Center to Sub-Districts Government

The first factor influencing the achievement of the program is distance to sub-district (X₁). This distance is calculated from each village government location to the sub-district government center. Based on regression test results can be obtained value of coefficient value -1,028. The minus value of the coefficient means that when the distance is increased by 1 unit, then the achievement of achievement will actually decrease by 1,028.

Furthermore, to know the significance of regression is by comparing probability value 0,05 with the value of probability significance that is resulted from statistical data processing.

- If the probability value of significance is more than equal to 0.05 or [Sig ≥ 0.05], then H₁ is accepted and H₀ is rejected, this means not significant (no effect).
- If the probability value of significance is less than equal to 0.05 or [Sig ≤ 0.05], then H₁ is rejected and H₀ is accepted, this means significant (effect).

It is seen that the Sig column (significance) in the table shows that the significance value of X₁ is 0.004. And this value is less than 0.05, so it can be concluded that the distance to the center of the sub-district government has significant effect on the achievement of the poverty alleviation program.

It can be concluded that when the distance of the sub-district government is further, the achievement will be lower. Of course, when the location of the program is closer to the central government, it will be easier in implementing, controlling or supervising the program, so that in the end of the program can get higher achievement.

B. The Extent of Village Factor

The second factor is the extent of the village (X₂), which the value of the coefficient is -0.774. The minus value of coefficient indicates that when the village area is increased by 1 unit, then

the achievement will actually decrease by 0.774. The opposite is that when there is a decrease in village area, then the achievement of PNPM-MPd will be greater.

Furthermore, to know the significance of regression is by comparing probability value 0,05 with the value of probability significance that is resulted from statistical data processing.

- If the probability value of significance is more than equal to 0.05 or [$\text{Sig} \geq 0.05$], then H_1 is accepted and H_0 is rejected, this means not significant (no effect).
- If the probability value of significance is less than equal to 0.05 or [$\text{Sig} \leq 0.05$], then H_1 is rejected and H_0 is accepted, this means significant (effect).

It is seen that the Sig column (significance) in the table shows the significance value of X_2 is 0.000. And this value is less than 0.05, so it can be concluded that the extent of the village has a significant effect on the achievement of the poverty alleviation program.

If viewed from the effectiveness of the implementation of the program, of course the smaller the area will be easier to monitor and control. Thus, the existence of a small area, it will be easier also in supervising, so the programs will be really effective and the value of achievement will increase.

C. Elevation Factor

The third factor is the elevation (X_3) with the coefficient of -3,333. This shows that when the elevation factor increases by 1 unit, the program's performance will decrease by 3,333.

Furthermore, to know the significance of regression is by comparing probability value 0,05 with the value of probability significance that is resulted from statistical data processing.

- If the probability value of significance is more than equal to 0.05 or [$\text{Sig} \geq 0.05$], then H_1 is accepted and H_0 is rejected, this means not significant (no effect).
- If the probability value of significance is less than equal to 0.05 or [$\text{Sig} \leq 0.05$], then H_1 is rejected and H_0 is accepted, this means significant (effect).

It is seen that the Sig column (significance) in the table shows the significance value of X_1 is 0.001. And this value is less than 0.05, so it can be concluded that the elevation has a significant effect on the achievement of the poverty alleviation program.

Thus, it can be seen that the value of achievement of PNPM-MPd will be higher when the location of the vilage has a lower elevation. As is the case with the implementation of PNPM-MPd in Trenggalek Regency, the lowest program achievement is in hilly area with high elevations. While the highest achievement is found in coastal and lowland areas.

D. Slope Factor

The last factor is slope (X_4), which the value of the coefficient is -6,104. The minus value of coefficient indicates that when the value of slope increases by 1 unit, then the achievement will actually decrease by 6,104. The opposite is that when there is a decrease in slope value, then the achievement of PNPM-MPd will be greater.

Furthermore, to know the significance of regression is by comparing probability value 0,05 with value of probability significance that is resulted from statistical data processing.

- If the probability value of significance is more than equal to 0.05 or [$\text{Sig} \geq 0.05$], then H_1 is accepted and H_0 is rejected, this means not significant (no effect).
- If the probability value of significance is less than equal to 0.05 or [$\text{Sig} \leq 0.05$], then H_1 is rejected and H_0 is accepted, this means significant (effect).

It is seen that the Sig column (significance) in the table shows the significance value of X_4 is 0.003. And this value is less than 0.05, so it can be concluded that the factor of slope has a significant effect on the achievement of the poverty alleviation program.

The condition of slope relates to disaster vulnerability. In the hilly area, landslide often occurs especially in the rainy season. This natural disaster finally can damage the infrastrucutre which has been built before. In the lowland and coastal area, flood also becomes the threat for the existence of infrastructure.

Based on the results of regression test and also the description, it can be concluded that the findings of research on the influence of poverty alleviation programs in Trenggalek Regency reinforce the theories that have been put forward by experts who discuss the linkage between geographical factors with poverty. Since this poverty phenomenon can not be separated from the geographical factors, so in order to overcome the problem of poverty, it must consider the geographical aspects.

V. CONCLUSION

The results of this study indicate that there are differences in the achievement of poverty alleviation program between villages located in hilly areas with villages located in lowland and coastal areas. The condition of infrastructure located in the hilly area has larger quality degradation compared to the other two areas. This is because the threat of disaster like landslide which often occurs, thus affecting the durability of infrastructures that have been built previously. While on the accessibility to facilities, hilly areas are also still quite far behind when compared with lowland areas and also coastal areas. This is related to the distribution of service development, which the development in the hilly areas tends to cluster in one place. The highest achievement of infrastructure program development in Trenggalek Regency is in the coastal area. However, this value is slightly different with the achievements in the lowland areas. And furthermore, the lowest achievement of infrastructure program is in the hilly area.

Geographical factors that have influence on the achievement of the alleviation program are the elevation, the extent of the village, slope, and the distance to the center of the subdistrict. Testing the effectiveness of these factors is done through multiple linear regression by producing the following conclusions:

1. Geographical factors have significant influence on the achievement of poverty alleviation programs.
2. The closer the village distance to the center of the sub-district, the higher the achievements.
3. The smaller or narrower the extent of the village, the higher the achievement.
4. The lower the elevation level of a region, then the achievement of the program will be higher.
5. The smaller the value of slope, the higher the achievement of alleviation program.

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For the educational background, after graduated from favourite senior high school in Trenggalek, she continued her bachelor degree in Gadjah Mada University, Yogyakarta and take the major of Regional Development, Faculty of Geography. There were some activities that she did at that time. From 2011 to 2012, she was the leader of department in faculty organization. In the same year, she also became the staff of Research Department in Geography Study Club. From August until December 2011, she

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After getting the scholarship from Indonesia Endowment Fund for Education (LPDP) to continue her study, she started her graduate program in Gadjah Mada University and took the major of Magister of Urban and Regional Planning, Faculty of Engineering, on February 2016. In 2017, she did her thesis about the influence of geographical factors to the poverty alleviation program.