Highland Rural Welfare

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Abstract

Keywords:
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Welfare, as the purpose of all economies, is often held backed poverty in economic society. Numerous studies indicated a negative correlation between access to clean water and poverty levels, particularly in rural areas in the highlands where people experience difficulties in procuring clean water. The study of poverty is indirectly related to the level of welfare. Nevertheless, the focus on welfare is still relatively lesser than on poverty. This study is aimed to conduct an empirical study of rural welfare in the highlands by analyzing the determinants that influence the occurrence of different classifications on people's welfare levels. The study was conducted in Bantaragung Village, Sindangwangi District, Majalengka Regency, West Java with a sample of 750 households. This study employed a welfare dimension approach by using socio-demographic and economic variables, including access to clean water, as well as a multidimensional poverty approach which was then modeled in an ordered logit. The results found indicated that the socio-demographic variables that determine the level of family welfare were the age of head of the family and the number of family members along with their education. Meanwhile, the economic variables that influence it were asset ownership and income levels.

How To Cite (APA 6th Style):

INTRODUCTION

Welfare which is a goal that every economy wants to achieve. Welfare is far broader than just a welfare. Efforts to improve welfare are often hindered by the level of poverty and inequality found in economic societies (Todaro & Smith, 2015).

In addition, welfare is actually one side of a coin, where the other side is poverty. This means that the study of poverty indirectly illustrates a portrait of the welfare as well. Nevertheless, the study of poverty is generally more frequently being a topic of research than welfare. This study attempted to look at these conditions from the welfare aspect.

The study of poverty is never separated from socio-demographic and economic characteristics. Poverty is never separated from rural areas, resulting in jargon or terms that poverty is a rural phenomenon (Bérenger, 2016; Aguilar & Sumner, 2019; Cerio et al., 2019; World, 2020).

Due to Sen's criticism (1976), the measurement of poverty is no longer based solely on a single economic dimensional approach, but instead employs a multidimensional approach. Alkire & Foster from the Oxford Poverty and Human Development Initiative (OPHI) as well as the United National Development Programme (UNDP) have developed the Multi-Dimensional Poverty (MDP) indicator since 2010. There are three dimensions in MDP with 10 indicators to form its composite index, namely the education dimension, health, and quality of life standards.

Furthermore, access to clean water is also a determinant of poverty (OECD, 2008; Sukartini & Samsubar, 2016; Putra & Rianto, 2016; Hove et al., 2019; Stewart et al., 2022). Other factors include employment opportunities in the agricultural sector and low levels of education, particularly in developing countries. In addition, differences in the rural environment such as topography, geography, and soil fertility also have a major influence on the welfare level of the people. The findings of Cerio et al., (2019) in the Philippine Mountains illustrated this. Meanwhile, studies by Tsehay & Bauer, (2012); Kumar & Sarkar, (2016); Bérenger, (2016); and Tsenkwo et al., (2019) also found almost similar thing.

Bantaragung Village in Sindangwangi District, Majalengka Regency, is a village located in the highlands, on the slopes of Mount Ciremai. This highland area is unique, since it is the only mountain in the northern region of West Java province, while a row of other mountainous areas is in the southern part of the province. Hence, this research is important to be taken into account to examine whether the

differences in location and topography correlate differences in the welfare level of the people in that region, compared to other regions.

Bérenger, (2016); Aguilar & Sumner, (2019); Cerio et al., (2019); World, (2020) conducted research on poverty in rural areas. While those who specifically observe poverty in the highlands include Tsehay & Bauer, (2012); Kumar & Sarkar, (2016); Bérenger, (2016); Tsenkwo et al., (2019,) and Cerio et al., (2019). The connection between clean water and poverty levels has also been studied, including by the OECD, (2008); Sukartini & Samsubar, (2016); Putra & Rianto, (2016); Hove et al., (2019); Stewart et al., (2022).

Numerous studies have employed the social welfare classification approach for more than one group. Among them were studies conducted by Rodriguez et al., (2016); Bérenger, (2016); Tiku et al., (2018); Tran et al., (2018); Cerio et al., (2019); and Umaña-Hermosilla et al., (2020). Meanwhile, study cases in Indonesia were conducted by Artha & Dartanto, (2018); Irwan & Moeis, (2019); Sumargo & Simanjuntak, (2019); Salam et al., (2020); and Najitama et al., (2020). Nonetheless, there are not many studies on rural welfare in the highlands through certain welfare classifications in Indonesia, and thus this study was conducted. Among those researches, these following researches observed welfare perspectives, such as Tran et al., (2018) in Vietnam, Falola et al., (2023) in Nigeria and Rahmawati & Rudiarto, (2022) in Dieng.

Furthermore, the novelty this study offered is the welfare dimension approach which is more the focus of the study, as well as the employment of access to clean water variables combined with socio-demographic and economic variables in modeling the determinants of the welfare level of people in the highlands. This study is aimed to conduct an empirical study of rural welfare in the highlands by analyzing the determinants that influence the occurrence of different classifications on people's welfare levels through a multi-dimensional approach.

RESEARCH METHODS

This study was conducted in Bantaragung Village, Sindangwangi District, Majalengka Regency, West Java. The location was selected due to its the distinctiveness, which is located in the highlands on the slopes of Mount Ciremai. This mountain is the only mountain in the northern region of West Java. While other mountains are in the southern region of West Java Province. This study, eventually, would complement poverty/welfare studies conducted in rural areas in West Java province, as well as in other regions in Indonesia.

The study was carried out in October 2021-January 2022. The primary data was obtained by directly surveying the heads of families in Bantaragung Village. While secondary data for support was obtained from data collection on sustainable and intelligent independent village families by LPPM (Research and Community Service Center) of Universitas Trilogi in 2021, as well as statistical data from Bantaragung Village in 2018, Sindangwangi District statistical data in 2019, as well as data from the Central Bureau of Statistics in 2020.

The population of this study was families or households who are residents of Bantaragung Village, in which at the time this study was conducted, amounted to 2,366 households. By employing the Krejcie et al., (1970) formula with a Chi-square value = 3.841, e = 0.05, P =0.5 and N= 2,366 households, it was found out that the minimum sample required was 331 respondents (families). Nevertheless, to meet the needs of the large sample required in the Maximum Likelihood Estimator method in Ordered Logistic Regression (Ordered Logit), the number of respondents is multiplied by two to 750 samples.

This study, in nature, is explanatory by explaining the causal correlation between family welfare variables in rural areas and their determinants consisting of socio-demographic variables, including access to clean water, as well as the economy. The correlation between the independent variables and the dependent variable was modeled in probabilistic regression, namely, ordered logit.

The independent variables were: income, employment, asset ownership, access to education, access to health, access to clean water, and sanitation. While the demographic variables observed were: number of family members, age, dependency ratio, and gender of the family head. Based on the collected data, family welfare was classified as the dependent variable. The grouping consisted of Pre-Prosperous, Prosperous-1, Prosperous-2, Prosperous-3 and Prosperous-3 plus.

By following Greene & Hensher, (2009), this regression was modeled in the form of a matrix as follows:

$$y_{i,1}^* = \boldsymbol{\beta}_{\mathbf{1}}' \boldsymbol{x}_{i.1} + \varepsilon_{i,1.} \quad y_{i,1} = j \ \ if \ v_{j-1.1} \ < \ y_{i,1}^* \ < \ v_{j,1,}$$

$$\vdots$$

$$y_{i,M}^* = \boldsymbol{\beta}_{\boldsymbol{M}}' \boldsymbol{x}_{i.M} + \varepsilon_{i,M1.} \quad y_{i,1M} = j \ \ if \ v_{j-1.M} \ < \ y_{i,M}^* \ < \ v_{j,M,}$$

$$\left(\varepsilon_{i,1} \cdots \varepsilon_{i,M} \right) \sim N[\mathbf{0}. \boldsymbol{R}]$$

Where **x** is the matrix of independent variables, **y*** is the unobserved dependent variable which is a function of the latent variable, ordinal **y** is the observed independent variable. **µj** is the threshold value employed for grouping options (1…M), i.e. **M** is the number of groups choices. **β** is the estimated coefficient in the model

and **R** is the unrestricted correlation matrix of random terms distributed following a standardized logistic function (Williams, 2021). **M** indicates the number of groups or classifications in the logistic opportunity regression model.

RESULTS AND DISCUSSION

Bantaragung is a village in Sindangwangi which is located at an altitude of 510-800 meters above sea level (LPPM Universitas Trilogi, 2021). Sindangwangi is located in a hilly area at the foot and slopes of Mount Ciremai with an altitude between 150 - 750 meters above sea level (BPS Kecamatan Sindangwangi, 2019). Descriptive statistical tabulations based on field data and data collection from the LPPM Trilogi (2021) are presented in Table 1.

The average age of the family head in Bantaragung is 50 years. This age is at the peak of productivity. According to LPPM Universitas Trilogi (2021) based on the age range of the population, the largest population group is in the productive age group (15-65 years). Two-thirds or 67 percent of the population in Bantaragung Village belong to the productive age group, so that the heads of households in Bantaragung Village are currently led by those who are at their peak of productive age (Table 1).

The average number of family members per household in Bantaragung is three or more. If each family consists of a father and mother, then they have one to two children. On average, the education of the family head in Bantaragung Village is still relatively low. They are educated at the elementary school (SD) level, although there are also outliers, who have graduated from university, then again there are also those who have not finished elementary school, on the other hand, with a very small number (Table 1).

Table 1. Descriptive Statistics of Family Profiles in Bantaragung Village

Variable	Obs	Mean	Std. Dev.	Min	Max
Age of family head	750	49.656	13.872	22	90
Number of family members	750	3.14	1.169	1	6
Dependency ratio	750	0.381	0.235	0	2
Education	750	5.261	2.048	1	16
Access to clean water	750	0.715	0.452	0	1
Occupations	750	4.716	1.639	1	8
Asset	750	3.251	1.217	1	5
Ln_income	750	14.566	1.043	12.2	18.172
Income (IDR)	750	4,191,287	7,221,586	200,000	78,000,000
Prosperous Family	750	2.66	1.1	1	5

Source: Processed from primary data (2022)

The focal occupation of the family head in Bantaragung Village is in the agricultural sector in a broad sense. The field of work ranges from workers, producers, processors of agricultural commodities, as well as distributors to sellers. Additionally, there are the suppliers of agricultural production facilities, including fertilizers and seeds as well as agricultural equipment. The main commodities produced are generally food ingredients in the form of rice and corn as well as other tubers.

On average, the family head in Bantaragung Village earns around IDR 4,000,000 per month (Table 1). This amount, of course, has a very wide range, since there are families who claim their income is only around IDR 200,000 per month, while there are also those who earn more than IDR 70,000,000 per month. This rough income inequality also needs to be observed further. This needs to be done in order to provide better study results. Though proportionally the field data illustrated respondents who have very high incomes, the numbers are very small. The same goes for those with very low incomes.

The largest part of the respondents have enjoyed access to clean water from four (4) springs. A small part of them relies on water sources that come from wells. Water from the spring is channeled through pipes and stored first in a holding tank. From the reservoir, clean water is then distributed for 24 hours to households in two areas in Bantaragung Village. In addition to household needs, water from springs and two rivers that pass through Bantaragung Village is used for agricultural purposes to irrigate rice fields. To avoid disputes arising from the distribution of water to rice fields, a farming community organization known as "Mitra Cai" was formed.

The results of an ordered logit probability regression estimate illustrated that based on social status in society, the lowest rank was in the low-income family group. The groups with the higher ranking are Prosperous 1, Prosperous 2, Prosperous 3 and Prosperous 3+ Families Groups respectively. Based on these rankings, Ordered Logistic Regression was employed to estimate the correlation between the determinants of the welfare level in rural highland communities in Majalengka Regency, West Java.

The estimation results also indicated that the Chi-square in this model is 373.53 with 8 degrees of freedom, this illustrated a high level of statistical significance. Thus, it implies that the independent variables in the empirical model built in this study can explain the ordered logit model well (Table 2).

From the model in ordered logit, there were five out of eight independent variables that had a statistically significant correlation with the welfare level of people in rural highlands. The five independent variables were age of the family head, number of family members, level of education, asset ownership and income of the family head (Table 2). The other three independent variables, such as the level of dependency, access to clean water and employment of the family head, had no significant effect (Table 2).

Table 2. Estimated Results of Ordered Logistic Regression

Family Prosperous	Coef.	Std.Err	z	p	[95% Conf]	Interval	Sig
Age of family head	-.01543	.00539	-2.86	.004	-.026	-.005	***
Number of family members	.2002	.08020	2.50	.013	.043	.357	**
Dependency ratio	.6131	.40438	1.52	.129	-.179	1.406	
Education	-.1008	.03875	-2.60	.009	-.177	-.025	***
Access to clean water	.21439	.15248	1.40	.161	-.085	.513	
Occupation	.03494	.04221	0.83	.407	-.048	.118	
Asset	.26182	.06034	4.34	.000	.144	.38	***
Income	1.435	.09620	14.91	.000	1.246	1.623	***
cut1	19.385	1.332			16.774	21.996	
cut2	21.298	1.37			18.614	23.983	
cut3	23.184	1.403			20.434	25.935	
cut4	25.579	1.472			22.694	28.464	
Mean dependent var		2.660	SD dependent var		1.100		
Pseudo r-squared		0.169	Number of obs		750		
Chi-square		373.532	Prob > chi2		0.000		
Akaike crit. (AIC)		1,862.169	Bayesian crit. (BIC)		1,917.610		

Source: Processed from primary data (2022)

The estimation results also indicated a negative association between the age of the family head and the probability of belonging to a prosperous family group. This can be interpreted that with the increasing age of the family head, it will reduce the possibility of the family being included in the 3+ Prosperous family group. This also means increasing their chances of belonging to the Pre-Prosperous family group (Table 2).

The findings of this study were in line with the results of a study by Mohammadi et al., (2015) in Iran, where age was associated in the opposite direction with income levels. Since the income level is assumed to be in line with prosperity, it is assumed that the relationship between age and prosperity is also related. Meanwhile, the results of this study contradicted the findings of a study conducted

by Oksuzler (2008) which illustrated a positive association between age, which is interpreted as experience, and income levels in Turkey.

The family situation in Bantaragung Village is dominated by families with heads of families who have reached their productive age. Increasing age, of course, will have an impact on decreasing their productivity. This decline in productivity has a direct effect on family income. The decline in income levels, certainly, has an opposite effect on family prosperity.

The independent variable number of family members has a significant influence on the chances of a family's prosperity. The estimation results stated that the correlation between the two variables was positive and significant. It implies that if family members increase, then the probability of the family to become a more prosperous family will also increases, and vice versa (Table 2).

Based on demographic characteristics, families in Bantaragung Village are generally small families; a husband and wife with one or two children. Nevertheless, there are also families with up to four children. But the number of these families is very limited. Based on the characteristics of the size of the family, it can explain why there is a unidirectional relationship between the number of family members and the opportunity to enter the prosperous family group. Increasing family members will increase the possibility of earning greater income than just the head of the family and his wife. A child can work to help their parents to make a living for the family concerned. The increase in income will also increase the probability that the family is classified as a more prosperous family.

Furthermore, these findings also support what was stated by Tran et al., (2018) that increasing family income would reduce poverty rates in rural highlands in Vietnam. Nguyen & Nguyen, (2019) also found similar results in other highlands of Vietnam. Almost the same thing was conveyed in research by Brown et al., (2006) in a study of highland poverty in Kenya, Tiku et al., (2018); Cerio et al., (2019) in Philippines; Nguyen & Nguyen, (2019); and Umaña-Hermosilla et al., (2020) in Latin America.

The coefficient sign in front of the education variable is negative (Table 2). This indicated that the increasing level of education causes a decrease in the opportunities for families in Bantaragung Village to achieve a prosperous family. This contradicts the findings of Salam et al., (2020) in East Java. The characteristics of families in Bantaragung Village indicated that the average education level of the family head was basic education. For those with this level of education, it seems that they value the opportunity to earn a living by working more than the opportunity to

improve their education. The time to improve education is more allocated to earn a living.

When viewed from the estimation of the independent variable number of family members, the results of this education level estimation supporting evidence between the two. Brain drained symptoms may also contribute to the negative association between education and opportunities to belong to this prosperous group.

The tendency of the younger generation who have successfully completed middle level education will seek better jobs by working outside Bantaragung Village, including choosing to become workers outside Indonesia. In addition, some of them who successfully completed their high school education continued on to higher education in big cities in West Java or in Jakarta. Since after they graduate from college, very few return to Bantaragung Village, working for the prosperity and well-being of their village community.

As previously stated, the findings of this study contradicted the study results by Oksuzler (2008) in Turkey, Rodriguez et al.*,* (2015) in Mexico, Tran et al., (2018) in Vietnam and Nguyen & Nguyen, (2019) in the other Vietnamese region. Meanwhile, a study by Cerio et al., (2019) in the Philippines did not find a statistically significant association between education level and poverty.

The independent variables of access to clean water and the main occupation of the family head did not have a statistically significant effect (Table 2). Almost all family groups in Bantaragung Village enjoyed access to clean water from four springs on the slopes of Mount Ciremai. The clean water is then channeled through pipes to storage tanks and then piped to every household. Residents work together to maintain the water pipeline and repair it if something is damaged. This spirit of mutual cooperation makes access to clean water accessible to all families regardless of their social status.

These findings contradicted the study results by Hove et al., (2019) in dry rural areas in South Africa, Staub et al., (2020) in Haiti, López-Álvarez et al., (2019) in Mexico, Brown et al., (2006) in the study on highland poverty in Kenya, Tiku et al., (2018) and Putra & Rianto (2016) in Indonesia. The researchers found that difficulties with access to clean water were a major obstacle to poverty alleviation efforts. Fortunately, the Bantaragung area is not a dry area and instead is a fertile area with abundant water which is enjoyed by all residents in the village. The area which is rather difficult to access water for agricultural needs is only on the slopes of the high mountains area.

The results of the ordered logit estimation have not succeeded in proving a positive association between access to clean water and welfare. Bias could occur in the understanding of respondents and the measurement of this variable. Thus, a more careful and thorough study is required in observing the link between access to clean water and prosperity.

There is a positive relationship between asset ownership and the probability of increasing family prosperity. Increasing ownership of these assets will also increase the chances of one family to a more prosperous level. This also means reducing the possibility that the family belongs to the pre-prosperous family group. Studies by Tsehay & Bauer, (2012); Kumar & Sarkar, (2016); Bérenger, (2016); Tsenkwo et al., (2019), Cerio et al., (2019) also illustrated almost the same results although from a different point of view with this research.

The same thing can be seen in the independent variable income level of the family head. This study proved a significant and positive one-way relationship between this income and the opportunity to belong to a more prosperous family group. An increase in family income (head of the family and its members) will also increase the probability of an increase in family status belonging to a more prosperous family. Conversely, a decrease in family income will affect the possibility of the family entering into a group with less prosperity. The findings in this study strengthened the results of other studies which are almost similar findings which were conducted including by Oksuzler, (2008) in Turkey, Rodriguez et al., (2015) in Mexico, Mohammadi et al., (2015) in Iran, Cerio et al., (2019) and Salam et al., (2020). Research by Tran et al., (2018) also indicated that income affects the prosperity level of highland rural communities in Vietnam, though the said income came from outside agriculture.

Almost all studies have proven that income levels have a negative and significant effect on poverty or a positive and significant effect on improving family welfare in rural areas. This includes villages in the highlands, such as the case in Bantaragung Village, Sindangwangi District, Majalengka Regency, West Java.

CONCLUSION

There are five socio-demographic and economic variables that are related to the welfare level of the people in the highlands. These determinants are the age of the family head, the number of family members, education level, asset ownership, and family income. There are two variables with an economic dimension that have a positive relationship with the chances of a household in a more prosperous family,

namely asset ownership and family income. Access to clean water does not have a statistically significant effect on the probability of belonging to a prosperous family.

SUGGESTION

This study has not been able to illustrate a positive relationship between access to clean water owned by the people of Bantaragung Village and their prosperity. Given the vital role of clean water in family prosperity, further research is needed related to optimizing the use of clean water which has implications for the economic sector to increase the prosperity of rural communities.

AUTHOR CONTRIBUTIONS

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