

Determinants of Poverty and their Policy Implications in Rural Areas of Jimma Zone: The Case of Woredas Around Gilgel Gibe Hydroelectric Dam

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Abstract

The study analyzes the determinants of poverty and their implications in rural areas of Ethiopia. A survey of three hundred forty eight (348) household heads was undertaken in four woredas around Gilgel Gibe Hydroelectric Dam, Ethiopia, in the year 2015. Binary Logistic regression is applied to find out the main factors responsible for poverty in the study area. The result from regression shows that distance from local market is positively and significantly related to the probability of being in poverty. On the other hand, work experience of household head, livestock possession, and access to market information considerably decrease households' chance of being in poverty. The study finally suggests that in order to alleviate the prevailing poverty situation due attention should be given to the improvement and strengthening of access to information and market to rural residents. Consideration should also be given to improve the ownership of productive resources. In this regard, the role of microcredit and finance institutions is pivotal.

Keywords: Poverty, Determinants, Binary Logistic Regression.

1. Background of the study

Poverty is one of the most serious socio-economic problems. The international community has been seriously working towards the eradication of poverty. Despite the huge efforts by international institutions, NGOs, Governments and local community, poverty is still affecting the life of hundreds of millions in all corners of the world. Scholars and experts regard poverty as a complex phenomenon characterized by insufficient access to social and economic services and also few opportunities for income generation.

Ethiopia with GDP per capita around USD 590¹ is among the world poorest countries by any standard. According to Human Development Report (2015), 88.2 percentages of people are poor measured in MPI in 2011. In line with this, Abu (2013) stated that poverty in Ethiopia is widespread, deep-rooted, dynamic and complex in nature and constitutes the priority development challenge in the country. It goes beyond the simple fact of too low income to meet basic needs. It is highly correlated with social exclusion, vulnerability, powerlessness, and other economic, political, environmental, social and cultural dimensions of deprivations.

The government of Ethiopia has launched several strategies and policies at different times sought to encourage the participatory bottom-up planning since 1992. The main objectives were to achieve higher standard of living by fighting illiteracy, disease, malnutrition, and poverty. In line with this, macro and micro evidences analysis indicate that the status of poverty in Ethiopia has been improved over the past two decades because of promising economic growth and developments registered in the country.

This study strongly believes that the search for the determinants is a half way to address poverty and its challenges. It is a shared the responsibility and commitment of all stakeholders. So, a practical understanding of factors influencing household decision making processes such as household physical, economic, political, and social environment are very important and also acceptance for designing participatory and context specific interventions.

Hence, this study incorporated indicators that are developed based on field survey that were carried out in rural area. The main aim of this paper was to investigate the determinants of poverty and give alternative directions to reduce poverty in Southwest Ethiopia, the case of Jimma zone; more specifically, four Woredas located around Gilgel-Gibe Hydroelectricity Dam.

2. Empirical Literature Review: Poverty and It's determinants

Poverty has remained to be a worldwide problem and consequently it has been studied many times at both global and national level. Literatures on the concept of poverty show various interpretations in economic, social, political, institutional, environmental and cultural contexts. Poverty is a multidimensional and dynamic phenomenon. The definition of poverty is broad and subject to changes overtime. Traditionally, poverty is defined as lack of income or money, however, this approach is later extended to incorporate other important aspects of life.

In order to identify the determinants of poverty, several studies have been conducted by various

¹ <http://www.worldbank.org/en/country/ethiopia/overview>

scholars and field experts in the different parts of the world. This discussion or review, however, focuses on the factors affecting poverty in rural areas of developing countries with special focus of Ethiopia.

Alemayehu et al (2005) using household level data examined the determinants of poverty in Kenya. The study showed that poverty is strongly associated with the level of education, household size and engagement in agricultural activity in both rural and urban. Ibrahim and Umar (2007) assessed the poverty status and its determinants in Nasarawa State, Nigeria. The results shows that the major determinants of poverty are household size, number of income sources of the household head, number of household members employed outside agriculture and the number of literate adult males and females in the household. In the same way, Adepoju (2012) conducted study in South West Nigeria to analyze poverty transitions in rural area. The results show an overlap between the causes of chronic and transient poverty.

In Ethiopian context, Maru (2004) conducted a study in Zeghe peninsula to identify the levels and determinants of rural poverty. The results reveal that land holding size, suitability of land for coffee production, participation in contractual farming activities, engagement in petty trading, beekeeping and fishing activities are negatively associated with the probability of households' falling into poverty. On the other hand, probability of being in poverty is positively related to high dependency ratio and participation in firewood selling activities. Ayalneh et al (2005) stated that rural poverty is strongly linked to entitlement failures as explained by lack of crucial household assets such as land, human capital and oxen. The study suggests that improved targeting devices can be a useful instrument in reducing poverty, in particular to reach the poorest of the poor.

Metalgn (2005), in South west Shoa Zone of Ethiopia, identified that rural poverty decreases as the level of education, saving size of cultivable land and number of oxen and other animals owned increases. Household size and access to micro credit are positively linked to poverty. According to Ayalneh (2011), rural poverty in the eastern highlands of Ethiopia is determined by location, irrigation, non farm income age, and household size among few. The result shows that poverty is location specific, depends on access to irrigated land and access to non-farm income. On the other hand, household's wellbeing is negatively affected by household size, and positively affected by age of household head.

Swanepoel (2005), using Ethiopian Rural Household Survey (ERHS) from 1994-1997, studied poverty dynamics in rural Ethiopia. The study finds that transiently poor households have a higher dependency ratio, face more frequent crop failures, and have smaller areas of land available for cultivation. In contrast, chronically poor households own fewer assets and earn less from the sale of livestock. In the same way, Bigsten and Shimeles (2008) analyzed poverty transition and persistence in Ethiopia using panel data of 1994-2004. The finding indicates that households in rural areas have a higher probability of ending poverty and lower probability of moving into than households in urban areas. The study found that household size, education of head of households, variation in rainfall and access to market are significant factors that will reduce transient poverty in rural areas.

Ahmed (2013) investigated the dynamics of poverty in rural Ethiopia during the period from 1994 to 2009. The result illustrates that the probability of being in poverty is a direct function of prior experience in poverty. Land size, oxen and other tropical livestock units have substantial impact in reducing the probability of being in poverty. Babu and Nega (2013) used cross-sectional household survey data to describe determinants of rural poverty in Gulomekeda wereda of Tigray National Regional, Ethiopia. The results of study reveal that total family size and dependency ratio have positive association with poverty of the household. While farm size, total livestock owned (TLU), value of asset, educational status of the household head, access to credit and access to off farm income have negative association with the households' poverty status.

Tilman and Sindu (2013) also examined the dynamics and causes of consumption and multidimensional poverty in rural Ethiopia. The study noticed that poverty is mainly transient in Ethiopia. Household size, off-farm employment, and short term shock such as drought significantly affect consumption poverty whereas simultaneous occurrence of many shock substantial determine multidimensional poverty.

As of the study by Tsegaye (2014) the main determinants of poverty in Gozamn district of East Gojjam are education, livestock ownership, cultivated land holding, oxen holding, off-farm income, credit utilization and frequency of extension contact. They have a strong but a negative association with the poverty status of rural households. On the other hand, family size has a positive association with poverty status of rural households. Addisu and Rao (2014), using rural household survey, analyzed factors that make poverty to persist overtime with its consequences. The study identified age of household head, adult equivalent household size and religion of household head have significant positive effects on poverty status of the households. Nevertheless, poverty status is negatively associated with male headship, age square of household head, mean education of household, food aid, access to modern inputs, agricultural income per adult, social capital and ownership of durable goods.

Muhdin (2015) examined socio-economic determinants of income poverty in rural areas of Ethiopia. The result shows that income poverty is determined by household size, number of income sources of the household, livestock and farm land ownership. Poverty status is negatively associated with number of income sources of the household, livestock and farm land ownership. But probability of being in poverty is positively

related to family size. Fasil (2016) identified factors responsible for rural households' vulnerability to poverty in Southern Ethiopia. The results from binary logistic regression show that being female headed households, large family sizes and low access to all season roads and local markets statistically significantly increased the vulnerability of rural households to poverty. On the other hand, credit uses, number of livestock, land size, annual farm income and participation in safety net program reduces the households vulnerability to future poverty.

In general, poverty is caused by so many economic, social, political, environmental and institutional factors. The aforementioned studies confirm that poverty is indeed multivariate and dynamic phenomenon that we need to assess and reassess as long as poor's exist in the world.

3. Methodology of the Study

The study used both quantitative and qualitative data. The main data source was primarily data collected from households using structured questionnaire and interview. In order to select a set of elements from a total population multi-stage sampling techniques was employed. This sampling enhances the probability of accomplishing research objectives and also allows for the objective assessment of the reliability of the sample. Accordingly, three hundred forty eight (348) samples were collected from four woredas around Gilgel Gibe Hydroelectric Dam.

This research applied descriptive statistical tools and econometric models in the assessment. Descriptive statistics like percentages, mean values, standard deviation, and frequencies were used to assess the socioeconomic conditions of rural households. A micro-econometric technique is applied to identify the socioeconomic determinants of poverty in rural areas, using SPSS 20 software.

To characterize the poor, the study used a probability model in which the chances of falling below the poverty line are linked to socio-economic characteristics. Hence, the binary logit model is adopted to analyze the socioeconomic determinants of poverty.

The Probability of being poor is defined as:

$$P_i = E(Y = 1 / R_i) = \alpha + \beta R_i$$

Where,

Dependent variable is $P(Y = 1)$, indicates the probability of being poor.

Vector of independent variables = R_i socioeconomic characteristics.

The expected relationship between dependent and independent variables used for this study were summarized as the following table.

Table 1: Summary of the relationship between poverty and explanatory variables

Independent Variable: Being in Poverty				
S. No	Independent variables	Nature of Variable	Expected Sign	Remark
1	Sex	Categorical	+	Sex (female) and poverty are positively related.
2	Age (Year)	Numeric	+/-	
3	Family size	Numeric	+	
4	Work Experience (Years)	Numeric	-	
5	Total land (in Hectare)	Numeric	-	
6	Livestock (in TLU)	Numeric	-	
7	Distance from local market	Numeric	+	
8	Access to market Information	Categorical	-	Access to market and poverty are negatively related.

4. Data Analysis and Discussions

4.1. Socio-Economic characteristics of Respondents

As indicated in the table below (Table 2), the study shows that the majority of the respondents are male. They are about 77.7 percent of the total respondents. The remaining 23.3 percent are females. The respondents' mean age is 45.85±12 years. The very majority (97.3 percent) of the respondents have an educational background of primary and below that. The proportion of those who attended secondary and above education is very low. Out of the total respondents, 94 percent of the respondents are Muslim in religion and 97.1 percent are Oromo in their ethnic. As regard to marital status, the greater portions of respondents (82.9%) are married. The average family size of the households is 5.94±2.5.

Table 2: Demographic features of Respondents

Features	Rural
Sex of household head(Percentage)	
Male	77.7%
Female	22.3%
Age of household head (Mean)	45.85±12.6
Religion	
Muslim	94%
Christian	5.4%
Others	0.6%
Ethnic	
Oromo	97.1%
Amhara	1.1%
Others	1.7%
Marital status(Percentage)	
Single	6.9%
Married	82.9%
Widowed/Separated/Divorced	10.3%
Family size (Mean)	5.94±2.5
Educational level of household head (Percentage)	
Primary and below	98%
Secondary and Above	2%

Source: Own Survey and Computation, 2015

The main economic activity is agriculture and its allied activities. In terms of occupation the majority of the respondents are farmers (88%), followed by business runners and salaried employee as shown in table 3. In line with expectation, the proportion of farmers in rural areas is by far greater than those in engaged in other sectors.

Table 3: Occupation and Work Experience

Features	Rural
Job of the household head	
Farmer	88%
Nonfarm business	3.1%
Salaried employee	2%
Others	6.9%
Work experience in years (Mean)	23.18±11.27

Source: Own Survey and Computation, 2015

The average work experience of the households is 23.18±11.27 years. The average is high due to the fact that rural residents experience rural livelihoods activities since their childhood.

The most important resources for agrarian society are land and livestock. They are the base for farmers' livelihood in general. The average landholding size and livestock possessions are 1.45 ha and 2.62 TLU, respectively. In rural and agricultural areas the contributions of land and livestock is pivotal in job creation and income generation.

Table 4: Ownership of Basic Resources

	Rural
Total land (Mean in hectare)	1.52±1.81
Livestock Possession (mean in TLU)	2.73±2.44

Source: Own Survey and Computation, 2015

The annual mean income of the total respondents is ETB 22,214.2. Consequently, the average per adult household mean income is ETB 7,636.1.

Table 5: Total income and Per Adult Equivalent Household Income

	Rural
Total Income (Mean in ETB)	22,214.2±29,930.7
Per Adult (mean in ETB)	7,636.1±8,318.5

ETB=Ethiopian Birr

Source: Own Survey and Computation, 2015

The Pearson correlation test is used to show the relationship between per adult household income on one hand and work experience, livestock possession, total land, age and family size on the other hand. The result shows that per adult equivalent income is significantly and positively associated with work experience, livestock and total land possessions.

Table 6: Pearson Correlation Test

Resident: Rural		Work Exp. (years)	Age (Years)	Total land (Hec)	Family size	Livestock (TLU)
Income	Pearson Correlation	.218**	.095	.338**	.096	.636**
	Sig. (2-tailed)	.000	.075	.000	.073	.000
	N	350	350	350	350	349

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Source: Own Survey and Computation, 2015

4.2. Determinants of Rural Poverty

In order to investigate the determinants of rural poverty binary logistic regression was applied. The dependent variable, poverty, was regressed against eight major variables.

The independent variables were selected after serious literatures review and personal observation of the study area. The dependent variable is variable which takes a value of 1 or 0 depending on whether the respondent is poor or not poor.

Before analyzing the effect of independent variables on the dependent variable, it is important to see the fitness of the chosen model. The classification table, omnibus tests and H-L test show the existence of a relationship between the dependent variable and the combination of the independent variables. In a logistic regression, the significance test for the addition of the predictor variables is based on the block chi-square in the omnibus tests of model coefficients.

Table 7: Omnibus Tests of Model Coefficients

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	90.259	8	.000
	Block	90.259	8	.000
	Model	90.259	8	.000

Source: Own Survey and Computation, 2015

Table 8: Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	8.167	8	.417

Source: Own Survey and Computation, 2015

In the classification table (appendix) we see a considerable increase in the overall success rate, from 59.9% to 74.2%. Therefore, all of the tests give similar conclusions for the present data, showing that the logistic Model with independent variables was more effective than the null model. The correlation matrix (appendix) shows that the effect of multicollinearity is fairly low.

Table 9: Binary Logit coefficient estimates for determinants of poverty

	B	S.E.	Wald	df	Sig.	Exp(B)
Sex (1)	.471	.343	1.884	1	.170	1.601
Family size	-.100	.062	2.571	1	.109	.905
Work Experience	.033	.016	4.221	1	.040*	1.034
Livestock (TLU)	.354	.095	13.826	1	.000**	1.424
Access to MKT Info(1)	.710	.257	7.667	1	.006*	2.035
Distance from Local MKT	-.091	.030	9.371	1	.002*	.913
Total land ownership	.178	.127	1.952	1	.162	1.195
Age	-.019	.014	1.936	1	.164	.981
Constant	.304	.780	.152	1	.697	1.355

Note: ** indicate that the coefficients are statistically significant at 0.01 levels.

* indicate that the coefficients are statistically significant at 0.05 levels.

Source: Own Survey and Computation, 2015

The table above shows that out of a total of eight independent variables, four of them are significant. That means work experience, distance from local market, livestock possession, and access to market information. Of these variables, distance from local market is the only variable positively correlated with the probability of being in poverty.

Work experience: Household's experience in his/her profession is found significant and positively related to probability of being non-poor. This implies that rich farm experience is one of the key elements in increasing the product and productivity of rural sectors. Therefore, an increase in farmer's experience reduces probability of being in poverty.

Livestock Possession: Livestock are one the main productive resources in rural areas of Ethiopia along the farm land. In this study, unlike land possession, livestock ownership is positively and significantly related to probability of being non poor. The more livestock ownership implies lower likelihood of being poor.

Distance from local market: Distance from local markets also significantly affects probability of being poor. The binary logistic regression shows that an increase in the distance from local market negatively and significantly related probability of being non-poor. The more households are close to markets, the more they are beneficial, because it creates a golden opportunity to participate in nonfarm and other business activities; reduces probability of being in poverty.

Access to market information: This is also one of the most important variable affecting poverty in rural areas of Ethiopia. Like that of proximity to market, access to market information is also pivotal in reducing the probability of being in poverty. The regression result shows access to market is significantly and positively associated to probability of being non-poor. The result from cross tabulation also shows a significant positive association between Non-poor and access to market information in rural areas.

Table 10: Crosstab: Poverty *Access to market information

			MKT info		Total
			Yes	No	
Poverty	Yes	Count	55	86	141
		% within MKT info	27.9%	56.2%	40.3%
	No	Count	142	67	209
		% within MKT info	72.1%	43.8%	59.7%
Total	Count	197	153	350	
	% within MKT info	100.0%	100.0%	100.0%	

a. resident = Rural

Source: Own Survey and Computation, 2015

Table 11: Chi-Square Tests for Poverty *Access to market information

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	28.651 ^b	1	.000		
Continuity Correction ^c	27.487	1	.000		
Likelihood Ratio	28.849	1	.000		
Fisher's Exact Test				.000	.000
N of Valid Cases	350				

a. resident = Rural

Source: Own Survey and Computation, 2015

5. Conclusions and Recommendations

The majority of the populations in developing countries live in rural areas. As a result, it is widely accepted that a well studied and organized interventions in these areas play a key role in socio-economic transformations of poor countries. In the view of that, this study aimed at identifying the determinants of poverty in rural areas of South West Ethiopia and their policy implications. The Pearson correlation shows that per adult equivalent income of rural residents are positively correlated to livestock possession, work experiences and total land. The result from binary logistic regression also concluded that the probability of being in poverty is determined by lack work experience, lack/low livestock possession, lack of access to market information and distance from local market.

Finally, the study recommends that the community, NGOs, Government officials and policy makers should work together to design policy directions and intervention strategies to alleviate poverty. Due attention should be given to variables causing poverty and potential resources used to address this challenge. In this regard, the role of microcredit and finance institutions is pivotal in empowering rural households so that they engage in

productive activities.

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Appendix

A. Classification Table

Observed			Predicted		
			Poverty		Percentage Correct
			Yes	No	
Step 0	Poverty	Yes	0	140	.0
		No	0	209	100.0
Overall Percentage					59.9

Observed			Predicted		
			Poverty		Percentage Correct
			Yes	No	
Step 1	Poverty	Yes	89	51	63.6
		No	39	170	81.3
Overall Percentage					74.2

a. The cut value is .500

B. Model Summary^a

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	379.826 ^b	.228	.308

a. resident = Rural

b. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

C. Correlation Matrix

	Sex	familysize	workexpe	TLU	mktinfo	localmkt	totland	Age
Sex	1.000	-.353	-.056	-.183	.058	-.077	-.038	.259
familysize	-.353	1.000	-.048	-.284	-.081	.082	-.045	.061
workexpe	-.056	-.048	1.000	-.089	.011	-.005	-.063	-.546
TLU	-.183	-.284	-.089	1.000	-.044	-.034	-.241	-.129
mktinfo	.058	-.081	.011	-.044	1.000	.170	-.064	.039
localmkt	-.077	.082	-.005	-.034	.170	1.000	.140	.058
totland	-.038	-.045	-.063	-.241	-.064	.140	1.000	-.002
Age	.259	.061	-.546	-.129	.039	.058	-.002	1.000