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RURAL POVERTY AND ITS DETERMINANTS IN WOLAITA ZONE, SOUTHERN ETHIOPIA

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ABSTRACT

This study examines the covariates of poverty among rural farm households in Wolaita Zone, Southern Ethiopia. Data for the study was collected from 168 randomly selected households using interview schedule. The FGT index was employed to analyze the extent &severity of poverty among poverty stricken households where as binary log it model was used to identify the major determinants of poverty in the study area. The finding from FGT index revealed that about 64 percent of households were found to be poor and the remaining 36 percent were non-poor. The gap and severity of poverty were found to be5percent and 81percent, respectively. The logistic regression model result revealed that family size, participation in off-farm activities, education status of the household head, sex of household head, farm income, and market distance were found to be the significant determinants of poverty in Wolaita Zone. As a result, encouraging family planning, raising household income diversification, promoting rural off-farm employment opportunities and investment in rural infrastructure are suggested so as to reduce the rural poverty in the study area.

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INTRODUCTION

Poverty is a worldwide problem hindering development endeavors. The United Nations Development Program's poverty estimation for three years (2014-2017) indicated that about 900 million people from about 7 billion people in the world suffer acute state of starvation. Not stop with that, almost half of the world's population live on less than USD 2 income per day. The prognosis also specified that virtually 1.5 billion people live in lingering poverty; less than USD 1.25 income per day, whereas 1.2 billion children universally are living in nutritional deficiency (UNDP, 2014). According to UNICEF (2015), 24,000 children die daily due to poverty; 975 million people worldwide face food shortage and more than 900 million people lack access to pure drinking water. Diseases such as cholera and lung inflammation win the lives of 2.2 million children for unable to afford the cost of treatment. It is stated one-fourth of the world population lives devoid of electricity-approximately 1.72 billion people. In addition, every day, 71 million primary school age children are not attending school because of poverty.

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However, the burden of poverty is unequally spread among various part of the world (Biewen, 2009). It is attested that Africa, relatively, in both absolute and relative poverty suffers a lot: three times more than the number for South East Asia, and two fold that for Latin America (UN-Habitat, 2013). People living in the rural area of Africa are more prone to multidimensional poverty than the urban one, while the urban residents are more likely to be vulnerable to poverty. According to the World Health Organization (2015), 51% of urban people in Africa replied to inquiry that living conditions as "fairly bad" or "very bad". About 20% affirmed, deprived of food. Nearly quarter of the urban residents responded that they are destitute of cooking fuel and medical care. Acute deficiency identified was access to water, with 31% reporting a lack of access to clean water. Sub-Saharan Africa zonehas the largest number of impoverished people in Africa (Akerele and Adewuyi, 2011). It has been among the fastest growing regions in the world since recent past for the sustained progress measures. It follows that urban poverty intensity reduced from 41% to 19% between 2002 and 2012(Lorenzo, 2005). However, due to urban population growth, the figure of urban poor remained intact. Furthermore, 172 million urban people in the region are either hungry or undernourished. In the last two decades Ethiopia has achieved a progress from

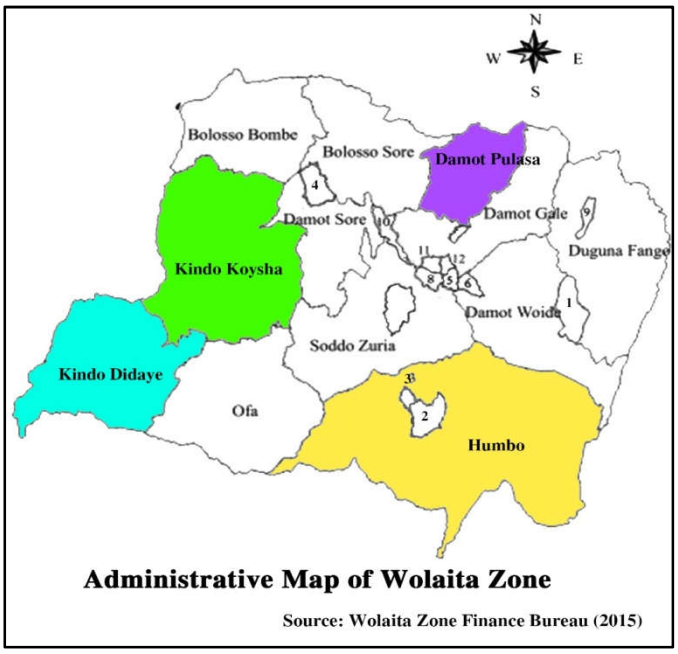
having one of the lowest levels of human development and highest poverty rates in the world (Andersson, 2014). The country is reported as one of the few countries in Africa on track to me*et al*l of the Millennium Development Goals (2000-2015). Consequently, improvement in access to primary education, and secondary enrolment ensured. Advancement in formal employment improved as the working population in the informal sector reduced by half since 2000 (Ayalneh *et al*, 2005). However, Poverty is still a challenge in Ethiopia as over 22 million people are living below the national poverty line (UNDP, 2018). Accordingly, it has often been recognized as one of the poorest countries in the world given its history mired by internal and regional conflict and major humanitarian catastrophes. However, dynamics and character of poverty in many cases differs. Though poverty is getting more urbanized following rapid urbanization, the rural people are still believed to be in devastating state of poverty (Ayalneh *et al*, 2005). The preponderate rural populations occupy the neighbor of poverty line; reciprocate in poverty and food insecurity. The rural poverty is highly correlated with rapid population growth, the size and composition of households, the educational level of household head, the degree and extent of dependency within the household, asset ownership, the occupation of household heads, major health problems, lack of infrastructure and extreme environmental degradation (Jones *et al*., 2010). There is also a regional disparity. Smallholder farmers, accounts for more than 92% of agricultural production in rural South region, face constraints including shortage of land, land degradation and soil infertility, poor terms of trade and lack of investment, erratic and unpredictable rainfall patterns, poor access to market, limited off-farm employment opportunities, low agricultural productivity and chronic illness (FAO, 2011).

As far as the knowledge of the researchers is concerned, there are limited studies conducted on poverty and its socio-economic determinants in Wolaita Zone of Southern Ethiopia. Beside this, most studies focuses on the national and urban level determinants of poverty than at rural and/or zonal level. Inquiry of poverty among rural households becomes sound enough to put an agenda on the poor, targeting of policy makers to intervene in the study area. Hence, this study comes through an integrated assessment of socioeconomic determinants of rural poverty in Wolaita zone.

METHODOLOGY OF THE STUDY

Description of the Study Area: Wolaita zone is one of the 13 zonal administrations of the South Nations, Nationalities, and People Region in Ethiopia, which is located 327 kilometers south of Addis Ababa. It is bordered on the south by Gamo-Gofa zone, on the west by the Omo River which separates it from Dawro zone, on the northwest by Kembata-Tembaro zone, on the north by Hadiya zone, on the east by the Bilate River which separates it from Sidama zone. Agriculture is the livelihood for more than 90 percent of the population in the rural areas. Mixed farming involving crop production and livestock rearing is the main livelihood of rural community in the zone. The average temperature varies from 15°C to 31°C, and the annual rainfall has characteristic monthly variation, with peak rainy seasons usually observed during March through May and July through September (Wolaita Zone, 2015).

Data Source and Method of Data Collection: The data for this study was obtained from primary sources. It was collected from a sample of three kebeles from each of the four Woredas in Wolaita zone, namely Kindo Didaye, Kindo Koysha, Humbo and Damot Pulasaby using interview schedule.



Sampling technique and Sample size: The study used a multi-stage sampling procedures to select the representative respondents from the study area. In the first stage, based on pilot study four Woredas of the zone, three kebeles from each, were purposively selected in consideration of water resources, living standard, food insecurity, and poverty situations in the Wolaita zone. Accordingly, Humbo, Kindo Didaye, Kindo Koysha, and Damot Pulasaworedas were selected. In the second stage, three sample kebeles were selected from each of four Woredas by using simple random sampling techniques. Finally, by applying proportional sampling method, a total of 270 household heads were interviewed in February 2018 based on the 2017/18 cropping year. Though the data was collected on many different variables across rural and urban kebeles, this study utilized respondents from rural areas alone. Consequently, respondents from urban and semi-urban kebeles were excluded for the purpose of this study. Hence, in this study, we used 168 rural respondents to identify the major socio-economic determinants of poverty in rural area of wolaita zone, southern Ethiopia.

Method of measuring poverty and poverty line: There are different methods which are employed to estimate the poverty line in various literatures. The most widely used method of estimating poverty line is the cost of basic needs method that includes both food expenditures and non-food expenditures (clothing, housing and health care and education). Accordingly, the study utilized the absolute poverty line of birr 7184 per year per adult equivalent as constructed by MoFED in 2015/16 as stated by National Planning Commission of Ethiopia (2017).That is, agiven household is deemed to be living inpoverty if the annual consumption expenditure per adult equivalentis less than Birr 7184.Otherwise, the household will be considered as non-poor.

Measuring the Extent of Households' Poverty Status: The Foster, Greer and Thorbecke (FGT) (1984) model was employed to analyze the extent ofpoverty in the study area.

The poverty index was given by Pα and defined as follows:

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{q}\left[\frac{(Z - Y_i)}{Z}\right]^\alpha$$

Where: Z is the poverty line,

Y is the consumption expenditure of the individual household
N The number of people in the population,
Q is the number of poor households and
a is a parameter reflecting the weight attached to poverty

When α = 0, the above equation gives us the indices of poverty that is called the head count ratio (head count index).When α = 1, the above equation gives us the depth of poverty called poverty gap index. When α = 2, the equation shows a measure called the severity of poverty index or squared poverty gap.

Econometric Model Specification: Since the dependent variable in this study is household's poverty status which can be classified as poor or non-poor, a binary Logistic regression model is useful. That is, the outcome (dependent variable) is binary, meaning zero or one, with one being success and zero otherwise. Following Gujarati (2004), the functional form of logit model is specified as follows:

$$P_i = E(y = 1|x_i) = \frac{1}{1 + e^{-(x'\beta)}}$$

$$P_i = E(y = 1|x_i) = \frac{1}{1 + e^{-z_i}} = \frac{e^z}{1 + e^{-z}}$$

Where, $Z_i = x'\beta = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_n x_n$, $\beta_0$is an intercept, β_1, β_2&β_n are slope coefficients and x_1, x_2, &$x_n$are related household characteristics.

If P_i, is the probability of household being poor, then$(1 - P_i)$, the probability of household being not poor can be expressed as:

$$1 - P_i = \frac{1}{1 + e^{z_i}}$$

Therefore, we can write

$$\frac{P_i}{1 - P_i} = \frac{1 + e^{z_i}}{1 + e^{-z_i}} = e^{z_i}$$

If we take the natural logarithm of the above equation, we obtain the following equation:

$$\mathcal{L}_i = \ln\left(\frac{P_i}{1 - P_i}\right) = z_i = \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_n x_n$$

By introducing the disturbance term $\boldsymbol{\varepsilon_i}$,the logit model can be written as follows:

$$\mathcal{L}_i = \ln\left(\frac{P_i}{1 - P_i}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_i x_i + \varepsilon_i$$

RESULTS AND DISCUSSION

Descriptive statistics: In this study, poverty line is set based on household's annual consumption expenditure per adult. Then, respondent households classified either poor or non-poor. The survey result has shown that from 168 sample households, 108 (64.3 percent) households were poor while only 60 (35.7 percent) were found to be non-poor. In line with this, as in table 1 shows, descriptive statistics is computed to determine whether there is significant difference between poor and non-poor households with regards to continuous variables.

Table 1. Descriptive Statistics for Continuous Variables

Variables	Description	Poor (108)		Non-poor (60)		Combined (168)		t-value	p-value
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.		
Expenditure	Consumption expenditure per adult in birr	3,344	1884	13,167	7000	6507	6964	13.7	0.000
Land size	Land holding in hectare	.97	0.80	1.09	0.72	1.01	0.77	0.90	0.81
Education level	Education level of the household head	4.29	4.06	5.13	4.89	4.59	4.38	1.18	0.88
Family size	Family size	5.62	2.03	4.88	1.85	5.35	1.99	-2.33	0.0106
Age	Age of the household head	44.41	11.28	44	11.62	44.26	11.37	-0.22	0.41
TLU	Number of Livestock in Tropical livestock unit	2.46	2.02	2.25	1.31	2.38	1.80	-0.71	0..23
Farm Income	Total (annual) farm income	9150	6672.5	30215	20996	16673	16934	9.6	0.000
Market distance	distance from the local Market in minutes	33.84	11.01	32.8	16.63	33.48	13.25	-0.47	0.32
Road distance	distance from the nearest road access in minutes	59.16	27.37	62.5	28.85	60.35	27.87	0.74	0.22

Source: Authors' survey, 2018
***shows significant at 1% probability level

Table 2. Descriptive Statistics for Discrete Variables

Variables	Categories	Poor (%) N= 108	Non-Poor (%) N= 60	Combined (%) N= 168	chi-square	p-value
Non-farm Activities	1= the household participate in any off-farm activities	36.11%	78.33%	51.19%	27.5204	0.000
	0= otherwise	63.89%	21.67%	48.81%		
Sex of the household head	1= male headed	85.19%	86.67%	85.71%	0.069	0.793
	0= female headed	14.81%	13.33%	14.29%		
Marital Status	1= married	88.89%	85.00%	87.50%	0.5333	0.465
	0= otherwise	11.11%	15.00%	12.50%		
Agro-ecological zone	1= mid-highland	65.74%	76.67%	69.64%	2.1779	0.140
	0= otherwise	34.26%	23.33%	30.36%		
Credit Access	1= the household have credit access	22.22%	50.00%	32.14%	13.65	0.000
	0= otherwise	77.78%	50.00%	67.86%		

Source: Authors' survey,2018

Table 3. Poverty indexes in the study area

Poverty Indices	Incidence of Poverty (Head count index)	Poverty gap (Short-fall index)	Squared poverty gap (Severity index)
Poverty Index no.	0.64	0.05	0.81

Source: Field Survey, February 2018

Table 4. Binary Logit Model Result for determinants of poverty

Poverty Status	Coefficients (β's)	Std. Err.	Z-values	P>z	Marginal effect		
					dy/dx	P>z	Mean
Age of the household head	.0156	.05	0.31	0.756	.0026	0.32	0.753
Family size	1.793	.45	3.92***	0.000	.3002	3.71	0.000
Land size	.4475	.52	0.85	0.397	.0749	0.81	0.418
Tropical Livestock Unit	.2559	.26	0.97	0.332	.0428	0.99	0.320
Off-farm activities	-4.73	1.37	-3.43***	0.001	-.707	-5.29	0.000
Education of the household head	-.226	.105	-2.16**	0.031	-.037	-1.84	0.066
Sex of the household head	2.647	1.3	2.02**	0.043	.5669	2.36	0.018
Marital status of the household head	-1.71	1.29	-1.33	0.183	-.193	-1.83	0.067
Agro-ecology	.3746	.748	0.50	0.617	.0653	0.48	0.634
Credit access	.3426	.738	0.46	0.643	.0553	0.47	0.640
Farm income of the household	-.00057	.0001	-4.21***	0.000	-.0001	-3.33	0.001
Market Distance	-.05427	.03	-1.73*	0.084	-.009	-1.69	0.091
Road Distance	.01504	.017	0.86	0.388	.0025	0.86	0.388
Dependency ratio	-1.323	.982	-1.35	0.178	-.221	-1.53	0.127
Constant	3.4857	2.56	1.36	0.174			

Dependent variable= Poverty Status Log likelihood = -30.973598; Number of observation = 168LR chi2(15)= 157.04; Prob> chi2= 0.0000Pseudo R2= 0.7171

Source: Authors' survey, 2018; Note: ***, **, and * shows significant parameters at 1%, 5%, and 10%, respectively.

Among these variables household expenditure, family size and farm income were found significant difference between poor and non-poor households.

Consumption expenditure: In table 1, it is demonstrated that the mean expenditure for poor households is birr 3,344 while birr 13,167is the mean consumption expenditure per adult for non-poor households. It is clear that the two groups have significant difference in consumption expenditure. This confirms to the conventional fact that there is significant difference in consumption outlay between poor and non-poor households.

Family size: The result revealed that family size has significant and negative relationship with poverty status of the households. That is, on average, poor households have more family size than non-poor households. This may be the fact that the responsibility to carry on the livelihood of the household members rests on the available adult working age household member. It increases dependency ratio and increases the tendency of being poor.

Farm income: of the household has significant association with the households' poverty status. In table 1 the average farm income for poor and non-poor household is birr 9,150 and birr 30,214.6 respectively. This significant difference revealed that households generating greater income from farm activities (crop and livestock production) were less likely to be poor in the study area. Table 2 presents whether the considered discrete variables exhibit significance difference between poor and non-poor households. Accordingly, two discrete variables found to be significant difference. These are non-farm activities and credit access. That is, 78.33 percent of non-poor households involves in non-farm activities while 36.11 percent of the poor households are involving in non-farm activities. The t-statistics difference between the two groups shows that participation in off-farm activities is found significant at 1 percent level of significance. This indicates that non-farm activities help households to be non-poor by increasing their income which intern raises consumption expenditure, other things remain constant. The result of the study also found that there is a significant difference between poor and non-poor households in credit access. Table 2 shows thatonly 22 percent of the poor have access to credit while 50% of the non-poor have access to credit witnesses that these households are better off and it may help to be out of poverty. On the other hand, about 78% poor households have no access to credit which may be witnesses as they are worse off due to lack the access to credit.

Analysis of extent and severity of rural poverty: Three fundamental measurements of the poverty indices were used to shed light on the extent and severity of poverty in the rural area of Wolaita zone, southern Ethiopia. These are head count ratio, poverty gap and severity index. Accordingly, the head count index revealed the percentage of the poor below the poverty line. In this study, about 64 percent of the households found to be below the poverty line. In this study, as depicted in table 3, about 64 percent of the households, whose annual consumption expenditure per adult person is found to be below birr 7184 in the study area. This result is much higher than the proportion of population below the poverty line in Ethiopia in which, according to national planning commission (2017), head count index is estimated to be 25.6 percentin rural part of the country in 2015/16. This means that Wolaita Zone constitutes the major share of poor households in the country. The poverty gap determines how far households fall below the poverty line. It is estimated to be about 5 percent. This indicates that 5 percent of poverty line (which is birr 7184) for each adult equivalent is needed to bring them up to the poverty line. The study also estimated severity of poverty (squared poverty gap index) which is 0.81. This measurement considers not only the distance of the poor from poverty line but also incorporates the inequality among the poor. It emphasizes on households far away from the poverty line. Therefore, it shows that 81% of the households falling below the poverty line are severely stricken poverty. It means there is a high degree of inequality among poor households in consumption expenditure.

Econometric Analysis of the Determinants of poverty: We used Logistic regression model in order to examine the determinants of poverty in rural farm households. Table 4 presents the log it model estimation result in which there are 14(fourteen) variables that are expected as the main factors that affect the poverty status of households. As table 4 shows households' family size, participation in off-farm activities, education status of the household head, sex of household head, farm income, and market distance were found to be significant determinants of poverty in the study area.

Family size: of the household has a significant and positive relationship with the probability of the household being poor at 1 percent significance level. That is, as the marginal effect result indicates that a one member increase of household's family size will increases the probability the household being poor by 30%, other things remaining constant. This result is consistent with the finding of Teshome and Sharma (2014); Sudhakara and Nega (2013); and Ayalneh *et al* (2008).

Households' involvement in off-farm activities: has a significant and positive effect on the probability of the household being poor. The coefficient of marginal effect shows that participation in off-farm activity decreases the likelihood of the households' being poor by about 71 percent. That is, households who participate in off-farm activities is less likely to be poor than those who didn't participate. As the household participate in any off-farm activities, the more income it can generate. This in turn increases the household's consumption expenditure. This result is consistent with the finding of Sudhakara and Nega (2013). The model also found a significance and negative association between the probability of the household being poor and the education level of the household head at 1 percent significance level. A one year increase in education level of the head decreases the probability of the household beingpoor by about 4%, citrus paribus. It may reveal that education is one of the main determinants of poverty status of the households. This resultis consistent with the finding of Sudhakara,and Nega (2013)and Ayalneh *et al*. (2005) who reported that education has important effects on the poor children's chance to escape frompoverty in their adult age and plays a catalytic role for those who are most likely to be poor in rural areas. The variable sex of household head has a significant and positive effect with the probability of the household being poor. That is, meal headed households will increase the probability of the household being poor as compared to its counterpart. However, it is a strange finding sincewe expected that, as a general truth, male headed households have greater potential in income diversification, in asset accumulation and/or land ownership that improves the livelihood of the household. Our result is contrary to the finding of the previous studies such as Melese et al. (2017); Teshome and Sharma (2014) who reported that household head being female are positively correlated with the probability of being poor.

Households' farm income proved to be a vital determinant of poverty status of the household at 1 percent significance level. The negative sign of the coefficient, as the marginal effect shows, indicates that a one birr increase in the farm income reduces the probability of household's being poor by about 0.01percent. It is obvious that, on average, the household who have higher income will have more consumption expenditure which reduces the poverty status of the household.

The distance from the nearest market place is another variable that has significant determinant of household poverty status. It is significant at a 10 level of significance. The association show that house holdsfar away from the nearest market place will increase the probability of the household being poor. This may indicate that market access plays its role in the household livelihood status in the study area.

Conclusion and Policy Implications: This study has examined the main determinants of poverty among rural farm households in Wolaita zone, Southern Ethiopia. The FGT index revealed that among the sampled households, about 64 percent households were found to be poor while only about 36 percent were found to be non-poor in the study area. This figure revealed that poverty in the study area is much higher than the proportion of population below the poverty line at the national level which was estimated to be 25.6 percent in rural part of the country in 2015/16.The gap and severity of poverty were found 5percent and 81 percent, respectively. In line with this, the descriptive statistics demonstrated that the two groups have significant difference in annual consumption expenditure per adult. That is, the mean expenditure for poor households is birr 3,344 while birr 13,167 is the mean consumption expenditure per adult for non-poor households. This confirms to the conventional fact that there is significant difference in consumption outlay between poor and non-poor households.

The logistic regression model result also revealed that farm income, participation in off-farm activities, education status of the household head and market distance have a significant and negative association with the probability of the household being to be poor while households' family size and sex of household head have significant and positive effect on the probability of the household being poor. Accordingly, the authors recommends family planning methods to reduce the burden of large family size, raising household income diversification to improve livelihood of the rural farm households, promoting rural off-farm employment opportunities and investment in rural infrastructure so as to reduce the poverty of farm households in the study area.

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