Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.5, No.27, 2014

Analysis of Rural Poverty and Exit time: The case of Gozamn District of East Gojjam Zone, Ethiopia

Tsegaye Molla[1*], Lemma Zemedu(Ph.D)[2], Belaineh Legesse(Ph.D)[3]
[1] Debre Markos University, Department of Agricultural Economics, Ethiopia
[2, 3] Haramaya University, School of Agricultural Economics and Agribusiness, Ethiopia

ABSTRACT
This study was conducted in Gozamn district with specific objectives of measuring rural poverty, estimating the average time needed to exit poverty and identifying the determinants of rural household poverty. The study made use of primary data collected from 120 selected sample households by conducting structured interview employing multi-stage sampling technique. To this end, the CBN approach of setting absolute poverty line was used and the estimated poverty line was found to be ETB 3650.75 per adult equivalent per year. Results of the FGT poverty index revealed that about 49 % of the sample rural households live below poverty line with 9.5% and 3.1% poverty gap and poverty severity, respectively. The average time that the poor rural household might need to exit poverty was estimated to be 4.4 years provided that the 6.4% GDP per capita growth rate per year continues. Econometric results of the binary logit regression model revealed that education, livestock ownership, cultivated land holding, oxen holding, off-farm/non-farm income, credit utilization and frequency of extension contact were found to be as theoretically expected, statistically significant and have a strong negative association with the poverty status of rural households whereas family size alone was found to have a positive association with poverty status of rural households. Hence, promoting equitable economic growth, adult education, family planning, expanded diversification, fostering rural-urban linkages, increasing land productivity, irrigation technologies and promoting research-extension-farmer linkage are indispensible policy interventions to better target rural poverty.
Keywords: Rural poverty, average exit time, binary logit, Gozamn

INTRODUCTION

Poverty has existed for a very long time, and to different extents it remains to be a worldwide social evil still now in the 21st century (FAO, 2012). More than two thirds of the 1.4 billion people who live in extreme poverty reside in rural areas of the developing countries (IFAD, 2011). Poverty in Ethiopia is a longstanding problem affecting a significant portion of its rural and urban population. Survey results of HICES indicated that the proportion of population below poverty line in Ethiopia stood at 30.4% in rural areas and 25.7% in urban areas in the 2010 fiscal year (MoFED, 2012).

Recently, the MPI value of Ethiopia was 0.564 (HDR, 2013). Although there is a declining trend of poverty both at regional and national levels, the highest food poverty was noted in Amhara National Regional State with a head count index of 42.5% according to the regional statistical figures of MoFED (2012). Rural and urban poverty head count index in the region stood at 30.7% and 29.2%, respectively in which the former is above the national head count index of 29.6% during the 2010/11 indicating that rural poverty is a widely spread problem in the region leaving rural households still poor.

For sustained fight against rural poverty and realization of poverty free Ethiopia, there is a need to design pro-poor and location specific poverty reduction policies and strategies in the country generally, and this is an on-going effort since ten years ago. But, for ease of intervention and to succeed in the near future, that entails deep assessment of not only the dynamics and extent of rural poverty, but also identification of who the poor are and how long will it take, on average, for the poor households to exit poverty provided that the per capita consumption of the poor increases by a positive rate per year. Moreover, factors which are antidotes of poverty and aggravating poverty need to be understood and substantiated both spatially and temporally.

It is obvious that it is hardly possible to use poverty assessment results carried out elsewhere in the country for other areas due to the fact that the country is differentiated with diverse socio-economic settings, and agro-climatic zones. Even, regional poverty analysis results are seldom used by other districts as the households may differ in their socio-cultural contexts and livelihood strategies being pursued. This inevitably calls for the need to go deep into the analysis of the average time that will take for the poor to exit poverty and the determinants of

* Corresponding author, E-mail: tsegayem4@gmail.com,

rural poverty at the household level so that it will support the on-going poverty reduction programme of the country ─ GTP the so-called PASDEP II (MoFED, 2010).

Studies with special focus on the average time needed for the poor households to exit poverty, the extent of poverty, and factors affecting rural poverty are not yet studied in the rural areas of Gozamn district. This was the motive behind the need to analyze rural poverty at a household level. Hence, this study is deemed to fill the existing knowledge gap concerning rural poverty in the study area with the following objectives: measuring the extent of rural poverty, estimating the average time needed to exit poverty and identifying the determinants of rural household poverty.

METHODOLOGY

Description of the Study Area

Gozamn is one of the fourteen districts in East Gojjam Administrative Zone of Amhara National Regional state (ANRS). The district, which is bordering Debremarkos town, is located 300 kms north west of Addis Ababa and 265 kilometers south east of Bahirdar, the capital city of Amhara National Regional State (EGZFED, 2011). Of the total cultivated area of 64,951 ha, 5.32% is found in *wurch* (>3500 m.a.s.l), 35.55% *dega* (2500-3500 m.a.s.l), 43.41% in *woina dega* (1500-2500 m.a.s.l), and 15.72% in *kola* (500-1500 m.a.s.l) agro-ecological zones, respectively.

Sample Size and Sampling Technique

Taking into account that there are tradeoffs between cost and accuracy in every research, the total number of samples was determined by applying a simple formula (Yamane, 1967). Multi-stage sampling procedure was used to select the total number of samples. The first stage involved stratification of the district consisting of 24 rural kebeles in to three agro-ecological zones (*dega, woinadega and kola*) for representativeness of the sample households. Then, a total of four kebeles representing the aforementioned agro-ecological zones were selected randomly in proportion to the area coverage of the agro-ecologies. Finally, after identifying the sampling frame which contains the complete list of all households within each selected kebele with kebele leaders, a total of 120 sample rural households were randomly selected from the selected kebeles in proportion to their total number of households.

$$n = \frac{N}{1 + N(e)^2} \quad \text{.....(1)}$$

Where n is the sample rural household, N is the total rural households (4,773 households) within the selected four kebeles of the district, and e is the level of precision set at 9%.

Methods of Data Collection

This study was accomplished from both quantitative and qualitative data types which were gathered from both primary and secondary sources. Primary data were collected from sample rural households by means of structured interview with the help of enumerators. Before the actual survey, questionnaire pretesting and continuous supervision were made to gather data relevant for the study. Secondary data were also utilized from sources such as zone report (EGZFED) and regional reports (BoFED) on issues associated with rural poverty.

Analytical Methods

Descriptive statistics

Descriptive statistical methods such as mean, standard deviation and percentage have been used for the data gathered from rural households in the study area. Besides, t-test was used to compare the mean difference of the poor households vis-à-vis the non-poor households for continuous explanatory variables considered in the study.

Measuring poverty indices

To estimate the poverty line, the study used the CBN method. To this end, a basket of food items actually consumed by the households were recorded and converted to calories using the food composition table

developed by EHNRI (2000). The aggregate food calories were adjusted in adult equivalent units and all that is consumed was multiplied by local prices of acquiring them to estimate the food poverty line. To account an allowance for non-food basic needs, non-food poverty line was determined using a simple linear regression of the share of food expenditure to total expenditure (S) to compute total poverty line (Ravallion, 1992).

$$S_i = \alpha + \beta \log\left(\frac{TE}{FPL}\right)_i + \varepsilon_i \quad \text{.....(2)}$$

Where: i runs through the sample households 1 to n. After constructing poverty line using expenses of food and non-food basic needs, three poverty measures were identified following the procedures developed by Foster *et al.* (1984), viz. the incidence of poverty (P_0), the depth of poverty (P_1), and the severity of poverty (P_2) are used. The FGT index is formulated as:

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{n}\left(\frac{z - x_i}{z}\right)^\alpha, \alpha = 0,1,2 \quad \text{.....(3)}$$

Where p_α is the poverty measure, Z is the poverty line, xi is the consumption expenditure level, N is the number of sample households, n is the number of the poor households and α is the weight given to severity of poverty (measure of sensitivity of the index to poverty).

Average time needed to exit poverty

The average time to exit poverty was addressed by using a poverty statistic provided by Morduch (1998) with the property of decomposability by population subgroups and sensitivity to expenditure/income distribution among the poor. Thus, for the j th household below poverty line, the expected time needed to exit poverty if consumption per capita grows at a positive rate g per year is:

$$t_g^j \approx \frac{\ln(z) - \ln(x_j)}{} = \frac{w}{g} \quad \text{..... ....(4)}$$

It is possible to estimate the average exit time of the average poor household by taking the average per capita consumption of the poor households per year as shown below although this measure is insensitive to the distribution of consumption/income below the poverty line.

$$t_g^{avg} \approx \frac{\ln(z) - \ln(\mu_p)}{g} \quad \text{..... ....(5)}$$

Where; μ_p = the average per capita consumption expenditure of the poor households below poverty line. Besides, the average exit time across the poor households is simply $t^j{}_g$ averaged over the entire poor households:

$$T_g = \frac{1}{n}\sum_{j=1}^{n} t^j{}_g = t^j{}_g = \frac{1}{n}\sum_{j=1}^{n}\frac{\ln(z) - \ln(x_j)}{g} = \frac{w}{g} \quad \text{.....(6)}$$

Where n is households whose per capita consumption expenditure x falls below poverty line z, X_j is per capita consumption expenditure in the j th household, and W is watts index.

Econometric model

Binary logit model is used to analyze the relationship of household's poverty status and its determinants. Thus, a household is deemed living in poverty ($Y = 1$) if it's total consumption per adult equivalent per year is less than

the poverty line or non-poor ($Y = 0$) if its consumption short fall is greater than or equal to zero. The econometric model is specified as:

$$Y_i^* = \beta_0 + \sum_{i=1}^{n} \beta_i X_i + u_i \quad \text{.....(7)}$$

Where; Y_i^* = latent variable that indexes the measure of poverty; Y_i^* =1 if $Y_i < 0$, 0 if $Y_i \geq 0$; n is the number of explanatory variables; β_0 is the intercept; β_i is the coefficient vector of all explanatory variables; U_i is the disturbance term; and X_i is explanatory variables.

Hence, the probability of a household being below poverty line is given by:

$$P(Y_i = 1) = \frac{\exp(X_i \beta_i)}{1 + \exp(X_i \beta_i)}, or \frac{e^{Y_i}}{1 + e^{Y_i}} \quad \text{.....(8)}$$

And the probability of a household being above poverty line ($1 - p$) is given by:

$$P(Y_i = 0) = \frac{1}{1 + \exp(X_i \beta_i)}, or \frac{1}{1 + e^{Y_i}} \quad \text{.....(9)}$$

The average marginal effect (AME) of a given explanatory variable, X_i, on the probability of a household to be above poverty line is given by:

$$\frac{\partial P(Y_i = 0)}{\partial X_i} = -\frac{\exp(x_i \beta_i)}{[1 + \exp(x_i \beta_i)]^2} \beta_i \quad \text{.....(10)}$$

For validation of the model, multicollinearity test using VIF and heteroscedasticity test using Breusch-Pagan/Cook Weisberg test were performed and adjustments were made accordingly using SPSS ver.20 and STATA ver.12 software packages.

Table 1. Definition of hypothesized effects of explanatory variables on rural poverty

Variable code	Variable type	Variable definition and measurement	Hypothesized effect on rural poverty
Dependent variable			
POVSTT	Dummy	Household poverty status: 1= poor; 0 = non-poor	
Independent variables			
AGE	Continuous	Age of the household head in years	+/-
DEPRATIO	Continuous	Dependency ratio in AE	+
LIVSOWN	Continuous	Livestock ownership in TLU	-
OXOWN	Continuous	Oxen ownership in number	-
LANDHLD	Continuous	Land holding of the household in hectares	-
EDULVL	Continuous	Education level of the head in years of schooling	-
DSTMRKT	Continuous	Distance from the market center in kilometers	+
SEX	Dummy	Sex of the head: 1 if male; 0 otherwise	-
OFFINCM	Continuous	Off-farm and non-farm income earned in	-

		birr/year	
FAMSIZ	Continuous	Family size of household in AE	+
FREQEXTN	Continuous	Frequency of extension contact in days/month	-
CRDTUTZ	Continuous	Credit utilized in birr within the year	-

Source: Own definition (2013)

RESULTS AND DISCUSSION

Dimensions of Rural Poverty

Poverty line and indices

Taking in to account the diet of sample households needed to attain the minimum caloric requirement of 2200 kcal per adult per day, the food poverty line in the study area is determined. Accordingly, the estimated food poverty line that provides the minimum food requirement is found to be Birr 2398.54 per adult equivalent per year (Table 2). Regression result[1] of the share of per adult food expenditure to total expenditure on a constant and the log of the ratio of total expenditure to the food poverty line showed that the share of food expenditure and non-food expenditure were found to be 65.7% and 34.3%, respectively. Using the latter figure, the non-food poverty line was estimated to be ETB 1252.21 per adult equivalent per year. Hence, the total absolute poverty line (the sum of food poverty line and non-food poverty line) demarcating the poor households from their non-poor counterparts was estimated to be ETB 3650.75 per adult equivalent per year or equivalent to ETB 10 per adult equivalent per day.

Table 2. Food consumption, food prices and food poverty line estimates

Food group	Gm per day per adult	*Mean kcal per gram	Kcal per day per adult	Caloric share (%)	Mean price per kg/lt	Value of poverty line per year	Expenditure share (%)
Cereals		3.41					
Teff	323.8		1104.15	50.19	11.6	1370.97	57.16
Barley	1.30		4.42	0.20	7.5	3.56	0.15
Wheat	48.88		166.70	7.60	6.54	116.68	4.86
Maize	92.16		314.27	14.28	5.65	190.06	7.92
Sorghum	88.98		303.43	13.79	7.97	258.85	10.79
Pulses		3.45					
Bean	17.63		60.84	2.76	8.79	56.46	2.36
Field pea	3.00		10.34	0.47	10.05	11.00	0.46
Cow pea	34.91		120.46	5.47	6.91	88.05	3.67
Salt	6.40	1.78	11.39	0.52	4.34	10.14	0.42
Oil/fat	5.78	8.12	46.92	2.13	42.24	89.11	3.72
Butter	0.59	8.12	4.82	0.22	12	27.22	1.14
Vegetables	10.81	0.37	4.00	0.18	2.2	8.68	0.36
Spices	6.13	2.97	18.21	0.83	42.1	94.20	3.93
Milk	34.94	0.86	30.05	1.36	5.76	73.46	3.06
Total			2200	100		2398.54	100

Source: Own computation (2013)
* Adopted from EHNRI (2000)

[1] Based on equation 2 specified to determine non-food poverty line, hence total poverty line.

The estimated poverty line was used to estimate poverty indices in the study area using the FGT class of poverty measures developed by Foster *et al.* (1984) are used to explain the extent of poverty in the study area. Accordingly, 0.49, 0.095, and 0.031 are the computed head count index, poverty gap and poverty severity, respectively (Table 3).

Table 3. Poverty indices of sample households

Poverty index	Index value
Poverty head count index (P_0)	0.49
Poverty gap/depth index (P_1)	0.095
Poverty severity index (P_2)	0.031

Source: Own computation (2013)

As shown in Table 3 above, 49% of the sample households are unable to fulfill the minimum amount of consumption expenditure of ETB 3650.75 per adult equivalent per year and they live under absolute poverty. Besides, a poverty gap ($\alpha = 1$) of 9.5% implies the amount of income transfer needed to close up the average gap or distance separating the poor from the poverty line. Finally, the FGT severity index ($\alpha = 2$) in the consumption expenditure reveals a 3.1% fall below the threshold line implying relatively low inequality as compared to the 2010/11 national poverty severity of 3.2% reported for rural areas.

Table 4. Summary statistics of all continuous explanatory variables by poverty status

Explanatory variable	Poor households		Non-poor households		t-value
	Mean	Std. Dev	Mean	Std. Dev	
Education level	1.07	1.7	2.39	3.37	-2.70***
Family size	4.79	1.04	4.46	1.11	1.70*
Dependency ratio	0.57	0.46	0.40	0.37	2.19**
Age of head	46.9	6.7	51.2	7.32	-3.37***
Frequency of extension contact	1.07	0.26	1.40	0.62	-3.58***
Cultivated land holding	1.63	0.43	2.39	0.59	-8.04***
Livestock ownership	4.24	2.30	6.76	3.87	-4.17***
Oxen ownership	2.6	0.90	3.4	0.67	-5.00***
Off-farm and non-farm income	4965	2387.29	6196.67	2119.61	-2.01**
Credit utilized	600.14	174.83	984.02	629.44	-1.96*
Distance from the market	19.02	4.13	15.40	6.38	3.67**

Source: Own survey result (2013)
***, ** and * denote significance at 1%, 5% and 10% significance levels, respectively

Time Needed to Exit Poverty

Average exit time is a simple metric of the potential for economic growth to reduce poverty by mapping the income/consumption distribution to the space of time. The average time that takes for the poor households to exit poverty is increasingly becoming popular these days for policy issues more than the proportion of the poor households. This is due to the fact that the objective of poverty reduction in a nation will only be successful provided that the economy of the nation grows continuously and at the same time the poor groups of rural households are taken in to account by policy makers. Hence, the concept of average time needed to exit poverty is central to lift majority of the poor households from poverty.

An appealing and more useful indicator for policy discussions may be the average exit time amongst the poor than the average exit time of all sample households because otherwise policy makers might conclude (based on the later) that poverty can be quickly eliminated, neglecting to remember that many people are already non-poor. Using the consumption per capita growth rate of the region, the average time needed for the poor households to exit poverty was estimated assuming that this growth rate is continuous and registers a positive result each year. Accordingly, it takes on average 4.4 years (Table 5) to push the poor households out of poverty or at least to bring them to the poverty line if GDP per capita of the region registers a positive growth rate of 6.4% per year on

average. The resulting exit time is almost comparable to the above if the estimation is made using projected values of the GDP growth rate for 2013.

It is also possible to demonstrate the contribution of inequality to this average exit time. The average expenditure level of the poor is ETB 2855.00 per capita per year, and starting from this point and growing by 6.4% per year, it would take 4.0 years for the average poor household to reach the poverty line. Hence, inequality amongst the poor adds an extra 0.4 year to their average exit time. Although the additional exit time looks negligible may be due to lower consumption inequality amongst the poor households, it is generally an indicator of to what extent higher consumption inequality delays the time needed for the poor households to exit poverty for longer years. It should be noted that exit times describe possibilities based on simple assumptions as used here; they are not based on actual economic figures. However, if used cautiously and economic possibilities are realized, exit times are certainly useful in identifying opportunities and constraints so that to guide poverty reduction policies and strategies accordingly. Among the opportunities and constraints, substantiating how much economic growth reduces poverty and to what extent consumption/income inequality of the poor delays the time needed to exit poverty, respectively is worth mentioning.

Table 5. Average time needed to exit poverty at 6.4% growth rate of RGDP of the region

Poverty measures	Estimated value
Average exit time of poverty for all sample households ($T_{6.4\%}$)	2.8 years
Average exit time of poverty for all poor households ($t_{6.4\%}$)	4.4 years
Exit time of poverty for the average poor household ($t^{avg}_{6.4\%}$)	4.0 years
Additional years to the average exit time due to inequality amongst the poor	0.4 years
Watts Index (*W*)	21.95
[A] Required Real GDP per capita growth rate/year to exit poverty by 2015	11%
[B] Estimated Real GDP per capita growth rate/year of the region in 2013*	6.4%
[A] - [B] Growth gap	-4.6%
Poverty line for the sample households (per capita per year)	ETB 3684.16
Average per capita expenditure per year for the poor households (μ_p)	ETB 2855.00

Source: Author's computation using regional RGDP data (2013)
* Based on the five year average RGDP growth rate (2005/06-2010/11)

Econometric Results of the Determinants of Rural Poverty

Out of the 12 explanatory variables included in the logistic regression model, eight continuous variables have shown statistical significance in determining rural households' poverty while the remaining four of them didn't show significant relationship with rural poverty. Of the 8 significant variables; land holding, oxen holding, livestock holding and off-farm/non-farm income are highly significant at 1% probability level. The variables education level, family size and frequency of extension contact are strongly significant at 5% probability level whereas credit utilization did at 10% (Table 6).

Table 6. Estimation results of binary logit model

Explanatory Variables	Coefficient (β)	Robust Standard Error	P>|Z|	Marginal effect (dy/dx)
FAMSIZ	0.853**	0.406	0.036	0.049***
AGE	-0.106	0.090	0.242	-0.006
SEX	1.229	1.318	0.351	0.070
EDULVL	-0.519**	0.224	0.021	-0.030***
DEPRATIO	0.959	0.987	0.332	0.055
LVSTOWN	-0.545***	0.201	0.007	-0.031***
OFFINCM	-0.0005***	0.0002	0.009	-0.00003***
DSTMRKT	0.082	0.077	0.284	0.005
CRDTUTZ	-0.003*	0.002	0.064	-0.0002**

FREQEXTN	-1.954**	0.801	0.015	-0.112***
LANDHLD	-3.144***	0.676	0.000	-0.180***
OXOWN	-2.427***	0.746	0.001	-0.140***
Constant	18.975***	7.077	0.007	

Sample size (N)	120
Log likelihood	-22.35
Wald $chi^2(12)$	38.22***
Prob > chi^2	0.000
Correctly predicted (count R^2)[1]	93.3%
Sensitivity[2]	93.2%
Specificity[3]	93.4%

*, **, and *** denote significance at 10%, 5%, and 1% significance levels, respectively
[1]Based on 0.5 cut value; [2]Correctly predicted poor group; [3]Correctly predicted non-poor group
Source: Model output (2013)

Household family size (FAMSIZ): As expected, family size was associated with rural household's poverty status positively and significantly at 5% level of significance. The explanation is that larger family size implies more dependent persons and hence a higher burden on the family for adequate food and non-food basic needs. The average marginal effect, holding all other variables constant, tells us that the probability of being non-poor decreases on average by nearly 5% if household family size increases by 1 adult equivalent (Table 6). The result conforms to the finding of Semere (2008) who found that family size is positively and significantly associated with rural poverty at 5% significance level.

Education level of household head (EDUCLVL): This vital human capital was expectedly having a strong negative relationship with the probability of rural household poverty and the variable is significant to determine rural poverty at 5% probability level. The justification is that literacy promotes households' awareness and use of new agricultural technologies, inputs and they are keener to diversify their income sources to escape from unforeseen risks of food insecurity and rural poverty. The average marginal effect of education level, holding other variables constant, shows that for each additional years of education promoted, there is an average of 3% increase in the probability of a household to exit from the risks of poverty validating the motives of promoting adult education in rural areas. The result is in conformity with the study of Ayalneh *et al.* (2005).

Household livestock ownership excluding oxen (LIVSTOWN): This economic variable was found to be highly significant and negatively related with rural poverty at 1% probability level. The negative relationship of livestock holding with household poverty lies in the fact households used to purchase food and non-food needs from the sale of livestock and livestock products being they are immediate sources of on-farm income. Holding other variables constant, the average marginal effect indicates that as the size of livestock holding increases by 1 TLU, the probability of the household to exit poverty increases on average by 3.1%. This result conforms to the findings of both Hilina (2005) and Semere (2008) who noted that large livestock endowment enables rural households to earn more on-farm income at 5% probability level in both of the findings.

Household off-farm and non-farm income (OFFINCM): Off-farm/non-farm income of the household was found to be a significant determinant of rural poverty negatively at 1% level of significance. The justification behind the result is that rural households earning more off-farm and non-farm income from different sources enables them to relieve financial scarcity as they can allocate it for whatever immediate requirements implying favorable opportunities to exit from poverty. The average marginal effect indicates that as the household earned one more unit of off-farm/non-farm income, the probability of being poor decreases on average by 0.003% holding other variables constant. The study finding conforms to Semere (2008) who underscored the merit of off-farm/non-farm income to reduce poverty at 1% significance level.

Credit utilization (CRDTUTZ): This financial capital is negatively correlated with poverty status and it is highly significant at 10% significance level. It is quite clear that a household utilizing credit is able to either financing farm input purchase and other immediate food and noon-food requirements or investing to different

income generating activities expecting profit in the long run which ultimately lead them to exit poverty. Holding other variables constant, the average marginal effect of credit utilization specifies that for each additional amount of credit received, there is an average of nearly 0.02% additions to the probability of a household to exit poverty. The study result is in agreement with Apata *et al.* (2010) who reported that credit can be used to invest in various income generating activities and the variable was found to be significant at 10% significance level.

Frequency of extension contact (FREQEXTN): Expectedly, the frequency of extension contacts made by rural households per month was negatively and significantly related with rural poverty at 5% probability level. This is due to the fact that household heads who are in close contact with development agents could receive extension advices, trainings and demonstrations on livelihood strategies pertinent to them. The average marginal effect shows that for each additional extension contact days made per month, the probability of a household to exit poverty increases by about 11.2% on average, holding other variables constant. The result of the study is consistent with the findings of Adugna and Sileshi (2013) in that rendering extension services to rural households is found to be negatively and significantly influence the likelihood of a rural household to be poor at 10% probability level stressing that poverty reduction motives could succeed through extension advice and technology promotion.

Cultivated land holding of the household (LANDHLD): As expected, cultivated land holding was found to be a highly significant determinant of rural poverty negatively at 1% level of significance. The justification lies in the fact that rural households who are cultivating larger land, may be through sharecropping beyond their holding, are capable of exploiting the benefit of diversified livelihood opportunities. Hence, cultivated land holding takes the lion share among others as an exiting vent from the blight of food insecurity and poverty for ultimate realization of establishing a poverty free household. The average marginal effect of land holding specifies that for each additional hectare of cultivated land holding, the probability of a household to exit from absolute poverty increases by an average of 18% holding other variables constant. The result is in complete agreement with study findings of Alemayehu *et al.* (2006) and Adugna and Sileshi (2013) who noted the imperativeness of cultivated land holding which supports rural households' effort to exit poverty, and the variable was significant at 1% probability level.

Oxen ownership (OXOWN): Oxen ownership, which is negatively associated with rural household's poverty status, was also highly significant at 1% significance level. The implication underlying rural households with an increased number of oxen holding tend to be non-poor is that they may enter sharecropping arrangements with other households with reasonable cultivated land holding but no oxen, hence they are able to produce enough food beyond securing the food need of their family. Holding other variables constant, the average marginal effect of oxen ownership suggests that the probability of being poor decreases by an average of 14% with each additions of ox owned by the household. The study finding conforms to Alemayehu *et al.* (2006) from their study of finance and poverty in Ethiopia who underscored the critical role of the number of oxen holding for rural poverty reduction is found to be significant at 1% significance level.

CONCLUSION AND RECOMMENDATIONS

The findings in the study area indicated that the proportion of population below poverty line still remained at its highest as compared to the 2010/11 regional and national rural head count indices of 30.7% and 30.4%, respectively. But, there is a slight decline in the poverty gap and poverty severity as compared to the previous poverty statistics reported in the region.

The average time needed to exit poverty was estimated by assuming a continuous and uniform economic growth across the population. One can't say as if there is an on-going poverty exit unless income/consumption inequality gets rid of through pro-poor interventions tailored towards increasing the consumption pattern of the poor from diversified livelihoods. This calls for the regional government to work hard to increase the economic growth by more than 11% if it is committed to attain the MDGs target 1 via equitable economic growth that increases the income sources thereby the consumption pattern of the poor, hence they would be better off.

Education level of household heads is negatively and significantly related with rural poverty. The more literate is the head, the more chance of being freed from poverty for they are able to understand how to make living and lead decent life. The positive contribution of education for positive returns to labor calls for an integrated intervention of rural people-centered education tailored to promote their educational level in all issues linked with rural livelihood and health via formal institutions like adult education coupled with expansion of health institutions on behalf of establishing literate, healthy and hence ultimately poverty free rural households.

Household family size was found to determine household poverty status positively. Households with larger family size are unable to exit poverty for they are not able to meet the minimum daily calorie requirement. Thus, limiting family numbers through continued family planning is central here for the establishment of poverty free family.

Off-farm/non-farm income are negatively and significantly related with rural poverty indicating that they are additions to households' on farm income for pursuing different livelihood strategies (diversification) besides farming; hence increasing their probability to exit poverty. Though much of the credit is spent for production than for consumption, the former is left undiversified by rural households which call for promoting credit spending in a possible combination of enterprises. Indeed, the availability of off-farm/non-farm income and credit opportunities alone is not a guarantee to better exploit the benefit of diversification unless rural-urban market linkages are strengthened. Hence, as policy intervention in this regard, fostering rural-urban linkages via rural infrastructural development should continue.

Cultivated land holding is also negatively and significantly related with poverty indicating larger land holding reduces rural household poverty through securing food need and earning substantial on-farm income for securing non-food basic needs. However, expanding any more land holding today is increasingly rare because of increasing demographic pressure on land and degradation of the existing land resource. This calls for introducing the issue of increasing productivity and intensification. This would be fruitful provided that it is accompanied with policy interventions of investment in small-scale and large scale irrigation technologies than depending merely on erratic rainfall thereby relieving livelihood risks emanating from shortage of rainfall. Furthermore, frequency of extension contact is negatively related to rural household poverty implying that households who contacted extension workers more are nearer for transfer of new technologies pertinent to better improve their livelihood strategies. Extension workers play a key role as a means of technology transfer from technology site to farmers' site. Investment in extension program is another area of intervention through capacity building to promote the existing research-extension-farmer linkage to a higher stage.

REFERENCES

Adugna Eneyew and Sileshi Mengistu, 2013. Determinants of Poverty in Agro-pastoral Societies of Southern Ethiopia. *Livestock Research for Rural Development*, 25(20). (http://www.lrrd.org/lrrd25/2/adug25020.htm) (Accessed on August 27, 2013).

Alemayehu Geda, Abebe Shimeles and Daniel Zerfu, 2006. Finance and Poverty in Ethiopia; United Nations University-World Institute for Development Economics Research. Research Paper No. 2006/51. May 2006. (http://www.wider.unu.edu/stc/repec/pdfs/rp2006/rp2006-51.pdf) (Accessed on September 2013).

Apata, T.G., Apata, O.M. and Igbalajobi, O.A., 2010. Determinants of Rural Poverty in Nigeria: Evidence from Small holder Farmers in South-western Nigeria. *Journal of Science and Technology Education Research,* 1(4): 85–91. (http://www.academicjournals.org/JSTER/PDF/). (Accessed on august 2013).

Ayalneh Bogale, Konard Hagedorn and Benedikt Korf, 2005. Determinants of Poverty in Rural Ethiopia. *Quarterly Journal of International Agriculture,* 44 (2): 101-120. (http://www.researchgate.net/publication/228342175_Determinnts_of_poverty_in_ruralEthiopia) (Accessed on September 2013).

BoFED (Bureau of Finance and Economic Development), 2013. Regional Macro-economy and Structure of Amhara National Regional State from 2005/06-2010/11, BoFED. Bahir Dar. (Unpublished report).

EGZFED (East Gojjam Zone Finance and Economic Development Guidance). 2011. Statistical report of all districts. Debre Markos. (Unpublished).

EHNRI (Ethiopian Health and Nutrition Research Institute), 2000. Food Composition Table For Use in Ethiopia. Ethiopian Health and Nutrition Research Institute, Part III, Addis Ababa. Ethiopia.

FAO (Food and Agriculture Organization), 2012. World Poverty: A Look at Causes and Solutions; by Vincent Wilmot; 166 Freeman Street; Grimsby, UK.

Foster, J., Greer, J. and Thorbecke, E., 1984. A Class of Decomposable Poverty Measures. Econometrica, Vol.52.

HDR (Human Development Report), 2013. The Rise of the South: Human Progress in a Diverse World. Explanatory note on the 2013 HDR composite indices.

Hilina Mikrie, 2005. Dimensions and Determinants of Poverty in Pastoral areas of Eastern Ethiopia; the case of Shinile zone in Somali National Regional State. M.sc thesis in Agricultural Economics, Alemaya University, April 2005.

IFAD (International Fund for Agricultural Development), 2011. Enabling Poor Rural People to Overcome Poverty; Rural Poverty Report; New Realities, New Challenges, New Opportunities for tomorrow's generation.

MoFED (Ministry of Finance and Economic Development), 2010. Ethiopia: Country Report on the Implementation of the Brussels Plan of Action (BPOA). February 2010. Addis Ababa, Ethiopia.

MoFED (Ministry of Finance and Economic Development), 2012. Interim Report on the 2010/11 Poverty Analysis. Addis Ababa: Federal Democratic Republic of Ethiopia.

Morduch, J., 1998. Poverty, Economic Growth and Average Exit Time. *Economics Letters,* 59: 385-390.

Ravallion, M., 1992. Poverty Comparisons: A Guide to Concepts and Methods. LSMS (Living Standard Measurment Study) Working Paper No, 88. Washington, D.C, World Bank.

Semere Gebretsadik, 2008. Dimensions and Determinants of Rural Household Poverty: The Case of Eastern Zone, Tigray National Regional State. M.sc Thesis in Agricultural Economics, Alemaya University, April 2008.

Yamane, T., 1967. Statistics, An Introductory Analysis, 2nd Edition. New York.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Academic conference: http://www.iiste.org/conference/upcoming-conferences-call-for-paper/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar