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**Determinants of farm household poverty status in South Wollo Zone, Amhara  
Regional state, Ethiopia**

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**ABSTRACT**

*The present study attempts to identify and analyze the determinants of farm household poverty status in South Wollo Zone of Amhara regional state, Ethiopia. Primary data is collected from 516 sampled farm households in four sampled districts by employing multi-stage stratified random sampling technique through conducting structured questionnaire. Results of the probit model reveals that educational status, use of irrigation, livestock holding, involvement in non-farm activities, size of farm land, agro-climate zones and productivity potential of districts show negative effect whereas family size, dependency ratio, religion of the head and average distance to various services have positive association with poverty status of rural households. Hence, promoting education, family planning, expanded diversification, increasing land productivity, irrigation technologies, provision of public goods, improving livestock production and productivity etc. are indispensable policy interventions to better target rural poverty.*

**Keywords:** Determinants, poverty, farm household, South Wollo Zone, Ethiopia

### **Introduction**

Up to half a billion people are thought to be extremely poor, with the vast majority of them living in rural areas in South Asia and Sub-Saharan Africa. Around one-third of all those who are extremely poor (below the international \$1.25 per person a day threshold) are also chronically poor: they are poor for many years or even for their entire lives – and often pass their poverty on to their children (ODI, 2014).

The crucial determinants of poverty among the majority of rural areas of the Third World countries are low levels of physical and human capital, unequal distribution of productive assets, inadequate access to social services, wide fluctuations in agricultural production as a result of drought, an ineffective and inefficient agricultural marketing system, underdeveloped transport and communication networks, underdeveloped production technologies, limited access of rural households to support services, environmental degradation and lack of participation by rural poor people in decisions that affect their livelihoods (IFAD, 2007).

Ethiopia is one of the largest countries in Africa and second most populous country in Sub-Saharan Africa, with population of 91 million and growing at 2.9 per cent per year (World Bank Report, 2012). The agriculture sector is important to the Ethiopian economy; contributing 46.4 per cent to GDP and employing roughly 85 per cent of the labour. This sector generates 90 per cent of export earnings. Hence, agriculture is the backbone of the economy. The 2010/11 HICE survey estimated the proportion of poor people in Ethiopia to be 29.6 per cent, falling significantly from 38.7 per cent in 2004/5. Poverty is slightly higher in rural (30 per cent) than urban areas (26.1 per cent). Over the same period, the poverty gap index fell from 8.3 per cent in 2004/5 to 7.8 per cent in 2010/11, indicating a reduction in the intensity of poverty. Despite the reduction in headcount poverty and the poverty gap, there has been an increase in the severity of poverty, as measured by the increase in the poverty gap squared from 2.7 per cent in 2004/5 to 3.1 per cent in 2010/11. This means that the poorest people were worse off in 2010/11 than they were in 2004/5 (MoFED, 2012).

Poverty is demonstrably present both in the urban and rural areas of Ethiopia, the magnitude of which is severely felt in the latter. Heavy dependence on rain-fed agriculture, reliance on traditional skills and backward techniques of production, increased fragmentation and marginality of land, engagement in conflict situations over a prolonged period of time, continuous environmental degradation, high rate of population growth, adverse climatic conditions and poor performance of the Ethiopian economy lent a structural dimension to the poverty situation in Ethiopia. In addition, lack of means by which the poor can address their problems and enhance their active participation in decision-making has hindered their attempts to move out of the state of deprivation (Enquobahrie, 2004).

From the regions of Ethiopia, Amhara region is the host of a large number of poor people. In terms of food poverty, the highest poverty is observed in Amhara region (42.5 per cent) followed by Tigray (37.1) and Benehsangul Gumuz (35.1 per cent) regions (MoFED, 2012). Rural and urban poverty head count index in the region stood at 30.7 per cent and 29.2 per cent, respectively in which the former is above the national head count index of 29.6 per cent during the 2010/11 indicating that rural poverty is a widely spread problem in the region leaving rural households still poor. Thus, the situation of poverty in Amhara region is seen to be most severe than the other regions of the country. Current trends in population growth, poor land and

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resource utilization, severe environmental degradation and erratic rainfall cause widespread and deep-rooted poverty in general and food insecurity in particular in the region (SARDP, 2010).

This research study is conducted in the South Wollo Zone of Amhara Region of Ethiopia. The challenges facing small holder agriculture in South Wollo Zone is not different from the above situations. The study zone is among the chronically affected zones in Amhara Region which is currently facing daunting challenges of poverty and food insecurity.

One of the challenges in the fight against poverty is clear identification of the prevailing impediments. Most research works in Ethiopia focused on national and district levels and little is done at zonal levels. But, analyzing the determinants of poverty at aggregate level hides many important differences that exist in different locations and at district level are unable to show the zonal situations. Thus, identification of zone specific factors determining the poverty status is essential to fill the gap in the field and assist poverty alleviation endeavors of the region in general and the zone in particular.

### **Methodology**

#### **Data Source and Data Collection Method**

In the present research study, primary and secondary data were used. Primary data was collected through structured questionnaires. The structured questionnaires were administered to the heads of the sample households. Secondary data was collected from zone and district agriculture and rural development offices, zone and district productive safety net programme offices, pertinent documents, and previous literature to support the primary data analysis and interpretation. The data used in this paper is based on the survey conducted for the year 2014-15.

#### **Sampling Technique and Sample size**

Multi- stage stratified random sampling technique was used viz., zone as the first stage, district as the second stage, the villages (*kebeles*) as the third stage and the farm households as the final or ultimate stage for data collection.

South Wollo Zone was selected for the purpose of the present study. The next stage of selection was districts; the 20 rural districts in the zone are at different levels in terms of productivity potential, viz. low, medium and high potential productivity districts (Zone Safety Net Programme Office, 2014/5). Out of the total 20 districts in the zone, 4 districts viz. Jama from high, Kalu and Tenta from medium and Ambasel from low productivity potential districts were chosen randomly on the basis of proportion.

For the selection of sample *kebeles*, the third stage is stratifying the sample districts in to *kebeles* based on the existing agro – climatic zones (the agro-climatic zones are traditionally classified into three categories with traditional names assigned to each zone, based on altitude and temperature: *kola* (low land), *wina-dega* (mid-land) and *dega* (high land) and from these a total of 20 *kebeles* were selected randomly from each district according to proportion

In the last stage, the households were selected from the sampled rural *kebeles*. The sample size required was calculated according to the Fowler (2002) formula and ultimately a total of 537 household heads were sampled for the field survey from the 20 rural *kebeles* using proportional random sampling technique. However, 21 questionnaires were not correctly filled for analysis.

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### **Method of Data Analysis**

To identify the determinants of farm household poverty status in the study area, the binary probit regression model was employed. In the model, the dependent variable takes a value of 1 if the household is below poverty line and otherwise takes a value of 0, i.e. non-poor.

### **Results and Discussion**

In identifying factors that determine the households' poverty status, a set of 14 explanatory variables are included in the binary Probit regression analysis. These variables are selected on the basis of theoretical explanations and the results of various empirical studies. As can be seen in the table below, out of the 14 explanatory variables included in the Probit regression model, eleven of them have shown statistical significance in determining rural households' poverty status while the remaining three of them don't show significant relationship with rural poverty status. The variables: family size, educational status, use of irrigation, livestock holding, engagement in non-farm activities, dependency ratio, average distance to various services and productivity potential of the district are highly significant at 1 per cent probability level. The variables religion of the head and agro-climate zones are strongly significant at 5 per cent probability level whereas size of farm land does at 10 per cent.

Generally speaking out of the eleven statistically significant variables educational status (literate), use of irrigation, TLU, involvement in non-farm activities, size of farm land, agro-climate zones and productivity potential of districts are negative determinants of farm household poverty status whereas the remaining five namely family size, dependency ratio, religion of the head and average distance to various services are covariates that are positively correlated with the probability of being poor. The results of the statistically significant variables are discussed as follows:

**Household family size (in adult equivalent):** As expected, household size is prime demographic factor and it is associated with rural household's poverty status positively and significantly at 1 per cent level of significance. The explanation is that larger family size implies more dependent persons who are unproductive and yet take a big proportion of household income in terms of school fees, medical bills, food and clothing and hence likely to put extra burden on household's assets and resources. The average marginal effect, holding all other variables constant, tells us that the probability of being poor increases on average by 25.57 per cent if household family size increases by 1 adult equivalent.

**Religion of the head:** The religion of the household head is positively and significantly correlated to poverty at 5 per cent level of significance. The marginal effect of the variable shows that when the head of the household is Christian, the probability of the household being poor increases by 12.61 per cent, ceteris paribus. The occurrence of this result may be due to the fact that the Orthodox Christians have quite frequent religious days, so on those days, they don't go to [do] farming work.

**Dependency ratio:** As hypothesized, dependency ratio is found to have a significant (at less than 1 per cent level of significance) positive correlation with the probability of being poor. It is interesting to note that the presence of more dependent family members increases the probability of the household being poor. The marginal effect indicates that as the dependency ratio increases by one, the probability of households falling into poverty increases by 12.24 per cent, ceteris paribus. This is obvious because dependents due to age and physical problems contribute less to family labour and income. The family on the other hand, requires additional money for their livelihood reducing the freedom to use the money for other purposes. So the high dependency ratio is a poverty enhancing factor in the study area.

**Table 1** Estimation result of the Probit model and its marginal effect

Variables	Coefficients	Robust Std. Err.	z-value	P> z	Marginal Effect
Gender	-0.1832	0.1993	-0.92	0.358	-0.0710
Family size(AE)	0.6706	0.0739	9.07*	0.000	0.2557
Educational status	-0.4383	0.1615	-2.71*	0.007	-0.1658
Religion	0.3294	0.1413	2.33**	0.020	0.1261
Age	0.0035	0.0072	0.49	0.626	0.0013
Dependency ratio	0.3211	0.1176	2.73*	0.006	0.1224
Own land	-0.3741	0.1980	-1.89***	0.059	-0.1426
Livestock holding (TLU)	-0.3208	0.0455	-7.05*	0.000	-0.1223
Use of irrigation	-0.6531	0.2186	-2.99*	0.003	-0.2247
Non-farm activity	-0.9416	0.1673	-5.63*	0.000	-0.3573
Use of fertilizer	-0.1417	0.1591	-0.89	0.373	-0.0545
Average distance to various services	0.1242	0.0384	3.24*	0.001	0.0474
Dega agro-climate	-0.3827	0.1925	-1.99**	0.047	-0.1420
Wina dega agro-climate	-0.4163	0.1930	-2.16**	0.031	-0.1527
High productivity potential	-0.7671	0.2734	-2.81*	0.005	-0.2674
Medium productivity potential	-0.6274	0.1981	-3.17*	0.002	-0.2376
Constant	-0.6445	0.4605	-1.4	0.162	

Source: Model output, 2014-15

Note: \*, \*\* and \*\*\* are level of significance at 1, 5 and 10 per cent respectively.

Dependent variable = Household poverty status (0 = non-poor and 1= poor)

Number of observations = 516 LR chi2 (16) = 119.85 Prob > chi2 = 0.0000

**Educational status of the household head:** Educational status of the household head is negatively related with the dependent variable (probability of being poor) and is statistically significant at less than 1 per cent level of significance showing that literate farm household heads (heads ability to read and write) have better access to information that enhances decision making capacity which may increase the possibility of adopting better production technologies, utilizing technical advice from extension workers, and diversifying their sources of income than the illiterate ones. The marginal effect of the variable shows that when the head of the household

is literate, the probability of the household being poor decreases by 16.58 per cent, *ceteris paribus*. Therefore, it deserves an important place in formulating poverty reduction strategies.

**Livestock holding (TLU):** As hypothesized the relationship between the amount of livestock holding in tropical livestock unit and the probability of being poor turned out to be negative and significant at 1 per cent probability level. This is an indication that ownership of livestock acts as a hedge against food insecurity in the study area. The logic behind is that livestock rearing helps the poor in many ways such as income from sale of products, insurance against drought, emergency cash requirements, tenancy for share cropping, household nutrition, fuel for cooking, manure for crops, drought power for farming, store of value etc. Holding other variables constant, the average marginal effect indicates that as the size of livestock holding increases by 1TLU, the probability of the household being poor decreases on average by 12.23 per cent.

**Engagement in non-farm activities:** As expected, the contribution of participating in non-farm activities is negatively and significantly (1 per cent probability level) associated with household poverty. The marginal effect indicates that, other things being constant, the probability of the household to be poor decreases by 35.73 per cent as the household engaged in one or more non-farm income generating activities. The possible reason is that non-farm activities complement agricultural sources of income by availing the household additional resources for both consumption and investment. Investment in turn enhances asset accumulation and opens up additional escape routes out of poverty.

**Use of irrigation:** Use of irrigation shows a significant ( $p < 0.01$ ) and negative relationship with poverty status of the farm households. The negative relationship indicates using irrigation reduces the risk of falling in to poverty among the sample households. The marginal effect indicates that a household who use irrigation is 22.47 per cent more likely to be non-poor than those who has no access to it, *ceteris paribus*.

**Size of farm land:** Size of farm land, which is significant at less than 10 per cent probability level, has negative influence on the probability of household's being poor in the study area. It implies that the probability of being poor decreases with large farm size. This result agrees with the hypothesis that farmers who have larger farm land holding would be less poor than those with smaller land size, due to the fact that, larger farmers are associated with higher possibility to produce more food. Household with large size of land can have wealth and income which increases availability of capital that could increase the probability of investment in purchase of farm inputs which increases food production and hence ensuring food security of farm households. The marginal effect of -0.1426 for the farm size implies that other things kept constant, the probability of being poor decreases by 14.26 per cent as the cultivated farm size increases by one hectare.

**Average distance to various services:** Average distance to various services defined over the average distance to travel (in km) for household to nearest health post, primary school, secondary school, grain mill, telephone, weather road and potable water shows, as expected, a

positive relationship on the probability of being poor. Its coefficient is highly significant and carries a positive sign. The marginal effect indicates that, when the household is far away from the various services by 1km, the probability of falling in to poverty increases by 4.74 per cent. This reveals that infrastructural facilities play a significant role in reducing the chances of poverty.

**Productivity potential:** The productivity potential of the district is also a key determinant of poverty status. The results of this study indicate that the households living in high and medium productivity potential districts are more likely to be non-poor than other households living in low potential districts. The marginal effect result indicates that being located in high or medium potential districts, *ceteris paribus*, has the most favourable impact on household welfare, the probability of being poor decreases by 26.74 and 23.76 per cent for those who are located in high and medium potential productivity districts as compared to those located in low potential districts, respectively.

**Agro-climate zones:** As expected, this variable has a negative and significant influence on the poverty status of the sample households. The model output indicates that those households living either in *wina-dega* or *dega* agro-climate zone have the probability of being non-poor compared to those living in *kola* area. Living in *kola* agro-climate zone seemingly has the most negative impact on household welfare. This might be due to differences in temperature, altitude and the amount and distribution of rainfall among them. Thus, favourable climate determine the productivity of the land and, therefore, the level of living standards in rural areas. It is likely that household welfare will be affected positively if the household is situated in a locality that is favorably endowed with agro-climate. According to the marginal effect result, the probability of being poor decreases by 14.2 per cent and 15.27 per cent for a rural household living in *dega* and *wina-dega* agro-climate zones compared to living in *kola* agro climate zone, respectively.

### **Conclusion and Recommendation**

Poverty alleviation efforts should start from identifying the social, economic and demographic factors that determine poverty status of the farm households. The main factors responsible for poverty in the study zone are identified as family size, educational status, use of irrigation, livestock holding, engagement in non-farm activities, dependency ratio, average distance to various services, productivity potential of the district, religion of the head, agro-climate, size of farm land. The identified factors are therefore critical in improving the livelihood of the farm households in the study zone and call for urgent interventions aimed at curbing the fate of the poor. Specifically, the following recommendations are made:

- Limiting rural family numbers to reduce at least the child burden through continued promotion of family planning and awareness creation among rural women by both government and non-governmental organizations,
- An integrated intervention of rural people-centered education tailored to promote their educational level in all issues linked with rural livelihood diversification, health, extension and sustainable agricultural practices

- Introducing new and strengthening the existing alternative income generating activities for the poor,
- Improving production and productivity of livestock sector through improving animal species, feed and health,
- Pursuing of geographically differentiated strategies. Specially, great work in *kola* areas to reduce poverty through improvement of dry areas through irrigation systems and improved technologies,
- provision of social and physical infrastructures to the rural poor,
- Enhancing the welfare of the poor farm households by increasing production and productivity through investment in irrigation,
- More emphasis and efforts on low productivity potential districts,
- Enhancing farmers for better management of their existing land which could help improving the productivity of land. Moreover, farmers and concerned bodies should envisage other options for the generation to come that never base land.

### **References**

- Enquobahrie, A. (2004). Understanding Poverty: The Ethiopian Context, A Paper presented at Gambia RoundTable Conference, Banjul, The Gambia, April 19 - 23, 2004.
- Fowler, F. (2002). Survey Research Methods, 3rd ed., Applied Social Science Research Methods Series, Vol. 1, Newbury Park, Calif.: SAGE Publications, 2002.
- International Fund for Agriculture Development (2007). Rural Poverty Report 2007. The Challenge of Ending Rural Poverty, Oxford University press.
- Ministry of Finance and Economic Development (2012). Ethiopia's Progress Towards Eradicating Poverty: An Interim Report on Poverty Analysis Study (2010/11), May, Addis Ababa.
- Overseas Development Institute (2014). Chronic Poverty Report. The road to zero extreme poverty. London.
- Sida-Amhara Rural Development Programme (2010). Building Ethiopia's future: Sida-Amhara Rural Development Programme, Bahir Dar, Ethiopia.
- South Wollo Zone Safety Net Programme office (2014/5). Programme coordinator interview information.