POVERTY SITUATION AMONG SMALL-SCALE APPLE PRODUCERS: THE CASE OF CHENCHA DISTRICT IN ETHIOPIA

MELKAMU MADA*
RICHARD KWASI BANNOR**

*PhD Scholar (Agricultural Economics), College of Agriculture, SK Rajasthan Agricultural University, Bikaner, India
**PhD Scholar (Agribusiness), Institute of Agribusiness Management, SK Rajasthan Agricultural University, Bikaner, India

ABSTRACT

The proportion of poor people in the study area is estimated to be 56.4% representing almost half of people living in the study area which are unable to meet a monthly per capita consumption expenditure of 315 Birr. National results shows that, the poor households require only 7.8% expenditure per capita to reach the poverty line at national level but our research shows a requirement of 47.4 % that is 39.6% more to escape from poverty group. Poverty severity index is 0.404 at the study area but it is 0.031 at national level indicating government policy intervention should target this 40.4% of the poorest among the poor; these are the group of people or as it were the percentage of the population in Chencha district that needs policy intervention by the government and other stakeholders. Logit analysis showed family size, land size, apple production, livestock and expenditure are major determinants of poverty in the Chencha district. The result indicates family size is positively related to poverty, meaning, an addition of one member to the family size will result 9.7% probability of a household becoming poor. Expectedly, land size and apple production decreases the extent of poverty. A hectare increase in land size will result in 8.9% probability of a person not being poor. Again, a quintal increase in apple production will result in 0.8% probability reduction in poverty. A Birr (US$ 0.05) increase in expenditure will result in about 0.0096% probability of poverty reduction. Unexpectedly education, savings and marital status do not have effect negative effect on poverty or otherwise.

KEYWORDS: Poor, Poverty Gap, Poverty Severity, Chencha District, Ethiopia, Apple.

INTRODUCTION

Notwithstanding Ethiopia's rapid economic growth in the past decade with an average 10.1 percent for the last nine years, agriculture continues to dominate the economy by contributing about 45% of GDP (World Bank 2012). It accounts for about 80% of employment of the labour force even though the level of productivity is very low; which has negative impact on the socio-economic characteristics of farmers in the country. It is

212

therefore not surprising that majority of the people who are involved in agriculture in the country are poor and most of them live in rural areas (Alemu et al., 2011) where 83 percent of the total population lives (World Bank, 2012). Head count poverty estimated 30 % of rural households to be poor in 2012 (World Bank, 2012).

Consequently, Ethiopia was ranked 173rd out of 187 nations with HDI value of 0.396 (UNDP, 2013) by the recent World Development Report 2013, which was based on a per capita income of US$ 498 (World Bank, 2013). Also, the proportion of people who are unable to attain their minimum nutritional requirement was reported to be 52 percent of the rural population (MEDAC, 2011).

Poverty status in Southern Nations, Nationalities, and Peoples' Region (SNNPR) remains multifaceted and complex. GamoGofa Province is one of thirteen Provinces of SNNPR state. Like other Ethiopian areas, poverty is major problem in GamoGofa Province. According to Ethiopian government poverty study document, poverty trend in GamoGofa province was persistence. The number of poor people in 2004/2005 and 1999/2000 were 40.6% and 61.2% respectively in GamoGofa province (MoFED, 2013).

In Chencha district which is one of the 15 districts of GamoGofa Province, almost all the people depend on small-scale and subsistence rain-fed agriculture. Apple production is the main cash crop in the district followed by traditional weaving for their means of economic livelihood (GamoGofa, 2012). Rural poverty is still a critical challenge, despite government emphasis and donor support to the agricultural sector in Chencha district. Thus, if poverty eradication or alleviation was and is the central development agenda of both federal and local government of Ethiopia, effective strategy implementation with clear information on incidence, severity and its determinants is fundamental in achieving the former. Hence a better understanding of the current poverty situation in terms of incidence, gap, severity and determinants in the district will therefore pave way for strategic rural poverty alleviation in the study area.

Methodology

Sampling Technique

Multi- stage random sampling procedure was applied to select households. Chencha district was purposively selected for this study because of high number of male migration. In the second stage, 8 *kebeles* out of 50 district *kebeles* were selected randomly. Finally, 250 farming households were drawn using systematic random sampling proportionate to

213

household head techniques. The household head list in each *kebele* was used as sampling frame to select sample households. Primary data was collected with the aid of interview using schedules administered by the researchers.

Analytical Techniques

In this study, consumption is used as standard of measurement to measure poverty. The choice between income or consumption as a measure of welfare is the main issue one should discuss before any analysis of poverty. Consumption was chosen because it is a better measure of longer-term household welfare as it is subjected to less temporal variation than income (MoFED, 2013). That is to say, consumption is likely to be measured more accurately than income. However, for consumption to be an indicator of the household's welfare, it has to be adjusted for differences in the calorie requirement of different household members (age). This adjustment was done by deflating household consumption by an adult equivalent scale that depends on the nutritional requirement of each family member.

In this study, to address dimension of poverty in the study area, the FGT poverty measure that was introduced by (Foster, Greer, and Thorbecke, 1984) was used. The first step was by distinguishing between the poor and non poor using poverty line. Poverty line is a per capita income∕consumption or a cut of living standard level below which an individual is considered to be poor (MoFED ,2013; Doyle, 2003; Ravallion, 1992). The government of Ethiopia has set the poverty line per adult person per year to be 3781 Ethiopian Birr (US$ 186.37) by valuing groups of consumption items that generate 2200 kilo calories per adult equivalent (AE) per day. The determination of the adult equivalent takes into account the age and sex of each household member (Gassmann F and C Behrendt 2006). Hence, for this study, following (MoFED, 2013) 3781 Birr (US$ 186.37) per adult equivalent per year will be employed as a cut-off value between poor and non-poor households. People are counted as poor when their measured standard of living (generally in either income or consumption) is below poverty line, otherwise non-poor (Rath, 1996)

Based on data from households, this study used three poverty dimension instruments that were identified by (Foster, Greer, and Thorbecke, 1984) to achieve the objective related to the extent of poverty in Chencha district. These included headcount index; the poverty gap index; and severity index or Foster-Greer- Thorbecke (FGT) index of poverty. Using these three poverty dimension instruments we identified the percentage of the poor (headcount

214

index), the aggregate poverty gap (poverty gap index), and the distribution of income among the poor (poverty severity index).

The mathematical expression of the model in Foster, Greer, and Thorbecke (1984) for poverty measure is explained by considering, **Pα** as class of poverty measures. By levelling real per-adult (per capita) household consumption expenditure per person, Y_i, as

$$Y_1 \leq Y_2 \leq \ .... \ Y_q \leq \ Z \ < \ Y_{q+1} \ ....\leq \ Y_n \ ----------(1)$$

Where

Z = poverty line

n = total population or respondents q = the number of poor respondents

Then, **Pα** is given by

$$P_\alpha = \frac{1}{N} \sum_{i=1}^{q} \left(\frac{Z - Y_i}{Z}\right)^\alpha --------------(2)$$

Where:

P$_\alpha$ = Poverty measure

Z = Poverty line

N = Population number

q = Number of persons/households below the poverty line

Y_i = Income of the household per adult equivalent per year

α = the weight attached to the severity of the poor which takes the value 0, 1, 2 depending on the degree of concern about poverty

In the equation, **Z - Y_i** = 0 if **Y_i** > **Z**.

*Headcount index:-*This is the share of the population whose monthly per capita consumption expenditure is below the poverty line, that is, the share of the population that cannot afford to buy a basic basket of goods. However, this index does not capture differences among the poor.

$$P_0 = \frac{1}{N} \sum_{i=1}^{q} \left(\frac{Z - Y_i}{Z}\right)^0 -----------(3)$$

Poverty gap index:- indicates the depth of poverty or this provides information regarding how far households are from the poverty line. This measure captures the mean aggregate monthly per capita consumption expenditure shortfall relative to the poverty line across the whole population. In other words, it estimates the total resources needed to bring all the poor to the level of the poverty line (divided by the number of individuals in the population).

215

$$P_1 = \frac{1}{N} \sum_{i=1}^{q} \left(\frac{Z - Y_i}{Z}\right)^1 \quad --------(4)$$

Poverty severity index *(squared poverty gap):-* This takes into account not only the distance separating the poor from the poverty line (the poverty gap), but also the inequality among the poor, that is, a higher weight is placed on those households further away from the poverty line.

$$P_2 = \frac{1}{N} \sum_{i=1}^{q} \left(\frac{Z - Y_i}{Z}\right)^2 \quad -------(5)$$

After identification of percentage of the poor (headcount index), aggregate poverty gap (poverty gap index), and distribution of income among the poor (poverty severity index), an examination of the determinants of poverty was done using logit regression analysis.

Logit regression can be defined as:

$$log\left[\frac{pi}{1-pi}\right] = logit\ of\ being\ poor\ or\ non\ poor \dots\dots\dots\dots 6$$

Logit (pi) scale ranges from negative infinity to positive infinity and is symmetrical around the logit of 0.5 (which is zero). The formula below shows the relationship between the usual regression equation (a + bx … etc.), which is a straight line formula in the logistic regression equation. The form of the logistic regression equation is:

$$logit[Pi] = log\left|\frac{pi}{1-pi}\right| = a + b_1x_1 + b_1x_2 + b_3x_3 \dots\dots + b_kx_k + U_i \quad \dots 7$$

Pi = Probability one is poor

1-Pi = Probability of one is not poor

Where P_i = (poor respondent) if $P_i \geq 0$

$\quad\quad P_i$ = (respondent is not poor) if $P_i < 0$

The probability of one becoming poor or non poor based on the explanatory variables can be calculated with the formula below, which is simply another rearrangement of formula above:

$$p = \frac{exp^{a+b_1x_1+b_1x_2+b_3x_3\dots\dots+b_kx_k}}{1 + exp^{a+b_1x_1+b_1x_2+b_3x_3\dots\dots+b_kx_k}} \quad \dots\dots\dots\dots\dots\dots 8$$

Result and Discussion

In measuring poverty situation of households, a headcount index (P_0), poverty gap index (P_1), Poverty severity index (squared poverty gap) (P_2) were computed and the results presented .

216

Table1: Estimates of Poverty situation indicators

Poverty Variables	National (2010/11)	Regional rural (2010/11)	Study area(Chencha)
Headcount index	0.296 (29.6%)	0.300 (30%)	0.564 (56.4%)
Poverty gap index	0.078 (7.8%)	0.093 (9.8%)	0.474 (47.4%)
Poverty severity index	0.031 (3.1%)	0.043 (4.3%)	0.404 (40.4%)

Source: Authors computation and MoFED (2013)

Evidences given by the poverty indicators result designate very alarming poverty scenario in the study area. The proportion of poor people in the study area is estimated to be 56.4% indicating almost half of people living in the study area are unable to meet a monthly per capita consumption expenditure of 315 Birr. The head count ratio of number of poor from this study is two times that of country average. Obviously, there is existence of widened differences in headcount index at national, regional and district level despite the fact that, the number of people living in poverty has fallen to 29.6 % in 2010/11 from 38.7 % in 2004/05 at national level. It therefore shows it is not always true that, a decline in the proportion of poor at national level brings equal change in the entire country. This scenario can be attributed to unequal growth from the national through regional to district level.

Poverty gap index shows not only how much would have to be transferred to the poor to bring their expenditures or incomes up to the poverty line but also the minimum cost of eliminating poverty. The minimum cost of eliminating poverty is logical if transfers could be made efficiently and perfectly targeted. Cost of eliminating poverty in Chencha district is much higher than at the national level because of poverty severity. The country or national results depicts poor households require about 7.8% percent expenditure per capita to reach the poverty line but our research shows requirement of 47.4 % that is 39.6% more to escape from poverty group.

Poverty severity index (squared poverty gap index) takes into account inequality among the poor. Hence, by squaring the poverty gap index, the measure implicitly puts more weight on observations that fall well below the poverty line, in other words the poorest among the poor. Poverty severity index is 0.404 at the study area but, it is 0.031 at national level. The lower your standard of living, the poorer you are deemed to be. This implies that, the severity of poverty among the poor households in the study area is 40.4%. This indicates government policy intervention should target this 40.4% of the poorest among the poor; these are the

group of people or as it were the percentage of the population in Chencha district that needs policy intervention by the government and other stakeholders.

Table 2: Description of the explanatory variables used in the logistic regression model.

Variable	Description	Measurement	Expected sign
Family size	Number of people in household	Number	+/-
Land size	Size of the farm	Hectares	-
Apple Production	Total output of apple production for the year	Quintal	-
Livestock	Total number of livestock in TLU	Number	-
Savings	Total amount of savings	Birr	-
Expenditure	Total annual expenditure	Birr	-
Education	Education status	Illiterate = 1 Otherwise = 0	-/+
Marital status	Marital status	Married = 1 Otherwise = 0	+/-

Table 3: Logit regression estimates of determinants of Poverty.

Variable	Marginal effect	Std Error	Z	P>(Z)
Family size	0.09711567	0.00659	14.73	0.000*
Land size	-0.0890798	0.05275	-1.63	0.091***
Apple Production	-0.008000	0.00339	-2.59	0.010*
Livestock	0.0252529	0.01028	2.46	0.014**
Savings	0.000012	0.000124	0.97	0.334
Expenditure	-0.0000956	6.50e-06	-14.53	0.000*
Education	0.0374165	0.51213	0.73	0.465
Marital status	0.0055563	0.06197	0.09	0.929
Number of observations = 250		Prob > chi2 = 0.0000		
Log likelihood = -70.413872		Pseudo R^2 = 0.5868		

Source: Authors computation based on field data
NB: Significance; 1%=*, 5%=, 10%=***

The result indicates family size is positively related to poverty of the households as expected. An addition of one member to the family size will result 9.7% probability of the household becoming poor. This is not peculiar only in Chencha district but most developing countries. Babatunde et al (2008); Apata et al (2010), commenting on this, argued, poverty increases with increasing in family or household size because large family size tends to reduce the per capita income available to the household. Many polygamous societies males see marrying of more than one wife and having many children as an asset especially for farming however this is not always true hence most end up in poverty. Thus, the rich or non poor get few children or get richer whiles the poor get more children. Expectedly, land size and apple production decreases the extent of poverty. A hectare increase in land size will result in 8.9% decrease in the probability of a person being poor. This is because; large landholding size means the

farmer can produce different verities of crops which can feed the family in different seasons and also sell the marketable surplus. Large landholding again, removes the constraint for establishment of other nonfarm enterprises and is also an asset which enables households to easily access both input and credit markets. Commenting on such scenario, Schubert (1994) noted, the poor own little or qualitatively poor land for agricultural production to work with and little or no access to capital. Furthermore according to our results, a quintal increase in apple production will result in 0.8% probability reduction in poverty. This is not surprising because apple production is the main cash crop in the area. Which means increase in apple production or other government interventions that will increase apple production will contribute to employment and higher incomes thereby reducing poverty. Secondly, the sector can contribute to the development of infrastructure and efficient delivery of social services, including education, health, and portable drinking water with poverty alleviation as by product. In addition, an Ethiopian Birr increase in expenditure will result in about 0.0096% probability poverty reduction. It means the poor spend less on even the most basic life necessities resulting in underweight of infants, diseases and nutritional imbalances and extreme cases reduction in life expectancy age among dwellers. Unexpectedly education does not have effect on poverty or otherwise in our research and also similar for savings and marital status of respondents.

Conclusions and Recommendations

The proportion of poor people in the study area is estimated to be 56.4% representing almost half of people living in the study area which are unable to meet a monthly per capita consumption expenditure of 315 Birr. National results shows that, the poor rural households require only 7.8% percent of expenditure per capita to reach the poverty line at national level but our research shows a requirement of 47.4 % that is 39.6% more to escape from poverty group. Poverty severity index was 0.404 at the study area but, it was 0.031 at national level. This indicates government policy intervention should target 40.4% of the poorest among the poor; these are the group of people or as it were the percentage of the population in Chencha district that needs policy intervention by the government and other stakeholders. The results have brought to light that, an application of a single poverty line for the whole country implicitly and dubiously assumes absence of price differential across the regions. Thus, the estimate of poverty based on this methodology assumes a fixed consumption basket of the poor overtime, and a uniform consumption basket for all the regions in the country which is

not always true. Regional and rural and urban based poverty line would better indicate the poverty situation than single poverty line in culturally diversified countries like Ethiopia. Logit analysis showed family size, land size, apple production, livestock and expenditure are major determinants of poverty in Chencha district. Increase family size has the highest effect on poverty with probability increase of 9.7% hence birth-control programmes should be encouraged by government, NGOs and other stakeholders to ensure farmers have a manageable family size. Furthermore, since most households, regardless of poverty status depend on agriculture especially apple production for their livelihood, policies to improve apple production will have a positive impact on poverty situation in the district. Government and other stakeholders should put in measures to increase agricultural output through subsidizing inputs, distribution of hybrid and high yielding seeds, extension services and promotion efficient marketing system Finally, while apple production and other agriculture related works play a major role in reduction of poverty, the poverty problem under small-scale farmers having small plot cannot be solved by promoting agriculture alone. Hence, attention should also be given to the promotion of non-farming activities to diversify and stabilise income of farmers.

References

1. Apata,T. G., Apata O. M., Igbalajobi, O. A. and Awoniyi,S. M. O. (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.
2. Babatunde, R.O., Olorunsanya, E.O. and Adejola, A.D. (2008). Assessment of rural household poverty: evidence from south-western Nigeria. *American-Eurasian Journal Agriculture and Environmental. Science*, 3 (6): 900-905.
3. Foster, J., J. Greer, and E. Thorbecke. 1984. A class of decomposable poverty measures. *Econometrica* 52(3): 761-766.
4. GamoGofa(2012). Zonal Annual Report. Arbamich, Ethiopia
5. MEDaC (2011). Poverty Situation in Ethiopia,Welfare Monitoring Unit, Addis Ababa
6. MoFED (Ministry of Finance and Economic Development) (2013). Development and Poverty in Ethiopia 1995/96-2010/11.Ministry of Finance and Economic Development, Addis Ababa, Ethiopia.
7. M. Ravallion and Datt, G.(1992).Growth and redistribution components of changes in poverty measures. *Journal of Development Economics* 38 (2): 275-295.
8. Rath, N. (1996). Indian Journal of Agricultural Economics: Poverty in India Revisited.
9. pp. 76-109. *Indian Society of Agricultural Economics,* Mumbai
10. Schubert, R. (1994). Poverty in development countries: Its Definition, Extent and Implications .*Economics,* 49/50, 17-40.
11. UNDP (2013) Human Development Report the Rise of the South: Human Progress in a Diverse World
12. World Bank (2012).The Africa Competitiveness Report: Washington DC, USA.
13. World Bank, (2013). Poverty Profile and Trend in Ethiopia. Washington DC, USA.