Determinants of Poverty among Major Food Crop Farmers: The Case of Ghana

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Abstract

This article analyzes the extent and determinants of poverty among farmers who grow five major food crops (cassava, maize, sorghum/millet, rice and yam). Based on national survey data, it was found that incidence of poverty is highest in savanna zone and, among illiterates, males and the married. The depth and severity of poverty follow the ranking of poverty incidence among categories. This implies that social segments with high incidence of poverty have higher costs of eliminating poverty and higher levels of inequality. This study also shows that poverty is influenced by a plethora of factors including household income, gender, education, location and dependency ratio. The following recommendations are made to help reduce poverty: Women groups should be trained and given business loans to help reduce their vulnerability; Social protection programme which links support to the obligation of household heads to enroll children in schools can lessen financial burden of farm families in a more sustainable way; General training in functional literacy, entrepreneurship and management should be promoted to increase farmers' acceptance of productivity-enhancing technical innovations and to make farm families employable in the non-agricultural sector thereby enhancing their incomes; and policymakers should combine zonal and household targeting to effectively identify the poor from the non-poor for any poverty alleviation support that may be forthcoming.

1. Introduction

Ghana has made significant progress towards poverty reduction. Incidence of poverty has declined from 51.7% in 1991 to 39.5% in 1998 and further to 28.5% in 2005. This has resulted in reduction in the number of poor people in Ghana from 7.9 million in 1991 to 6.2 million in 2005 (GSS, 2007). The remarkable fall in poverty is not experienced evenly across various segments of Ghanaian society. The forest and coastal ecological zones witnessed drop in headcount poverty to less than 20% while headcount poverty in the northern savanna zone still remain high at 52-88%. The northern savanna zone makes for about 45% of the headcount poor, although accounting for only 22% of the population (GSS, 2007). Food crop farmers, disproportionately resident in the savanna ecological zone, accounting for 43% of the population and 69% of the headcount poor, have high poverty incidence of 68% (GSS, 2007).

Most previous studies on poverty in Ghana including GSS (2007) among others deal with identification and analysis of the extent of poverty in Ghana, with only a few (Ennin et al., 2011) attempting to quantify the impacts of the factors influencing poverty. Despite high level of poverty among food crop farmers, no studies, to the best of my knowledge, have been conducted to investigate the determinants of poverty among this category of people to enhance sustainable anti-poverty programmes. The objective of this study is therefore to empirically determine the factors that help farming households exit from chronic poverty.

The rest of this paper is structured as follows: section 2 elaborates on the issue of poverty and reviews past researches on the

subject matter; section 3 explains the framework used to analyze poverty; section 4 describes data on all model variables and provides summary statistics of those variables; section 5 profiles the poverty conundrum among farmers and uses econometric models to analyze the determinants of poverty among food crop farming households in Ghana; and section 6 draws conclusions based on the results of the study and, at the end, make recommendations for consideration of policy makers.

2. Review of literature

Poverty has many facets and can be viewed from many angles, be it lack of access to basic needs, impaired access to and use of productive resources, outcome of inefficient use of common resources and result of "exclusive mechanisms" (Ajakaiye and Adeyeye, 2001). Normally, individuals or households are considered poor if they are incapable of purchasing a certain basket of goods and services including food, shelter, water and healthcare (Streeten and Burki, 1978). Low income, unemployment/ underemployment, and inadequate endowment of human capital impairs access to productive resources (agricultural land, physical capital and financial assets) and reduces the capability of individuals to convert those resources to a higher quality life (Sen, 1985; Adeyeye, 2000). Inefficient use of common resources resulting from weak policy environment, inadequate infrastructure, and weak access to technology or credit can generate pockets of poverty. An individual can be excluded from partaking in development if his/her field of expertise cannot be accommodated in the labor market, vested interest ceasing control of activities in goods and factor markets or an individual having troubled relationship with the community (Silver, 1994).

Originally, the poor were blamed for being poor and that their character and attitude sustain poverty. In this sense, poverty was seen as a way of life and transferred from generation to generation in a "vicious circle" unless income level increases significantly high enough to pull that person out of the poverty trap (Lewis, 1966). Lewis (1954), based on dual economy paradigm, argues that people are poor because they are engaged in the traditional sector which is characterized by local ineptitude and weak response to economic incentives to work hard. In the view of Marxists, society is comprised of few rich capitalists who exploit the labor of the poor miserable masses for their own benefit. Poverty is, thus, perpetuated in the process.

In this modern era, level and distribution of income occupies a central place in poverty related discussions. That is, poverty emerges from changes in level and distribution of income which result in reduced access to basic services such as food, housing or water. Poverty cannot be attributed solely to personal attributes alone but also geographical or locational characteristics of where people live (Holzer, 1991; Aikaeli, 2010). Direct relationship between poverty and income growth supports the assertion that productive work is the way out of poverty, and strategies to expand economic opportunities and promote income growth are sine quo non to sustained poverty reduction.

Sen and Palmer-Jones (2006) report that poverty in India is determined by where one lives and places with low potential for irrigation have higher incidence of poverty. Decorn and Krishnan (1998) concludes from a study in Ethiopia and Tanzania between 1989 and 1995 that households with substantial human and physical capital and better access to roads and towns have both lower poverty levels and more likely to get better off over time. Using micro-level panel data from villages in rural Ethiopia, Decorn (2001) notes that the main driver of poverty during the initial phases of the economic reform (1989-1995) is relative price changes, which alter the returns to factors of production such as land, labor and human capital. Audet et al. (2006) find poverty to be lower the more educated household heads are while incidence of poverty is high in households with large sizes. They also find variation in poverty by household's geographical location in Albania. Astrup and Desus (2001) find that households with educated heads, working members and high asset ownership are less poor while large households are poorer. Solow (1957) and Nelson (1964) argue that education adds to the effectiveness of labor through technical progress. Okurul et al. (2002) found that large household sizes increase one's probability of being poor. Verner (2006) argues rural folk are poorer because of low level of education. Bogale et al. (2005) attributes persistence of rural poverty in Ethiopia to an entitlement failure including lack of access to land, human capital and oxen and recommends improved targeting in order to reach the poorest of the poor. Hunt (2002) attributes differences in economic status in USA to the differences in household religious beliefs about poverty. Households who are members of dominant religions such as Protestants tend to have individualistic beliefs that their own effort can be rewarded with high incomes thereby making them less poor. Others who are of minor religions like Jews or moslems attribute their economic circumstances to bad luck or weak socio-economic systems which provide less economic opportunities rather than one's own abilities or efforts. Marital status of household heads may contribute to reduce levels and probability of poverty (Grinstein-Weiss et al, 2004). They argue that married couples tend to work harder to meet daily financial demands of the home while at the same time pulling together part of their earnings as savings for a rainy day as compared to single parents or the unmarried.

Medeiros and Costa (2006) argues that there is no evidence of consistent difference in poverty between male and female headed homes. In using Foster-Greer-Thorbecke (FGT) measures to analyzing poverty levels among women in Latin America, they alluded to the fact that poverty is high among households headed by females but find no significant difference in poverty from male

headed homes. Maharjan and Joshi (2011) and Joshi et al. (2012) use binary logistic models to analyze the determinants of food security and poverty in Nepal respectively. According to Maharjan and Joshi (2011), households in Nepal are food-insecure because of limited access to productive resources resulting from illiteracy, large farm families and higher dependency ratio, subsistent nature of agriculture with small farm size, limited irrigation and fertilizer, and wage labor dependence. Joshi et al. (2012) find household size, operational landholding, livestock holding, education and dependency ratio to be the main drivers of poverty in the Patan and Melauli VDCs of Nepal. Apata et al. (2010) identify smallholder farmers as the majority of the poor in southwestern Nigeria. According to them, access to micro-credit, education, livestock assets and access to extension services are the main drivers of poverty but find no significant effect of age of the household head on the likelihood of being poor.

Based on repeated cross-sectional data from Ghana Living Standards Survey for 1991/92, 1998/99 and 2005/2006, Ennin et al. (2011) use a binary logistic model to examine the factors influencing poverty incidence in Ghana. The results of their study indicate that large agricultural households headed by the illiterate living in the savanna ecological zone have higher probability of becoming poor. They, however, find weak significant difference in the probability of being poor between males and females. This study extends this line of analysis by assessing the determinants of incidence, depth and severity of poverty among farming households in Ghana using additional statistical methods. The focus on farm families is instructive because this category of people produces food, a basic need which is a key element in poverty measurement and analysis in developing countries including Ghana. Since there is overrepresentation[1] of this category of Ghanaians in the number of the poor, it is methodologically preferable to carry out poverty analysis within this group rather than for the entire population (Medeiros and Costa, 2006). This approach cures the problem of perceived overrepresentation of farm families in poverty discourse in agricultural developing countries including Ghana.

It can be concluded from the above exposition that the major factors identified in driving poverty in most deprived communities are a plethora of various socioeconomic and demographic variables including income and asset ownership, education, religion, gender, marital status, dependency ratio and location. Unlike Ennin et al. (2011), this study uses most of the above mentioned factors to analyze both the extent and the determinants of poverty with focus on only households who grow at least one of the five major food crops of cassava, maize, sorghum, rice and yam.

3. Analytical framework

To assess the extent of poverty among the five major food crop farmers in Ghana, Foster, Greer and Thorbecke (1984) poverty index, otherwise known as FGT index is used. The FGT index is, generally, expressed as follows:

$$P_\alpha = \frac{1}{\mathrm{N}}\sum_{i=1}^{n}\left(\frac{g_i}{z}\right)^\alpha \quad \ldots\ldots\ldots\ldots\ldots (1)$$

$$g_i = z - y_i \quad \ldots\ldots\ldots\ldots\ldots (2)$$

Where g_i is the poverty gap of individual household; N is the total number of farming households who grow at least one of the major food crops; n is the total number of poor households; P is the poverty index; z is the poverty line; y_i is the real consumption per adult equivalent of individual household i and α indicates aversion for poverty. The parameter α is normally assigned values 0, 1 and 2 indicating the incidence (P_0), depth (P_1) and severity (P_2) of poverty respectively. The three different measures of extent of poverty are specified in equations (3), (4) and (5) as follows:

$$P_0 = \frac{1}{N}\sum_{i=1}^{n}\left(\frac{g_i}{z}\right)^0 = \frac{n}{N} \quad \ldots\ldots\ldots\ldots\ldots (3)$$

$$P_1 = \frac{1}{N}\sum_{i=1}^{n}\left(\frac{g_i}{z}\right)^1 \quad \ldots\ldots\ldots\ldots\ldots (4)$$

$$P_2 = \frac{1}{N}\sum_{i=1}^{n}\left(\frac{g_i}{z}\right)^2 \quad \ldots\ldots\ldots\ldots\ldots (5)$$

In the case of equation (3), an individual household is assigned a value of 1 if g_i is greater than zero and 0 otherwise. Values of g_i/z and $(g_i/z)^2$ in equations (4) and (5) respectively are assigned to individual households if g_i is greater than zero and 0 otherwise.

This study adopts binary logistic (logit) specification to analyze the determinants of poverty incidence, and a Tobit regression model (Tobin, 1958) to analyze the determinants of poverty depth and severity among farming households. In this vein, a

household is poor if its real consumption per adult equivalent is below the poverty line of GHS 370.89 (US$ 403.14). The general specification of a limited dependent variable for analyzing poverty determinants is as follows:

$$poor_i = poor_i^* = \beta_k X_i + \varepsilon_i \quad \text{.....(6)}$$

Where ε_i is the stochastic error term which is normally distributed in tobit models and Gumbel distributed in logit models; β_k is the vector of model parameters; and X_i is a vector of independent variables; $poor_i^*$ is the latent variable indicating poverty measure which is equal to 1, g_i/z or $(g_i/z)^2$ for incidence, depth or severity of poverty respectively for each poor household and 0 for each non-poor household. That is, $poor_i^*$ is only observed if the real consumption per adult equivalent hit a certain threshold (poverty line) and it is determined as follows:

$$poor_i = \begin{cases} poor_i^* \; if \; poor_i^* > 0 \\ 0 \; if \; poor_i^* \leq 0 \end{cases} \quad \text{..... (7)}$$

Following the method of Bogale (2005) in analyzing the determinants of poverty incidence, equation (6), expressed in logistic form as in equation (8) below, is used:

$$\text{Probability}(poor_i = 1) = \frac{exp(X_i\beta)}{1+exp(X_i\beta)} \quad \text{..... (8)}$$

The marginal impact of k explanatory variables on the probability of being poor is specified below:

$$\frac{\partial P(poor_i=1)}{\partial X_i} = \frac{exp(X_i\beta)}{[1+exp(X_i\beta)]}\beta_k \quad \text{..... (9)}$$

From equation (9) above, it can be seen that, unlike ordinary least square regressions, the marginal effect varies with the values of the explanatory variables.

To analyze the determinants of depth and severity of poverty among farming households, a Tobit model where the dependent variable ($poor_i$) takes value 0 with positive probability but continuous random variable over strictly positive values [g_i/z or $(g_i/z)^2$], is used to efficiently estimate equation (6). The marginal effect of k explanatory variables on poverty depth or severity is specified in equation (10) below:

$$\frac{\partial P(poor_i^*)}{\partial X_i} = \beta_k \quad \text{..... (10)}$$

4. Data description

This study utilizes data from the fifth round of Ghana Living Standard Survey (GLSS V), compiled by the Ghana Statistical Service (GSS), from October 2005 to September 2006, to assess the extent and determinants of poverty among farmers cultivating the major food crops in Ghana. GLSS V contains information on demographic and socioeconomic conditions of 8,687 households covering 37,128 individuals. Out of the total number of households, this study covers only 4,067 households who cultivate at least one of the five major food crops in question.

All model variables are created using data from the GLSS V. Real consumption per adult equivalent is the most important variable in this model. It is obtained by summing household expenditure over essential goods including home consumption. Rather than dividing by household size, the number of adult equivalent is computed and used as divisor to take care of varying nutritional needs of household members by age and gender. The nominal household consumption is then converted into real consumption value using regional Consumer Price Index (CPI)[2] as a deflator. Household income is also converted into Real income per adult equivalent using the same procedure as in the case of real consumption per adult equivalent. Asset index is constructed using a wide ranging list of more than thirty items including land, radio, television, tractors, houses, and cooking utensils. The asset index is generated using principal component analysis based on the survey data.

Table 1. Description and summary statistics of independent variables for the logistic model

Variable	Variable Description	Mean	Standard Deviation	Hypothesis	Authors
Age of head	Age (in years) of household head	46.9838	15.1055	+/-	Apata et al. (2010)
Dependency ratio	Number of household members aged 0-14 plus those aged above 60 divided by the workforce aged 15 - 60	1.0467	0.8949	+	Joshi et al. (2010)
Log of income	Logarithm of household real income per adult equivalent (GHS)	5.5512	1.6174	-	Holzer (1991); Aikaeli (2010)
Asset index	Index of household assets calculated using principal component analysis	-0.1717	5.3155	-	Astrup & Desus (2001)
Male	Gender of household head (= 1 if male and 0 if female)	0.7962	0.4029	+/-	Medeiros & Costa (2006)
Divorced	Civil status of household head (=1 if divorced or widowed & 0 otherwise)	0.1871	0.3901	+	Grinstein-Weiss (2006)
Single	civil status of household head (=1 if single and 0 otherwise)	0.0334	0.1798	+	
Basic	Education of household head (=1 if basic and 0 otherwise)	0.2422	0.4285	-	Andet et al. (2006) Solow (1957) Nelson (1964)
Secondary	Education of household head (=1 if secondary and 0 otherwise)	0.0482	0.2142	-	
Tertiary	education of household head (=1 if tertiary and 0 otherwise)	0.0148	0.1206	-	
Coastal	ecological zone (=1 if coastal and 0 otherwise)	0.15	0.3571	-	Ennin et al. (2011)
Savanna	ecological zone (=1 if savanna and 0 otherwise)	0.4388	0.4963	+	
Moslem	Religion of household head (=1 if moslem & 0 otherwise)	0.1876	0.3904	+	Hunt (2002)
Traditional	religion of household head (=1 if traditional and 0 otherwise)	0.1475	0.3547	+	
Free thinker	religion of household head (=1 if free thinker and 0 otherwise)	0.0826	0.2753	-	

Notes: The exchange rate of Ghana Cedis (GHS) to the United States dollars in 2006 is 0.92; the negative sign on the mean value of asset index indicates "less than average".
Source: Authors' calculation from GLSS V data.

Other variables used in this study are gender, age, education and civil status of household heads, dependency ratio, religion and location. The gender of household head is 1 if household is headed by male and 0 otherwise. Education, civil status, religion and location are categorical variables. Education is categorized into Illiterate, Basic, Secondary and Tertiary; marital status is categorized into Married, Divorced and Single; religion is categorized into Christian, Moslem, Traditional and Free thinker; and location is categorized into Forest, Coastal and Savanna. All categorical variables are converted into dummy variables to facilitate model estimation. For each categorical variable, all elements except one are included as additional explanatory variables when running regressions to avoid the problem of dummy variable trap. That is illiterates, Christian, Married and Forest for categorical variables education, religion, civil status and ecological zones respectively are, thus, dropped as displayed in Table 1.

Table 1 above shows that a typical household cultivating at least one of the crops in question is headed by illiterate, male, married, Christian head aged 46 years, residing in the savanna ecological zone whose family together with one dependent lives on an annual per capita income of GHS 257.54 with less than average asset holdings. The last but one column in Table 1 indicates the

expected direction of impact of the various independent variables on the probability of a typical household being poor.

5. Presentation of results and discussion

This study assesses the extent and determinants of poverty among farmers who grow five major food crops. To assess the extent of poverty, the FGT poverty index is used to profile poverty by household and spatial characteristics. To identify the drivers of poverty among farming households, logit and Tobit models are used. In the ensuing sections, the details of model results are presented and discussed.

5.1 Profile of poverty among farmers of major food crops

In this section, the FGT poverty index is employed to calculate the extent of poverty among farmers who grow the major food crops. More specifically, incidence (headcount), depth and severity of poverty are computed and used for the poverty analysis. Table 2 below shows the results of the FGT poverty index by location, educational attainment, religion, marital status and gender.

From Table 2 below, incidence, depth and severity of poverty are 50.55%, 21.30% and 11.84% among major food crop farmers. By ecological zone, incidence of poverty is highest in the savanna, followed by forest and coastal zones. The number of poor people is highest among the illiterates and decreases as one climbs up the educational ladder, from basic up to the tertiary levels. In terms of religion, headcount poverty is higher among traditionalists and Moslems as compared to Christians and free thinkers. Except by location, social segments with higher population also tend to have higher number of poor people. The savanna zone makes for only 43.88% of the population but account for over 60% of the total number of the poor farming households.

The depth and severity of poverty follows the ranking of poverty incidence among categories. Groups with higher poverty incidence also have high depth and severity of poverty. Wider poverty gap (depth) means higher cost of pulling people out of the quagmire of poverty. Higher poverty severity indicates skewed distribution of income and poorer groups portray higher levels of inequality.

Table 2. Poverty by location, education, religion, marital status and gender

	N	n	P0	P1	P2
All sample	100.00	100.00	50.55	21.30	11.84
Forest	41.13	29.89	36.74	11.53	5.01
Coastal	14.99	9.49	32.02	9.30	3.65
Savanna	43.88	60.61	69.83	34.55	21.04
Illiterate	69.49	79.42	57.79	26.28	15.20
Basic	24.21	17.57	36.69	10.61	4.41
Secondary	4.82	2.43	25.51	7.79	3.52
Tertiary	1.48	0.58	20.00	6.41	2.80
Christian	58.19	48.42	42.07	15.47	7.83
Moslem	18.78	22.04	59.37	25.95	14.50
Traditional	14.76	21.36	73.17	40.23	25.86
free thinker	8.27	8.18	50.00	17.98	9.00
Married	77.93	82.34	53.43	22.79	12.72
divorced	18.73	16.11	43.50	16.99	9.12
Single	3.35	1.56	23.53	10.67	6.50
Female	20.35	16.69	41.48	15.12	7.61
Male	79.65	83.31	52.89	22.88	12.92

Notes: All values are in percentage.

5.2 Determinants of poverty among farmers of major food crops

Binary logistic and Tobit models are used to assess the underlying factors driving poverty among major food crop farmers. The logistic model whereby a binary variable, indicating whether a household is poor or not ($poor_i$), is regressed on a set of

independent variables consisting of real income per adult equivalent, asset index, gender, age, education, religion, marital status, household dependency ratio, and location is used to analyze poverty incidence. The Tobit model is used to analyze the depth and severity of poverty.

The results of the binary logistic regression are displayed in Table 3 below. Male headed households have significantly higher likelihood of being poor as compared to females. This may be due to the fact male headed homes are highly represented in the sample of households for this study (about 80%). Additionally, females generally are engaged in petty trading to supplement family income. On the other hand, there are few job opportunities accessible by unskilled male farmers during the dry season. The probability of being poor is 10.08% higher among male headed homes. Probability of being poor is not significantly different between married and divorced household heads but does differ significantly from single household heads. Being single reduces the probability of poverty by 31.18%. Probability of being poor significantly increases with the age of the household heads because they become less productive at advanced age. This indicates that households headed by older header heads may not be receptive of new technology and farming practices which enhances farm productivity and incomes.

Households with higher dependency ratios tend to have higher probability of being poor. A unit increase in the dependency ratio raises the probability of being poor by 8.64%. Education attainment of the household head has significant positive effect on the likelihood of a household being poor. Household head with basic level of education has a reduced probability of pushing a household into poverty as compared to illiterate household heads. Increasingly reduced probabilities of household poverty are observed from a lower educational ladder to a higher one. Education at basic, secondary and tertiary levels reduces probability of poverty by 10.43%, 28.31% and 37.11% as compared to being illiterate.

The likelihood of poverty is highest in the savanna ecological zone, followed by the forest and the coastal zones in that order. By virtue of a food crop farmer residing in the coastal zone, they have an additional reduction in probability of poverty by 7.77% whereas those of the savanna zone have an additional increase in probability of poverty by 27.40% as compared to forest zone food crop farmers. There is no difference among religious faiths in the probability of being poor.

Predictably, both household real income per adult equivalent and wealth have significant negative effects on the probability of being poor. The real household income captures short run effects while the wealth index traces the long term impact of household financial resources. Households with higher real incomes tend to spend more resulting in low poverty. Higher wealth index indicates that the household has resource buffers which it can deliberately dispose of in times of seasonal crisis or crop failure to smoothen consumption.

Table 3. Logit results of poverty incidence determinants among major food crop farmers

	logit coefficient	**standard error**	**marginal effect**	**p-value**
Intercept	1.6876	0.2521		
Male	0.4046	0.1245	0.1008	0.001***
Divorced	-0.1571	0.1291	-0.0392	0.224
Single	-1.3727	0.2488	-0.3118	0.000***
Age of head	0.0068	0.0028	0.0017	0.016**
Dependency ratio	0.3471	0.0446	0.0864	0.000***
Basic	-0.4188	0.0954	-0.1043	0.000***
Secondary	-1.2142	0.1939	-0.2831	0.000***
Tertiary	-1.7575	0.3720	-0.3711	0.000***
Coastal	-0.3115	0.1138	-0.0777	0.006***
Savanna	1.1344	0.0955	0.2740	0.000***
Moslem	-0.1729	0.1101	-0.0431	0.116
Traditional	0.1947	0.1313	0.0482	0.135
Free thinker	0.1716	0.1376	0.0425	0.209
Log of income	-0.4999	0.0289	-0.1245	0.000***
Asset index	-0.0270	0.0071	-0.0067	0.000***

Notes: *** means significant at 1%, ** means significant at 5% and * means significant at 10%; the p-values are applicable to the marginal effects values only; Goodness of fit: The model correctly predicts 74.58% of poor households and 71.64% of non-poor households; Pseudo R-squared is 20.62%.

Table 4 below displays the results of Tobit model explaining the determinants of depth and severity of poverty among farming households in Ghana. Just like poverty incidence, depth and severity of poverty are higher among male heads relative to females. Poverty depth and severity are 8.07% and 5.72% higher in male headed homes. There is significant difference in poverty depth and severity between household heads who are married and those who are not. Household heads without partners are less deeply and severely poor. The depth and severity of poverty are 4.36% and 2.91% lower respectively for divorced heads, 23.57% and 14.58% lower for single household heads. Both age of household head and the dependency ratio significantly increase depth and severity of poverty. While the effect of age is not economically large, a unit increase in the dependency ratio increases poverty depth and severity by 6.30% and 4.10% respectively. There is an inverse relationship between level of education and, poverty depth and severity. Poverty depths are 12.16%, 27.54% and 35.60% lower for household heads with basic, secondary and tertiary education respectively. Similarly, poverty severities are 8.62%, 18.65% and 24.08% lower for household heads with basic, secondary and tertiary education.

Table 4. Tobit results of poverty depth and severity determinants among food crop farmers

	Poverty depth		**Poverty severity**	
	tobit coefficient	**standard error**	**Tobit coefficient**	**Standard error**
Intercept	0.3758***	0.0397	0.2371***	0.0275
Male	0.0807***	0.0218	0.0572***	0.0152
Divorced	-0.0436*	0.0223	-0.0291***	0.0155
Single	-0.2357***	0.0428	-0.1458***	0.0298
Age of head	0.0013***	0.0005	0.0009***	0.0003
Dependency ratio	0.0630***	0.0072	0.0410***	0.0050
Basic	-0.1216***	0.0171	-0.0862***	0.0119
Secondary	-0.2754***	0.0349	-0.1865***	0.0245
Tertiary	-0.3560***	0.0635	-0.2408****	0.0447
Coastal	-0.0729***	0.0209	-0.0531***	0.0146
Savanna	0.2582***	0.0163	0.1860***	0.0113
Moslem	-0.0380**	0.0181	-0.0306**	0.0125
Traditional	0.0796***	0.0199	0.0695***	0.0137
Free thinker	0.0132	0.0238	0.0052	0.0165
Log of income	-0.0990***	0.0041	-0.0715***	0.0028
Asset index	-0.0037***	0.0012	-0.0019**	0.0008

Notes:*** means significant at 1%, ** means significant at 5% and * means significant at 10%; The Tobit coefficients indicate the marginal effect of explanatory variables on the latent dependent variable ($poor_i^*$); Pseudo R-squared for poverty depth and severity are 31.34% and 48.32% respectively; multiple squared correlation is 35.64% and 33.18% for poverty gap and poverty severity respectively.

Households in the coastal ecological zone have 7.29% lower poverty depth while those in the savanna zone have 25.82% higher poverty depth relative to those residing in the forest zone. Poverty severity follows the trend of poverty depth. Poverty severity is 5.31% lower in the coastal zone but 18.60% higher in the savanna zone relative to the forest ecological zone. Relative to Christians, Moslems have lower poverty depth and severity of 3.80% and 3.06% respectively, whereas traditionalists have higher poverty depth and severity of 7.96% and 6.95% respectively. Being a free thinker has not significant effect on poverty. The effects of household income and assets on poverty depth and severity are statistically significant but the effect of assets is not economically large (less than 1%). One percent increase in household income reduces depth and severity of poverty by 9.90% and 7.15% respectively.

6. Conclusion and recommendations

Ghana's poverty reduction efforts over the years have resulted in reduced levels of poverty in Ghana. However, poverty among major food crop farmers still remains unacceptably high. This article attempts to assess the extent and determinants of poverty among this segment of Ghanaian society who are overburdened with poverty.

Based on Ghana national survey data, FGT poverty index is used to calculate incidence, depth and severity of poverty among farmers who grow five major food crops in Ghana. The extent of poverty is analyzed by location, educational attainment, religion, civil status and gender. By ecological zone, incidence of poverty is highest in the savanna, followed by forest and coastal zones. The number of poor people is highest among illiterates and decreases as one climbs up the educational ladder, from basic up to the tertiary level. In terms of religion, headcount poverty is higher among traditionalists and Moslems as compared to Christians and free thinkers. Except by location, social segments with higher population also tend to have higher percentage of the poor. The savanna zone makes for only 43.88% of the population but account for over 60% of the total number of the headcount poor. The depth and severity of poverty follows the ranking of poverty incidence among categories. Groups with higher poverty incidence also have high depth and severity of poverty. Wider poverty gap (depth) means higher cost of pulling people out of the quagmire of poverty. Higher poverty severity indicates skewed distribution of income and poorer groups portray higher levels of inequality. The results of the FGT measures are generally consistent with GSS (2007) which uses data covering the entire population rather than only farming households as in this study.

Further, logit and Tobit models are used to assess the underlying factors driving poverty among major food crop farmers. The results of the logit and the Tobit regressions identify gender, education and civil status of household head, location and income as important factors explaining variation in poverty incidence across Ghana. The direction of impact of all explanatory variables is the same across all poverty measures (incidence, depth and severity). Although there are some differences between the explanatory variables used in this study and in Ennin et al. (2011), the results of the common variables are consistent except those indicating gender and age of the household heads. Female headed households have proven to be better managers of household resources in improving members living conditions. A policy to empower female household heads in particular and female spouses in general will enhance optimal use of household resources to combat debilitating poverty among food crop farmers. Microcredit schemes whereby women groups are trained and given business loans can help empower women and reduce their vulnerability. Married or divorced household heads are more at risk of poverty vis-à-vis household heads who are single. Social protection programme which links support to the obligation of household heads to enroll children in schools, joining national health insurance schemes or immunization can lessen financial burden of farm families in a more sustainable way. Poverty is higher among older or less educated farm families with high dependency ratio. General training in functional literacy, entrepreneurship and management will not only increase farmers' acceptance of productivity enhancing technical innovations, but also make them employable in the non-agricultural sector thereby enhancing family income. Most poor households reside in the savanna zone. A sizeable percentage is also found in the forest zone. By combining zonal and household targeting, location-specific and household characteristics can be used in identifying the poor from the non-poor for any poverty alleviation support that may be forthcoming.

In the nutshell, there is no single specific government policy or program that can serve as a silver bullet to eliminate poverty among farm families once and for all. However, by adopting a combination of measures such as the above, poverty can be reduced among food crop farmers in Ghana.

Endnotes

[1] This relates the size of a sub-group on the poor to the size of this sub-group in the entire population. In this sense, increased poverty in the sub-group may be neutralized by the reduction in numbers of the sub-group in the entire population, indicating no change in poverty status when, in fact, there is a change. This can mislead policy makers in the decision making.

[2] The regional consumer price index is used because the community price questionnaire is not currently available for GLSS V. The community price questionnaire enables the calculation of deflators at cluster rather than regional levels.

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