



Poverty and its determinants among farming households in West Africa: Empirical evidence from Borno State, Nigeria

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Received 18 May 2008, accepted 5 September 2008.

Abstract

The study examines the extent of poverty and its determinants among farming households in Borno State of Nigeria. Primary data were obtained from 1,998 farming households using well-structured questionnaires in 2004. Mean monthly per adult equivalent household expenditure poverty line was used to characterize the households into poor and non-poor, while Tobit regression model was used to determine the factors associated with poverty experienced by the farming households in the study area. About 67% of the households were categorized as poor. The Tobit regression analysis reveals that 15 out of the 23 household livelihood-related variables included in the model had their coefficients significant at between ($P < 0.01$) and ($P < 0.10$), representing about 63 percent of the variables. The Tobit result reveals that increases in farm size, amount of credit, agricultural production diversification and extent of agricultural output commercialization contributed to reduce the poverty level among farming households. Poverty intensity is high among households having large size, high child dependency ratio and expenditure on education. Therefore, policy measures should aim at enhancing the rural farmers' access to improved agricultural inputs, land and credit; thereby increasing agricultural productivity and production so as to meet home consumption and generate an increased surplus for the market.

Key words: Poverty, farming households, poverty intensity determinants, elasticity, agricultural production, diversification, savanna, Borno State, Nigeria.

Introduction

In Nigeria, 65 percent of the country's population live in the rural areas where agriculture is the predominant occupation. It is estimated that about 70 percent of the rural population are engaged in agriculture¹. Generally, the agricultural sector is the single largest sector of the economy, contributing about 41 percent to the country's gross domestic product (GDP). The agricultural sector contributes significantly to rural employment, and is also an important contributor to the nation's food security, foreign exchange earnings and the supply of industrial raw materials².

The distribution of extreme poverty by occupational category in 1992 indicates that 67.4 percent of the poor in Nigeria were in agriculture³. The rural, traditional and mostly private agricultural sector is characterized by small-scale, poor subsistence and semi-subsistence farmers and informal traders. The farmers cultivate small landholdings, which are often less than one hectare in size and in fragmented plots. The traditional system of agricultural production still prevails, with its characteristically low technical base, high reliance on manual labour and, hence, low resource productivity. Agricultural production is seasonal with annual output fluctuations. Because of adverse biophysical conditions, such as erratic rainfall, marginal soil fertility and a non-conducive policy environment, the sector is no longer able to cater for the growing population, much less to cope with unexpected shocks. Hence, farmers have been obliged to diversify their livelihood with incomes from outside the sector.

Fully aware of the problems, the project Promoting Sustainable Agriculture in Borno State (PROSAB) came in to amend the situation. PROSAB is a project funded by Canadian International Development Agency (CIDA) approved in September 2003, funding to the agricultural and rural development sector by supporting IITA's proposal in Borno State. The goal of the project is to contribute to poverty reduction and improved livelihoods through improved sustainable agricultural production, through the transfer of improved agricultural technologies and management practices, improved market access and a more enabling policy environment for male and female farmers.

Several authors have investigated the determinants of poverty in sub-Saharan Africa. Okurat *et al.*⁴ in a study of regional poverty in Uganda found that northern Uganda was found to be the poorest region; it has the largest depth of poverty and worst inequality. It is characterised by the poor having large mean household sizes, least education, least mean household incomes, least expenditure on health, least chance of child survival and highest concentration in rural areas. Similarly, Minot⁵ found out that rural poverty is associated with remoteness, poverty is higher in remote areas of Tanzania. In a recent study⁶ on determinants of poverty in Sierra Leone, almost 80% of the rural households were poor, and people were less likely to be educated and more likely to work in agriculture, particularly rice production. Determinants of poverty were found to differ between rural and urban

households, where urban households were found to be relatively better-off.

In order to achieve the goal of poverty reduction, it became necessary to empirically measure the poverty status and examine the determinants of poverty among the farming households. The need to investigate poverty and its determinants has also been justified by Ravallion⁷ and Bandabla⁸ who argued, that “a credible measure of poverty and its determinants can be a powerful instrument for focusing the attention of policy makers on the living conditions of the poor.” Poverty data can inform policies intended to reduce poverty. Hence, this study investigated poverty and the factors associated with it among the farming households in the PROSAB project area.

Methodology

Study area and data: The study area consists of areas covered by the PROSAB project in the Sudan and Guinea savannas of Borno State, Nigeria. The project area is located between latitudes 10° and 12° North of the equator and longitudes 11.30° and 14° East. It comprises Biu, Damboa, Hawul and Kwaya Kusar Local Government Areas (LGAs). There are numerous ethnic groups and cultures, with approximately 80 percent of the population being small-scale farm producers. Farming is characterized by a variety of crop and livestock-based production systems. Maize, rice, sorghum, groundnut and cowpea are major crops which are grown for home consumption as well as for the market. Livestock - small and large ruminants as well as poultry - is an integral part of the farming system and provides income as well as financial safety nets.

The data were obtained through a household survey carried out in 2004, using well-structured questionnaires administered by trained enumerators. The bulk of the data was on the socioeconomic variables of the households as well as on their income and expenditure. The data were collected from 39 settlements. In each selected community, a random selection of households was carried out using the sampling proportion to size procedure. A total of 1,998 questionnaires were collected from farming households in the study area.

Household poverty measurement: In the context of this study, poverty is defined as the inability of households to satisfy their basic needs of food, clothing and shelter. They are unable to meet social and economic obligations, lack gainful employment, are deprived of access to basic facilities such as education, health, potable water and sanitation and, hence, have restricted welfare⁹. Rowntree¹¹ defined poverty as a level of total earnings, which is insufficient for obtaining the minimum necessities of life (including food, rent and other basic needs) and for the maintenance of physical efficiency.

In determining the poverty status of the households in the study area, a poverty line was constructed using the two-thirds mean per adult equivalent expenditure, below which the households are classified as poor or non-poor. The use of monetary income or consumption to identify and measure poverty has a long tradition, from the study of Rowntree¹¹ to the recent study of the World Bank³ on global income poverty. Most of these studies share common approaches and methods. They were based on household income and expenditure surveys, and this has made the approach

standard for quantitative poverty analysis¹². Rowntree¹¹ generated different poverty lines for different families, depending on their sizes, and compared these with their earnings to arrive at their poverty status. The World Bank, on the other hand, has been estimating global income poverty by using expenditure data collected through household surveys, because consumption, which is reflected in expenditure, has been conventionally viewed as the preferred welfare indicator. Also, for practical reasons of reliability, consumption expenditure levels are thought to capture long-run welfare levels better than current income¹². However, literature is explicit that consumption expenditure may not fully capture the command over goods and services to a household or an individual but in the absence of more practical approaches, consumption expenditure has become the most widely used variable for determining the poverty line^{12,13}. The poverty line for Nigeria was determined from the National Integrated Survey of Households (NIHS) data as two-thirds mean per capita household expenditure¹.

Empirical model for household poverty: For the determinants of household poverty, a Tobit regression analysis was conceptualized and the full model, developed by Tobin¹⁴, is expressed in Equation 1, following McDonald and Moffit¹⁵ and as adapted by Omonona¹³:

$$V_i^* = \beta T X_i + e_i; V_i = 0 \text{ if } V_i^* \leq 0; V_i = V_i^* \text{ if } V_i^* > 0 \quad (1)$$

$i = 1, 2, \dots, n$

V_i^* = limited dependent variable, it is the depth of household poverty defined as $(Z - Y_i)/Z$ (2)

Z = poverty line, Y_i = mean monthly household expenditure per adult equivalent, X_i = vector of explanatory variables, βT = vector of unknown parameters, e_i = independently distributed error term.

The independent variables are:

AGE = age of head of household (years),

FARMINC = farm income of a household per annum (₦),

FARMSZ = farm size of a household (ha),

HHSZ = household size of a farmer,

FAMEX = farming experience (years),

COOP = cooperative membership (D = 1, if yes; D = 0, otherwise),

EDUC = level of education of a farmer (years),

DIST = distance to input source (km),

GEND = gender of head of household (D = 1 for male, D = 0 for female)[†],

DIVER = diversification index (using Herfindhal index),

ASSETS = total value of household disposable assets (₦),

FARMEN = household enterprise (D = 1 if farm enterprises alone, otherwise D = 0),

CREDIT = household head's access to credit facilities (D = 1 if yes, otherwise D = 0),

CDR = child dependency ratio,

EXTAG = household head's access to extension agents (D = 1 if yes, otherwise D = 0),

EXCOM = extent of produce commercialization (proportion of farm produce sold),

REMIT = value of remittances received per adult equivalent per annum by household (₦),

HLAB = hired labour (mandays),

FLAB = family labour (mandays).

[†] D in the description of variables stands for dummy.

The diversification extent (DIVER) was measured using Herfindal index defined as:

$$DIVER = \sum_{i=1}^n R_i^2 \quad (3)$$

where,

$$R_i = \frac{A_i}{\sum_{i=1}^n A_i} \quad (4)$$

A_i = share of farm revenue from enterprise i cultivated by the household, n = number of enterprises owned by the household.

The empirical model in Equation 1 was used to draw inferences on the causal factors for household poverty. The probabilities of being poor and the depth or intensity of poverty in the context of household characteristics (as captured by the explanatory variables or X_i) were obtained from the Tobit regression estimate. A multicollinearity test was first carried out on the variables included in the Tobit model and, as a result, some of the explanatory variables initially proposed for inclusion were dropped from the analysis.

The Tobit model can further be disaggregated to determine the effect of a change in the i^{th} variable on changes in the probability of household being in poverty and the expected depth of poverty. It can be shown that: $E(V_i) = F(Z) E(V_i^*)$ (5)

where $E(V_i^*)$ is the expected value of V_i for those households that are already poor, and F is the cumulative normal distribution function at Z , where Z is $X\beta/\delta$.

For a change in any aspect of household characteristics (independent variables X_i), the effect on the poverty levels of the households can be decomposed into two, by differentiating Equation 5 with respect to the specific household characteristics (X_i). $\partial E(V_i)/\partial X_i = F(Z) \{ \partial E(V_i^*)/\partial X_i \} + E(V_i^*) \{ \partial F(Z)/\partial X_i \}$ (6) Multiplying by $X_i/E(V_i)$, the relationship (6) can be converted into elasticity forms: $\partial E(V_i)/\partial X_i \cdot X_i/E(V_i) = F(Z) \{ \partial E(V_i^*)/\partial X_i \} \cdot X_i/E(V_i) + E(V_i^*) \{ \partial F(Z)/\partial X_i \} \cdot X_i/E(V_i)$ (7)

Rearranging Equation 7, we have: $\{ \partial E(V_i)/\partial X_i \} \cdot X_i/E(V_i) = \{ \partial E(V_i^*)/\partial X_i \} \cdot X_i/E(V_i) + \{ \partial F(Z)/\partial X_i \} \cdot X_i/F(Z)$ (8)

Therefore, the total elasticity of a change in the level of any variable of rural farming household variables (X_i) consists of two effects: (1) the change in the elasticity of poverty intensity for the poor household and (2) the change in the elasticity of the probability of being poor.

Results and Discussion

Classification of households by poverty levels: From a mean monthly per adult equivalent expenditure of ₦3670.00 (US\$ 27), a poverty line of ₦2446.67 (US\$ 18) per month or ₦81.56 (US\$ 0.60) per day was obtained using the two-thirds mean per adult equivalent household expenditure. This value, however, is lower than the international poverty line put at one US\$ per day. Households whose mean monthly expenditure per adult equivalent was below this poverty line were classified as being poor. Those with higher mean monthly per adult equivalent expenditure were classified as being non-poor. About 67 percent of the households in the project area were poor, while about 33 percent were non-poor (Table 1).

Table 1. Distribution of households by poverty status.

Category	Frequency	Percentage
Poor	1,332	66.67
Non-poor	666	33.33
Total	1,998	100.00

Source: Computed from field survey data, 2004.

Determinants of household poverty intensity: In this section, the factors that affect household poverty status and the elasticities that show the degree and direction of the responses of poverty level to changes in these variables are presented. Two types of elasticities were generated from the Tobit regression model used: the elasticity of the probability of a household being poor and the elasticity of the intensity of poverty of a household that is already poor.

In the Tobit regression analysis used, only poor households were considered. Hence, the dependent variable measured the intensity of poverty among households in the project area. The values of this dependent variable ranged between 0 and 1; the farther away the value is from 0, the worse the poverty situation.

The results of the Tobit regression analysis are presented in Table 2 and show the various parameter estimates from the Tobit regression analysis. Table 2 reveals that 15 out of the 23 explanatory variables related to household livelihoods included in the model had statistically significant coefficients at between 1% ($P < 0.01$) and 10% ($P < 0.1$), representing about 63% of all the explanatory variables. Also, the sigma (σ) value was 0.36, with a t-value of 19.28. This was statistically significant at the $P < 0.01$ level, thus indicating that the model had a good fit to the data.

Table 2. Maximum likelihood estimates (MLE) of Tobit regression analysis.

Variable	Estimate	t-value
Constant	0.44	2.145***
Demographic		
HHSZ	0.211	3.64***
GEND	0.375	3.08***
EDUC	0.226E-04	1.41
CDR	0.293	2.71**
Economic (Production/Consumption)		
RFETE	0.045	0.50
FARMSZ	-0.103	-0.83***
CREDIT	-0.196	-2.34**
FARMEN	-0.224	-2.06***
FLAB	-0.657	-1.825**
HLAB	0.851E-03	0.56
PERCUL	-0.342	-2.96
RQPQC	0.471	1.22
DIVER	-0.112	3.06***
EXCOM	-0.031	-1.77*
Health/Hygiene		
MEDOP	-0.086	-3.20***
DISWAT	0.751E-03	0.56
DISMED	-0.002	-0.98
HELTEX	0.673E-06	0.31
Institutional influence		
EDUCEX	0.962	2.03**
EXTAG	-0.013	-1.98*
COOP	-0.084	-2.77***
Vulnerability and resilience		
ASSETS	-0.162	-1.71*
REMIT	-0.205	-3.47***

Source: Computer printout of Tobit analysis *** Significant at $p < 0.001$; ** Significant at $p < 0.005$; * Significant at $p < 0.01$ $\delta = 0.36$; Log Likelihood function = 64.91

Furthermore, the value of the intercept was 0.44, meaning that the autonomous poverty intensity was 0.44 in the study area. The 15 explanatory variables, which were found to significantly affect household poverty intensity, are discussed as follows.

Household size (HHSZ): Households with large size had a higher intensity of poverty than those with smaller size. The household size variable has a regression coefficient of 0.211, meaning that an unit increase in household size would bring about an increase of 0.211 in the probability of household poverty, and vice versa. The coefficient is positive and statistically significant at 1%.

Gender of the household head (GEND): The coefficient of the variable is statistically significant at the 1% level and shows a positive relationship with the intensity of poverty. This result shows that households headed by males had higher poverty intensity than those headed by females in the study area. Because GEND is a dummy variable, its coefficient of 0.375 implies that, given all other factors, the probability of the poverty intensity of male-headed households was autonomously higher than that of female-headed households by 0.375.

Child dependency ratio (CDR): The degree of child dependency of a household is believed to affect the welfare of such a household. In this study, the child dependency ratio was found to have negatively affected the poverty status of the households in the project area. That is, a high dependency ratio was found to be inimical to households' poverty status. The regression coefficient of 0.293 for the child dependency variable implies that an unit increase in the child dependency ratio would increase the probability of poverty intensity by 0.239 in an average household in the project area, and vice versa.

Household farm size (FARMSZ): Household farm size was one of the highly significant factors affecting the intensity of poverty among households in the project area. Households with larger farm size were, on average, less poor than those that cultivated smaller size farm. This was because households with larger farm holdings were expected to generate more income, which would enhance their consumption level and subsequently improve their household poverty status. The regression coefficient is -0.103 , meaning that an unit increase in the size of farm holding would lead to a reduction in the probability of household poverty by 0.103, and vice versa.

Household head's access to credit (CREDIT): Households whose heads had access to credit facilities had a lower level of poverty intensity than those whose heads did not have such access. This might be due to the fact that those households with access to credit were able to acquire more productive resources for their household enterprises. This would subsequently enhance the household's income-generating ability and household welfare. This variable has an intercept dummy of -0.196 , meaning that the autonomous poverty intensity of households whose heads had access to credit facilities was, on average, lower by 0.196 than that of households without access.

Household production enterprise structure (FARMEN): Households whose enterprise structure was not restricted to farm production alone had a lower intensity of poverty than those that depended solely on farm production. An intercept dummy of -0.224 implies that the probability of poverty intensity was autonomously reduced by 0.224 among households whose enterprise structure was not restricted to farm production alone

in the study area, compared with households having only farm production enterprises.

Family labor (FLAB): Households with higher level of family labor supply had a lower intensity of poverty than those with lower level of supply. That is, given other factors, the higher the level of household labor available, the lower the intensity of household poverty. This might be because the abundance of family labor would tend to reduce the need for expenses on paid (hired) labor, thereby leaving some extra money to take care of other household needs. The regression coefficient also indicates that, given other factors, an unit increase in the quantity of family labor would reduce the probability of household poverty intensity by 0.657, and vice versa.

Extent of household production diversification (DIVER): This is another variable that significantly affected the poverty status of households in the project area. The coefficient of the variable is statistically significant at the 1% level and carries a negative sign. This shows that households with relatively more diverse farm enterprises and, hence, more diverse sources of farm income tended to have lower probabilities of poverty intensity than households with relatively less diverse enterprises and income sources, given other factors. The regression coefficient shows that, given other factors, an unit increase in the diversification index would tend to reduce the probability of poverty intensity by 0.112, and vice versa. Production diversification is a well-known strategy to minimize risk. In this case, it could serve as a strategy for minimizing the risk of losses in farm income and, hence, the risk of a more intense household poverty level.

Extent of agricultural output commercialization (EXCOM): A negative relationship between the extent of production commercialization (EXCOM) and household poverty intensity implies that the higher the extent of commercialization, the lower the intensity of poverty, and vice versa. This is plausible, because the sale of output is expected to generate income for households to meet their needs, such as expenses for healthcare and the education of their children and this tends to reduce the household's poverty level, given other factors. The regression coefficient shows that an increase of one unit in commercialization by a household would reduce the probability of household poverty intensity by 0.031, and vice versa.

Health/hygiene-related variable (MEDOP): The statistical significance of the MEDOP coefficient shows that households that combined traditional methods (herbs) with modern methods of healthcare were less poor than those that did not. Since the cost of receiving treatment in the hospitals was often perceived to be too high in the project area, households that resorted to using less expensive traditional healthcare methods might save some money. This could be spent on other household items that might enhance the welfare of such households. The intercept dummy of -0.086 suggests that, on average, the autonomous poverty intensity of households that combined traditional methods (herbs) with modern methods of healthcare would decrease by 0.086, given other factors.

Household expenditure on education (EDUCEX): Households with higher expenditure on education were, on the average, poorer. This may be due to the fact that expenditure on education as an item of priority expenditure would deprive a household of some other basic needs. This could have a negative impact on

household welfare and increase the intensity of household poverty. The regression coefficient of 0.962 implies that an unit increase in the expenditure of a household on education would increase the probability of household poverty intensity by 0.962, and vice versa.

Household's access to agricultural extension services (EXTAG): The coefficient of this variable is statistically significant at the 10% level and shows a negative relationship with the poverty status of households. This implies that households that had access to extension services had lower probabilities of being poor than those that did not have such access, and vice versa. This might be because contact with extension services provided more access to improved crop production techniques, improved inputs and other production incentives. These would positively affect farmers' outputs and their income-generating ability, thereby reducing their poverty level. An intercept dummy of -0.013 suggests that, on average, the autonomous poverty intensity of households that had access to extension services was lower by 0.013 in the project area.

Membership of cooperative societies or other farmers' associations (COOP): This variable exhibits a negative relationship with household poverty intensity. This implies that the intensity of poverty was lower in a household whose head was a member of a cooperative society or any other farmers' association than in one whose head did not belong to such an organization. This might be as a result of various benefits accruable to members of cooperative societies, such as credit facilities, access to improved production inputs and access to information that could enhance their productive capacity. The intercept dummy of the variable suggests that membership of cooperative societies would autonomously reduce poverty intensity by 0.084, and vice versa.

Total value of household assets (ASSETS): A negative relationship between the value of household assets owned and the intensity of household poverty implies that the higher the value of household assets, the lower the household poverty intensity, and vice versa. The value of household assets measures the ability of the household to withstand economic shocks and income shortfalls to finance the purchase of household needs; ownership of assets serves as a surety and a fallback strategy for the household against transitory poverty because some of these assets could be sold to procure basic household needs in periods of temporary financial distress. The regression coefficient of -0.162 implies that an unit increase in the value of household assets would reduce the probability of household poverty by 0.162, and vice versa.

Total value of remittances received by household (REMIT): The negative relationship between total value of remittances received by a household and poverty intensity implies that households with higher values of received remittances tended to have lower probabilities of poverty intensity. Also, an unit increase in the value of household remittances received would reduce the probability of poverty of an average household by 0.21, given other factors.

Elasticities of household poverty intensity: Elasticity coefficients were computed for only nine of the variables included in the model because other variables with statistically significant coefficients were dummies. Elasticity coefficients computed were those of

household size, total household expenditure on education, total value of household assets, child dependency ratio, extent of household agricultural output commercialization, extent of household agricultural production diversification, farm size, total value of remittances received and quantity of family labor available. As shown in Table 3, only the coefficients of farm size, extent of agricultural production diversification and total value of remittances received by household were elastic (i.e., >1) out of the nine computed.

The important factors that reduced household poverty intensity, in order of importance, were the total value of remittances received by households, farm size, the extent of agricultural production diversification, the quantity of family labor available and the total value of household assets.

Table 3 reveals that a 1% increase in three variables would reduce the intensity of household poverty as follows: by 4.46% with an increase in the total value of remittances received by households, by 2.26% with an increase in farm size and by 2.26% with an increase in household agricultural product diversification, and vice versa. On the other hand, an 1% increase in the amount of family labor available would lead to a decrease of only about 0.79% in household poverty intensity and in the total value of household assets to a decrease of only about 0.12%, and vice versa.

Some variables were, however, found to increase household poverty intensity. These, in order of importance, were the household size, child dependency ratio and household expenditure on education. From Table 3 it can be deduced that an 1% increase in household size would increase household poverty intensity by about 0.56%; the same increase in the child dependency ratio would increase household poverty by 0.4% and in household expenditure on education by 0.10%, and vice versa.

Policy Recommendations

Broadly, policy recommendations are grouped into four categories covering policy issues relating to (1) gender mainstreaming, (2) production input and credit support, (3) household enterprise organization and (4) social capital formation.

Gender: The analysis of poverty status showed that female-headed households were less poor than male-headed households. This finding points to the need for gender mainstreaming with regard to the promotion of entrepreneurship among females households to enhance their income-earning capacity through training for technical and managerial skill acquisition, credit support, resource supply support and social capital formation. Women's comparative advantage in rearing small stock (sheep, goats and poultry), small-scale agroprocessing and produce marketing should be fully exploited to promote household food security and reduce household poverty.

Production input and credit support: As findings from this study have revealed, inadequate production input and credit supply constituted some of the most binding constraints to household crop and livestock production, especially in respect of the supply of fertilizer, improved seeds, pesticides and veterinary products. There is, therefore, a need for measures to ensure an adequate supply of these inputs as well as credit through both public and private sector initiatives.

Table 3. Elasticity estimates of household poverty depth.

Variable	Elasticity of probability of poverty (a)	Elasticity of intensity of poverty (b)	Total elasticity (a+b)
Household size	0.278	0.277	0.555
Expenditure on education (₦)	0.031	0.031	0.062
Household assets (₦)	-0.062	-0.060	-0.122
Extent of agricultural production diversification	-1.23	-1.03	-2.26
Farm size	-1.57	-1.09	-2.66
Child dependency ratio	0.182	0.180	0.362
Extent of output commercialization	-0.029	-0.028	-0.057
Total value of remittances received	-4.594	-0.0004	-4.594
Family labour (mandays)	-0.382	-0.403	-0.785

Source: Computed from Tobit regression results

Organization and structure of household enterprises: Findings from this study have revealed that household enterprise diversification is a strong factor in household poverty reduction. Farm enterprise diversification, involving mixed (crop and livestock) farming and also promoting crop and livestock interaction, as well as farm/non-farming enterprise diversification can, therefore, serve as an effective strategy for reducing household poverty in the project area. Commercialization of agricultural production was also found to be a strong factor in household poverty reduction. It follows, therefore, that measures that promote both household enterprise diversification and agricultural production commercialization are highly desirable. Such measures would include the adequate supply of improved farm inputs, the provision of technical services, including technical training and agricultural extension services, and the supply of adequate credit to farmers.

Social capital formation: In this study, membership of cooperative societies and farmers' organizations was identified as one of the significant factors reducing household poverty status. As such, measures should be put in place to encourage the formation of effective farmers' cooperatives and other farmers' organizations for the purpose of knowledge transfer, input and output marketing and distribution, savings mobilization and farm credit sourcing and supply.

Acknowledgement

This research was undertaken with the financial support of the Government of Canada provided through the Canadian International Development Agency (CIDA).

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