

## Factors Influencing Farmer's Participation in Agricultural Projects: The case of the Agricultural Value Chain Mentorship Project in the Northern Region of Ghana

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### Abstract

Farmers' participation in agricultural projects has a direct bearing on technology awareness, adoption, livelihoods, environment, nutrition, poverty, performance of the agricultural sector and the macro economy. This study therefore sought to identify factors, which delimitate farmer's participation in agricultural projects using the case of the Agricultural Value Chain Mentorship Project. A multi-stage sampling technique was employed to collect cross sectional data from 180 farmers in the Saboba and Chereponi districts of the Northern Region of Ghana. The study adopts the binary probit model and results of the analysis indicate that number of years in school, access to production credit and agricultural extension service are factors that significantly determine farmer's participation in agricultural projects. It appears that farmer's interest in agricultural projects can be permanently sustained by providing them with tangible benefits such as production credit and agricultural extension services.

**Keywords:** AVCMP, Chereponi, Farmer-Based Organization, Participation, Probit, Saboba

### 1. Introduction

Developmental efforts that employ the top-bottom approach with minimal input and involvement of target beneficiaries have long been recognized as an unsustainable and poor pathway to beneficiary empowerment and development. Bottom-up approaches that view beneficiaries as partners, utilize local experience and endeavour to empower target beneficiary have been promoted in the past few decades (Chambers, 1983; Kumba, 2003). Chambers (1983) recommended farming systems research and extension as a model for agricultural development. The farming systems and extension model recognizes the critical role farmers play in the success or failure of an agricultural project. It recognizes farmer's involvement in identifying farming problems as well as solutions for sustainable development (Kumba, 2003). In Ghana, the Savanna Agricultural Research Institute (SARI) of the Council for Scientific and Industrial Research (CSIR) has adopted the concept of farming systems research. In fact, the bottom-up approach to development has arguably been adopted by almost all agricultural projects in Ghana. The emphasis has shifted from instructing farmers to collaborating and coaching farmers to participatorily identify and solve local agricultural constraints.

Agriculture is the spine of Ghana's economy. The agricultural sector is basically responsible for achieving the first millennium development goal of halving the proportion of the population suffering from hunger. According to the Ministry of Food and Agriculture, MoFA (2011), agriculture contributed about 26 percent of the gross domestic product in 2011 in spite of the discovery of oil and gas. The sector provides employment for majority of the population (about 51 percent) and is the largest foreign exchange earner (MoFA, 2010). Agriculture is the mainstay of the people of Saboba and Chereponi districts. About 40 percent of the total area in both districts is utilized for agricultural purposes with a significant proportion left uncultivated (SRID, 2012). Maize, rice, soybean, groundnut, cowpea, yam and cassava are common crops cultivated.

Northern Region and for that matter Saboba and Chereponi have been categorized among the poorest in the country with per capita income lower than national average (Ghana Statistical Service, GSS, 2008). It is not uncommon for households in the region to struggle every year to find enough food for a period of 5 months (Quaye, 2008; Al-Hassan and Poulton, 2009). According to Al-Hassan and Poulton (2009), poverty and food insecurity is generally high among food crop farmers. In response, several agricultural related interventions have been implemented in the past (for example, Global Sasakawa 2000, Agricultural Sub-Sector Improvement Program, Root and Tuber Improvement Program, Purdue Improved Cowpea Storage, among others); numerous interventions are currently being implemented (for example, Agricultural Value Chain Mentorship Project, AVCMP, Alliance for a Green Revolution in Africa' Soil Health Project, AGRA-SHP, Block Farm Project, Northern Rural Growth Program among others) with others planned for the future potentially in the area of climate-smart agriculture.

According to Ashley and Maxwell (2001), the performance of the agriculture sector has a direct bearing on

livelihoods, environment, poverty and malnutrition. In order to enhance the performance of the agricultural sector and more specifically the performance of agricultural projects, there is the need to identify factors, which delimitate farmer's participation in agricultural projects. Farid *et al.*, (2009) defines participation as playing a role or taking part in an activity usually with others. Participation also refers to involvement of individuals and groups in development processes with the aim of ensuring self-reliance and better standard of living (Nxumalo and Oladele, 2013). The important relationship between farmer's participation in agricultural projects on one hand, and economic development and poverty alleviation on the other hand, cannot be over emphasized. According to Nxumalo and Oladele (2013), without participation there would be no program and no development. Farmer's participation in agricultural projects can either be nominal, consultative, action-oriented or collegial (*ibid*).

The AVCMP is being funded by the Danish International Development Agency through AGRA and is jointly implemented by CSIR-SARI, International Fertilizer Development Center, IFDC, and Ghana Agricultural Associations Business Centre, GAABIC. The project is being implemented in sixteen districts in the Northern Region of Ghana including Saboba and Chereponi districts. The goal of the AVCMP is to contribute towards the Government of Ghana's objective of achieving food security and becoming an agro-industrial economy by developing the entrepreneurial and technical skills of small and medium enterprises, agro-dealers, farmer-based organizations (FBOs) and their member farmers. Almost all farmers participating in the AVCMP have ever participated in a previous agricultural project. The AVCMP mainly identified and primed FBOs who were animated or formed by previous projects. As a result, farmers participating in the AVCMP are relatively experienced in terms of participating in an agricultural project or being a member of a farmer-based organization. Empirical works on factors that influence farmer's participation in agricultural projects is limited especially with respect to Ghana and the Northern Region. The authors are not aware of any such empirical work to date with respect to the Saboba and Chereponi districts. This paper therefore attempts to estimate the factors that determine farmer's participation in agricultural projects considering specifically the case of the AVCMP. The concept of farmer-based organizations has perhaps been widely accepted by all stakeholders of the agricultural sector including donors, policy makers, administrators, project implementers and farmers. The study also documents farmer's perception of an effective and ineffective FBO.

## 2. Methodology

### 2.1 Study Area

Chereponi District was carved out of the Saboba-Chereponi District in 2008 with both now being part of the administrative districts in the Northern Region of Ghana. The two districts are rural in nature with scattered settlements, and located within the Savannah agro ecological zone. Rainfall usually occurs between May and October with an annual average of about 1000mm. The weather is generally warm with temperatures ranging between 21°C and 41°C (SRID, 2012). According to SRID (2012), Saboba and Chereponi districts have a potential of supporting a cropping season of 120 to 180 days. Sole cropping, intercropping and relay cropping are the main cropping systems in both districts. Agriculture is mainly rain-fed with manual tillage as the commonest farming practice. Farmers within the two districts also rear livestock such as cattle, sheep, goat, pigs, donkey and poultry. Livestock rearing is mostly not on commercial basis but as a source of family savings.

Agricultural projects that have been implemented or are being implemented in Saboba and Chereponi districts include AVCMP, AGRA Soil Health Project, Nitrogen to Africa Project, Purdue Improved Cowpea Storage, Livestock Development Project, Block Farm Project, Northern Rural Growth Program, linking Farmers to Markets Project among others.

### 2.2 Data and Sampling Procedure

The study relied on primary data for analysis. Semi structured questionnaires were designed, pre-tested and administered to soybean farmers in the Saboba and Chereponi districts. The questionnaire was developed to adequately collect data on farmer and farm characteristics. A multi-stage sampling technique was adopted for the study. Saboba and Chereponi districts were purposively selected because they are key soybean producing districts in Northern Region and by extension Ghana. A list of soybean producing communities was generated at each district with the help of officials of MoFA. Nine communities were selected in each district based on simple random technique. On the average, 10 farmers were randomly enumerated in each community. A total of 180 farmers were enumerated in 18 communities.

### 2.3 Method of Analysis

Binary probit model is used by this study to estimate the factors that influence farmer's participation in agricultural projects using the case of AVCMP. Farmers participation was captured as a dummy variable with the value 1 assigned to a farmer who is benefitting from the AVCMP and 0 for otherwise. Following from Greene (2003), the binary probit for the two choice models can be written as;

$$Y_i^* = \begin{cases} 1 & \text{if } Y_i^* > Y \\ 0 & \text{if } Y_i^* \leq Y \end{cases} \quad (1)$$

Where  $Y$  = a threshold which is assumed to be zero for this study.

Assuming a normal distribution of errors and following from Greene (2003), the probability of a farmer participation in the AVCMP is given by;

$$\Pr(Y = 1) = \int_{-\infty}^{\beta'x} \phi(t) dt = \Phi(\beta'x) \quad (2)$$

Where  $\phi(\cdot)$  = standard normal distribution,  $(Y = 1)$  implies that a farmer is participating in the AVCMP and  $x$  represent the exogenous variables likely to have an influence on farmers participation. In addition to estimating the probabilities, the study also estimates the marginal effects which are actually used for the discussion of the results. The marginal effects are more informative and easy to understand and explain. Following from Nyaupane and Gillespie (2011), the marginal effects for continuous variables are estimated using equation 3;

$$\frac{\partial E[Y|x]}{\partial x} = \phi(\beta'x)\beta \quad (3)$$

Marginal effects for dummy variables are however estimated using equation 4;

$$\Pr[Y = 1|\bar{x}, d = 1] - \Pr[Y = 1|\bar{x}, d = 0] \quad (4)$$

Where  $\bar{x}$  refers to the mean values of all continuous variable. Empirically, the model for estimating the determinants of farmer's participation in the AVCMP is specified as;

$$Y = \beta_0 + \sum_{i=1}^9 \beta_i x_i \quad (5)$$

Where  $\beta_0$  is the constant term or intercept and  $\beta_i$  represent the parameters to be estimated. The maximum likelihood estimates of the parameters are generated using the STATA software.

#### 2.4 Description of Explanatory Variables

Exogenous variables expected to influence farmer's decision to participate in the AVCMP is presented in table 1. The location of a farmer may be an influencing factor in determining the decision to participate in an agricultural project or otherwise. The district in which a farmer resides which is measured by a dummy variable is used by this study to capture location effects.

The sex of a farmer may have a negative or positive effect on the decision to participate in an agricultural project. Female farmers are usually more networked socially and may therefore be more likely to have links with an agricultural project. On the other hand, male farmers usually have more access and control over resources. Males are also usually the decision makers and are also therefore well placed to participate in agricultural projects. Nxumalo and Oladele (2013) observed that male farmers are more likely to participate in agricultural projects. Nnadi and Akwiwu (2008) did not, however, find any significant relationship between sex and farmers participation in an agricultural project.

A younger farmer is likely to participate in an agricultural project because younger farmers are usually innovative, risk loving and may want to try new concepts. Alternatively, older farmers are usually more experienced and endowed hence they may have either experienced or observed the benefits of participating in an agricultural project. Also older farmers may not be resource constrained to participate in an agricultural project. Several authors have observed a positive relationship between age and participation in an agricultural project (Nnadi and Akwiwu, 2008; Farid *et al.*, 2009; Nxumalo and Oladele, 2013). Kahn *et al.*, (2012) observed that as a woman's age increases, she becomes physically weak and therefore her ability to participate in an agricultural project diminishes. Oladejo *et al.*, (2011) did not however observe any significant relationship between age and participation in agricultural projects.

A married farmer may have access to information and resources of the spouse and may therefore be more likely to participate in an agricultural project as compared to a farmer who is not married. Nnadi and Akwiwu (2008) noted that marriage increases a farmer's concern for household welfare and food security which is therefore likely to have a positive effect on their decision to participate in an agricultural project. Oladejo *et al.*, (2011)

however found a negative relationship between marriage and farmers participation in agricultural projects. Education is expected to positively influence a farmer's ability to source and decipher information including information on available agricultural projects and the benefits of participating in such projects. According to Nnadi and Akwiwu (2008), educated farmers are more likely to participate in agricultural projects in order to put into practice the knowledge they may have acquired in school. Farid *et al.*, (2009) and Kahn *et al.*, (2012) however observed a negative relationship between education and women's participation in agricultural activities. Oladejo *et al.*, (2011) and Nxumalo and Oladele (2013) did not observe any significant relationship between education and the decision to participate in an agricultural project.

A farmer with a large household can easily participate in an agricultural project while delegating other important activities to other household members and vice versa. Also, each adult household member could be a source of information or beneficiary of an agricultural project hence as a household size increases, the higher the likelihood of coming into contact with an agricultural project. Nxumalo and Oladele (2013) did not find any significant relationship between household size and farmer's participation in an agricultural project. Whereas Nnadi and Akwiwu (2008) and Farid *et al.*, (2009) both found a positive relationship between household size and women's participation in agricultural activities, Oladejo *et al.*, (2011) rather reported a negative relationship.

Access to credit is expected to have a positive influence on the decision to participate in an agricultural project. Most financial institutions in the Northern Region of Ghana do not have the staff to monitor disbursed credit and may not have the knowledge to provide technical support to farmers hence these institutions usually prefer to grant production credit to farmers and FBO who have links to an agricultural project (Etwire *et al.*, 2013). Oladejo *et al.*, (2011) did not find any significant relationship between access to credit and participation in an agricultural project.

Contact with agricultural extension is expected to have a positive effect on farmer's decision to participate in an agricultural project. Most projects partner the agricultural extension service to identify farmers and FBOs to participate in their projects hence the likelihood of a farmer being informed and primed to participate in a project increases with contact with an extension agent.

The relationship between farm size and farmer's decision to participate in an agricultural project is expected to be positive. Farm size may be a proxy for level of commercialization hence farmers who decide to cultivate an additional hectare of land are usually moving away from subsistence production and are therefore more likely to participate in an agricultural project in order to have access to inputs, technology and output market. Farid *et al.*, (2009) reported a negative relationship between land holdings and women's participation in agricultural activities. Nxumalo and Oladele (2013) did not however find any significant relationship between farm size and participation in an agricultural project.

Table 1: Exogenous Variables Considered for the Probit Model

Variable	Measurement	Apriori Expectation
District	Dummy, 1 = Chereponi, 0 = Otherwise	+/-
Sex	Dummy, 1 = Female, 0 = Otherwise	+/-
Age	Years	+/-
Marital status	Dummy, 1 = Married, 0 = Otherwise	+/-
Education	Years in school	+/-
Household size	Number	+/-
Received credit	Dummy, 1 = Yes, 0 = Otherwise	+
Received extension	Dummy, 1 = Yes, 0 = Otherwise	+
Farm size	Hectares	+/-

### 3. Results and Discussion

#### 3.1 Socio-Demographic Characteristics of Respondents

Analysis of the socio-demographic characteristics of respondents was disaggregated by participation in the AVCMP or otherwise, as shown in table 2. The data was subjected to the independent-samples t-test. Statistically, results of the test show that farmers who are participating in the AVCMP significantly had higher access to production credit and agricultural extension services, had younger ages, spent fewer years in school and cultivated smaller farm sizes as compared to farmers who are not participating in the AVCMP. In terms of marital status and household size, there was however no statistical difference between farmers who are participating in the AVCMP and otherwise.

A very large proportion (90 percent) of the sample is married. Marriage is arguably one of the most respected and sacred institutions in almost all farming communities in the Saboba and Chereponi districts. As a result of the importance attached to the marriage institution, it is not uncommon for girls to be betrothed for marriage at a very young age. Marriage is mostly a source of prestige and may serve as a source of additional farm labour for a

man and his family. A prospective husband is also a source of farm labour for his in-laws. Married farmers are more likely to take a longer time to reach a decision as compared to unmarried farmers. Married farmers may have to either consult or reach a consensus with their spouses before making decision such as participating in an agricultural project.

About 21 percent of the sample who are not participating in the AVCMP received production credit. This statistic is less than half the proportion of farmers (48 percent) who received production credit in 2012 and are participating in the AVCMP. Analysis of the data suggests that most farmers who rely on their own resources can only support the cultivation of a small piece of land. Most farmers therefore desire production credit although only a few are usually able to access it. According to Etwire *et al.*, (2013), being a member of an effective FBO and participating in an agricultural project are some requirements for accessing institutional credit in northern Ghana. Production credit as well as repayment can be in kind or cash.

About 41 percent of the sample who are not participating in the AVCMP received agricultural extension service. Majority of the farmers (64 percent) who participated in the AVCMP also received agricultural extension service in 2012. Agricultural extension agents are mandated to serve as a bridge between technology generation and technology utilization. As a result of constraints such as limited personnel and logistics, it is not uncommon for extension service to collaborate with other institutions and development projects with the aim of improving extension delivery.

The average age of the respondents is 39 years. This implies that farmers on the average can work productively for another 2 decades hence, with the right investment and policy, the future of soybean production in Saboba and Chereponi districts looks bright. Farmers who are participating in the AVCMP are however slightly younger than non-participants.

About 77 percent of the respondents have never been to school. According to the GSS (2008), 76.8 percent of adults have never been to school in the Northern Region. The mean number of years spent in school is 2. Formal education is important for impacting literacy and numeracy skills which is necessary for farm planning and budgeting as well as comprehension of good agronomic practices. An illiterate farmer will not therefore be able to read an instruction manual or a label on a seed or agrochemical package.

The average household size of the sample is 8. This result is slightly higher than the 5.5 estimated by the GSS (2008) for households in the Northern Region. Household size can be a proxy for family labour. Availability of family labour implies that the household head may have time to engage in other activities including participating in an agricultural project. Household size is also sometimes perceived as an indication of manliness or wealth.

The mean farm size of the sample is about 2 hectares. Crop production is mainly on subsistence basis. This result is consistent with MoFA (2010) who reported that about 90 percent of farm holdings in Ghana are less than 2 hectares in size.

Table 2: Demographic Characteristics of the Sample

Characteristic	Percent		
	AVCMP	Non-AVCMP	Overall
Married	92.8	89.3	90.0
Received credit	48.0***	21.4***	28.4
Received extension	64.0***	40.7***	46.8
Received formal education	18.0	24.3	22.6
	Mean		
Age (Years)	37*	41*	39
Education (Years)	1*	2*	2
Household size (Number)	8	9	8
Farm size (Hectares)	1.8***	2.5***	2.3

\* and \*\*\* represent statistically significance at 10% and 1% respectively

### 3.2 Determinants of Farmers Participation in Agricultural Projects

Maximum likelihood estimates of the results of the probit model are presented in table 3 and appendix 1. Whereas table 3 contains the marginal effects, the coefficients are presented in appendix 1. The estimated log likelihood value is highly significant indicating that the model with predictors is to be preferred over a model without predictors. Number of years in school, access to production credit and agricultural extension service are factors that significantly determine farmers' participation in agricultural projects in the Saboba and Chereponi districts of northern Ghana.

The probability of participating in an agricultural project reduces marginally (about 2%) if a farmer stays in school for an additional year. Analysis of the data suggests that farmers who are educated mostly engage in agriculture in addition to either a primary or secondary occupation. Farmers who do not depend solely on agriculture usually have to allocate resources and time to their other occupations and are therefore more likely to



be time constrained with respect to participating in agricultural projects. Educated farmers are usually more progressive and mostly the preferred contacts for most agricultural extension agents. Such farmers may not therefore need to participate in an agricultural project in order to receive extension services. Educated farmers are usually able to read and understand basic instructions and may not therefore need to participate in an agricultural project to get basic knowledge in farming since such knowledge already exist in print and electronic forms. Most farming communities do not have high schools (junior or senior) and higher institutions of education hence farmers who stay in school for more than 6 years usually have to continue their education outside their communities. Upon return, such farmers usually feel superior to their peers and may not jointly participate in agricultural projects with them. In some instances, educated farmers accept to be secretaries for farmer-based organizations even though their participation in group activities may be low. The finding of this study contradicts that of Nnadi and Akwiwu (2008) who observed that an additional year in school rather increases (about 2%) the likelihood of participation of youth in rural agriculture in Nigeria. The finding of the study confirms that of Farid *et al.*, (2009) and Kahn *et al.*, (2012) who both reported a negative relationship between education and rural women's participation in agricultural activities. Oladejo *et al.*, (2011) however found no significant correlation between education and women's participation in agricultural projects in Osun State, Nigeria.

Farmers who have access to credit are about 15 percent more likely to participate in an agricultural project. It is not uncommon for agricultural projects to either provide production credit to farmers or implement activities that are aimed at linking farmers to production credit. Farmers who require production credit are therefore more likely to participate in these projects in order to take advantage of these credit facilities. Most financial institutions that have credit facilities for farmers usually do not have capacity to provide technical backstopping as well as monitor effective utilization of the loans (Etwire *et al.*, 2013). These institutions therefore usually partner agricultural projects to provide such services; farmers are therefore motivated to participate in such agricultural projects. Some agricultural projects serve as guarantors for farmers to access credit while others have guaranteed funds. Farmers are therefore more likely to participate in these projects in order to be able to apply for such credit facilities. Oladejo *et al.*, (2011) did not find any significant relationship between access to credit and women's participation in agricultural projects in Nigeria.

A farmer who has access to agricultural extension service is about 14 times more likely to participate in an agricultural project. Agricultural projects and programs of the Government of Ghana are mostly implemented through the Directorate of Agricultural Extension Services of the Ministry of Food and Agriculture. MoFA also partner other institutions and projects to identify, prime and extend support to farmers and farmer-based organizations. Farmers who have contact with agricultural extension agents are therefore more likely to benefit from agricultural interventions such as the Agricultural Value Chain Mentorship Project, AGRA Soil Health Project, Block Farm, Fertilizer and Seed Subsidy among others.

Table 3: Marginal Effect Estimates of the Probit Model

Variable	$\delta_v/\delta_x$	Std. Err.	P>[Z]
District	0.0689	0.0645	0.285
Sex	0.0077	0.0721	0.915
Age	-0.0032	0.0028	0.250
Marital status	0.0069	0.1082	0.949
Education	-0.0165*	0.0099	0.095
Household size	-0.0051	0.0067	0.448
Credit	0.1521**	0.0689	0.027
Extension	0.1378**	0.0699	0.049
Farm size	-0.0315	0.0252	0.211
Number of observations		190	
LR $\chi^2$ (9)		26.67	
Prob > $\chi^2$		0.0016	
Pseudo R <sup>2</sup>		0.1174	
Log likelihood		-100.218	

\* and \*\* represent statistically significance at 10% and 5% respectively

### 3.3 Farmers perception of FBO

Farmer-based organizations are increasingly becoming important vehicles for producer development. A farmer-based organization is usually a group of like-minded farmers who agree to work together to achieve a common goal. Effective farmer-based organizations have competitive advantages over individual farmers in terms of purchasing power, advocacy, lobby and economies of scale. Farmer-based organizations afford the opportunity to reach relatively more farmers with technical and advisory services at no extra cost.

The study solicited farmer's perception about an effective FBO. About 39 percent of the sample opined that an effective FBO is one whose membership are able to work together to satisfy their immediate needs and that of the broader society through farming activities. An effective FBO must therefore put in place plans and measures to ensure food security. About 25 percent of the sample perceives an effective FBO to be one with a good level of understanding existing within the group. An effective FBO usually have minimal conflicts and is characterized by a high level of cooperation and brotherliness among its membership. Group cohesion and dynamics are generally good in an effective FBO. About 17 percent of the sample placed emphasis on information flow, opining that an effective FBO meet regularly to update members on happenings and to plan for the future. An effective FBO have minutes of their meetings and also keep other important records. About 10 percent of the sample noted that an effective FBO is one with an active leadership and financial base. An effective FBO should therefore have an operational bank account, be formally registered with the Department of Cooperatives and have functional bye laws. Leaders of an effective group treat members equally and members also make financial commitments to the group through payment of monthly dues for example. About 9 percent of the sample opined that an effective FBO is one that provides tangibles to its members. An effective FBO should therefore be able to link its members to structured markets, credit facilities and extension services.

The study also sought to document farmer's perception of factors that make FBOs ineffective. The responses were identical but opposite to their perception of an effective FBO. About 30 percent of the sample opined that FBOs who lack principles such as transparency and accountability are inevitably ineffective which mostly result from either the absence of an operational bank account or bye laws. Weakening of an FBO was perceived by about 15 percent of the sample to be an outcome of little or no interaction between members as evidenced by irregular meetings without minutes, and poor information flow within the group. Lackadaisical and poor attitude towards work was espoused by about 13 percent of the sample as being responsible for making FBOs ineffective. About 12 percent of the sample associated weakening of an FBO to illiteracy. They argued that illiteracy hampers record keeping and affect the capacity of farmers to seek for development. FBOs whose leaders are not honest, open, transparent and trustworthy are a threat to the survival of their group according to 11 percent of the sample interviewed. About a tenth of the sample opined that poor group dynamics, lack of cooperation and unclear goals are factors that are responsible for making FBOs ineffective. About 9 percent of the sample blames weak FBOs on weak financial resource base resulting mainly from none payment of dues and lack of an economic activity for the group.

#### **4. Conclusion and Recommendation**

The study adopted the binary probit model to estimate the determinants of farmer's participation in agricultural projects using the case of the AVCMP. Number of years in school, access to production credit and agricultural extension service are factors that significantly determine farmers' participation in agricultural projects in the Saboba and Chereponi districts of northern Ghana. The probability of participating in an agricultural project reduces by about 2 percent if a farmer stays in school for an additional year. Farmers who have access to credit are about 15 percent more likely to participate in an agricultural project. A farmer who has access to agricultural extension service is also about 14 times more likely to participate in an agricultural project.

Farmer-based organizations are increasingly becoming important vehicles for farmer development. For an FBO to be attractive to farmers, it must be seen to be working towards achieving a particular goal, have good group cohesion, good information flow, noble leadership and capable of providing tangible support to its member farmers.

For active participation and maximum impact, the study suggests that full time farmers and people whose primary occupation is farming should be the main targets of agricultural projects. It may even be desirable not to select very educated people as lead or contact farmers. It appears that farmer's interest in agricultural projects can be permanently sustained by providing them with tangible benefits. In this regard, agricultural project should also endeavour to provide FBOs or farmers with credit preferably input credit or revolving input credit (starter packs). Also, agricultural projects if for nothing at all, should not fail to deliver extension services to FBOs participating in their projects. Extension services could be in the form of on-farm demonstrations, technical trainings among others.

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Appendix 1: Parameter Estimates of the Probit Model

Variable	Coef.	Std. Err.
District	0.2419	0.2270
Sex	0.0271	0.2529
Age	-0.0113	0.0099
Marital status	0.0245	0.3796
Education	-0.0580*	0.0352
Household size	-0.0178	0.0235
Credit	0.5336**	0.2503
Extension	0.4835*	0.2498
Farm size	-0.1105	0.0888
Constant	-0.2989	0.6359
Number of observations	190	
LR chi <sup>2</sup> (9)	26.67	
Prob > chi <sup>2</sup>	0.0016	
Pseudo R <sup>2</sup>	0.1174	
Log likelihood	-100.218	

\* and \*\* represent statistically significance at 10% and 5% respectively



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