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FACTORS ENHANCING SMALLHOLDERS FARMERS` ACCESS TO MASARA N'ARZIKI PROJECT IN THE NORTHERN REGION OF GHANA

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ABSTRACT

Farmers in Savelugu-Nanton district are peasant in nature, only few are into smallholder farming for sales with the support of Non-Government Organisation Masara N'Arziki. The company gives input credit support to smallholder farmer and in return buy their produced. This study assessed factors that influence access to the project and the challenges participants in the project encountered using probit regression model and Kendall`s W. 195 smallholder farmers were selected comprising of 118 participants and 77 non-participants. Significant mean difference was arrived for participants and non-participants' education, household size, farm size, extension and farming experience. Access to Masara project was significantly but positive determined by farmers` land size, access to agricultural extension officer, years of experience of the farmer in the cultivation of maize and farmers` participation in off farm activities while household size and farmers` access to other agricultural project were negative determinants of access to the project. However, the age of the farmer, the farmer marital status and number of years the farmer attend school (education) do not significantly determine farmers` access to Masara farmer support project. The Kendall`s W indicates strong agreement of 847% among the participants on the ranking of the challenges. It is recommended that development partners should close the gap in the study area by offering credit in cash or in kind to smallholder farmers at a relatively cheaper input cost and attractive price for output to boost their moral for farming to ensure food security in the area.

INTRODUCTION

Smallholders farmers` access to microcredit for agricultural purposes remain a critical factor in the development of agriculture in Northern region of Ghana. Most smallholder farmers are characterized by limited access to agricultural microcredit often due to lack of collateral security and the small nature of the loan required. To close the accessibility of credit gap between large-holder farmers and smallholder farmers in Northern region of Ghana, the government of Ghana and Non-government organization including Masara N'Arziki have adopted the on kind credit by given input credit to smallholder farmers. Omonona *et al.,* (2010) assert that access to credit improves the production efficiency of smallholder farmers which enhances a reduction in rural poverty and food insecurity.

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Access to credit induces farm productivity because farmers who are credit-constrained are more likely to use lower levels of inputs in production relative to farmers who have access to credit. Improving access to credit therefore has the capacity to facilitate optimal input use leading to a positive impact on productivity. Again, according to Nouman *et al.,* (2013) agricultural credit increases agricultural technology adoption, leads to agricultural modernisation and economic development. It is also observed that access to credit creates and maintains adequate flow of inputs thus increasing efficiency in farm production. Reyes (2012) noted that, rural development, specifically, farm productivity, can be influenced by several factors including access to credit. Dittoh (2006) assert that, access to credit is the highest priority that most smallholder farmers in Northern Ghana intend to achieve to boost their production as agriculture is the main economic activity in the region. The smallholder farmers in most developing countries including Ghana contribute immensely to employment, income generation, foreign exchange earnings,

gross domestic product (GDP) and food security. The sector plays a critical role in the rural economic development and national economic development as a whole. The important role of the smallholder farmers in the economies of developing countries calls for an increase in investments in the sector to increase production. This lead to the response of the call by Masara N'Arziki to carry an input credit project in Northern Ghana (Northern, Upper East and Upper West regions). The MasaraN'Arziki is on to supporting smallholder farmers who involved in the cultivation of maize in the study area. The company has been in operation in these regions since 2008 with a main focus of assisting smallholder farmers with technologies coupled with management practices that are expected to boost production as well as improve their livelihoods. MasaraN'Arziki project is incorporated as a company limited by guarantee, as a subsidiary of Wienco Incorporation.

The Masara farmer support project operates with the overall aim of ameliorating the sufferings of the rural poor through their input credit model. The project operates with the following model: willingness to belong to a group of between 8 to 10 members and signing up to two contractual forms for MasaraN'Arziki project where farmers go into a contract to sell all realized production to Masara, and Masara in turn facilitates the harvest and credit recovery from beneficiary farmers. There is a legally enforceable contract that binds the farmer into contract for which he/she is compelled to sell all the products to the company. Farmers must therefore proactively source other inputs to produce a separate plot for household consumption if the cost of the credit is not paid by the farmer after recovery. According to United States Agency for International Development (USAID) Enabling Agriculture Trade (EAT) programme (2012), the MasaraN'Arziki programme indirectly contributes to a reduction in food insecurity and improves the living standard of participating households. Zaney (2016) assert that there is widespread hunger and, particularly, northern parts of the country in which most farming households still experience food insecurity for 3-7 months in a year. The question posed and demands an answer is, if Masara N'Arziki project improve food security and livelihood, what factors demand the project accessibility?
Though, many researchers analyse factors influencing smallholder farmers' access to microcredit in Northern Ghana, Ghana and elsewhere including: Sebopetji and Belete (2009), Sanusi and Adedeji (2010), Duy *et al*. (2012), Ibrahim and Aliero (2012), Chauke *et al*. (2013), Nouman *et al*. (2013) and Anang *et al.,* (2015). Very few researcher carry out studies on in- king credit and none of the researchers to the authors knowledge worked on Masara N'Arziki project. This study therefore attempts to assess the factors that enhance smallholder farmers` access to MasaraN'Arziki project and the challenges the participating farmers encounted in their dealing with the company.

Literature Review

Smallholder Farmers Support in Northern Region of Ghana

Small scale farmers are characterised by poverty and the hungriest in the world and yet small scale farming is supposed to pave the way to ending poverty in sub-Saharan Africa (IFAD, 2008). Perhaps it appears as if efforts by previous governments in Ghana and other private development partners to support small scale farming are not yielding significant and sustainable results as expected by these farmers (MoFA, 2010). A small scale farmer getting the opportunity to participate in any support project must be a prerequisite to the adoption of a new technology which can sustain him or improve upon his income after the intervention has ended. Based on global recommitments and emphasis to agriculture progression, calls are being made wherever possible to invest in small scale agriculture, however different results cannot be expected if the same strategies are used (World Bank, 2008). Smallholder farming is the dominant agricultural activity in most developing countries, particularly the northern part of Ghana. Invariably most of Ghana undernourished people and people living in absolute poverty are concentrated in northern part of Ghana (FAO, 2010). Despite views that small farms are not viable and are not competitive with more mechanised and capital intensive larger scale farms, and the forcasting that they will soon disappear (IFAD, 2009), smallholder farms have proved to performed significantly well. Indeed, the sector operated in small farms in the developing world appears to be rising rather than falling, although mean farm sizes persistently decline in large parts of the developing world. There is a new perspective that, tracing to the duration of the 'Green Revolution' where new crop technologies delivered agricultural growth across developing country like Ghana, that smallholder farms can be a key driver for poverty reduction. Investments in smallholder farms is comparatively advantage in the case of increases in income in rural areas, and through linkages effects, to poverty reduction on a sustainable basis (IFAD, 2009). Globally, significant changes in the political, economic and social situations inversely affects smallholders, but some positively. Flactuation in climate, low investments and reduction in productivity, withdrawal of state support and institutions helping the development of the smallholder sectors are limiting them in becoming the engine of growth that many would like them to be.

Determinants of Smallholder Farmers' Participation in Support Project

Farmers' participation in agricultural projects has a direct impact on technological awareness, adoption, livelihoods, environment, nutrition, poverty, performance of the agricultural sector and the macro economy (Etwire *et al.,* 2013)**.** Participation refers to involvement of individuals and groups in development processes with the main reason of ensuring self-reliance and better standard of living (Nxumalo and Oladele, 2013). According to Nxumalo and Oladele (2013), without participation there would be no program and no development. Farmer's accessing agricultural projects can either be nominal, consultative, action-oriented or collegial (Etwire *et al.,* 2013). Empirical work on factors that influence farmer's participation in agricultural projects is limited particularlly, in the case of Ghana and the Northern region (Etwire *et al.,* 2013). The more technically complex an innovation is, the less attractive it is to farmers. The decision of whether or not to adopt or participate in a new technology will be based on careful analysis of a large number of technical, economic and social factors associated with the technology. The economic potential of new technology in terms of yields, costs of production and profit are also very important factor for adoption decision. However, the economic impact of an innovation is not known in advance with assurance. Not similar with the new technology makes the initial impact on yields and input usage uncertain. The

adoption of modern technology is urgently required to increase productivity so as to meet the increasing demand of food for rapidly growing population. According to Karki (2004), the adoption of modern technologies, especially in subsistence farming, would be influenced by a complex set of factors such as human capital, information, location, natural resource endowments and organisational assistants. Within this frame condition, farmers' decision depends on their needs, cost incurred and benefit accruing to it would be the major motivating factors for the acceptance or rejection of a particular technology (Karki, 2004).

Literature suggests several theoretical or conceptual models on farmers' decisions to adopt new technology (Feder & Slade, 1984; Abadi & Pannel, 1999; Negatu & Parikh, 1999; Isham, 2002). According to Ephraim (2005), factors influencing technology adoption decisions include farm size, risk exposure and capacity to bear risks, human capital, labour availability, land tenure, access to financial and produce markets, access to information, beneficiaries participation in off-farm activities, social capital, household characteristics and ecological and environmental factors. Feder& Slade (1984), develop a model of technology diffusion based on human capital and land constraints. Their model indicates that farmers with more education and larger land will have more knowledge of improved farming systems and are likely to adopt technology more rapidly.

MATERIALS AND METHODS

Study Area

The research was carried at the Municipality of Savelugu-Nanton which shares boundaries with West Mamprusi to the north, Karaga to the east, Kumbungu to the west and Tamale Metropolitan Assembly to the south and has about 149 communities with a lot of the communities concentrated at the southern part. The municipality has a total land area of about 1,790.70 sq. km and a population of 139,283 representing 49.7% male and 50.3% female. Study area is the district that has the highest beneficiaries of MasaraN'Arizki operates in four districts/municipality in the Northern region. The Municipality has a total of 26 Masara N'Arziki project farmer groups (with an average membership of 10) in each group across 24 operational communities.

Data Collection and Sampling techniques

The study employed primary data from the study area. The data was collected using semi-structured Questionnaires to attain the desire objective. The questionnaire for this study was pre-tested to reduce the state of ambiguities and unanswered questions as indicated by Ahuja (2007). A stratified random sampling and simple random sampling approaches were used to select respondents for the study. The population of the survey was stratified into participants and non-participants' groups. The study randomly selected 195 smallholder farmers among 24 communities of Masara project in the Savelugu-Nanton municipality. Masara N'Arziki project participants and non-participants were interviewed. The survey interviewed 118 participants in the project who were considered as the treatment group. A control group of 77 non-participant farmers were selected by simple random sampling technique to form a total of 195 sampled respondents. Data was collected on farmers' socio-economic characteristics and the challenges faced in using the project in their agricultural production. The data was organised and analysed to determine factors that influence participation and the constraints of the project.

Empirical Model

Descriptive statistics such as mean and standard deviation were used to analyse the socioeconomic characteristics of the respondents (participants and non-participants of project). The factors that influence smallholder farmers` access to the project was determined by the logit regression model and challenges beneficiaries/clients faced in participating Masara N'Arziki input credit project was ranked using Kendall's coefficient of concordance.

Probit Regression Model

Access to agricultural input credit aid in the improvement of Agricultural productivity and uplift the livelihood of the rural poor. Probit regression was used to determine factors enhancing participation in the Masara N'Arziki input credit project. The model was developed to find remedy to dichotomous dependent variables within the regression framework. When an individual's choice is discret nature, there are only two responses involved which is binary choice (requiring yes or no answer) in which yes=1 and no=0. The Ordinary least squares (OLS) regression has been observed to be deficient for a situation when we have dependent variables that are discrete (Agresti, 1990; Collett, 1991). A Logit or Probit model is based on literature is the most appropriate. In this study, a probit model was used in the analysis due to the fact that, probit has more advantage in small sample and there is no rule restricting the choice of the two models (Gujarati, 2004). The dependent variable is access/participation assuming the value of 1 for participant, and 0, otherwise. The general formula for probit is specified as:

$$y_i^* = \beta X_i . + \varepsilon$$

Where $\varepsilon \sim N(0,1 >\leq)$

In probit we observe only

$$y_i = \begin{cases} y_i^* > 0 \text{ is} = 1 \\ y_i^* \leq 0 \text{is} = 0 \end{cases}$$

$$\text{Prob}\left(y_i = 1/X\right) = \int_{-\infty}^{X'\beta} \Phi(t)dt = \Phi(X'\beta)$$

The general probit function is

$$Y(0,1) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + ... + \beta_n X_n + \varepsilon_{ij}.$$

Where β_0 is the constant term or intercept and β_1, β_2 …….. β_n represent the parameters to be estimated and **ε** is the error term.

Kendall's Coefficient of Concordance

The Kendall's coefficient of concordance was used to rank some of the challenges that farmers in Masara N'Arziki project experienced in their dealing with the company. The Kendall's *W* measures the extent of the agreements level among several respondents who have common characteristics of suffering a

given set of *n* objectives (challenges) (Legendre, 2005). *W* is an index ratio of observed variance of the sum of ranks to the maximum possible variance of the ranks. The reason for the computation of the index is to find the ranks sum for each challenges been ranked.

If there is a maximum agreement among the respondents ranking, then the ranking is said to be perfect. Otherwise, there is variability within or among the ranks sum (Mattson, 1986). According to (Legendre, 2005), the Kendall's coefficient of concordance *(W)* is given by the relation

$$w = \frac{12S}{P^2(n^3 - n)} - P^T$$

Where: *W* denotes the Kendall's coefficient of concordance*; P* denotes number of respondents ranking the challenges, *n* denotes the number of quality perceptions. *T* denotes correction factor for tied ranks, *S* denotes sum of squares statistics over the row sum of ranks (R_i).

The sum of square statistics (*S)* is given as:

$$S = \sum_{i-1}^{n} (R_i - R)^2$$

Where R_i is row sums of rank and *R* is the mean of R_i

The correction factor for tied ranks (T) is also given as:

$$T = \sum_{k=1}^{m} (t_k^3 - t_k)$$

Where t^3 is the number of ranks in each of *m* group of ties
The test of significance of the Kendall's coefficient of concordance will be done using the chi-square statistics which is computed using the formulae:

$$X^2 = P(n-1)W$$

Where *n* is the number of constraints, *P* is the number of respondents and *W* is Kendall's coefficient of concordance. The null hypothesis for the Kendall's is that, there is no agreement among respondents on the challenges faced while the alternative stood that, there is at least some agreement among respondents. If the computed chi-square is greater than the tabulated chi-square, then the null hypothesis of zero conscious is rejected. However, the alternative hypothesis that there is some level of conscious among the respondents in the ranking of the constraints could not be rejected.

RESULTS AND DISCUSSION

Descriptive Statistics

From the Table 2 below, the mean age of participants (47.14) of Masara N'Arziki project insignificantly outweigh that of non-participants (46.12) with a pooled mean of 46.74. On average, household size and farm size of participant were 16 people and 4.09 hectares respectively relative to non-participant with household size and farming experience of 10 people and 3.09 hectares respectively. This implies that, smallholder farmers who had more household members and larger piece of land were willing to participate in the project, since they would be able to provide labour for their production which was not catered for by the project and also engage is commercial farming after taking care of their dependents. In addition, smallholder farmers who accessed the project have a mean of 4.08 access to agricultural extension officer as well as 24.41 farming experience compare to non-participants of 0.77 and 18.69 respectively. This give a pooled mean of 2.45 and 22.16 for the respective variables. The farmers' greater years of farming experience enables them to better understand credit support project and hence produce enough to increase their output with Masara credit support model. However, the average off farming activities for participants and non-participants were 0.25 and 0.26 with a pooled of 0.25 though, was not significant at 90% confident level suggest that, people are not willing to participate in the project have a better alternative jobs aside the farming activities which serve as a demotivating factor for them accessing the project. Only education indicates a significant mean difference between participants with a mean of 1.29 and non-participants with a mean of 1.47 and a pooled of 1.36.

The results from Table 2 indicate that, participants and non-participants mean difference by age, marital status and engagement in off farm activities are statistically insignificant while mean comparison of test for education, house size, farm size, access to extension and experience on farming activities show significant different between participants and non-participants at 1% percent significant level. Only farmers access to other agricultural project indicate a 10% significant level. Farmers who have access to the project on average have greater household size, farm size, more access to extension and experience in maize cultivation than those who do not have access to the project. The reverse is the case of education which suggest that, people who do not participate in the project have a better education on average leading to them identifying the disadvantages of the project which make them not to participate.

Table 1. Description of Variables

Variable	Description	Unit of Measurement	A Prior Expectation
Explanatory Variables			
Age	Age of a farmer	Years	+/-
HHsize	Household size of farmer	Number of household members	+
Marital Status	Marital status of farmer	Dummy: married=1 and Otherwise=0	+
Education	The level of education of a farmer	Years	+/-
Experience	Level of experience of farmer in maize cultivation	Years	+
Off farm activities	Farmer participating in off farm activities	Dummy: yes=1 and Otherwise=0	+/-
Extension	Farmer access to extension	Dummy: access=1 and Otherwise=0	+/-
Farm size	Total farm size	Hectares	+
Other project	Farmer access to other credit project	Dummy: access=1 and Otherwise=0	+/-
Explained Variable			
Participation/Access	Farmer access to Masara N'Arziki project	Dummy: access=1 and Otherwise=0	

Table 2. Descriptive Statistics of Variables

Variable	Participants		Non-Participants		Pooled		Mean Comparison Test	
	Mean	Stand. Dev.	Mean	Stand. Dev	Mean	Stand. Dev.	t-test	P-Value
Age	47.14	10.12	46.12	9.70	46.74	9.92	1.10	0.274
Marital status	0.97	0.181	0.97	0.23	0.97	0.20	-0.233	0.812
Education	1.29	0.628	1.47	0.89	1.36	0.75	-3.143	0.002***
Household size	15.52	6.46	10.45	4.64	13.53	6.29	8.514	0.000***
Farm size	4.09	2.38	3.09	1.66	3.69	2.17	4.581	0.000***
Extension	4.08	1.36	0.77	0.83	2.45	1.02	26.430	0.000***
Farming experience	24.41	10.67	18.69	7.87	22.16	10.01	5.822	0.000***
Off farm	0.25	0.43	0.26	0.44	0.25	0.43	-0.357	0.721
Other Project	0.23	0.42	0.16	0.37	0.20	0.40	1.771	0.079*

*,**,***: refers to significance at 10, 5, and 1% level, respectively

Table 3. Probit results of factors influencing farmers' access to Masara project

Variable	Estimate	Stand. Error	Z	P>|Z|	Marginal Effects
Age	-0.213	0.144	-1.48	0.139	-0.556
Marital Status	2.016	29.715	0.32	0.996	0.610
Education	-2.542	1.627	-1.55	0.120	-0.628
Household size	-0.345	0.185	-1.86	0.063*	-0.284
Farm Size	1.119	0.518	2.16	0.031**	0.366
Extension	12.525	4.228	2.96	0.003***	0.383
Farm Experience	0.152	0.080	1.88	0.060*	0.214
Off farm	5.771	2.319	2.49	0.013**	0.591
Other project	-8.079	3.380	-2.39	0.017**	-0.692
Constant	19.590	29.790	0.05	0.964	
Number of observations = 195					
LR Chi2 (9) = 239.38					
Log likelihood = -11.129					
Prob >Chi2 = 0.0000					
Pseudo R2 = 0.9149					

*** , ** and * denote 1%, 5% and 10% respectively
Source: Authors` computation

Determinants of Access to Masra N'Arziki Project

Access to Masara project was significantly determined by household size, farmers` land size, access to agricultural extension officer, years of experience of the farmer in the cultivation of maize, farmers` participation in off farm activities and farmers` access to other agricultural project. However, the age of the farmer, the farmer marital status and number of years the farmer attend school (education) do not significantly determine farmers` access to Masara farmer support project. From the Table 3, house size has a negative relation to participation in the credit project. The study revealed that a unit increase in the household of a farmer decreased his probability of participation by 28.4% which was significant at 10% significance level. This is consistent with Ebojei *et al*. (2012) where household size had less significant influence on participation in hybrid maize. MasaraN'Arziki project was labour intensive since the project technical staff were always on the ground ensuring that the best agricultural practices for a good yield and recovery is achieved by each farmer, hence farmers who were not able to provide the needed farm labour from their household was not a factor to participate since they had probable chances of delegating other farm activities to other household members for a good yield.

However, the result was contrary to Martey *et al*. (2013) that household size serves as a form of family labour and complements the effort of the household heads on the farm hence influences their participation in support project. There was a positive significant relationship between farm size and farmer's decision to participate in the project. The study revealed that a unit increase in farm size of smallholder farmer increase his likelihood of participation by 36.6%, significant at 95% confident level. This is in line with Sithole *et al.,* (2014); Martey *et al*. (2013); Mohammed and Jema, (2013) and Nxumalo and Oladele (2013), who observed that farm size influenced household heads decision to participate in agricultural projects. Farmers who had large farm sizes under the project received the correspondent number of farm inputs required for a good yield. Hence many of them were encouraged to increases their farm sizes to enables them acquire more farm inputs such as fertiliser which was given at the ratio of 11bags (50kg) per hectare. This was also more common with farmers with large household size. Access to agricultural extension officer is associated with a 1% significant positive effect on participation in Masara project. The probability of participation in the project by a smallholder farmer with access to extension officer was higher than those without access to extension officer. The marginal effects illustrate that, a farmer with access to agricultural extension officer was 38.3% more likely to participate in the project. This confirmed the differential mean test between participants and non-participants which is also significant at 1% level. The results of the study revealed a positive significant difference in the years of experience of the participant farmers which implies that their years of experience in farming determine their probability of participation in Masara project. A 1% increase in the year of a farmer experience is likely to rise his willingness to participate in the project by 21.4%. This is consistent with Adesiji *et al*. (2011), who found farmers with more years of farming experience are considered knowledgeable and are expected to be well acquainted with the use of credit facilities from support project. However, the study was contrary to Ebojei *et al*. (2012) which reveals that the greater the experience of farmers in maize production, the lesser the probability of partaking in hybrid maize production. In addition, most of the experienced farmers were largely

made of the aged farmers who had worked and acquired rich experiences by their engagement with agricultural development and research organisations (Ministry of Food and Agriculture and Non-Governmental Organisations). Hence enhanced their access to information and technology uptake and higher farm productivity. Farmers` engagement in other activities aside farming has significantly positive relation to their decision of participating in Masara project. The results show that, when a farmer involved in anything apart maize cultivation, there is 59.1% likelihood that the farmer will participate in the agricultural project. Smallholder farmers who had the experience of participating in other activities such as trading increase their access to information on pricing which is important to production and marketing decisions. Finally, the study revealed that farmers who participated in other projects had a lesser probability of participation in Masara project than those who did not. The results of the survey revealed that, when a farmer is participating in other project there is 69.2% probability of the farmer not participating Masara project which was statistically significant at 5 % level of significance. Masara N'Arziki project was not different from other existing farmer support for smallholder farmers. The experience acquired from other projects enables them to work effectively for good yield in the project. So, there is no need of joining Masara project. This is consistent with Sithole *et al.,* (2014) which show that engaging in other self-help groups is time consuming and limits participation in agricultural project. However, this is contrary to the work of Botlhoko and Oladele (2013) that participation in other projects increase farmers' ability to adopt new agricultural practices to improve their performances for a good yield.

Table 4. Rank of Challenges in Masara Project

Challenges	Mean rank	Rank
High cost of input	1.25	1st
Difficult to access tractor for ploughing at the beginning of the season	1.90	2nd
Unsatisfied output price offered by the company	3.20	3rd
Erratic rainfall	4.72	4th
Cost of farm labour not catered	4.75	5th
Increase in cost of production through harvesting, threshing and bagging	5.70	6th 7th
Loss of yield through crop pest invasion	7.21	8th
Poor seed quality	7.26	

N= 118 Kendall`s W[a]= 0.847 Chi-Square = 700.030 Sig. = 0.000
Source: Authors` Computation

Kendall's Co-efficient of Concordance

The results of the Kendall`s Co-efficient of Concordance are presented in Table 4. From the table 4, it is evidence that, high cost of input was considered and ranked as the most prioritised challenge with a mean rank of 1.25. The next most challenging factor by smallholder farmers` who have access to Masara project was difficult in accessing tractor for ploughing at the beginning of the season bearing a mean rank of 1.90. Unsatisfied output price offered by the company to participants in selling their output to the company after harvest was ranked as the third most prioritised challenge to the beneficiaries of Masara project with a mean rank of 3.2. Erratic rainfall which affects the yield of farmers, cost of farm labour not catered, increase in cost of production through harvesting, threshing and bagging which reduce profit of smallholder farmers and Loss of yield through crop pest invasion were ranked as the fourth, fifth, sixth and seventh challenges with mean ranks of 4.72, 4.75, 5.7 and 7.2 respectively. Poor seed quality was considered as the least challenge. The Kendall`s co-efficient (0.847) shows greater agreement among respondents in the ranking of the challenging which is significant at 99 percent confident level as the significant values is 0.000.

Conclusions and Recommendations

Smallholder farmers who have access to Masara N'Arziki project in Savelugu-Nanton district of Northern region of Ghana are persons within the working class of 45 years, who have a lesser educational background of at most 2 years with greater number of family members of 16 people. Participants have more farming experience on average 24 years with access to extension officer of 4 times within a year. It is recommended that, financial institutions and credit agencies who wants to ensure active participation of smallholder farmers in the study area should target farmers with primary education, who have moderate family size and more experience in farming activities as well as access to agricultural extension officers at least 3 times within a year. Access to input credit project is one way of empowering smallholder farmer as it enables farm to acquire improved seed and modern agricultural knowledge. Participation in Masara N'Arziki project was significantly influence by the household of size of the farmer, the scale of the farmer land, farmer access to extension officer, number of years a farmer been in farming, participation in off farm activities and farmers` access to other agricultural project. Farmers who have access to other agricultural project are less likely to participate and those who partake in off farm activities are more likely to participate. Hence, policy makers should offer opportunity to farmers who do not have access to other project and support it with off farm activity of trading or marketing as a motivation factor for participation. The three most prioritised challenges were high cost input, difficult to access tractor for ploughing at the beginning of the season and unsatisfied output price offered by Masara company. The challenges suggest that, there is less competition in offering input credit to smallholder farmers in the study as the farmers are willing to participate at a higher cost of input which is not sufficient. The government of Ghana and other development partners should close the gap in the study area by offering credit in cash or in kind to smallholder farmers at a relatively cheaper input cost and attractive price for output to boost their moral for farming to ensure food security in the area.

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Authors' contributions: All authors read and approved the final manuscript.

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