Research Paper

Factors Determining Participation of Farmers In Agricultural Projects: Evidence From Usaid Markets Ii Project In Southwest Nigeria

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ABSTRACT
This study was conducted to assess the factors determining participation of farmers in the United States Agency for International Development (USAID) Maximising Agricultural Revenue and Key Enterprises in Targeted Sites (MARKETS) II agricultural project in Southwest, Nigeria. Multistage sampling procedure was used to select a sample size of 525 farmers, out of which 254 were project participants and 271 were non- participants of the project. Copies of questionnaire were used to collect the data from the respondents. The results were analysed using frequencies, percentages and the Binary Logit Regression. The results of the socioeconomic characteristics of the respondents showed that the participants were younger than the non- participants, farming in the study area is male dominated, majority of the respondents were married and were members of a cooperative society. The values of the model Chi- square and the Hosmer- Lemeshow statistics indicated that the selected variables fit the model well and the model containing all independent variables was statistically significant (155.437, p < .001). The results also showed that the factors that significantly determined the farmers' participation in the MARKETS II project include educational status (0.976, p<.01), farming experience (0.538, p<.01), membership in cooperative society (0.514, p<.01), attitude (1.693, p<.01) and access to credit (- 1.162, p<.1), where attitude of the farmers towards the project was the strongest determinant of participation. The study therefore recommends that trainings and programmes should be put in place to ensure reorientation of the farmers to have positive and receptive attitude towards agricultural projects.
KEYWORDS: MARKETS II Project, Farmers, Participation, Agricultural Projects

I.   INTRODUCTION

Agriculture contributes immensely to the Nigerian economy in the provision of food for the increasing population; supply of adequate raw materials to a growing industrial sector; a major source of employment; generation of foreign exchange earnings; and, provision of a market for the products of the industrial sector. Agricultural development has been considered as one of the main objectives of development policies in many countries (Moradi, Mirakzadeh, Rostami & Karimi, 2015). Agricultural technology transfer plays a very important role in increasing agricultural production especially in a situation where food demand surpasses the production capacity (Mgendi *et al.*, 2019). Rural development projects have raised food availability and kept food prices low, providing critically important benefits for extremely poor households. (Kerr & Kollavali, 1999; Yabi & Afari-Sefa, 2009). In order to promote agricultural growth, agricultural input subsidies have been used as a social protection instrument for ensuring access to inputs, and access and availability of food to vulnerable groups (Chirwa, Matita & Dorward, 2011).

United States Agency for International Development (USAID) was created by the United States (US) government in 1961 to lead international development and humanitarian efforts to save lives and reduce poverty. The Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites (MARKETS II) is a United States Agency for International Development (USAID) Nigeria's flagship project under Feed the Future (FTF) programme. The project was launched in April, 2012. The MARKETS II project worked in five value chains: cocoa, cassava, rice, sorghum and aquaculture and two sub-value chains, soybean and maize, to provide raw materials for aquaculture fish feed. The objective of the MARKETS II project is to promote agricultural

development through: increased private sector participation and investment in the sector; smallholder farmer increased output and income; ready markets; better inputs (improved seeds and optimal use of fertilizer); adequate finance; better water and pesticide management; appropriate technology, and extension services; and increasing employment.

The work of Jamilu, Atala, Akpoko, & Sanni (2015), on the factors influencing Smallholder Farmers Participation in IFAD-Community Based Agricultural and Rural Development Project in Katsina State, logit regression analysis was used to analyze the data. The results showed that level of education, household size, farm size, membership of cooperative and extension contact were the factors influencing smallholder farmers' participation in the project. In the work of Omotesho, Ogunlade, Lawal and kehinde (2016), the Ordinary Least Square (OLS) regression analysis was the analytical tool used for the study. The results revealed that total annual income, farm size, number of extension contact, membership of farmer groups, access to credit and access to training influenced farmers participation in farmer-groups. Agwu, Nwankwo and Anyanwu (2015), employed the probit regression model to analyse the determinants of agricultural labour participation among youths in Abia State, Nigeria. The results showed that the coefficients of education of the respondents, income from nonagricultural sources, occupation of the parents, education of the father, farm size and the rate of mechanization influenced agricultural labour participation among the youths in the study area. Apart from the coefficient of farm size that had a positive sign, the other variables had negative relationship. Adesina and Eforioku (2016), employed multiple regression analysis to analyse the determinants of participation in Youth-in-Agriculture Programme (YIAP) in Ondo State. Results revealed that predictors significantly related to YIAP participation were household size, farm size, years of farming experience, attitude, and constraints while farm size and years of participation mostly contributed to participation in YIAP.

One of the fundamental constraints of agricultural development in Nigeria is the peasant nature of the production system, which is characterised by low productivity, poor response to technology adoption strategies, inadequate supply of inputs and poor returns on investment (Anyanwu, 2013, Awotide, Abdoulaye, Alene, & Manyong, 2015; Okunlola, 2019). Also, the Nigerian agricultural sector has suffered from years of poor management, inconsistent and poorly implemented government policies and projects, government neglect and lack of basic infrastructure (Amos, 2018; Ogunleye, Ajibola, Enilolobo & Shogunle, 2018). Ibietan (2011), also posited that most of the agricultural projects implemented in Nigeria have recorded low performance. There is also a dearth of empirical works on factors determining participation in agricultural projects in Southwest, Nigeria. Therefore this study has assessed the factors determining participation of farmers in Agricultural Projects in Southwest, Nigeria, considering specifically the case of USAID MARKETS II project with a view to maximize the performance of agricultural projects consequent to promoting the viability of the agricultural sector and achieving the Sustainable Development Goal of zero hunger.

II.   MATERIALS AND METHOD

The study was conducted in Southwest, Nigeria, which is made up of six states: Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo states. The region lies between longitude 2^0 311 and 6^0 001 East and latitude 6^0 211 and 8^0 371 North and has a total land area of 77,818km^2 and the total population was 27,581,992 as at 2006 (NPC, 2006). The population of the study comprises all cocoa, cassava and aquaculture farmers in the areas of intervention of MARKETS II project in Southwest, Nigeria which were Ondo state and Oyo state. In the first stage, purposive sampling technique was used to select Local Government Areas in Ondo and Oyo states that are known for cocoa, cassava and aquaculture production. The second stage involved a random sampling in which 175 farmers were randomly selected for each value chain in both Ondo and Oyo states, making a total sample of 525 farmers.

Binary Logit Regression Model was used to examine the factors determining participation of the farmers in the MARKETS II project. Logit regression assesses suitability of the predictors and indicates the relative importance of each predictor variable or interaction among predictor variables (Berkson, 1944, Hazra and Gogtay, 2017). Owusu (2017), also posited that the model is extremely flexible and capable of generating meaningful interpretation. Participation in the project was conceptualized as bivariate, taking the value of 1 for respondents that participated in the project and 0 for non participation in the same period. This was used as the dependent variable. Demographic variables as well as other variables were used as independent variable and specified explicitly in the model as:

$Y = \beta0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + U$ …………(I)

Where; Y = Participation in the MARKETS project (1 = Yes, 0 = otherwise)

β_0 = Constant

X_1 = Age of the farmer (years)

X_2 = Gender of the farmer (Male = 1 : Female = 0).

X_3 = Educational status of the farmer (Number of years).

X_4 = farm size (hectares)

X_5 = farming experience (Number of years)
X_6 = Membership of cooperatives (Yes = 1: No = 0)
X_7 = Annual Income (Amount in Naira)
X_8 = Access to credit (formal or informal) (Yes = 1: No = 0)
X_9= farmers' attitude towards participation in the project
U = Error term

III. RESULTS AND DISCUSSION

Socio- Economic Characteristics of the Respondents
Table 1 shows the Socio- economic characteristics of the respondents, both participants and non- participants of the MARKETS II project. It provided descriptive information on age, gender, educational qualification, marital status, family size, farming experience, land size, and membership of respondents in cooperative societies.

Age of Respondents
The age of the respondents as revealed in Table 1 shows that majority of the respondents are between the ages of 40 and 49 years. The highest percentages which were 27.2% of the participants and 36.2% of the non-participants were in the age range of 40-49years. 12.2% of participants and 0.0% of non-participants were below the ages of below 20, which may imply that the MARKETS II project involved the younger farmers. The percentage of respondents below the age of 50 is higher for the participants than the non- participants, which implies that the participants are younger and a larger percentage are within their active and productive years and this also has implication for easy adoption of technology by the participants. This is in agreement with works of Oladapo *et al* (2012), and Fanola and Fakayode (2014), Mazza *et al* (2015) and Balogun *et al* (2018).

Gender of Respondents
Table 1shows that 65.2% of the participant farmers and 72% of the non-participant farmers were male while 34.8% and 28% of participants and non-participants respectively were females. The percentage of male farmers were higher for both the participants and the non-participants of the project. This implies that farming of cocoa, cassava and aquaculture in Southwest Nigeria is male dominated. This may be as a result of the tedious nature of the process. This corroborates the study of Oluwatusin (2014), Mazza *et al*., (2015), Abidogun *et al*., (2019), Alhassan *et al*., (2021).

Educational Qualification
Table 1 also shows the highest level of education attained by the respondents. It reveals that 6.7% of participants and 15.9% of non-participants had no formal education. For the participants, 23.2% had primary education, 30.7% had secondary school education, 5.9% had vocational education, and 33.2% proceeded to tertiary institution. For the non-participants, 33.6% had primary education, 18.8% had secondary, 9.2% had vocational and 22.6% had tertiary education. These results revealed that the participants are more educated than the non-participants, this agrees with the findings of Mazza *et al*., (2015) and Balogun *et al*., (2012) that posited that the beneficiaries of the FADAMA project were more educated than the non- beneficiaries. This also has implication for better adoption of technology and better administration of their farming business.

Marital Status
The marital status of the respondents revealed that majority (74.4% of participants and 93% of non-participants) of the respondents were married, this indicates a sense of responsibility in managing their farms well and filling out the questionnaires correctly. Majority of the respondents were married, this may have positive effect on the availability of family labour. This finding is in agreement with the works of Balogun *et al*., (2011) and Mazza *et al*., (2015) that asserted that the marital status of the respondents showing a large percentage of married respondents implies that the farmers have the responsibility of working hard to take care of their family.

Household size
The distribution of respondents according to household size revealed that majority of the participants (62.6%) and non-participants (57.9%) had household size between 4 and 6 persons. The implication of this is that the respondents had family hands to assist them and hence spend less on hired labour, as in the works of Balogun *et al*., (2011)

Farming experience
Adequate farming experience is pivotal to the success of any agribusiness. Table 1 shows the distribution of the respondents according to their farming experience. The participants and non-participants had varying degrees of farming experience. Majority (37%) of the participants had between 16 and 20 years farming experience, while most of the non-participants had between 11 and 15 years experience. This is in agreement with Balogun *et al*. (2011), that the more experienced a farmer is, the more they are better at taking production decisions. The farming experience will increase their knowledge and consequently enhance productivity.

Farm Size

Table 1 also shows the distribution of respondents according to the farm size in hectares. The percentage of participants that had less than 1 hectare was 3.1% while the non- participants accounted for 12.6%. The highest percentage of the participants, 93.7%, were those with farm size between 1 and 5 hectares, this is because the MARKETS II project targeted the smallholder farmers. The highest percentage of the non-participants was also the farmers with farm size between 1 and 5 hectares. This corroborates the work of Okunlola (2019), which asserted that a characteristic feature of the agricultural production system in Nigeria is the disproportionately large fraction of the agricultural output that is in the hands of smallholder farmers.

Membership of Cooperative Societies

Cooperative societies serve as an arrangement for provision of capital to the farmers, hence income enhancement. As shown in Table 1, 72.4% and 57.2% of the participants and non-participants respectively were members of a cooperative society. This shows that more of the MARKETS II project participants were members of a cooperative society and it has implication for better involvement in agricultural projects. It is the belief of the farmers that involvement in cooperative societies help them to have better access to agricultural information, cheaper inputs and extension services. This agrees with the findings of Balogun *et al.,* (2011), Ojiagu and Uchenna, (2015).

Table 1 : Socio- economic Characteristics of Farmer Respondents

	Participants		NonParticipants	
Characteristics	**Frequency**	**Percentage (%)**	**Frequency**	**Percentage (%)**
Age (Years)				
Below 20	31	12.2	0	0.0
20-29	20	7.9	4	1.5
30-39	59	23.2	68	25.1
40-49	69	27.2	98	36.2
50-59	48	18.9	82	30.3
60 and above	27	10.6	19	7.0
Total	**254**	**100.0**	**271**	**100.0**
Gender				
Male	166	65.2	195	72.0
Female	88	34.8	76	28.0
Total	**254**	**100.0**	**271**	**100.0**
Educational Qualification				
Primary school	59	23.2	91	33.6
Secondary School:	78	30.7	51	18.8
Vocational/ Technical	15	5.9	25	9.2
OND	45	17.7	37	13.7
HND	13	5.2	16	5.9
BSc, BA, BEd, BTech	27	10.6	8	3.0
Informal	17	6.7	43	15.9
Total	**254**	**100.0**	**271**	**100.0**
Marital status				
Married	189	74.4	252	93.0
Single	55	21.6	8	3.0
Divorce/ Separated	6	2.4	11	4.1
Others	4	1.6	0	0.0
Total	**254**	**100.0**	**271**	**100.0**
Family size				

1-3	25	9.8	65	24.0
4-6	159	62.6	157	57.9
7-10	70	27.6	43	15.9
Total	**254**	**100.0**	**271**	**100.0**
Farming experience (years)				
Below 5	7	2.8	46	17.0
6-10	24	9.4	55	20.3
11-15	61	24.0	64	23.6
16-20	94	37.0	56	20.7
21-25	34	13.4	24	8.9
25 and above	34	13.4	26	9.6
Total	**254**	**100.0**	**271**	**100.0**
Farm size (hectares)				
<1	8	3.1	34	12.6
1-5	238	93.7	212	78.2
6-10	7	2.8	25	9.2
11-15	1	0.4	0	0.0
16-20	0	0.0	0	0.0
21-25	0	0.0	0	0.0
Above 25	0	0.0	0	0.0
Total	**254**	**100.0**	**271**	**100.0**
Membership of cooperatives				
No	70	27.6	116	42.8
Yes	184	72.4	155	57.2
Total	**254**	**100.0**	**271**	**100.0**

Source: Field Survey, 2021

Factors determining participation of farmers in MARKETS II project

Table 2 shows the statistical results from the binary logistic regression performed to assess the factors determining participation of farmers in the MARKETS II project in the Southwest, Nigeria. The values of the model Chi- square and the Hosmer- Lemeshow statistics indicated that the selected variables fit the model well. The model containing all independent variables was statistically significant (155.437, $p < .001$), indicating that the model was able to distinguish between respondents who participated and respondents who did not participate in the project. The model as a whole explained between 29.2% (Cox & Snell R^2) and 39.5% (Nagelkerke R^2) of the variance in project participation and correctly classified 76.9% of participation. The results also showed that the factors that significantly determined the farmers' participation in the MARKETS II project include educational status ($p<.01$), farming experience ($p<.01$), membership in cooperative ($p<.01$), attitude ($p<.01$) and access to credit ($p<.1$). This corroborates the work of Akpan and Udoh (2016), who posited that farming experience, educational status and membership in social organization were positive determinants of farmers' participation in agricultural programmes. On the other hand, this study contradicts that of Etwire (2013) that posited that access to credit had a positive influence on farmers' participation in projects. Educational status with coefficient value (0.976), farming experience (0.538), membership in Cooperative (0.514), access to credit (-1.162), attitude of farmers to the project, (1.693). The positive value of educational status implies that the higher the educational status of the farmer, the higher the probability of farmers participating in the MARKETS II project. Khoza *et al.* (2018), Alabi *et al.* (2021), found similar results among smallholder farmers in Guateng, South Africa and Abuja, Nigeria respectively. The coefficient values also show that the more the farming experience the farmer has, the more likely it is that he participates in the project. The significant and positive value of the farmers' membership in cooperatives and their attitude toward the project implies these variables were an important factor in inducing farmers to participate in the project. However, the negative value of the coefficient of access to credit indicates that the more access to credit a farmer gets, the less likely it is for the farmer to participate in the project. This may be attributed to the fact that availability of credit to farmers will likely put a farmer in an equilibrium or satiable state, which implies that farmers who already have access to

credit through other means will no longer be enthusiastic about participating in agricultural projects. This is in line with the works of Nwaobiala (2014), and Akpan and Udoh (2016). The results further showed that the strongest determinant of farmers' participation in the project was the attitude of the farmers towards the project, recording an odds ratio of 5.44. This implies that farmers with positive attitude towards the project are 5.44 times more likely to participate in the MARKETS II project than those with a negative attitude.

The odds ratio of 1.71 for farming experience indicates that for every additional year of farming experience, the odds of the farmer participating in the project increased by a factor of 1.71, all other factors in the model being equal. Considering the farmers' access to credit, the odds ratio of 0.313 implies that the farmers with access to credit are 0.31 times less likely to participate in the project than the farmers who had no access to credit. Considering the farmers' membership in cooperative societies, results showed that the farmers who are members of cooperative societies are 1.67 times more likely to participate in the MARKETS II project than those who are not members of any cooperative society. This may be because the cooperative societies exposed farmers to various information about agriculture. The results also showed that the odds of a farmer participating in the project is 2.65 times higher for the educated farmers than for the uneducated farmers, all other factors being equal. This means that the higher the level of education of the farmer, the more likely it is for the farmer to participate in the MARKETS II project. This is in tandem with the work of Alabi *et al*. (2021).

Table 2:   Factors determining participation of farmers in MARKETS II project

Code	Variables	Coefficient	S.E.	Sig.	Odds Ratio
X_1	Age	-20.507	8180.987	.998	.000
X_2	Gender	.444	.265	.094	1.559
X_3	Educational status	.976***	.257	.000	2.654
X_4	Farm Size	.149	.194	.442	1.161
X_5	Farming Experience	.538***	.110	.000	1.713
X_6	Membership in Cooperative	.514*	.268	.055	1.672
X_7	Annual Income	.000	.000	.695	1.000
X_8	Access to Credit	-1.162***	.426	.006	.313
X_9	Attitude	1.693***	.313	.000	5.437
	Constant	9.939	8180.987	.999	20716.941
Model Chi- square		155.437***			
Hosmer- Lemeshow test:					
Chi- square		15.784			
Significance		.146			
Cox and Snell R^2		.292			
Nagelkerke R^2		.395			
Overall predicted percentage correct		76.9			

*, **, *** Significant at 10, 5, and 1 percent levels respectively
Source: Field Survey, 2021

IV.   CONCLUSION

The study has provided empirical evidence on the factors that determined farmers' participation in the MARKETS II project, and these factors include educational status, farming experience, membership in cooperative associations, farmers' attitude towards the project and access to credit. The higher the educational status and or farming experience of the farmer, the higher the probability of the farmer participating in the project. Also farmers who are members of cooperatives societies and or have positive attitude towards the project were more likely to participate in the project while on the other hand, farmers with access to credit were less likely to participate in the project. The study therefore recommends that programmes should be put in place to educate farmers, encourage them to be involved in cooperative societies, and to reorientate the farmers on positive and receptive attitude towards agricultural projects.

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