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# Financial Inclusion of Arable Crop Farmers in Nigeria

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## **Abstract:**

*This study investigates financial inclusion of smallholder arable crop farmers in Nigeria. Primary data were collected for the purpose of the study. Descriptive statistics and Logit regression model were employed in the analysis. The average age of the respondents was 43.67 years and male actively participated in food crop production more than female. Though 64.16% of the respondents had access to banks within their community, only 27.65% are banked. Fear of insolvency (90.57%), lack of required form of identification (31.13%), lengthy process (29.72%) and distance to the nearest bank (50.94%) are the main barriers to opening a bank account. Co-operative is the major means of savings as well as source of credit. Farmers' awareness of agricultural insurance scheme is low, however, more than half of the farmers are willing to participate. Age, labour cost and cultivation of improved varieties had negative and significant effect on willingness to participate while awareness, years of formal education, credit access and membership of association had significant positive effect on willingness to participate. Hence, financial institutions should consider boosting their services to arable crop farmers and create enabling environment that will facilitate financial inclusion of farmers in Nigeria. Keywords: Financial services, Arable crops, Farmers, Nigeria*

*Acknowledgment:*

**JEL Codes:** O32,

#1521



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## **Abstract**

This study investigates financial inclusion of smallholder arable crop farmers in Nigeria. Primary data were collected for the purpose of the study using well-structured questionnaire. Descriptive statistics and Logit regression model were employed in the analysis. The average age of the respondents was 43.67years and male actively participated in food crop production more than female. Though 64.16% of the respondents had access to banks within their community, only 27.65% are banked. Fear of insolvency (90.57%), lack of required form of identification (31.13%), lengthy process (29.72%) and distance to the nearest bank (50.94% ) are the main barriers to opening a bank account. Co-operative is the major means of savings as well as source of credit. Farmers' awareness of agricultural insurance scheme is low, however, more than half of the farmers are willing to participate. Age, labour cost and cultivation of improved varieties had negative and significant effect on willingness to participate while awareness, years of formal education, credit access and membership of association had significant positive effect on willingness to participate. Hence, financial institutions should consider boosting their services to arable crop farmers and create enabling environment that will facilitate financial inclusion of farmers in Nigeria.

**Keywords:** Financial services, Food crops, Farmers, Nigeria

## **Introduction**

Financial inclusion is achieved when there is easy accessibility to a wide array of formal financial services that meet needs and are provided at affordable cost. According to Enhancing Financial Innovation and Access (EFInA) (2013) financial inclusion is the provision of a broad range of high quality financial products, such as savings, credit, insurance, payments and

pensions, which are relevant, appropriate and affordable for the entire adult population, and especially the low income segment. It is a state in which all people have access to appropriate, desired financial products and services in order to manage their money effectively. Financial inclusion involves more than having improved access to credit but covers enhanced access to savings and risk mitigation products, a well-functioning financial infrastructure that allows individuals and companies to engage more actively in the economy, while protecting users' rights. Widening access to financial services will mobilize greater household savings, organize capital for investment, expand the class of entrepreneurs, and enable more people to invest in themselves and their families (AFI, 2011). Financial inclusion is therefore necessary to ensure that economic growth performance is inclusive and sustained.

There is a nexus between financial inclusion and attainment of the Sustainable Development Goals (SDGs). Aspects of financial inclusion factor into many of the SDGs, directly or indirectly. Financial inclusion enables access to goods and services; it empowers individuals to improve their quality of life. The link between financial inclusion and poverty plays a crucial role in enhancing economic and social progress in developing countries. There are evidences that financial inclusion has the potential to reduce poverty and promote pro-poor growth (Chibba, 2008; World Bank, 2008). Furthermore, the poor and low-income earners in developing countries can lead better lives through financial literacy and inclusion; access to finance at reasonable cost, a secured savings and more options than those available in the informal sector (Chibba, 2009).

The magnitude of the financially excluded population in the world is colossal. According to the United Nations, approximately three billion people around the globe lack access to formal financial services such as a bank account, credit, insurance, a safe place to keep savings and a secure and efficient means to receive social benefit payments through a registered financial institution (UN, 2007; Chibba, 2008, AFDB, 2013). According to Financial Access Initiative (FAI) ,2.5 billion adults which is over half of the world's population, do not use formal financial services to save or borrow. Sixty-two percent of adults living in Asia, Africa, Latin Africa and Middle East are un-served. Although this dilemma is universal, financial exclusion is more prevalent in developing countries. Forty-one percent of adults in developing economies are banked compared to 89% of adults in high-income economies, 37% of women in developing

economies are banked compared to 46% of men and only 23% of adults living below \$2 per day have a formal account (Demirguc-kunt and Klapper, 2012).

Despite the recent financial sector growth in Africa, many individuals and firms are still excluded from access to formal financial services. Analysis of the access to and usage of financial services by adults and enterprises shows that African countries lag behind other developing economies in both aspects (AFDB, 2013). The Sub-Saharan African economies are characterized with low number of commercial bank branches per 100,000 adults and low account penetration, only 24% of adults have a bank account even though Africa's formal financial sector has grown in recent years (AUSAID, 2010).

Nigeria, is however not an exception with a large population of financially unserved people put at 46.3% in 2010 (EFInA, 2010 in Paul, 2013). Many Nigerians, for numerous reasons are unbanked and lack access to formal financial services. The EFInA Access to Financial Services in Nigeria revealed that 34.9 million adults which represents 39.7% of the adult population were financially excluded. Only 28.6 million adults were banked, representing 32.5% of the adult population while a large proportion saves at home. This resulted in billions of Naira being circulated through the informal sector and this has a negative impact on the country's economic growth and development.

However, the vast majority of those who are fully excluded from formal financial services live in rural areas where agriculture is the predominant occupation. However, access to credit, payment services and insurance products are essentials to rural populations especially the farmers. Credit provides opportunities for farmers to invest and enlarge their business hence, increasing productivity; payment services gives room for more efficient and less costly transactions; while insurance products help reduce their exposure to risk. This is all the more important as the poor and farmers are often the most at risk.

Therefore, it is pertinent to examine financial inclusion of small-holder farmers. Though studies (Triki and Faye, 2013; EFINA, 2012) have revealed financial exclusion of rural households in Africa including Nigeria, however, empirical evidence of financial inclusion of farmers is very scanty indicating a gap in the literature that must be filled. To fill the gap and complement previous studies, this study investigates financial inclusion of smallholder arable crops farmers in Nigeria. The study provides answers to pertinent questions such as: Do farmers have access to banks in their communities?; what proportion of the farmers owns a formal account?; what are the barriers to formal account ownership?; with which financial institution do farmers save their money?; What are the credit sources available to farmers?; are farmers aware of agricultural insurance schemes? And what are the factors influencing the farmers' willingness to participate in agricultural insurance scheme. From a policy perspective, answers to these questions are crucial to addressing the challenge of financial exclusion of farmers and attain improvement in smallholder farmers' welfare in Nigeria.

The rest of the paper is organized as follows: section 2 presents the literature review while section 3 presents the Methodology. Section 4 entails the results and discussion. Finally, section 5 gives a brief summary of the main findings, the conclusion, and policy recommendation.

## **2. Literature review**

### **2.1 State of Financial Inclusion in Nigeria**

Since 2005, the Nigerian financial services sector has witnessed increasing activities by both the government and the regulatory authorities aimed at deliberately promoting policies that are intended to grow financial inclusion. The Central Bank of Nigeria (CBN) has been at the forefront of encouraging and supporting products that are specifically targeted at the low income and financially excluded, while the government has focused more on both interventionist financing arrangements and building institutions and frameworks that promote financial inclusion.

The World Bank Global Financial Inclusion (Global Findex) provides data by capturing how adults in 148 countries save, borrow, make payments and manage risk in 2011. The survey comprises four sets of measures, namely: ownership and use of formal financial accounts, savings in formal account, borrowing from formal financial source and the use of insurance. The survey shows that about 30 percent of Nigerians have an account with a formal financial institution. Ownership is relatively higher among males (33.3 per cent) than females (26 per cent). There is also disparity according to the education levels of Nigerians. Specifically, while 12.1 per cent of those that completed primary or less education have a formal account, 43.5 per cent of those with secondary education do and the figure is 81.8 per cent in the case of those with tertiary education. Ownership of formal account is also observed to change with the way economic power is distributed in the economy. For instance, while only about 12 per cent of those in the lowest income quintile own formal account, 62.6 per cent of those in the highest income quintile do.

## **2.2 Recent Developments in Financial Inclusion in Nigeria**

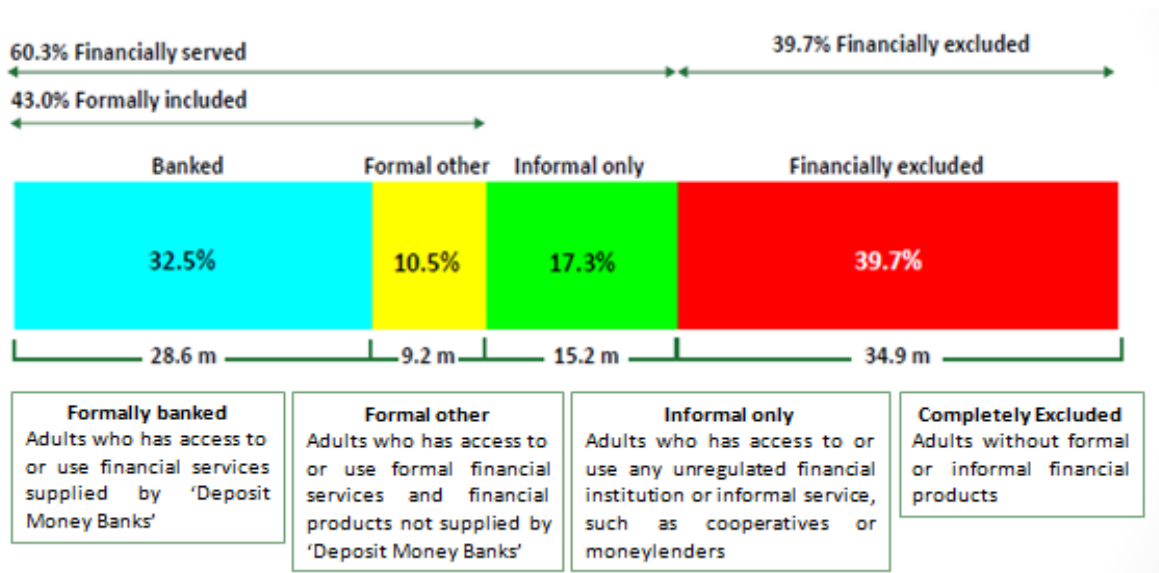
A survey conducted by the Enhancing Financial Innovation and Access (EFInA) in 2010 indicated that only 30.7 million out of the 85 million Nigerians above the age of eighteen have access to formal financial services (services from deposit money banks and other formal

institutions), leaving out over 54 million either served by the informal institutions or totally unbanked. The formally banked (25.4 million) use the products and services of the deposit money banks either as salaried workers or as business men and women, while the remainder (5.3 million) of the formally serviced use the services of other formal institutions like the finance houses, microfinance banks etc.

Nigeria has a higher proportion of financially excluded adults at 46.3 per cent, compared with 26.0 per cent in South Africa, 33.0 per cent in Botswana and 32.7 per cent in Kenya (EFInA, 2010). There was an observed wide spread overlap in the usage of financial services between the formal and informal financial system. Most market women for example, operating the typical savings account with the deposit money banks most times also operate the traditional contributory/savings scheme with the “Esusu” provider. Out of the 25.4 million formally served, over 1 million use both the deposit money banks and other formal institutions, while about 7 million use other informal institutions and services in addition to the conventional banking services. Rural Nigeria is disproportionately more excluded from financial services, compared with the urban Nigeria. Similarly, while the North has the highest percentage of the unbanked population, it also has the lowest number of bank branches with as low as between 0.99 to 1 branch per 100,000 customers, compared with as high as over 5 branches per 100,000 in some parts of the South (EFInA, 2010).

The report also indicated a large disparity in access to finance among gender. The EFInA 2010 financial access survey report has more male Nigerian adults who are banked, while more females are financially excluded. Although women are often the main provider (especially in similar developing economies) for the family, the discrimination and cultural norms which prevents them from having access to finance causes their inability to provide for themselves and their families. In Nigeria, this phenomenon is well pronounced between the male and female population where about 52.0 per cent of the female adult are financially excluded, in contrast to the 41.0 per cent of the male adult being financially excluded.





**Figure 2: State of Financial Inclusion in Nigeria**

Source: EFINA Access to Financial Services in Nigeria, 2012 survey

### 3. Methodology

#### 3.1 Data

The study area is South-west, Nigeria. The South west is one of the six geopolitical zones in Nigeria. It falls on latitude  $6^{\circ}$  to the North and latitude  $4^{\circ}$  to the South while it is marked by longitude  $4^{\circ}$  to the West and  $6^{\circ}$  to the East. It is bounded in the North by Kogi and Kwara States, in the East by Edo and Delta States, in the South by Atlantic Ocean and in the West by Republic of Benin. The climate is equatorial with distinct wet (rainy) and dry seasons with relatively high humidity. The mean annual rainfall is 1480mm with a mean monthly temperature range of  $18^{\circ}$ - $24^{\circ}\text{C}$  during the rainy season and  $30^{\circ}$ - $35^{\circ}\text{C}$  in the dry season. Southwest Nigeria covers approximately an area of 114,271 kilometer square that is approximately 12 percent of Nigeria's total land mass and the vegetation is typically rainforest. The total population is 27,581,992 as at 2006 and the people are predominantly farmers. The climate in the zone favours the cultivation of crops like maize, yam, cassava, millet, rice, plantain, cocoa, kola nut, coffee, palm produce,

cashew etc. (National Population Commission, 2006). The zone comprises of six states out of which Ekiti and Ondo States were selected for this study.

A multi-stage sampling procedure was employed. The first stage was the selection of two states (Ekiti and Ondo states) from South-west Nigeria. In the second stage, one agricultural zone was selected from each state while the third stage involved random selection of three rural Local Government Areas (LGAs) from each agricultural zone, out of which four villages/communities each were selected. The final stage involved selection of arable crop farmers from the communities proportionate to size resulting in a total sample of 310 farmers. The data were collected using well-structured questionnaire. Due to incompleteness of data, 293 (94.52%) of the questionnaire were used in the analysis.

### **3.2 Data Analysis**

The data collected were analyzed using descriptive statistics and Logit regression model analysis. The descriptive statistics include frequency, mean, percentage and standard deviation.

#### **Logit Regression Model Specification**

The specification of the logit model is as follows:

$$P_i = E(Y= 1/X_i) = 1 / ( 1 + e^{-Z} ) \dots\dots\dots (1)$$

Where,  $Y$  is dependent variable which is a dichotomous response variable (1=willing to participate in NAIS; 0=otherwise)

$P_i$  is a probability that  $Y_i = 1$ , its values range from 0 to 1, and it is assumed to be non-linearly related to  $Z$ .

$$Z = \beta_0 + \beta_i X_i \dots\dots\dots (2)$$

$X_i$  is a set of independent variables

$\beta_0$  is the intercept which is a constant

$\beta_i$  is the coefficient of the identified variables influencing farmers willingness to participate.

$X_1$ = Age of Respondents (Years)

$X_2$ = Gender of Respondents (male=1;female=0)

$X_3$ = Number of years of formal education

$X_4$ = Household Size of Respondents

$X_5$ = Cost of Labour (Naira)

$X_6$ = Farm Size (Ha)

$X_7$ = Farming Experience (Years)

$X_8$  = Farm Income in the last production season (Naira)

$X_9$  = Membership of Organization (Yes=1; Otherwise=0)

$X_{10}$  = Access to credit (Yes=1; No=0)

$X_{11}$  = Use of improved varieties (Yes=1; No=0)

$X_{12}$  = Cost of Agrochemicals (Naira)

$X_{13}$  = Land ownership (Owner =1; otherwise=0)

$X_{14}$ = Extension Agent Contact (Yes=1; otherwise=0)

$X_{15}$ = Non-farm Income source (Yes=1; No=0)

$X_{16}$  = Awareness of Agricultural Insurance Scheme (Awareness=1, otherwise=0)

u = Error term

**Table 1: A Priori expectation of the Exogenous Variables affecting the Willingness to Participation**

Variables	Description	Expected signs	Literature
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Gender	Dummy =1, if the farmer is male	+	Hill <i>et al.</i> , 2012
Age of the farmer	Continuous	-	Ali, 2013; McCarthy, 2003
Awareness of agricultural insurance policy	Dummy=1, if the farmer is aware	+	Coble and Knight, 2002
Year of education	Continuous	+	Ali, 2013
Membership of association	Dummy =1 if farmer belongs to an association	+	Olila, 2014
Farm size	Continuous	+	Coble and Knight, 2002;
Credit Access	Dummy=1 if farmer has access	+	Hill et al., 2013; Ali, 2013
Farm income	Continuous	+	Ali, 2013
Cultivation of improved varieties	Dummy=1 if farmer plants improved variety	-	McCarthy, 2003
Extension agent contact	Dummy=1 if farmer has contact with extension	+	Ali, 2013
Household size	Continuous	+	Ali,2013
Non-farm Income	Continuous	+	Ali, 2013

Author's compilation from past literature

#### 4. Empirical Results and Discussion

This section presents the distribution of the respondents according to socio-economic characteristics; the financial inclusion indicators such as accessibility to formal financial institutions, bank account ownership, institutions through which farmers saved their money, accessibility to credit and sources as well as participation in agricultural insurance scheme.

##### 4.1 Descriptive Analysis of the Socio-economic Characteristics of the Respondents

The descriptive analysis of the socio-economic characteristics of the respondents is presented in Table 1. The mean age of the respondents was 44 years, this reveals that majority of the farmers are in their active age. Male constitutes 68.60 percent of the respondents while 31.40% were female; this indicates that males participate more in crop production than females. This might be as a result of the tedious nature of crop production. Distribution according to the

educational status revealed that majority (81.2%) of the respondents had formal education while 19.11% do not. This will afford them the opportunity to read, write and process information relevant to their financial inclusiveness. The mean household size and farming experience were 7 persons and 17 years respectively, this implies that the crop farmers were well experienced in crop production. The mean farm size was 1.37 hectares indicating that the farmers were small-holders.

**Table 1: Distribution of Respondents According to Socio-economic Characteristics**

<b>Variable</b>		<b>Frequency</b>	<b>Percentage</b>
<b>Gender</b>	Male	201	68.60
	Female	92	31.40
<b>Age</b>	0-30	30	10.24
	31- 40	111	37.88
	41- 50	71	24.23
	51- 60	47	16.04
	>60	34	1.61
	Mean	43.67	
Standard Deviation(S.D)	12.39		
<b>Marital status</b>	Married	247	84.30
	Single	46	15.70
<b>Education</b>	No formal	56	19.11
	Primary	116	39.59
	Secondary	105	35.84
	Post secondary	16	5.46
<b>Household size</b>	1-5	108	36.86
	6-10	128	43.69
	>10	57	19.45
Mean	7.0		
S.D	1.97		
<b>Farm size</b>	<1	96	32.76
	1-3	167	57.00
	>3	30	10.24

Mean	1.37		
S.D	0.95		
<b>Years of Farming Experience</b>			
	1-5	14	4.78
	6-10	64	21.84
	11-15	89	30.38
	16-20	104	35.49
	>20	22	7.51
Mean=	17.13		
S.D =	0.32		

#### 4.2 Distribution of Respondents by Access to Formal Financial Institutions

The distribution of the farmers according to accessibility to formal financial institutions revealed that 64.16% of respondents in the study area had access to financial institutions / banks within their community while 35.84% do not have such access (Table 2). This implies that most of the farmers had at least a formal financial institution within their communities.

**Table 2: Distribution of Respondents by Access to Formal Financial Institutions**

<b>Accessibility</b>	<b>Frequency</b>	<b>Percent (%)</b>
No	105	35.84
Yes	188	64.16
<b>Total</b>	<b>293</b>	<b>100.0</b>

Source: Field survey, 2016

### 4.3 Distribution of Respondents by Ownership of Bank Account

Table 3 shows the distribution of farmers by bank account ownership. From the table, majority (72.35%) of the farmers do not have a bank account while only 27.65% had a bank account. This revealed that despite that most of the farmers had access to banks in their communities, very few of them are banked.

**Table 3: Distribution of Respondents by Ownership of Bank Account**

<b>Ownership of bank account</b>	<b>Frequency</b>	<b>Percentage</b>
<b>No</b>	<b>212</b>	<b>72.35</b>
<b>Yes</b>	<b>81</b>	<b>27.65</b>
<b>Total</b>	<b>293</b>	<b>100</b>

Source: Field survey, 2016

### 4.4 Distribution of Respondents According to Types of Institutions Used in Saving Money

Table 4 presents the institutions through which the farmers saved their money. From the results, Most (46.76%) of the farmers saved their money in cooperatives, while 14.33%, 6.83% and 33.08% had savings in micro-finance banks, commercial banks and savings associations respectively. This indicates that most of the farmers had their savings in cooperatives while few had savings in the banks. This finding supports Obayelu (2012) that found out that most of the famers had their savings with cooperatives.

**Table 4: Distribution of Farmers by Institutions Used in Saving Money**

<b>Institutions</b>	<b>Frequency</b>	<b>Percentage</b>
Cooperatives	137	46.76
Microfinance banks	42	14.33
Commercial banks	20	6.83
Savings associations	94	32.08

<b>Total</b>	<b>293</b>	<b>100</b>
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#### **4.5 Distribution of Respondents According to Barriers to Formal Account Ownership**

The distribution of respondents by barriers to formal account ownership (Table 5) revealed that fear of insolvency (90.57%) remains the major barrier to account ownership. Other constraints were lengthy process (29.72%), distance from home to banks (50.94%), lack of access (21.70%) and identification requirements (31.13%) were the major constraints to bank account ownership among the farmers.

**Table 5: Distribution of Farmers by Barriers To Formal Account Ownership**

<b>Barriers</b>	<b>Frequency</b>	<b>Percent (%)</b>
Identification requirements	66	31.13
Distance to banks	108	50.94
Lengthy process	63	29.72
Lack of access	46	21.70
Fear of Insolvency	192	90.57

**Source: Field Survey, 2016**

**\*Multiple responses**

#### **4.6 Accessibility and Sources of Credit**

Accessibility to credit from informal financial institutions was high among the farmers (Table 6).

The most patronized credit source in the study area was co-operatives while the least patronized was agricultural banks. The study revealed that 60.34% of the farmers with credit access obtained credit from co-operatives while 55.60%, 40.61%, 21.70% and 16.72% got credit from the village lending groups, family and friends, agricultural/microfinance banks and money lenders respectively. The low rate of obtaining credit from banks might be associated with the terms and conditions attached to obtaining credit facilities from formal financial institutions.



**Table 6: Distribution of Respondents by Source(s) of Credit**

Source of Credit	Frequency	Percentage
Co-operatives	140	60.34
Village lending groups	129	55.60
Family and Friends	94	40.52
Money lenders	51	21.98
Micro-finance/Agricultural banks	39	16.81

**Field Survey, 2016 \*Multiple responses N= 232**

#### **4.7 Awareness of Agricultural Insurance Scheme**

Majority (66.21%) of the farmers were not aware of the agricultural insurance scheme while 33.79% were aware of the scheme in the study area. This implies low level of awareness of NAIS among farmers in the study area. Hence, there is need for more enlightenment and awareness of the scheme by the agricultural insurance company. This result contradicts the findings of Abdulmalik et al. (2013) who reported high awareness of agricultural insurance in Federal capital territory in Abuja, Nigeria.

**Table 7: Distribution of Farmers by Awareness of Agricultural Insurance Scheme**

Awareness	Frequency	Percentage
Yes	99	33.79
No	194	66.21
Total	293	100

Source: Field survey, 2016

#### **4.8 Willingness to Participate in Agricultural Insurance Scheme**

More than half (54.27%) of the farmers were willing to participate in agricultural insurance scheme at a stipulated rate of premium at 2.5% of total investment per hectare per annum. However, 45.73% of the farmers were not willing to participate stating that they prefer to adopt other mitigation measures against production risks that might occur.

#### **4.9 Factors Influencing Farmers' Willingness to Participate in Agricultural Insurance Scheme**

The results of the binary Logit regression model on the factors affecting farmers' willingness to participate in agricultural insurance scheme are shown in Table 8. The Log likelihood is 66.507 and significant at 1% indicating the model has a good fit to the data. The results showed that out of the sixteen variables included in the model, only seven variables statistically influenced willingness to participate in agricultural insurance scheme. These factors are age, labour cost, awareness, planting of improved varieties, years of formal education, access to credit, and membership of association. A positive sign on a parameter indicates that the higher the value of the variable, the higher the level of market participation and vice-versa.

The regression results indicated that the coefficient of age is significant ( $P < 0.05$ ) but had a negative effect on farmers' willingness to participate in agricultural insurance scheme. This implies that an additional year to the age of the farmer would decrease the likelihood of participation by 0.2112. This might be adduced to the fact that older farmers are more capable of managing risk effectively using other mitigation measures than the younger ones because of experience gained over the years. Older farmers lack receptivity towards new interventions and rely more on traditional methods. This is in line with Ali (2013) that age decreases farmers' willingness to pay for index based crop insurance in Pakistan.

Labour cost has a negative but significant ( $P < 0.05$ ) influence on participating in insurance scheme. A unit increase in the cost of labour will reduce the likelihood of participation by 0.034. Cost incurred through the use of hired labour instead of family labour invariably increases the cost of production and incapacitate the farmers to pay for crop insurance. Cultivation of improved varieties significantly ( $p < 0.01$ ) but negatively influence participation in agricultural insurance by farmers. From the results, planting of improved varieties will reduce participation likelihood by 0.071. Improved varieties are employed by farmers as a measure of mitigating against risks. This finding is in tandem with McCarthy (2003) that as the farmers cultivate improved varieties, the probability of participation in agricultural insurance reduces in Nigeria. Access to credit facilities has a positive and significant ( $p < 0.05$ ) influence on willingness to participate in agricultural insurance scheme. Access to credit will increase the likelihood of participation by 0.3201. This finding conforms to Hill *et al.*, (2013) that access to credit enhanced adoption weather- index agricultural insurance in Ethiopia.

Furthermore, awareness of agricultural insurance scheme has a positive and significant ( $p < 0.05$ ) effect on farmers' willingness to participate in the scheme. Farmers' awareness of the scheme will increase the likelihood of participation by 0.045. This finding is in agreement with Coble and Knight (2002). Membership of association significantly ( $p < 0.01$ ) and positively influence the willingness to participate in agricultural insurance scheme. From the results, membership of association will increase the likelihood of participation by 0.1527. Associations facilitate easy dissemination of information. According to Olila (2014), membership of association increased level of awareness of crop insurance and influenced farmers' purchase decision in Kenya.

**Table 8: Estimates of Logit Regression for the Determinants of Willingness to participate in Agricultural Insurance Scheme**

<b>Variables</b>	<b>Coefficients</b>	<b>Standard Error</b>	<b>T-value</b>
Age	-0.2112**	0.0938	2.2513
Gender	0.1853	0.1494	1.2405
Awareness	0.0449**	0.0223	2.013
Labour cost	-0.034**	0.0170	1.9908
Household size	0.1745	0.1832	0.9523
Years of Education	0.1327**	0.0619	2.1430
Credit access	0.3201**	0.1378	2.3224
Farm size	0.0127	0.0190	0.6682
Farming Experience	0.0101	0.0065	1.5528
Improved varieties	-0.0712***	0.0173	4.125
Land Ownership	0.0755	0.1664	0.4538
Extension agent contact	0.1332	0.1322	1.0076
Membership of association	0.1527***	0.0458	3.3321
Off-farm income source	0.0579	0.1482	0.3906
Farm income	0.0067	0.0043	1.5402
Cost of agro-chemicals	-0.0573	0.0571	1.003
Constant	0.6678	0.2213	3.0173
Log likelihood	-66.507		
Prob >chi <sup>2</sup> = 0.0000			

Pseudo R <sup>2</sup> = 0.5266			
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Source: Field Survey, 2016

### 5. Summary, Conclusion and Policy Recommendation

Improving the financial inclusion of farmers is an important policy goal in developing countries especially Nigeria where agriculture remains an important sector in the economy. This study examined financial inclusion among arable crop farmers in Nigeria. The results showed that males participate more in crop production than females. Majority of the farmers are still in their active age, cultivating an average of 1.37ha of farm land. A large proportion of the farmers have access to formal financial institutions while very few are banked. Fear of insolvency, distance to banks, lengthy process and lack of required form of identification are the main barriers to formal account ownership. Co-operatives are the common financial institutions where arable crop farmers keep their money and obtain credit. There is low awareness of agricultural insurance scheme among the farmers, however, more than half of the farmers are willing to participate at a stipulated premium rate of 2.5% total investment per hectare per annum.

The empirical model of the Logit regression model indicates that only seven out of the sixteen variables included in the model significantly influenced willingness to participate. Age, awareness, years of education, credit access, and membership of association had positive and significant effect on willingness to participate while cost of labour and cultivation of improved varieties significantly but negatively influence farmers' willingness to participate.

In conclusion, arable crop farmers are financially excluded, hence, financial institutions should consider boosting their services to arable crop farmers and create enabling environment

that will facilitates the financial inclusiveness of farmers in Nigeria. Financial inclusion should be incorporated into agricultural development programs in Nigeria.

## References

African Development Bank (2013). *Financial Inclusion in Africa*. AFDB, Tunisia. ISBN: 978-9938-882-193

Ali, A. (2013). Farmers' Willingness to Pay for Index Based Crop Insurance in Pakistan : A Case Study on Food and Cash Crops of Rain-fed Areas. *Agricultural Economics Research Review*, 26(2):241–248.

Alliance for Financial Inclusion (AFI). 2011. "Charter of the AFI Financial Inclusion Data Working Group." Available at: <http://www.afi-global.org/library/publications/charter-afi-financial-inclusion-data-working-group>.

Coble, K.H., and T.O. Knight. (2002). *Crop Insurance as a Tool for Price and Yield Risk Management. A Comprehensive Assessment of the Role of Risk in U.S. Agriculture*. London: Kluwer Academic Publishers. pp. 445–68.

Chibba, M. (2008) *Financial Inclusion and Development: Concepts, Lessons Learned and Key Pillars*. Mimeo.

Chibba, M. (2009). *Financial Inclusion, Poverty Reduction and Millenium Development Goals*. *European Journal of Development Research* 21, 213-230, doi: 10.1057/ejdr. 2008.17

Demirgüç-Kunt, A., and L. Klapper. 2012. "Measuring Financial Inclusion: The Global Findex." *World Bank Policy Research Working Paper Series* 6025.

Demirguc-Kunt A, Klapper L & Singer D (2013) *Financial Inclusion and Legal Discrimination Against Women: Evidence from Developing Countries*. Policy Research Working Paper No. 6416. The World Bank, Washington DC, US.

Enhancing Financial Innovation and Access (2010). Access to financial Services in Nigeria.

Hill, R. V., Hoddinott, J., and Kumar, N. (2013). Adoption of weather-index insurance: learning from willingness to pay among a panel of households in rural Ethiopia. *Agricultural Economics*, 44(4-5):385–398.

McCarter, N. (2003) Demand for Rainfall Index Based Insurance: A Case Study from Morocco. IFPRI Environmental and Production Technology Division Working Paper No. 106, Washington D. C.

Olila, D. O. (2014). Determinants of farmers' awareness about crop insurance: Evidence from Trans-Nzoia County, Kenya. *Annual Egerton University International Conference*, 26, 1.

Sherrick, B., Barry, P. J., Ellinger, P., and Gary D. Schnitkey. (2004). Factors influencing farmers' crop insurance decisions. *American Journal of Agricultural Economics*, 86:103–114.

United Nations (2007) Press Conference on best practices for financial inclusion, UN Department of Public Information, 30 May.

World Bank. (2008) Finance for All? Washington DC: World Bank.