Factors Influencing Smallholder Farmers Access to Credit in Ondo State, Nigeria

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Abstract: Access to credit among smallholder farmers has being a major problem confronting smallholder production in the rural areas. However previous studies on access to credit focused on farming households with little empirical evidence to understand factors influencing smallholder farmers' access to credit. Hence, factors influencing smallholder farmers' access to credit in Ondo state. Nigeria was investigated. The multistage sampling technique was used to select respondents for the study. The primary data for the study was gathered with a structured questionnaire. The descriptive statistics and multinomial logit models were used to analyse data collected. The mean age of smallholder household heads was 44.3±7.6 years, 60.3% were male headed households while 57.1% were married with 7±2.6 members per household and 58.3% had primary education while 51.9% were primarily into farming with 10.4±7.1 years of experience. The main source of credit was the money lenders with inadequate funds and collateral security as major challenges in accessing credit. The MNL estimates revealed age, education, gender, household size, land size, occupation among others were the significant variables influencing smallholder farmers' access to credit in the study area. It was recommended that smallholder farmers should be given access to credit; credit policy and collateral security arrangements should be reviewed.

Introduction

Smallholder farmers in rural areas of sub-Saharan Africa countries and Nigeria in particular have limited access to factors of production including information and credit. It is an undeniable fact that smallholder farmers are faced with problem of access to credit which is a reflection of their poverty status. Most farming households in Nigeria have low capital base and low savings due to poor farm harvest and productivity. Farm credit is widely recognized as one of the intermediating factors between production and consumption among smallholder farmers (Akudugu, 2012). Credits is an important instrument for improving the welfare of the poor, consumption, procurement of inputs, adoption of technology and payment for labour and reduce vulnerability in income on the farm (Odu,1996; Okurut *et al.,* 2004). The problem of smallholder farmers' access to credit remains crucial in affecting their production pattern and level of productivity (Ortmann, 2000). Moreover, World Bank (1996) reported that credit is necessary for small-scale farmers to increase their agricultural productivity and farm income; however their access to institutional credit is curtailed. Smallholder farmers individually look insignificant but collectively form an important foundation upon which the agriculture sector of the developing countries rests upon (Nwaru *et al*., 2004). Despite lack of access to credit and other support services in the rural areas, smallholder farmers still manage to produce to meet the basic needs of the family or consumption and market.

Credit could be secured either through formal (Banks) or informal sources which include family/friends/relatives, NGOs/cooperative society, ROSCAs and money lenders (Okurut *et al*., 2004). However, the interest rate charged by formal financial institutions especially commercial and micro-finance banks in giving out loans make it difficult for small scale farmers to access credit from this source. Moreover these formal credit institutions are not available in almost the rural areas and the distance to urban centers where they are available discouraged the smallholder farmers due to high transaction cost. As a result the informal sector becomes the next available alternatives or options for smallholder farmers in accessing credit. The informal market receives wide patronage because of the timeliness of loan disbursement to farmers, accessibility, flexibility of services, and collateral free, however, the loans are usually rationed and short term since the scale of operation of the average individual lender is small.

Credit is one of the major inputs for smallholder farm production in Nigeria and other developing economies; hence, analyzing factors which influence its access can give us a better understanding of farm household production in general. Moreover, an understanding of the characteristics of smallholder farmers' in relation to accessing agricultural credit could assist policy formulation that will enhance the

welfare of the poor rural smallholder farmers. From this background this study is set out to address following questions: What are the socio-economic/demographic characteristics of the smallholder farmers in the study area? What are the sources of credit open to the smallholder farmers in the study area? What are the challenges facing the smallholder farmers in accessing credit in the study area? What are the factors influencing smallholder farmers' access to credit in the study area? From the foregoing the study is specifically designed to investigate the determinants of smallholder farmers' access to credit in the study area.

Materials and Methods

This study was carried out in Ondo State in the South-West geo-political zone of Nigeria. The study area consists of 3,441,024 people occupying 14,798.8 square kilometres land area (NPC, 2006). Geographically, Ondo State lies between latitude 5^0 45^1 and 8^0 15^1 North and longitude 4^0 45^1 and 6^0 East (Ondo State, 2010). The state has typical tropical climate of averagely high temperatures and relative humidity, seven months of rainfall patterns and five months of dry season. The primary data for this study was gathered with the aid of structured questionnaire. A multi-stage sampling technique was employed in the selection of the smallholder farmers for the study. The first stage entailed the random selection of four (4) Local Government Areas (LGAs) from the four agricultural zones in the state. The second stage involved random selection of five (5) rural communities from each LGA. The third stage was the selection of farming households from each rural community based on probability proportionate to size of communities. A total of one hundred and fifty-six (156) respondents were used for the purpose of analysis. Descriptive statistics was used analyze the socio-economic/demographic variables of respondents while the multinomial logit model was adopted to analyze factors influencing smallholder farmers' access to credit in the study area.

Model Estimation: The multinomial logit model is used to analyse smallholder farmers' access to credit by individual choice; Banks, cooperative society, ROSCAs, money lenders and family/relatives. The MNL model has response probabilities;

$$P(y=j/X_i) = \frac{\exp(Xi\beta j)}{\sum_{j=1}^{4}\exp(Xi\beta j)} \dots \dots \dots \dots \dots \dots 1$$

$P(y=j/Xi)$ denotes the probability that is associated with the sources of credit. The various sources of credit are classified as the dependent variables. It is assumed that the dependent variables D_{it} can take on one of the j categories 1,2,3........, k five responses were used as dependent variables j = 0

if household head does not access credit from any source (reference category); j =1 if credit is sourced from banks; j =2 if credit is sourced from cooperative society; j = 3 if credit is sourced from ROSCAs; j = 4 if credit is sourced from money lenders So setting $\beta_1 = 0$, the MNL model can be expressed as;

$$P(y=j/X_i) = \frac{\exp(Xi\beta j)}{1+\sum_{j=2}^{4}\exp(Xi\beta j)} \quad (j = 2,3,4) \dots \dots \dots \dots \dots \dots \dots \dots .2$$

and

$$P(y=1/X_i) = \frac{1}{1+\sum_{j=2}^{4}\exp(Xi\beta j)} \dots \dots \dots \dots \dots \dots \dots \dots \dots ..\dots\dots\dots\dots\dots.3$$

When j=2, β_2 is a K x1 vector of unknown parameters of individual smallholder household head who source credit from the various sources of credit (Mpuga, 2008). The maximum likelihood was used to estimate the empirical models in order to obtain asymptotically efficient parameter estimates (Greene, 1992). The log likelihood function for the multinomial logit can be written thus:

$$\ell = \sum_{i=1}^{n}\sum_{j=1}^{k} dijLog(Pij) \dots \dots \dots \dots \dots 4$$

Access to credit is modelled as a function of the socio-economic/demographic characteristics (Mpuga, 2008; Durojaiye, 2011).

The explanatory variables include: X_1 = Age of household head (Years); X_2 = Gender of household head (1 male, 0= otherwise); X_3 = Education level of household head(Number of years spent in formal schooling); X_4 =Marital status of household head (1 if married, 0 otherwise); X_5 = Household size (Number of persons); X_6 = Primary occupation of household head (1 if farming, 0 otherwise); X_7 = Dependency ratio (Number of non-working members/ working members); X_8 = Distance to source of credit (Km); X_9 = Total farm size (Hectares); X_{10} = Non-farm income (₦).

Result and Discussions

Table 1a reveals the age, gender, marital status, household size and educational status of smallholder household heads. On age, age is an important factor that determines individual's choices and decision make up in relation to household activities. The result of (Table 1) revealed that 57.0% of the smallholder farmers were between 43-60years. The mean age of the smallholder farmers in the study area was 44.3±7.6years which implies that majority of the respondents are economically active. The gender of the smallholder farmers revealed that 60.3% were male while 39.7% were female. This by implication means that there were more male-headed households than female in the study area. World Development Report (2008) reported that the gender of household head has significant influences on the capacity of the household to source income, access credit and assets

such as land and capital which directly affect agricultural productivity.

The marital status of smallholder farmers is important for households because it promotes specialization and risk sharing strategies. The result shows that majority (57.1%) of the household heads were married. This submission is in line with Mercer and Zhang (2005) that being married yields economies of scale and provides a risk-sharing protection against unexpected events hence yields greater productivity and income. The analysis of household size shows that 41.7% and 53.8% of the smallholder farmers have less than 6members and between 6-10members per household respectively. The mean household size was 7±2.6members per household. Household size and composition affect the demand for credit which may not be unconnected with the increased use of family income to feed, clothe and educate a larger number of children due to limited funds to meet farming expenditures (World Development Report, 2008).

On educational attainment of smallholder farmers, the education of the household head often influences the household choices of economic activity. The result shows that 60.3% of the smallholder farmers had primary education while respondents with non-formal education, secondary education, and tertiary education accounted for 11.5%, 20.5% and 9.6% respectively. This concurred with the report of Adegoroye and Adegoroye (2008) that low literacy level of the rural farmers denied them access to vital information on sources of credit, fulfillment and completion of loan documents required in the formal financial institutions. Also, Kiplimo (2013) reported that low level of education among smallholder farmers is a major constraint in understanding lending policies, complicated application procedures and the bureaucracies of the formal lending institutions.

Table 1b presents the occupation, years of experience, land size, distance to source of credit and income of smallholder farmers in the study area. The occupation of the smallholder farmers revealed that 51.9% were predominantly into farming while 30.1% and 18.0% respectively were into non-farm and both farm and non-farm activities. The involvement in non-farm activities and both (farm and non-farm activities) may not be unconnected with the fact that the income from agriculture alone is meagre or small relative to income from the farm. The year of experience revealed that 59.0% of the smallholder farmers had between 15-24years of farming experience. The mean years of experience of smallholder farmers in the study area was 10.4±7.1years this implies more knowledge, technical ideas and better productivity or output hence more income (Nwaru, 2011).

Table 1a: Socio-Economic/Demographic Characteristics of Smallholder Household Heads. n= 156

Variable	Frequency	Percentage (%)
Age (Yrs)		
<25	8	5.1
25-42	47	30.2
43-60	89	57.0
>60	12	7.7
Mean(SD)		**44.3±7.6**
Gender		
Male	94	60.3
Female	62	39.7
Marital Status		
Single	12	7.7
Married	87	57.1
Widowed	21	13.4
Divorced	34	21.8
Household Size (No of Person)		
<6.00	65	41.7
6.00-10.00	84	53.8
>10.00	7	4.5
Mean(SD)		**7.3±2.6**
Educational Attainment		
Non-formal Education	18	11.5
Primary Education	91	58.3
Secondary Education	32	20.5
Tertiary Education	15	9.7

Source: Field Survey, 2015

Landholding is an important factor among the smallholder household heads. Results show that 71.8% of the respondents cultivate between 1-3hectares of land. The mean land holding was 1.7±1.1hectares. The finding is in line with Matshe and Young (2004) that land constraint is a major factor in diversification activities among farmers also increasing population in Nigeria, exerted more pressure on arable lands. The distance to the nearest formal credit market centres revealed an average kilometre of 20.9±11.4kilometers. Results show that 72.5% reported that they normally travelled over 34kilometres before accessing formal credit while others 9.0%, 14.7% and 3.8% accounted for between 5-19kilometres, 20-34kilometres and less than 5kilometres respectively. This submission is in line with Durojaiye (2011) that the farther the distance to the formal credit centre discouraged smallholder farmers due to high transportation costs. The income of the respondents revealed that 63.5% have between ₦100,000:00- ₦220,000:00per annum as income. The mean income of the smallholder farmers was ₦56,015:28±₦16,213:66. This finding is not unconnected with the fact that income from farm is

poor which is revealed in the poverty status of the   farmers.

Table 1b: Socio-economic/Demographic Characteristics of Smallholder Household Head   n= 156

Variable	Frequency	Percentage (%)
Occupation		
Farm activities	81	51.9
Non-farm activities	28	18.0
Both Farm and Non-farm activities	47	30.1
Years of Experience (Yrs)		
>5	8	5.1
5-14	29	18.6
15-24	92	59.0
>24	27	17.3
Mean (SD)		**10.4±7.1**
Land Size (Hect.)		
<1.00	7	4.5
1.00-3.00	112	71.8
>3.00	37	23.7
Mean (SD)		**1.7±1.1**
Distance (Km)		
<5.00	6	3.8
5.00-19.00	14	9.0
20.00-34	23	14.7
>34.00	113	72.5
Mean (SD)		**20.9±11.4**
Income of Household Head (₦)		
<100,000.00	14	9.0
100,000.00-220, 000.00	99	63.5
230,000.00-340,000.00	32	20.5
>340,000.00	11	7.1
Mean (SD)		**56015.28±16.213:66**

Source: Field Survey, 2015

Table 2 shows the sources of credit available to the smallholder farmers in the study area. The results revealed that 44.2% of the smallholder farmers patronised the local money lenders while 26.3%, 17.9%, and 7.1% respectively patronised the cooperative societies, friends/relatives and rotating savings and credit associations (ROSCAs) and banks. This is not unconnected with the collateral free arrangements, timeliness of release and easy access to credit (Kiplimo, 2013). According to Oldeebo and Oladeebo (2008) availability of adequate and timely credit will help in expanding the scope of operation and adoption of new technology as well as enhancing the purchase and use of some improved inputs which are not available on the farm. However, only 4.5% of the smallholder farmers accessed credit from the formal sector (Banks) this could be linked with difficult procedural arrangements smallholder farmers will undergo before accessing the credit.

Table 2: Sources of Credit in Patronised by Household Heads in the study area n= 156

Sources of Credit	Frequency	Percentage (%)
Cooperative Societies	41	26.3
Friends/Relatives	28	17.9
ROSCAs	11	7.1
Money lenders	69	44.2
Banks	7	4.5
Total		100.0

Source: Field Survey, 2015

On constraints in accessing credit in the study area (Table 3), the result shows that 29.5% of the smallholder farmers reported that request for collateral security has prevented them from accessing or approaching the formal credit sector for credit. This in line with Ololade and Olagunju (2013) that the low levels of collateral security among the poor to a great extent explained their limited access to financial instruments in the formal credit sector. Collateral security requirements are a major factor that influences credit access, especially in the formal sector. Inadequate fund/rationing of credit as indicated by 26.9% of the respondents as one of the major problems of the informal credit sector despite the accessibility and timeliness of loan release to borrowers. However, informal report by credit operators stated that rationing of credits enables them to meet the request of their clients in the rural areas. Other identified problems included delay in the release of credit (15.4%) which is not unconnected with stringent procedures in accessing credit in the formal sectors unlike the informal sectors and high transaction cost (22.4%) which is in agreement with Kiplimo (2013) that the distance between the rural areas and the urban centres where the formal credit institutions domicile accounted for high transaction cost. High interest rate accounted for 5.8% of the respondents. This is in line with Atieno (2001) that despite the flexibility and accessibility of loans in the informal sector, the short maturity and high interest rates make it unattractive for working capital and investments.

Table 3: Challenges of Accessing Credit by Household Heads in the study area n= 156

Constraints to Accessing credit	Frequency	Percentage (%)
Inadequate fund/Rationing of credit	42	26.9
Delayed release of credit	24	15.4
High transaction cost	35	22.4
Collateral security demand	46	29.5
High interest rate	9	5.8
Total		100.

Source: Field Survey, 2015

Factors Influencing Smallholder Farmers Access to Credit in Ondo State

The results of the multinomial logit estimates (MNL) shows the likelihood ratio chi-square test was 197.21 with a p-value of 0.0000 and Pseudo R^2 was 0.4613 while the log likelihood was -349.4367 implying that the model as a whole fit significantly with the variables as good predictors of access to credit Ondo state. The sources of credit available to the smallholder farmers are banks, cooperative societies, rotating savings and credit associations (ROSCAs) and money lenders.

Access to Credit from the Banks

The variables that determine access to credit in Ondo state on Table 4 include age, years of completed education, household size and land size. The above finding is in agreement with Ololade and Olagunju (2013)) that access to credit is influenced by both lender and household characteristics. Age has a positive coefficient significant at 5% level of significance with positive marginal effect. It implies that an additional year to the age of household head would increase the probability of accessing credit by 0.3% relative to household that do not apply for credit. Zeller et al. (1994) reported that access to credit from the Gambian Co-operative was positively and significantly influenced by age and household income. The effect of years of completed education was statistically significant but with negative coefficient at 1% level of significance with negative marginal effect. This means that an additional year of completed education of household head decreases the probability of access credit from the banks in the study area by 0.5% compared to the reference category.

On household size, the coefficient was positive and significant at 1% level of significance with positive marginal effect on household heads access to credit. This implies that increase in the household size, increases the probability of accessing credit by 0.2% from the banks relative to household heads that do not apply for credit. On land size, coefficient was negatively significant at 10% level of significance with negative marginal effect on access to credit from the banks. This implies that as land size decreases, the probability of accessing credit increases by 4.7% compared to the base category with no request for credit. This is consistent with the assertion that smallholder farmers request for credit because of the constraints of gaining access to productive inputs on the farm (Matshe and Young, 2004).

Access to Credit from Cooperative Societies

Table 4 shows that, gender; occupation and non-farm income are the significant variables influencing access to credit from cooperative societies in Ondo state. Gender had a positive effect on access to credit from cooperative societies and statistically significant at 10% level of significance. This implies that being male increases, the probability of accessing credit

from the cooperative society's increases by 0.4% compared to household heads that do not apply for credit. This is supported by Zeller *et al*. (1994) that being a female household head had a negative and significant effect on access to credit in Gambia cooperative society. On occupation, the result shows a positive coefficient and positive marginal effect significant at 1% level of significance on access to credit from cooperative societies. This implies that being primarily involved in farming will lead to increase in the probability of accessing credit from cooperative societies by 2.4%. Non-farm income of household heads was found to be negatively significant at 1% level of significance to accessing credit from the money lenders. This implies that as non-farm income increases the probability of accessing credit decreases by 0.01% compared to household that do not apply for credit in the study area.

Access to Credit from ROSCAs

Table 4 shows that age; gender and occupation were found to be important variables influencing smallholder farmers' access to credit in ROSCAs. The effect of age of household heads on access to credit was statistically significant and positive at 5% level of significance. This implies that as the age of household heads increases, the probability of accessing credit increases by a marginal value of 2.7% in comparison to household that do not request for credit in the study area. This means that an increase in age of household head increases the likelihood of access to credit. The gender of household heads' shows a positive sign of coefficient significant at 5% with positive marginal effect on access to credit in ROSCAs. This implies that being male increases the probability of access to credit by 23.8% relative to the household that failed to apply for credit in the study area.

Access to Credit from Money Lenders

Table 4 shows that years of completed education, marital status, dependency ratio and non-farm income were significant in influencing access to credit from the money lenders in Ondo state. Years of completed education show a positive sign of coefficient at 10% level of significance with positive marginal effect. The result implies that as years of completed education increases, the probability of accessing credit increases by 1.6% compared with the base category where no access was made for credit. The above finding supports the fact that education increases the probability and ability to complete the loan documents and understand the lending policies. The marital status of the household head shows negative coefficient significant at 5% level of significance. This implies that being a married household head decreases the likelihood of access to credit from the money lenders by 1.0%. This at variance with the submission of Ferede (2012) that single-headed households or widowed are often considered 'less lucky' or disadvantaged in accessing credit however, Jappelli (1990) submitted that married couples could be given more credit because they are less mobile and loans may be jointly underwritten and singles are more likely to be constrained than married couples. Dependency ratio shows a negative sign of coefficient but statistically significant at 1% level of significance with negative marginal effect on the probability accessing credit from the money lenders. This implies that as the dependency ratio increases the probability of accessing credit decreases by 13.1% ($p<0.10$) relative to the reference category. This could be connected with the fear exercised by credit operators on high rate of default by smallholder farmers. Non-farm income of household heads was found to be positively significant at 5% level of significance to accessing credit from the money lenders. This implies that as non-farm income increases the probability of accessing credit increases by 0.3% compared to household that do not apply for credit in the study area.

Table 4: Multinomial Logit Model for Factors Influencing Smallholder Famers Access to Credit in Ondo State

Explanatory Variable	Banks		Cooperative Societies		ROSCAs		Money Lenders	
	Coefficient	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal effect	Coefficient	Marginal effect
Age	0.0356(0.67)**	0.003	0.1555(1.64)	0.000	0.1398(2.94)***	0.027	0.0046(0.10)	-0.213
Gender	0.3822(0.55)	0.000	3.6386(2.12)*	0.004	1.2714(2.07)**	0.238	0.0332(-0.06)	0.136
Years Educ.	-0.0550(0.94)***	-0.005	-0.0313(-0.82)	-0.000	-0.0405(-0.78)	-0.009	0.0071(-0.15)*	0.015
Maristat	0.7071(0.46)	0.062	-0.0607(-0.02)	-0.000	-0.2178(-0.15)	-0.052	-0.1042(-0.10)**	-0.021
H/H size	0.0421(0.25)***	-0.002	0.1123(0.36)	0.000	0.0658(0.52)	-0.001	0.1475(1.24)	0.025
Occupation	-1.2918(-1.34)	-0.149	5.9046(3.25)***	0.024	1.2413(1.77)*	0.215	0.6243(0.96)	0.039
Depend ratio	-0.5024(-0.76)	0.001	1.7486(1.53)	0.003	-0.5894(-1.13)	-0.020	-0.9113(-1.76)*	-0.131
Distance	-0.0484(-1.14)	-0.002	-0.0420(-0.56)	-0.000	-0.0254(-0.87)	-0.002	-0.0122(-0.40)	0.001
Land size	0.6779(1.95)*	0.047	-0.1395(-0.28)	-0.000	-0.3198(-1.15)	-0.056	0.0748(0.29)	0.067
Nonfarminco	1.1728(1.20)	0.119	-4.6310(-2.59)***	-0.015	0.0017(0.00)	0.107	1.3103(-2.05)**	0.316
Constant	-1.3833(-0.50)		-4.4997(-2.83)***		--4.5986(-1.97)**		1.1286(0.56)	
Observation	156	LR chi$^2_{(10)}$	191.23	Pro b>chi^2	0.0000	Pseudo R^2	0.4603	LogLikelihood -349.3373

Source: Field survey, 2014 * ** and *** significant at 10%, 5% and 1% level. Absolute value of z statistics in parenthesis.

Conclusion and Recommendations

This study examined factors influencing smallholder farmers' access to credit in Ondo state. Analysis of data for the study revealed the mean age of household heads was 44.3years, 60.3% were male and 57.1% were married with mean household size of 6 members per household however, 60.3% had primary education. The major source of credit to the smallholder farmers in the study area was the money lenders. Lack of collateral security and inadequate fund/rationing and high transaction cost were some of the challenges militating against easy access to credit. Furthermore, the MNL model revealed age, education of smallholder farmers; household size and occupation among others were some of the factors influencing access to credit from the various sources of credit in the study area. Hence the need for financial institutions to review the collateral security arrangements, women should be given access and credit policies should be made flexible and accessible to the smallholder farmers. Household heads should be mobilized into cooperative group to enable them harness resources together to boost their access to credit from bank.

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