

Access to Credit by Vegetable Farmers in Nigeria: A Case Study of Owerri Agricultural Zone of Imo State, Nigeria

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ABSTRACT

This study examined the access to credit by vegetable farmers in Nigeria with Owerri agricultural zone of Imo State, Nigeria as a case study. Multi-stage random sampling technique was used to select 120 vegetable farmers. Descriptive and inferential statistics, logit model and factor analysis were used for data analysis. The results showed that the respondents had the following mean scores: Age 43.7 years, household size 6.2, average farming experience 9.9 years and farm size 1.32 ha. About 74.5% of these respondents accessed credit from informal sources while only 25.5% had access through formal sources. Logit model result showed that education and land tenure had significant ($p<0.05$) relationship with access to informal credit, while education, household size, off-farm income and farming experience had significant ($p<0.10$) relationship with farmers' access to formal credit. Factor analysis result showed that the constraints against vegetable farmers in obtaining formal credit in the study area were untimely delivery of credit, bureaucratic processes, high administrative charges, high interest rates, high transaction costs, unreliability and hidden charges. It is evident from this study that vegetable farmers in the study area did not have access to credit especially formal credit and therefore necessary agricultural credit schemes were recommended.

Key words: Access to credit, vegetable farmers, formal credit, informal credit, owerri agricultural zone, Nigeria

INTRODUCTION

In Nigeria, one of the major problems confronting small scale farmers is poor access to adequate credit, even though this category of farmers produces the bulk of the domestic agricultural output (Eze and Ibekwe, 2007). Access to credit is regarded as one of the key elements in raising agricultural productivity (DBSA., 2005). Availability of adequate and timely credit help in expanding the scope of operation and adoption of new technologies, enhance the purchase and use of improved inputs and facilitate other up-stream and down-stream operations in agriculture (Oladeebo and Oladeebo, 2008). Modern agriculture requires high-yielding seeds, fertilizers and pesticides most of which have to be purchased against the background of increased monetization of the rural economy. More and more farm households have come to depend on credit. Credit provides cash reserves required to fast track the process of production and consumption in the next cycle. It provides an opportunity for the farmers to meet their consumption requirements and input needs (Feder *et al.*, 1990). The development process of the agricultural sector can be triggered by

the ease with which credit is obtained by farmers. However, for a farmer to derive benefits from any institutional credit, the size of loan, the process of granting such loan, timeliness in disbursement and repayment are important, irrespective of the level of education, marital status and family size of the farmer (Nweze, 1991).

Agricultural credits are loans extended to farmers for production, storage, processing and marketing of farm products. Such credit can be short, medium or long term depending on its duration. Credit institutions range from well developed and large sized commercial banks to localized small cooperatives. It can also be formal or informal. According to Diagne and Zeller (2001), a household is said to have access if it is able to borrow from a credit source (commercial banks, cooperative societies, money lenders, etc). The extent of access to credit is measured by the maximum amount a household can borrow at a time from a given source.

Vegetable production in Nigeria is carried out by thousands of small scale farmers. The intensity of their effort and the extent of reward from their production, need to be investigated and documented. Because of the absence of timely credit facilities at reasonable rates, many vegetable farmers, who are willing, are unable to buy improved seeds and manures or use other better methods or techniques of production (Olaitan, 2001). Use of modern technology is relatively expensive and small scale farmers cannot afford to self finance. As a result, the utilization of agricultural technologies is usually very low. Most vegetable farmers in the study area are subsistent farmers with limited access to inputs of production (IADP., 2000).

Furthermore, it has been noted that most vegetable production in the study area takes place on parcels of land set aside for legally planned but yet to be executed non-agricultural projects. These farms are therefore found near private and public lands, riverbanks and real estates. Credit is needed if these farmers are to be able to acquire more permanent estates and locations, if their operations are to be sustainable.

This study analyzed the access to credit by vegetable farmers in Nigeria using Owerri Agricultural Zone of Imo State as a case study. Specifically, the study sought to, (1) Describe the socio-economic characteristics of vegetable farmers in the study area, (2) Describe the sources of credit used by the vegetable farmers, (3) Ascertain the farm-specific and institutional factors that influence access to credit by these farmers, (4) Identify the credit constraints faced by the vegetable farmers and (5) Make appropriate recommendations based on the findings.

MATERIALS AND METHODS

The study was carried out in Owerri Agricultural Zone of Imo State, Nigeria. Imo State is located in the Southeast zone of Nigeria and lies between latitude 5°10'N and 6°35' and longitudes 6°35'E and 7°28'E (Ministry of Lands Survey and Urban Planning Owerri, 1992). Owerri Agricultural Zone is one of the three agricultural zones in Imo State. It is located at the southwestern part of the State. It is bounded on the East by Abia State, on the west by Anambra and Rivers States, on the North by Isu and Isiala Mbano Local Government Area of the State and on the south by Abia and Rivers State (IADP., 2000). Owerri Agricultural zone is made up of eleven Local Government Areas (LGAs) namely; Aboh Mbaise, Ahiazu Mbaise, Ezinihitte Mbaise, Ikeduru, Mbaitoli, Ngor-okpala, Ohaji/Egbema, Oguta, Owerri Municipal, Owerri North and Owerri West. There are two main seasons in the zone-dry and rainy seasons. The mean annual temperature is between 26-28°C with a relative humidity of about 98% during the wet seasons (IADP., 1990). The

zone is richly endowed with fertile land suitable for the growth of vegetables like fluted pumpkin, telfera, okra and water leaf. Farmers in the zone are mainly small holders with about 80% of them involved in vegetable production (IADP., 1990).

A multi-stage random sampling technique was adopted in selecting the respondents for the study. Random sampling was used in the selection of 6 out of the 9 LGAs that made up the study area. From each of these LGAs, 4 communities were purposively selected according to the intensity of vegetable production in the area. Five vegetable farmers were also randomly selected from each community to give a total of one hundred and twenty respondents. One hundred and fifteen of the respondents were finally used for the analysis because 5 of the respondents provided inconsistent information and were discarded during analysis. Data was obtained from primary sources with the aid of pre-tested questionnaire administered by trained enumerators.

Objectives (1) and (2) were achieved using descriptive statistics such as frequency, percentages and mean. Objective (3) was realized with the use of logit model, while objective (4) was achieved using factor analysis with principal component analysis as the extraction method.

Logit model: Logit model was used to determine the factors that influence access to informal/formal credit by the respondents.

The Logit model was specified thus:

$$p_i = P[Y_i = 1/x_i] = \frac{\exp(\beta_1 + \beta_2 x_i)}{(1 + \exp(\beta_1 + \beta_2 x_i))^2} \quad (1)$$

where, P is lies between 0 and 1 ($0 < p_i < 1$).

The p_i is the dependent binary variable (1 for access to informal/formal credit and 0 otherwise) and X_i is the independent variable

Where:

- I = 1, 2, 3,..., 10
- X_1 = Sex (Male = 1, female = 0)
- X_2 = Age of farmer (Years)
- X_3 = Education level of farmer (Years of schooling)
- X_4 = Household size (number)
- X_5 = Off-farm income (in Naira)
- X_6 = Farming experience (Years)
- X_7 = Farm size (Hectare)
- X_8 = Extension contact (Dummy yes = 1, 0 otherwise)
- X_9 = Cooperative membership (Dummy yes = 1, 0 otherwise)
- X_{10} = Land Ownership (Owned his/her farmland = 1, 0 otherwise)

Factor analysis: Factor analysis was employed to identify constraints to Credit from formal source by vegetable farmers. To group the identified constraints, principal component analysis with varimax rotation was used. The cut off point for factor loading was /0.50/. Therefore, factor loading less than 0.50 or variable that load in more than one factor were discarded (Madukwe, 2004).

Model specification for factor analysis: Principal component factor analysis model used to determine factors that constrained vegetable farmers from obtaining credit from formal sources. This was stated as follows:

$$\begin{aligned}
 Y_1 &= a_{11}X_1 + a_{12}X_2 + \dots + a_{1n}X_n \\
 Y_2 &= a_{21}X_1 + a_{22}X_2 + \dots + a_{2n}X_n \\
 Y_3 &= a_{31}X_1 + a_{32}X_2 + \dots + a_{3n}X_n \\
 * &= * \\
 * &= * \\
 * &= * \\
 Y_n &= a_{n1}X_1 + a_{n2}X_2 + \dots + a_{nn}X_n
 \end{aligned}$$

Where:

- Y_1, Y_2, \dots, Y_n = Observed variables/constraints to credit from formal sources by vegetable farmers
- $a_{11}-a_{nn}$ = Factor loadings or correlation coefficients
- X_1, X_2, \dots, X_n = Unobserved underlying factors constraining vegetable farmers from obtaining credit from formal sources

To test whether there were significant differences between the access of these farmers to credit from formal and informal sources, the Levene's test for equality of means was carried out at 0.05 level of significance. The mean scores of the farmers on factors that constrained access to the 2 sources of credit were compared at 5% probability level using the Levene's approach.

Levene's test is an inferential statistics used to assess the equality of variances in different samples. It tests the null hypothesis that the population variances are equal (called homogeneity of variances or homoscedasticity). If the resulting p-value of Levene's test is less than some critical value (typically 0.05), the obtained differences in sample variances are unlikely to have occurred based on random sampling from a population with equal variances. Thus, the null hypothesis of equal variances is rejected and it is concluded that there is a difference between the variances in the population.

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents: Table 1 showed that 33% of the vegetable farmers had a mean age of 43.7 years, implying that the farmers were still productive and economically active. This agrees with the result of Otitoju and Arene (2010) that small-scale soybean farmers in Benue State were within the productive age range. Majority of the respondents (76%) were married, implying that more married people are involved in vegetable farming in the study area. This may also not be unconnected with access to credit which usually favours male respondents (Agbugba *et al.*, 2014). This trend seems to agree with the findings of Mbam *et al.* (2011), who found that 79% of sampled vegetable farmers in Ebonyi state were married. There was slight gender bias in access to credit in the study area because about 54% of those that obtained credit were males. This shows that vegetable production is dominated by male farmers in the study area. This has implication on gender equality and calls for main streaming of the female gender in vegetable production since they constitute the bulk of work force in agricultural production.

Table 1: Frequency distribution of vegetable farmers in Owerri agricultural zone by their socio-economic characteristics

Variables	Frequency	Percentage
Age (Years) mean = 43.7 years		
≤30	10	8.7
31-40	32	27.8
41-50	38	33.0
51-60	25	21.7
60	10	8.7
Total	115	100.0
Marital status		
Single	20	17.4
Married	87	75.7
Divorced	1	0.9
Widow/widowed	7	6.1
Total	115	100.0
Sex		
Male	62	53.9
Female	53	46.1
Total	115	100.0
Level of education (years) mean = 11.5 years		
Never attended school	6	5.2
Attended primary school	20	17.4
Attended secondary school	43	37.4
Attended any higher institution	46	40.0
Total	115	100.0
Household size (No.) mean = 6.2		
1-5	53	46.1
6-10	51	44.3
11-20	11	9.6
Total	115	100.0
Farm size (hectare) mean = 1.32 ha		
<1.0	58	50.4
1.1-5.0	57	49.6
Total	115	100.0
Farming experience (years) mean = 9.9 years		
1-5	6	5.2
6-10	71	61.7
11-15	29	25.2
16-20	9	7.8
Total	115	100.0
Extension contact		
No extension contact	66	57.4
Extension contact	49	42.6
Total	115	100.0
Cooperative membership		
No	60	52.2
Yes	55	47.8
Total	115	100.0

As indicated in Table 1, as much as 94.3% of the respondents had formal education, with the average year of schooling scoring 12 years. This result agrees with the findings of Otitoju and Arene (2010) that average year of schooling for farmers in Benue State was 11 years and also Nwaru and Onuoha (2010), who also noted an average year of schooling of 10 years for farmers in Imo State, Nigeria. The possible explanation is that farmers with formal education are more likely to access credit compared with the uneducated ones. Mean household size for the study was 6 persons. Household size at times determines the availability of family labour. Family labour is recognized as a major source of labour supply in small holder production. Higher household size, however, may at times not translate to higher use of family labour. Average farm size in the study area was 1.32 ha, implying that vegetable farming in the study area was dominated by small holder farmers. Mean farming experience was 9.9 years, implying that there are older farmers in the study

area than younger farmers. Majority (57.4%) of the sampled vegetable farmers had no contact with agricultural extension services or personnel. This may have hindered their access to modern or improved technologies in vegetable production. From Table 1 also, about 52.2% of the vegetable farmers did not belong to cooperative societies. This may have hindered their access to credit services offered through cooperatives.

Sources of credit for the respondents: About 25.5% (Table 2) of the farmers got credit from formal sources while 74.5% got theirs from informal sources. Informal credit institutions proved relatively more successful in meeting the credit needs of the farmers in the study area though the limited resources of the informal sources usually restrict the extent to which they can effectively and substantially satisfy the credit needs of farmers. The reason behind this is that as farm enterprise grows in size, the nature of loan required becomes increasingly difficult for informal credit sources to satisfy its credit needs, yet they still remain too small for the formal lenders, who consider them as uncredit-worthy.

Credit markets in Africa have mainly been characterized by their inability to meet the existing demands for credit in rural areas. For the informal sector, the main reason for this inability is due to the small size of the resources it controls, while for the formal sector, it is not the inadequate lending base but difficulties in loan administration like screening and monitoring, high transaction costs and the risk of default (Aryeetey, 1996).

Factors that influenced access to credit by the respondents: Access to credit is very crucial to small scale farmers especially in less developed nations of the world. This is because it increases farmer's total production and improves their productivity per unit input. Credit is a necessary ingredient in the various aspect of farming operation. However, there are factors that influence access to credit (both formal and informal) by farmers (Oladeeo and Oladeeo, 2008). This section presents these factors that influence their access to credit.

Factors that influenced access to informal credit: The result of the logit model indicates that different socio-economic factors (sex, age, education level, household size, off-farm income and farming experience) and farm-specific and institutional factors (farm size, extension contact, cooperative membership and land ownership) influenced access to credit from informal sources. The likelihood ratio statistics as indicated by χ^2 statistics were highly significant ($p<0.10$), suggesting the model used had a strong explanatory power. In terms of consistency with a priori expectations on the relationship between the dependent and the explanatory variables, the model seems to have behaved well. Table 3 presents the parameter estimates, standard error and the z-ratios from the logit model.

Table 2: Frequency distribution of vegetable farmers by sources of credit in Owerri agricultural zone, Imo State, Nigeria

Source of credit	Frequency	Percentage
Informal source		
Friends and relatives	67	24.5
Neighbours	41	14.9
Cooperative societies/farm associations	75	27.4
Money lenders	21	7.7
Formal source		
Commercial banks	34	12.4
Savings and thrift institutions	23	8.4
Bank of Agriculture (BOA)	13	4.7
Total	274*	100.0

*Multiple response

Table 3: Factors that influence access to informal credit by vegetable farmers in Owerri agricultural zone of Imo State, Nigeria

Variables	Coefficient	Standard error	z-value	p>/z/
Socio-economic factors				
Sex (male = 1, female = 0) (X_1)	0.658	0.446	1.47	0.140
Age (years) (X_2)	0.0272	0.0257	1.06	0.289
Educational level (years of schooling) (X_3)	-0.698	0.304	-2.30	0.022**
Household size (number) (X_4)	-0.099	0.0813	-1.22	0.224
Off-farm income (naira) (X_5)	-4.21e-07	9.80e-07	-0.48	0.667
Farming experience (years) (X_6)	-0.0926	0.0599	-0.15	-0.15
Farm-specific and institutional factors				
Farm size (hectare) (X_7)	-0.272	0.322	-0.85	0.398
Extension contact (yes = 1, no = 0) (X_8)	-0.292	0.478	-0.61	0.542
Cooperative membership (yes = 1, no = 0) (X_9)	0.000114	0.484	0.00	1.000
Land ownership (owned his/her farmland = 1, 0 otherwise) (X_{10})	1.154	0.509	2.27	0.023**
Constant	0.911	1.458	0.62	0.532
Number of observation	115.0			
LR chi ² (10)	17.36			
Prob>chi ²	0.0668			
Pseudo R ²	0.1128			
Log likelihood	-68.29			

***p≤0.01, **0.0<p≤0.05, *0.05<p≤0.10

Table 3 shows that education level of the farmers had negative but and significant ($p<0.05$) relationship with the probability of farmers' to access credit from the source. This implies that a one-unit increase in education (i.e., years of schooling), would lead to 0.698 (69.8%), decrease in the probability of having access through informal source. This means that less educated farmers had greater recourse to borrow from informal sources. Furthermore, land ownership had a positive and significant ($p<0.05$) relationship with the probability of farmers' access to access credit from the informal source. This implies that vegetable farmers who had own lands have access to credit from informal sources probably, because the lenders have greater assurance of repayment.

Factors that influenced access to formal credit: Factors that influenced the farmers' access to formal credit included gender, age, education level, household size, off-farm income and farming experience. The farm-specific and institutional factors that affected access were farm size, extension contact and cooperative membership.

Table 4 shows that education level of the farmers had direct and significant ($p<0.05$) relationship with the probability of farmers' access to formal credit in the study, implying that a one-unit increase in years of schooling would lead to 0.3632 (36.32%) increase in the probability of having access to formal credit. This agrees with a priori expectation. This means that better educated farmers had more access to formal sources of credit than the less educated ones. This may be because they are more aware of the available credit sources. This agrees with the work of Sanusi and Adedeji (2010), which confirmed positive relationship between literacy level and accessibility of small scale farmers to formal source of credit in Ogbomoso zone, Oyo State, Nigeria. Household size had direct and positive significant relationship ($p<0.10$) with the probability to access credit from the source. Off-farm income, also had direct and positive significant relationship ($p<0.005$) with the probability of having access to formal credit. This implies that a-unit increase in off-farm income increases the probability of having access to formal credit sources by 0.00000255. Vegetable farmers that had off-farm employment might be privy to formal credit sources information than their counterpart that was into vegetable production on full-time basis. In the same vein, farming experience had direct and significant relationship ($p<0.05$) with the probability of access to formal

Table 4: Factors that influence access to formal credit by vegetable farmers in Owerri agricultural zone of Imo State, Nigeria

Variables	Coefficient	Standard error	z-value	p>/z/
Socio-economic factors				
Sex (male = 1, female = 0) (X_1)	-0.1373	0.2660	-0.52	0.606
Age (years) (X_2)	-0.00752	0.0157	-0.48	0.632
Educational level (years of schooling) (X_3)	0.3632	0.1945	1.87	0.062*
Household size (number) (X_4)	0.0848	0.0512	1.66	0.098*
Off-farm income (naira) (X_5)	2.55e-06	1.22e-06	2.09	0.037**
Farming experience (years) (X_6)	0.0779	0.3949	1.97	0.049**
Farm-specific and institutional factors				
Farm size (hectare) (X_7)	0.0944	0.2178	0.43	0.664
Extension contact (dummy) (X_8)	-0.0217	0.2845	-0.08	0.939
Cooperative membership (dummy) (X_9)	0.016	0.2847	0.06	0.955
Constant	-1.785	0.955	-1.87	0.062**
Number of observation	115			
LR chi ² (9)	15.19			
Prob > chi ²	0.0860			
Pseudo R ²	0.0986			
Log likelihood	-69.38			

***p≤0.01, **0.01<p≤0.05, while *0.05<p≤0.10

Table 5: Varimax rotated of constraints facing vegetable farmers in obtaining credit from formal institutions in Owerri agricultural zone, Imo State, Nigeria

Variables	Factor 1	Factor 2	Factor 3	Commonality
Untimely delivery of credit	0.837			0.757
Bureaucratic processes involved in obtaining loan	0.798			0.773
Stringent terms and conditions on credit use	0.765			0.692
High administrative charges	0.594			0.441
High interest rate		0.751		0.649
Collateral requirements		0.682		0.663
Inability to get the amount of loan requested for		0.678		0.510
High transaction cost		0.807	0.725	
Distance of the formal credit institutions to the farmers residents			0.761	0.730
Undisclosed/hidden charges attached to the credit			0.584	0.674
Percentage of total variance	41.02	15.45	9.680	

Factor 1: Untimely delivery of credit, bureaucratization, stringent conditions and high administrative charges, Factor 2: High interest rate, collateral requirements and inability to get the needed loan and Factor 3: High transaction cost, distance to the formal credit institutions and hidden charges

credit. A unit increase in the year of farming experience increases the probability of having access to formal credit by 0.0779 (7.79%). The more experienced a farmer is in vegetable farming the more he/she can reliably handle credit from formal sources. This shows that with increasing farming experience, farmers became very avant-garde about sourcing credits from formal sources.

Constraints to access to credit: Table 5 shows the varimax-rotated principal component factor analysis of major factors constraining access to credit in the study. Three factors were extracted based on the responses of the respondents. The Kaiser criterion (1960) was used for selecting the number of underlying factors or principal components explaining the data. In this study, the number was decided by leaving out components with corresponding Eigen values (a measure of explained variance) of less than one. Only variables with factor loadings of /0.50/ and above at 10% overlapping variance were used in naming the factors. Variables that have factor loading of less than /0.50/ were not used while variables that loaded in more than one constraints were also discarded (Madukwe, 2004). The communalities represent the relation between the variable and all other variables (i.e., the squared multiple correlation between the item and all other items). These factors are: Factor 1 (Untimely delivery of credit, bureaucratization, stringent conditions and

high administrative charges), factor 2 (high interest rate, collateral requirements and inability to get the needed loan) and factor 3 (high transaction cost, distance to the formal credit institutions and hidden charges).

After rotation, the first factor accounted for 41.02% of the variance, the second factor accounted for 15.45% and the third factor accounted for 9.68%. The true factors that were retained explained 66.15% of the variance in the 10 constraining factors or variable components.

Variables that loaded under factor 1 (Untimely delivery of credit, bureaucratization, stringent conditions and high administrative charges) included; untimely delivery of credit (0.837), bureaucratic processes involved in obtaining loan from formal credit institutions 0.798, stringent term and conditions on credit use (0.765) and high administrative charges (0.594).

Among the vegetable farmers the specific issues that amplified the constraints included; high interest rate (0.751), collateral requirements (0.682) and inability to get the amount of loan requested for (0.678).

Under factor 3 (high transaction cost, distance to the formal credit institutions and hidden charges) factors that loaded high included, high transaction cost (0.807), distance of the formal institutions to the farmers' residence (0.761) and undisclosed/hidden charges attached to the credit (0.584).

The findings of this study agree with Olowa and Olowa (2011) who found that problems restricting farmers and other rural entrepreneurs' access to formal credit included high transaction costs in form of travel costs to lenders, application fees, collateral requirements, restrictions on loan usage, concerns about the timely delivery of credit, inflexibility in loan repayments and the need to make applications for the loans.

CONCLUSION

It is then evidenced from this study that the vegetable farmers did not have enough access to credit especially formal credit. Therefore, the credit needs of these farmers need to be well attended to through necessary agricultural credit programmes and schemes. To achieve this, appropriate government and private agencies and institutions should be charged with the responsibilities of ensuring that agricultural credit are designed and administered in such a way that the small-scale farmers, women and landless/ tenants can have access and get it for their farming activities.

The findings of this study have some important policy implications for enhancing access of vegetable farmers to credit especially formal sources of credit. The following recommendations are therefore presented:

- An intensive credit education should be incorporated to educate the farmers on how to source and use credit
- Government should support as a matter of fact its credit policy with the provision of infrastructure, good marketing facilities, storage, processing and manpower training, since credit does not exist in a vacuum
- All inclusive supervised credit programmes/schemes especially agricultural credit schemes that take into consideration those that have been traditionally left out by previous credit programmes/schemes-experienced smallholder farmers, women and resource poor should be put in place to enhance agricultural productivity in Nigeria especially for peri-urban farming activities or enterprises like vegetable farming

- Laws on rural savings should be promulgated to regulate indigenous and informal credit institutions as veritable agencies for savings mobilization. It is also imperative that one or other rural saving institutions (post office savings banks, cooperative banks, formal saving and thrifts agencies etc) should be encouraged to spring up in the rural communities
- Farmer friendly interest rate should be put into consideration, when establishing credit programmes and institutions that target farmers, as this will enhance their access to credit especially the formal type
- Managers of formal credit institutions and credit officers need to be trained and re-trained on how to reduce the bureaucracies involved in lending to small-scale farmers especially vegetable farmers

REFERENCES

- Agbugba, I.K., E.J. Ihemezie and A.E. Ahmed, 2014. Informal sources of financing climate change adaptation amongst crop farmers in Nigeria. *Int. J. Agric. Sci. Res. Technol. Exten. Educ. Syst.*, 4: 7-13.
- Aryeetey, E., 1996. Informal Financial Markets in Africa. In: *Forging Links: Economic Research and Policy Making in Sub-Saharan Africa*, Mathew, M. and G. Ngola (Eds.). African Economic Research Consortium, Nairobi.
- DBSA., 2005. Development report 2005. Development Bank of South Africa (DBSA), Agriculture in South Africa Second Economy.
- Diagne, A. and M. Zeller, 2001. Empirical measurements of household's access to credit and credit constraints in developing countries. *Methodological Issues and Evidence*, International Food Policy Research Institute, Washington DC.
- Eze, C.C. and U.C. Ibekwe, 2007. Determinants of loan repayment under the indigenous financial system in Southeast, Nigeria. *The Social Sci.*, 2: 116-120.
- Feder, G., L. Lau, J. Yifo Lin and X. Luo, 1990. The relationship between credit and productivity in Chinese agriculture: A microeconomic model of disequilibrium. *Am. J. Agric. Econ.*, 72: 1151-1157.
- IADP., 1990. sWork program. Imo State Agricultural Development Programme (IADP), Imo ADP, Owerri, Imo State.
- IADP., 2000. Annual report 2000. Imo Agricultural Development Programme (IADP), New York.
- Madukwe, M.C., 2004. Multivariate Analysis for Agricultural Extension Research. In: *Research Methods in Agricultural Extension*, Olowu, T.A. (Ed.). Agricultural Extension Society of Nigeria. (AESON), Agricultural and Rural Management Training Institute (ARMTI), Ilorin, Nigeria, pp: 206-236.
- Mbam, B.N., S.U. Nwibo and K.N.N. Ezike, 2011. Urban agriculture: A sustainable tool for poverty reduction in Abakiliki urban of Ebonyi state. Proceedings of the 25th Farm Management Association of Nigeria (FAMAN) Conference, September 5-8, 2011, Akure, pp: 116-123.
- Ministry of Land Survey and Urban Planning Owerri, 1992. Area of Imo State by local government area. Government Printer, Owerri.
- Nwaru, J.C. and R.E. Onuoha, 2010. Credit use and technical change in smallholder food crop production in Imo State of Nigeria. *New York Sci. J.*, 3: 144-151.
- Nweze, N.J., 1991. The role of women traditional savings and credit cooperative small holder farm development. *Issues in Africa Rural Development*, pp: 234-236.

- Oladdeebo, J.O. and O.E. Oladdeebo, 2008. Determinants of loan repayment among smallholder farmers in Ogbomoso agricultural zone of Oyo State, Nigeria. *J. Soc. Sci.*, 17: 59-62.
- Olaitan, M.A., 2001. Emerging issues on micro and rural financing in Nigeria. *Central Bank Nigeria Bull.*, 35: 64-71.
- Olowa, O.W. and O.A. Olowa, 2011. Issues, problems and policies in agricultural credit: A review of agricultural credit in Nigeria. *Bangladesh Sociol. Soc.*, 8: 87-108.
- Otitoju, M.A. and C.J. Arene, 2010. Constraints and determinants of technical efficiency in medium-scale soybean production in Benue State, Nigeria. *Afr. J. Agric. Res.*, 5: 2276-2280.
- Sanusi, W.A. and L. Aadedeji, 2010. A probit analysis of accessibility of small scale farmers to formal source of credit in ogbomoso zone, oyo state, Nigeria. *Int. J. Agric. Environ. Biotechnol.*, 3: 21-25.