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Impact of informal agricultural credit on food security status of rural farm households in Enugu state, Nigeria

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ABSTRACT

Aim: The study was aimed to evaluate the impact of informal agricultural credit on food security status of rural farm households in Enugu state, Nigeria**.**

Materials and Methods: Multistage random sampling was used to select 240 rural farm households from whom data were collected using semi structured questionnaire. Data were analyzed using descriptive statistics, food security index, z-test and probit regression.

Results: The Results showed that farm households applied for ₦95,690.54 from informal sources but received ₦52,885.86 as informal credit. Result further showed that farm households had access to credit from friends/relatives (X = 3.86), daily/weekly contribution scheme (X = 3.51) and rotating joint contribution scheme (X = 3.16). Food security line, food insecurity incidence, food insecurity gap and food insecurity severity of the farm households were N9,612.31, 0.4228, 0.3873 and 0.2640 respectively before access to informal credit, while after access to informal credit, food security line, food insecurity incidence, food insecurity gap and food insecurity severity of the farm households were N12,202.19, 0.3162, 0.2369 and 0.1907 respectively. Z-test analysis showed that access to informal credit impacted significantly on food security line and food security incidence of farm households. Result of Probit regression analysis showed that gender of household head, level of access to informal credit, education level, extension access, farm income and household size were significant determinants of farm households' food security status.

Conclusion: It was concluded that access to informal credit had significant impact on farm households food security status.

Keywords: Farm households, food security, informal credit.

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Introduction

Credit has a significant role to play in increasing farm productivity and income because access to credit increases willingness of farming households to adopt more farming technologies which could result to increased productivity, output and income (Li & Zhu, 2007). Credit extended to farmers empowers them to invest in agriculture and permits them to sustainably remain in farming. According to Smith and Thurman (2007) the poor are poor not because they are lazy but often because they have no access to credit.

Even though it is well understood that financial exclusion of the rural population stunts development, fewer than two percent of rural households in Nigeria are estimated to have access to any form of institutional finance (International Fund for Agricultural Development, 2009). Adebajo (2010) noted that irrespective of the importance of credit for agricultural productivity, accessibility to formal credit has been difficult for most farmers in Nigeria. Their only respite has been to source credit from informal credit units. Such informal credit has been shown to improve welfare of farmers, smoothing their consumption and reducing their vulnerability to short term income shocks. Okurut and Thuto (2007) noted that informal credit is demanded by farmers for both productive investment (agricultural production and/or business) and consumption smoothening.

Within the parley of agricultural financing in Nigeria, informal credit sources are unquestionably most popular (Udoh, 2005). Collateral free lending, proximity, timely delivery and flexibility in loan transaction are some of the attractive features of informal credit available to farmers (Khandler & Farugee, 2001). Informal credit play important role in poverty reduction, enterprise development, creating opportunity for savings, empowerment of vulnerable groups, promotion of gender equality, and overall development of low-income farm households in the society (Pitt *et al*., 2006).

Informal financial sector is an unorganized sector that grants short term loans in credit markets, and involves lending and borrowing of small amounts among group members, friends or relatives. According to Simtowe *et al*. (2006), the provision of credit to rural farmers is widely perceived as an effective strategy for promoting adoption of improved technologies which could translate to increased food security. Cornejo and McBride (2002) opined that access to informal credit is a key determinant of adoption of most agricultural innovations. It is believed that access to informal credit by rural small scale farmers promotes their adoption of technologies through relaxation of liquidity constraint as well as through the boosting of household's risk bearing ability. Simtowe *et al.* (2006) reported that informal credit access had significant impact on the adoption of hybrid crops among credit constrained rural farm households in Malawi. Thus, improved access to informal credit facilitates optimal input use and could have a major impact on food security status of farm households.

Food security is defined as a situation that exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life (Food and Agricultural Organization, 1996). According to Algamir and Arora (1991), food security means the assured availability of food for individual households to draw on to meet their minimum consumption requirements during a given period.

Maintaining food security at the household level and individual level is still a major challenge for many developing countries including Nigeria. FAO (2012) estimated that about 900 million people globally are undernourished (food insecure). Vast majority of these undernourished people (about 852 million) live in developing countries, with the most vulnerable region being sub-Saharan Africa. The average amount of food available per person per day in the region was 1,300 calories compared to the world wide average of 2,700 calories (FAO, 2012). Ayodeji (2010) asserted that the number of hungry people in Nigeria is over 53 million, which is about 33% of the country's total population of roughly 160 million. The Global Food Security Index (GFSI) of the Economist Intelligence Unit ranked Nigeria among countries with low food affordability, availability and quality (Ahmed *et al.,* 2015). These are matters of grave concern largely because Nigeria was self-sufficient in food production and was a net exporter of food to other regions of the world in the 1950s and 1960s. Although, successive Nigeria governments in an attempt to alleviate the food insecurity problem in the country have made efforts to achieve national food security through setting up of a number of agricultural development institutions, and special programmes and projects which include: the National Agricultural Development Fund, NADF (2002); National Special Programme on Food Security, NSPFS (2002); National Food Crisis Response program [NFCRP] and Food Security Thematic Group [FSTG] in 2009, an overwhelmingly large proportion of Nigerians are still food insecure (Abimbola & Kayode, 2013).

Among Nigerian households, rural farm households are the most vulnerable to food insecurity even though they produce the bulk of food eaten within the country (Osondu, 2018). Most foods produced by farming households in Nigeria are consumed, or sold for cash only to be repurchased when household barns run short with supplies. This cyclic and unstable condition most times leaves affected farm households in a state of food insecurity (Emerole *et al*., 2014).

According to Mafimisebi *et al*. (2009) robust economic growth cannot be achieved without making adequate policies and initiating programmes aimed at reducing poverty and food insecurity. It is imperative that the effect of informal credit on farm household's food security in Enugu State be empirically determined as a reference point for economic policies aimed at improving food security status of rural farm households. The specific objectives of this study were to: (i) describe socio-economic

characteristics of rural farm households in Enugu state; (ii) estimate amount of informal credit applied for and received by the rural farm households; (iii) assess level of access of the rural farm households to credit from informal sources; (iv) assess food security status of the rural farm households before and after access to informal credit; (v) ascertain impact of informal credit on food security status of the rural farm households; and (vi) determine factors influencing food security status of the rural farm households.

Materials and Methods

Study Area

The study was carried out in Enugu State, which is one of the five states in south-eastern Nigeria. The state has a land area of 7,161 Km^2 and population of about 3.891,339 million persons comprising 1,990,773 females and 1,900,566 males, with an annual projected percentage increase of 2.6% from base year (National Population Commission, 2006). Enugu State is bounded to the Northwest and Northeast by Kogi State and Benue State respectively, to the East by Ebonyi State, to the South by Abia State and Imo State and to the West by Anambra State. The state is located between latitudes 58°50´ N and 78°01´ N of the Equator and longitudes 68°50´ E and 78°55´ E of the Greenwich Meridian. The state has 17 Local Government Areas (LGAs) clustered within three agricultural zones (Enugu North, Enugu East and Enugu West).

Sampling Technique and Data Collection

Multi-stage random sampling technique was adopted for the study. First, one Local Government Area (LGA) was randomly selected from each of the three agricultural zones, to give three LGAs. The second stage involved random selection of four rural communities from each of the selected LGAs which gave twelve rural communities. In the third stage, two villages were selected at random from each of the twelve communities to give a total of twenty four villages. In each of the chosen villages, lists of informal credit sources were obtained from the village secretaries who served as key informants. These lists were used to form the sampling frame from which ten (10) farm household informal credit beneficiaries were randomly selected. In all a total of two hundred and forty farm households were selected for the study.

Data Collection: The research made use of primary data. The primary data were collected with the use of semi structured questionnaire. Method of administering the questionnaire was by personal interview. The data collected include socio–economic characteristics of the respondents (gender, age, education, farm size, farm income, marital status, amount accessed from informal credit sources, household size, farming experience, membership of association and extension contact). Data were also collected on value of household's food consumption before and after access to informal credit, and level of access to informal credit.

Data Analysis and Model Specification

The data were analyzed using descriptive statistics and inferential statistics. Objective (i) and (ii) were analyzed with descriptive statistics such as mean, frequency and percentages. Objective (iii) was achieved with aid of mean score derived using 5 point Likert type scale. Objective (iv) was analyzed with food security index while objective (v) was analyzed with Z-test analysis, while objective (vi) was realized using probit regression analysis.

A five point Likert type scale was used to determine level of access to informal credit as follows: (level of informal credit access was graded thus: very high = 5; high = 4; moderate = 3; low = 2 and very low = 1). Likert scaling is a method of ascribing quantitative values to qualitative perception to make them amenable for statistical analysis. The values of the responses were added and further divided by 5 to obtain a mean score of 3.0. Farmers with accessibility score of 3.0 and above were considered to have access to informal credit, while farmers with accessibility score of less than 3.0 were regarded as not having access to informal credit sources.

Thus mean accessibility score = $\bar{X}$

$\bar{X}$ = Σfx/N, ---------- (1)

Mean of each item was computed by multiplying the frequency of positive response with its appropriate likert nominal value and the sum was divided by the sum of the number of the respondents to the items. This is summarized by the equation below:

$\bar{X}$ = Σfn/N.---------- -- (2)

Where

$\bar{X}$ = Mean score;

Σ = Summation sign;

f = Frequency or number of respondents who responded positively;

n = Nominal Likert score;

N = Number of respondents

The farm households were classified into their food security status as either food secure or food insecure households based on the food security line. A food insecure household is that whose per capita monthly food expenditure falls below two-thirds of the mean monthly per capita food expenditure while a food secure household is that whose per capita monthly food expenditure is above or is equal to two-thirds of the mean per capita food expenditure (Hassan & Badu, 1991; Sulaiman *et al.*, 2015).

The food security index which was used to profile the food security status of the farm households was derived from Foster, Greer and Thorbecke (FGT) weighted poverty measure and had been applied to several studies whose main focus was food security (Hassan & Badu, 1991; Omonona & Agoi, 2007, Sulaiman, *et al.*, 2015). The FGT weighted poverty measure was adopted from Foster *et al.* (1984) and applied following Sulaiman *et al.* (2015) as:

$$P\alpha = \frac{1}{N}\sum_{i=1}^{q}\frac{z - Yi}{z}\alpha \geq 0 \ldots \quad (1)$$

Where:

Yi = Per capita household food expenditure (i = 1, 2 .....q);

z = Food security line;

N = Total number of farm households;

q = Number of food insecure farm households;

Pα = Weighted food security index, α ≥0 and it can take values of 0, 1 and 2. When = 0, the FGT index P_0 measures food insecurity incidence. This represents the proportion of the households that are food insecure i.e. the proportion of households that fall below the food security threshold (line). When = 1, the FGT index P_1 measures the food insecurity depth of the households. This denotes the proportion of food security line that the food insecure household required to get out of food insecurity. When = 2, the FGT index P_2 measures the severity of food insecurity status. It measures how far away the food insecure households are from the food security line.

$$Z = \frac{X_1 - X_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} \quad \ldots (2)$$

Where:

Z = Student "Z" Statistic

X_1 = Mean household monthly expenditure before access to informal credit

$\overline{X_2}$= Mean household monthly expenditure after access to informal credit

S_1^2 = Variance of household monthly expenditure before access to informal credit

S_2^2 = Variance of household monthly expenditure after access to informal credit

n_1 = Number of households before access to informal credit

n_2 = Number of households after access to informal credit

The Z-test will be tested at 5.0% alpha level of probability with a critical value of 1.96

Probit regression model was used to analyze factors influencing food security status of farm households. The probit model is appropriate when response takes one of only two possible values representing absence or presence. The model was used by Gujarati (2003). The probit regression model is explicitly expressed as follows:

Pi [y=1] = [Fzi]

Where,

Zi = β0 + β1X1… (3)

y1 = β1 + β2 X2i + … + βk Xki … (4)

yi* is unobserved but yi = 0 if yi* < 0, 1 if yi* ≥ 0

P (y1 = 1) = P (yi*≥ 0)

= P (u1≥ - β1 + β2 X2i +…+ βk Xki)… (5)

i = 1,2,…..240

Where Y_i = Food security status of farm households (food secure = 1; food insecure = 0)

β_1 = Unknown coefficients value of factors; X_1 = Gender of household head (male = 1; female = 0); X_2 = Age of household head (years); X_3 = Level of informal credit access (≥ 3.0 = access =1; < 3.0 = no access =0); X_4 = Dependency ratio (ratio of workers to non-workers in each household); X_5= Level of education (years); X_6= Extension access (access = 1; no access = 0); X_7= Annual farm income (Naira); X_8 = Farm size (Hectare); X_9 = Household size (Number); X_{10} = Household asset endowment (Total asset value) (Naira); X_{11} = Membership of agricultural association(1 if member; 0 if otherwise).

Results and Discussion

Socio-economic Characteristics of Farm Households

Distribution of the farm households according to selected socio-economic characteristics was presented (Table 1). It was showed that the farm households had mean household size of 7 persons. In the absence of well-functioning

labour markets, large households face fewer labour bottlenecks at critical points in the farming cycle such as land preparation and harvest (Ezeh *et al.*, 2012). The table also shows that mean farm size and mean annual farm income of the farm households were 0.78 hectare and ₦181,226.64 respectively, indicating that the farm business of most of the farm households was still small scale in nature and required external funding to boost production scale for higher income and food security status. The small farm size of the farm households could have been the reason why the farm households borrowed funds from informal credit source, since they would be constrained to satisfy the condition for formal loan acquisition. The annual farm income of ₦181,226.64 may not be adequate to access food in right amount in the face of prevailing economic crunch in Nigeria. The income farm households earn from farming have implications on the number of improved technologies and amount of food they can be able to access. According to Osondu and Ibezim (2015) the higher the farm income, the more likely farmers can save, invest in improved technologies and attain better welfare.

It was further showed that 55.83% of the farm households were headed by males, with about 48.33%, 34.17% and 8.33% of the farm household heads having attained secondary school education, primary school education and tertiary school education respectively (Table 1). The ability to read and write will enable farm household heads to better utilize effectively and efficiently available resources for increased productivity and food security status. According to Amaza *et al.* (2006) male headed households have higher probability of being food secure than those headed by females as a result of having relatively better access to land, credit and extension services.

Table 1: Distribution of farm households according to socio-economic characteristics

Variables	**Mean**
Household size (number)	6.87
Farm size (hectare)	0.78
Annual farm Income (₦)	181,226.64
Gender of household head	**Percentage (%)**
Male	55.83
Female	44.17
Level of Education Attained	**Percentage (%)**
No formal education	9.17
Primary school education	34.17
Secondary School education	48.33
Tertiary school education	8.33

Source: Field survey data, 2019

Size of Informal Loans Applied for and Received by Farm Households

Distribution of the farm households according to amount of loans applied for and amount received was shown (Table 2). The table shows that 25.83% of the farm households applied for informal credit between N 61000 to N 80000 from various informal sources; however, 9.17% of the farm households received loan amount of same range. The table also shows that 21.67% of the farm households applied for informal loan of N20000 at most but, surprisingly, 28.33% of the respondents received loan amount of that much. This implies that some farm households who applied for loan amount in higher ranges had lesser amounts approved for them from the informal credit sources. The mean amount of informal credit applied for and received by the farm households were N 75,690.54 and N 52,885.86 respectively. The lower amount of money received as loans by individuals in relation to the amount applied for shows that informal credit sources had low portfolio of loan facilities compelling funds to be rationed among successful applicants. The loans obtained by the farm households could be used to procure additional farm resources with which to increase farm income and finance household food expenditure. This could have a positive effect on food security level of beneficiary households.

Table 2: Distribution of the farm households according to amount of informal credit applied for and received

Loan size	**Amount applied for**		**Amount received**	
	Frequency	**%**	**Frequency**	**%**
1000- 20000	52	21.67	68	28.33
21000 – 40000	42	17.50	58	24.17
41000 – 60000	32	13.33	68	28.33
61000 – 80000	62	25.83	22	9.17
81000– 100000	28	11.67	16	6.67
101000-120000	24	10.00	8	3.33
Total	240	100.00	240	100.00
Mean	75,690.54		52,885.86	

Source: Field Survey, 2019

Level of Access of Farm Households to Credit from Informal Sources

The level of access of farm households to credit from informal sources was showed (Table 3. The table shows that the farm households had access to credit from friends/relatives (X = 3.86), daily/weekly contribution scheme (X = 3.51) and rotating joint contribution scheme (X = 3.16). All these informal credit sources had mean score values that are greater than the Likert critical score of 3.0, implying that the farm households

had access to credit from these informal sources. This result compares favourably with findings of Osondu (2014) that farmers in Abia state, Nigeria had unhindered access to credit from friends/relatives, daily/weekly contribution scheme and rotating joint contribution scheme.

Food Security Status of Farm Households Before and After Access to Informal Credit

It was showed the food security profile of the farm households before and after access to informal credit (Table 4). Food security indices were computed using data on household food expenditure. As shown in the table, the mean monthly household food expenditure before and after access to informal credit by the farm households were N14,418.47 and N18,303.28. Using this value, the farm households food security line (2/3 of mean per capita household food expenditure) was estimated as N9,612.31 and N12,202.19 before and after access to informal credit respectively.

It was further showed that food insecurity incidence of the farm households which is also known as head count ratio was 0.4228 before access to informal credit and 0.3162 after access to informal credit. This implies that 42.28% and 31.62% of the farm households were food insecure before and after access to informal credit respectively because their food expenditure fell short of two-third mean per caput household food expenditure used as food security line.

The food insecurity gap allows for the assessment of the depth of food insecurity among the farm households before and after access to informal credit, and indicates the minimum cost of eliminating food insecurity (relative to the food security line) among food insecure farm households. The food insecurity gap of the farm households was 0.3873 before informal credit access and 0.2369 after access to informal credit. This implies that the food insecure farm households before and after access to informal credit have household food expenditure shortfall of 38.73% and 23.69% of the food security line respectively. Therefore, the food insecure farm households required an increase of N3, 722.85 (0.3873 x N9612.31) before access to informal credit, and N2,890.70 (0.2369 x N12202.19) after access to informal credit in their average monthly food expenditure to enable them rise above the food security line. Abu and Soom (2016) obtained a similar result among rural and urban farmers in Benue State, Nigeria.

The value of squared food security gaps (food insecurity severity) of the farm households were 0.2640 and 0.1907 before and after access to informal credit respectively. This implies that there was 26.40% and 19.07% inequality respectively among the food insecure farm households before and after access to informal credit respectively.

Table 3: Distribution of the farm households according to level of access to informal credit

Level of access	Very high (5)	High (4)	Moderate (3)	Low (2)	Very low (1)	Total	Mean
Types of informal credit sources							
Friends/relatives	86 (430)	88 (352)	32 (96)	14 (28)	20 (20)	926	3.86
Money lenders	14 (70)	20 (80)	22 (66)	80 (160)	104 (104)	480	2.00
Daily/weekly contribution scheme	76 (380)	52 (208)	60 (180)	24 (48)	28(28)	844	3.52
Cooperative Society	28 (140)	22 (88)	40 (120)	98 (196)	52 (52)	596	2.48
Rotating joint contribution scheme	44 (220)	68 (272)	48 (144)	42 (84)	38 (38)	758	3.16
Total average mean							3.00

Table 4: Food security profile of the farm households before and after access to informal credit

Food security indices	Before access to informal credit	After access to informal credit
Mean monthly household food expenditure	14418.47	18303.28
Food security line (2/3 of pooled mean household food expenditure) (₦)	9612.31	12202.19
P_0 (Incidence of food insecurity)	0.4228	0.3162
P_1 (Gap or depth of food insecurity)	0.3873	0.2369
P_2 (Severity of food insecurity)	0.2640	0.1907

Impact of Informal Credit on Food Security Status of Farm Households

The result of z-test analysis on effect of informal credit on food security status of farm households was shown (Table 5). In terms of effect on food security line, the table revealed that the food security line of the farm households before accessing loan from informal sources was N 9,612.31, while their food security line after accessing loan was N 12,202.19. The mean

difference was N 2, 589.88. The result of the z-test for mean difference showed that it was statistically significant at 1% alpha level. This indicates that access to informal credit access had significant impact on welfare of the farm households especially with respect to food access and consumption.

With respect to food security incidence, the table revealed that the food security incidence of the farm households before informal credit access was 0.4228, while the food security incidence after informal credit access was 0.3162. The mean difference was N 0.1066. The result of the z-test for mean difference showed that it was statistically significant at 5% alpha level. This implies significant decrease in number of food insecure farm households as a result of having accessed informal credit.

Factors Influencing Food Security Status of Farm Households

The estimates of the probit regression model used to determine factors that influenced food security status of the farm households is presented in Table 6. The model posted a log likelihood value of -17.27182, McFadden R^2 value of 0.6793 and a goodness of fit LR statistic value of 57.5642 which was statistically significant at $p < 0.01$ level. Six variables out of the eleven independent variables included in the model were significant determinants of farm households' food security status.

Specifically, gender of household head posted a positive coefficient (1.098358) which was significant at 5% alpha level. This implies that male headed farm households had higher probability of being food secured than farm households headed by females. According to Osondu (2018) female heads of farm households have fewer years of formal education, and lower access to credit, extension services and land compared to male farm household heads, consequently, male headed farm households tend to have higher probability of being food secure.

The coefficient (0.229429) of level of informal credit access was positive and significant at 1% alpha level, implying that the probability of the farm households being food secure increased with rise in level of informal credit access. Credit is an important means of investment and household heads who have access to credit can adopt improved technologies and invest in preferred businesses earning more income which results to increased financial capacity and purchasing power of their households, thus increasing their probability of being food secured. This finding is consistent with the findings of Osei *et al.* (2013) and Ahmed *et al.* (2015) among farmers in Ghana and Nigeria respectively.

Level of education had positive coefficient (0.117365) which was significant at 5% alpha level, implying that increase in level of education of farm household head increased probability of the farm households being food secure. The positive impact of level of education on food security could be due to the fact that level of formal education is a major factor in wage earning opportunities and determination in Nigeria where the higher the academic qualification, the higher the wage/salary (Osondu, 2018). Thus enhancing non-farm income potentials of the households, with which more food could be bought. In addition, formal education improves human capacity and technical know-how which aids rate of adoption, thus improving productivity level and farm income of such households. The result supports findings of Babatunde *et al.* (2007) and Ahmed *et al.* (2015) but differs from finding of Sulaiman *et al.* (2015) which reported that households with higher educated heads had lower chance of being food secure.

The coefficients of extension access (0.603860) and farm income (0.213903) were positive and significant at 1% and 5% alpha levels respectively. This implies that the probability of the farm households being food secure increased with access to extension services and rise in farm income. Access to extension services tends to enhance chances of a household having access to better production techniques, improved inputs, as well as other production innovations that positively affect farm production and thus household food security (Sulaiman *et al.*, 2015). Income generated from the farm can be used to finance investment opportunities and consumption of other food items not produced by the household, thus increasing the household's overall food intake and food security status. This finding compares favourably with result obtained by Ahmed *et al.* (2015) and Osondu (2018) but contradicts findings by Ojeleye *et al.* (2014) that farm income had a significant negative effect on household food security status.

Table 5: Z-test statistics result of impact of informal credit on food security of farm households

Variable	Individual mean	Mean difference	Standard error	z-value	Critical Z-value
Food security line of farm households before accessing informal credit	9612.31	2589.88	1206.56	3.124***	2.57
Food security line of farm households after accessing informal credit	12202.19				
Food security incidence of farm households before accessing informal credit	0.4228	0.1066	0.0178	1.974**	1.96
Food security incidence of farm households after accessing informal credit	0.3162				
Food security gap of farm households before accessing informal credit	0.3873	0.1504	0.1013	1.057	1.96
Food security gap of farm households after accessing informal credit	0.2369				

***Source**: Field Survey, 2019*

*** and **, significant at 1% and 5% alpha levels respectively.

Table 6: Binary probit regression estimates of factors influencing food security status of farm households

Variables	**Estimated coefficients**	**Standard errors**	**Z-statistic**	**Prob.**
Constant	-4.601637**	2.105819	-2.185201	0.0289
Gender of household head	1.098358**	0.531028	2.068363	0.0386
Age of household head	-0.011060	0.021340	-0.518286	0.6043
Level of informal credit access	0.229429***	0.071607	3.204022	0.0014
Dependency ratio	0.073355	0.146593	0.500397	0.6168
Level of education	0.117365**	0.050529	2.322729	0.0202
Extension access	0.603860***	0.180685	3.342051	0.0008
Farm income	0.213903**	0.084666	2.526422	0.0115
Farm size	0.205825	0.139336	1.477184	0.1396
Household size	-0.155157*	0.089193	-1.739558	0.0819
Household asset endowment	0.159675	0.141009	1.132381	0.2575
Membership of association	0.168089	0.117655	1.428656	0.1531
Log likelihood	-17.27182			
LR statistic	47.5642***			
Prob (LR statistic)	0.0000			
McFadden R^2	0.6793			

***Source**: Field Survey, 2019*

***, **, * Significant at 1%, 5% and 10% alpha levels respectively.

The coefficient of household size (-0.155157) was observed to be negative and significant at 10% alpha level. This implies that increase in household size reduced farm households probability of being food secure. All things equal, increase in household size results to more people eating from the same resources; leading to reduction in food intake. According to Osondu (2018) increasing household size results to rise in demand for food, this demand, however, when not matched with higher food supply from own production or purchase, ultimately leads to the household becoming food insecure. According to Abu and Soom (2016) as household size increases all things equal, income per capita within the household declines and the household becomes less food secure. This result consolidates finding of Babatunde *et al.* (2007) and Osondu (2018) that probability of a household being food insecure increased directly with household size.

Conclusion

Credit was rationed among farm households by informal credit sources and the farm households had unequal level of access to the different sources of informal credit in the State. Access to informal credit had significant impact on farm households food security status. Many factors such as gender of household head, level of access to informal credit, education level, extension access and farm income were positive determinants of food security status of the farm households, while household size was a negative determinant of food security status of the farm households.

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