International Journal of Research in Agricultural Sciences
Volume 5, Issue 4, ISSN (Online): 2348 – 3997

Factors Influencing Food Security among Maize-Based Farmers in Southwestern Nigeria

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Date of publication (dd/mm/yyyy): 17/07/2018

***Abstract* — The study examined the factors influencing the food security among the farming households in the south western part of Nigeria. Specifically, it profiled the socio-economic characteristics of the farmers with respect to their food security status, categorized them based on diversity of food consumed, identified the challenges of food insecurity and the strategies adopted by the farmers to withstand the effects of food insecurity. Multi-stage sampling technique was used to select 239 respondents from the study area. Descriptive statistics, composite score and Logit regression model was used to analyse the data collected. Result revealed that 63.59 percent of the respondents were food secured while 36.4 were food insecure. Average age for food secure category was 47 years while their counterpart was 45 years. The mean household size for the food secure category was 7 members which was less than that of food insecure category. They also have more years of farming experience (18 years) relative to their counterpart. Comparatively, only 19.74 percent of the food secure farmers consumed low food diversity while barely 18.39 percent of the food insecure consumed high food diversity. Over 90 percent of the farmers in both categories attested that food price volatility was a major problem they face in the study area. Also, generation of other sources of income ranked highest on the coping strategies adopted by farmers to cushion the effect of food insecurity for the categories studied. Farmers' age, marital status and total household income positively influence the probability of being food secure while household size negatively influence it. It was recommended that farmers should be encouraged to expand their sources of income, and be married to enhance their food security status. They should also be enlightened more about birth control methods to reduce the tendency of being food insecure.**

***Keywords* — Food Diversity, Food Security, Southwest, Nigeria.**

I. INTRODUCTION

Agriculture has remained an important aspect of any economy. Viable agricultural activities in any economy are capable of sustaining food supply and the reserves needed for the welfare of the populace. Agriculture is however despised in Nigeria because able bodied young men and women in Nigeria do not have interest in Agriculture. Consequent of this poor attitude to Agriculture is disequilibrium in the production, demand and supply of food giving birth to food insecurity issues (Eme and Onyishi, 2014). Nigeria, irrespective of her endowment with abundant agro-ecological resources and diversity, has become one of the largest food importers in sub-Saharan Africa, (Idachaba, 2009).

Globally, FAO 2012 reported that more than enough food is currently produced per capita to feed the global population, yet about 870 million people remained hungry from 2010 to 2012. The issue of food security has been on the front burner for long. Food demand in Nigeria has generally grown faster than either food production or its supply. Households' expenditure on food accounts for a large and increasing share of family budgets for poor and urban families in Nigeria, (Arene and Anyaeji, 2010). If prices of staple foods soar, poor people bear the brunt. Food, clothing and shelter serves as the basic necessities of life, but food remains the most vital because of its centrality to human existence. It is a known fact that the ruthless expedition for food has shaped human history, provoking wars, driving migration and underpinning the growth of nations. It was mentioned that the escalation of food prices calls for sober reflection, due to challenges facing the globe which worsen food crisis period and potentially lead to catastrophe (Idachaba, 2010).

The challenge today is that high food prices cause increase in food insecurity and widespread food crisis in many developing countries. Any increase in food prices will reduce food consumption which consequently increases hunger (FAO, 2008). This global food crisis has been attributed to a number of factors that include climate change, population growth, increased demand for bio-fuels, failure to improve crop yield, high oil prices, leading to increased input loss for producers and traders. Also, crop failures, temporary infirmity, seasonal scarcity or unemployment among the healthy members of households or an emergency need for large cash expenditures might all be the reasons for the sudden decline of a household's access to food (Ekpenyoung, Alfred and Lasisi 2012). Rapid urban growth for instance, is raising concerns about food supply. According to Mohammed (2003) food insecurity exists when there is physical unavailability of food, lack of social and economic access to adequate food and/or inadequate food utilization.

According to Olagunju *et al.,* (2012), most developing countries are net food importers, and their dependence on imports is growing at alarming rate. Combined with persistent constraints, from fiscal to physical, this dependence results in food insecurity for large sectors of the population, particularly the rural poor. Irohibe and Agwu (2014) posited that majority of households in Nigeria are food insecure, being the most populous country in Africa, and especially among the rural farming households. Several evidences have suggested that majority of the world's food insecure live and work in the rural areas (IFAD, 2001). This indicates that reducing rural food insecurity is very important to reducing overall food insecurity. Given the role of agriculture in the Nigerian economy, food insecurity and poverty could be attributed to the poor performance of the agricultural sector, which in turn, creates food

availability and accessibility problems at the household and national levels (Akinsanmi and Doppler, 2005).

Ojo and Adebayo (2012) reported that low food security occurs when individuals experience a reduction in food quality, variety, or desirability, and at times a reduction in food intake. Very low food security describes disrupted eating patterns and reduced intake because of insufficient resources. Among children in developed countries, very low food security has been associated with greater dietary intakes of total calories and percentage of calories from fat and added sugar.

Any system where demand for food is not sufficiently matched by supply is no doubt vulnerable to food crisis, despite pretensions to the contrary, Nigeria is far from being completely food secured. In any country food security is imperative because somewhere in the world, a child dies of hunger every five seconds, although the planet has more than enough food for all (Ojo and Adebayo, 2012).

This is the reason developed and developing countries make considerable efforts to increase food production capacity. Nevertheless, hunger which is a situation of inadequacy in available food quantity and malnutrition which indicates consumption of unbalanced diets; have been ravaging most developing countries, severely menacing poor families (Idrisa *et al.,* 2008). The identical challenge of hunger and malnutrition is closely associated with poverty. These problems drain the working strength of an economy, cripple the mind and body of children and subsequently deprive the society of its potentials in terms of future productive human resources. On a contrary, economies that are food-secure do not have this dreadful situation to contend with (Davies, 2009).

The food security challenge among others constitutes the thrust of this paper. This paper focused on rural food security and insecurity with attention paid to the diversity of food intake by households, the challenges faced and the strategies adopted to cushion the effects as well as the factors influencing food insecurity in the area of study. The community food security is an alternative approach at the local level which entails empowering those that are most at risk to act to alleviate food security themselves by getting involved in agricultural activities or expanding their productivity level.

II. Methodology

The study was carried out in southwestern part of Nigeria and this includes Oyo, Ogun, Ondo, Osun, Ekiti and Lagos states. This area lies between latitude 6^0 N and 8^0 N and between longitude 2^0 E and 6^0 E with 77, 818 km^2 land area (Faleyimu *et al.,* 2010) and 27,581,992 populations (NPC, 2006). Rainfall in this region ranges between 2000mm in the extreme North to 3000mm in the coastal areas which is distributed between April and October. Dry period exists between late July and early August. The bimodal nature of the rainfall experiences its peaks in late June or early July and September. The temperature is between the range of 28^0C and 30^0C the area covers rain forest to savannah. The southern parts of the southwest Nigeria is covered with rainforest while savannah interspersed with trees covered its northern parts. The vegetation cover reflects a rainfall pattern and edaphic factors. Areas with less than 1100mm rainfall in the south western Nigeria have shrubs and grassland. The favourable climate enable farming activities to thrive well hence, farming remains the main occupation of the people. The study area is dominated by the Yoruba tribe and livelihood activities include farming, trading, handcraft, public service, among others.

III. Sampling Procedure

The population comprises of all maize-based farmers in the study area. Multistage sampling technique was used to select study sample. A random selection of two states namely Oyo and Osun states out of the six states in the southwest region forms the first stage. The second stage is the purposive selection of two local government areas (LGA) from the selected state based on large concentration of maize farmers in the locality. These LGAs are Boluwaduro LGA and Ilesa East LGA of Osun state and Afijio and Ibarapa LGA of Oyo state. Two villages each were randomly selected from each LGA which makes a total of 8 villages in all. Finally, farmers were selected based on proportionate to size. In all 104 respondents were selected from Osun state while 135 accounted for Oyo state respondents. In all 239 respondents were selected from both states.

IV. Data Analysis

Descriptive statistics which includes frequency count, means, and percentages was used to profile the socio-economic characteristics of the respondents, coping strategies used by small scale maize-based farmers and challenges faced by small scale maize based farmers in the study area.

Composite score was used to classify the respondents based on the diversity of food consumed. The respondents' food dietary status was examined by considering the varieties of food that are available to the farming households which varies from cereals, legumes, vegetables, root and tubers, fruits, meats, eggs, fish etc. The composite score was used to categorise the farmers into high dietary diversity for farmers who consume wide varieties of food; intermediate dietary diversity for the farmers between high and low dietary diversity and low dietary diversity for those who consumes less food varieties within their households. Respondents' were made to respond to questions relating to types of food consumed at the household level which was measured on a binary scale scoring 1 point for Yes and 0 for otherwise. A respondent can score a maximum of 15 points and a minimum of 0 points. The categorisation into high, intermediate and low benefit was then achieved using a composite score as used by Sirkin (1995) and Adepoju *et al.,* (2011).

High category = Between Mean + S.D and 10 points.
Medium (intermediate) = between lower and upper categories.
Low Category = Between 0 and Mean – S.D.

Food Security Index (FSI) was used to classify the farming households into food secure and food insecure households which established the food security status of all households selected. As used by Omonana and Agoi (2007), the FSI is given by;

FSi = Per capita food expenditure for the ith household
2/3 mean per capita food expenditure of all households

Where FSi = food security index (food secure >= 1 and food insecure < 1)

A food secure household is household whose per capita monthly food expenditure is above or equal to two-third of the mean per capita food expenditure while food insecure household is the household whose per capita food expenditure is below two-third of the mean monthly per capita on food expenditure.

The headcount ratio (H) of food security that is, incidence was estimated to evaluate the percentage of the population of households that are food secure/insecure. According to Irohibe and Agwu (2014) the headcount index formula is given by; Headcount index (H) = M/N

Where M = number of food secure/insecure households
N = the number of households in the sample

Logit Regression model was used to identify the determinants of food security among the respondents. It is a binary choice model in which a dichotomous response variable is considered as the dependent variable. The logit model was used because according to Gujarati (1995), the logit model guarantees that the estimated probabilities lie in the 0-1 range and that they are not linearly related to the explanatory variables. Based on the food security index (FSi), multivariate logistic regression was estimated to identify determinants of food security among the respondents. Logistic prediction equation used was

$$\ln Y = \ln\left(\frac{P}{1-P}\right) \ldots (1)$$

$$\ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_1 + \cdots + \beta_9 X_9 \ldots + U \ldots (2)$$

Where Y = 1 for food secure and 0 = otherwise.
P = Probability of an individual being food secure.
1-P = Probability of an individual being food insecure.
In = Natural Logarithm Function.
β_0 = Constant.
$\beta_1 - \beta_9$ = Regression Coefficients.
X_1 = Age of household head.
X_2= Gender of household head.
X_3 = Farm size.
X_4 = Annual income.
X_5 = Education status of household head.
X_6 = Access to credit.
X_7 = Land ownership.
X_8 = Household size.
X_9 = Engagement of off-farm activities.

V. Results and Discussion

This section presents the result of the data analysed and discusses the findings from the research activities.

The profiled socio economic characteristics of the respondents were based on the per capita household expenditure and are presented in Table 1. The food insecurity line earlier defined is ₦2,735 indicating that those whose per capita expenditure fall below this line are food insecure. The food insecurity incidence reveals the pattern of food insecurity based on the socio-economic characteristics of the respondents.

The age distribution reveals a relatively high percentage of respondents of 37.5 percent of those between 41 -50 years among the food secure category and 31 percent of those between 31-40 years among the food insecure category. The least percentage however for both categories are farmers that are 30 years and below. The mean age for food insecure category is 45 years and 47 years for those who are food secure. The food insecurity incidence is highest among the respondents that are 30 years and below. Relatively, the food insecurity is low across other age brackets with respondents above 60 years having the least incidence. According to Omonona and Agoi (2006), farmers with ages of less than 30 years generally constitute a lower percentage of labour force, hence earn relatively low income while those above 30 years usually occupy top managerial position with high income. Consequently, they gain the capability to reduce incidence of food insecurity in their respective households.

The food secure households have 78.29 percent male farmers while food insecure households have 71.26 percent. Food security incidence is higher among the male farmers when compared to their female counterparts. This may be as a result of having a higher number of dependants where different relatives may live within the household unlike a household with female head that may reduce intake of dependants to what she can easily manage. With respect to the respondents' marital status, the married respondents accounted for the highest percentage for both food security categories, while next to this are the singles having 6.58 and 8.05 percent representation for food secure and food insecure categories respectively. The food insecurity incidence increases across the table from married to widowed household heads with an exception of the divorced farmers who recorded the least food insecurity incidence. This may be due to availability of resources relatively in the households where both spouses engage in income generating activities.

Forty-two percent of the food secure category have less than or 5 households' members and this percentage decreases with increase in household members. On the other hand, for food insecure category, the least percentage are those who have between 6 and 9 household member with accounted for 28.74 percent. The average household sizes are 7 and 8 members for food secure and food insecure categories respectively. This is fairly large, an indication for increased expenses to cater for the need of the family. The food insecurity incidence reduces with increase in household members. This can be as a result of having more

working class people within the household which invariable will increase income generated. The percentage of farming experience decreases with increase in years of farming for both food security categories. However, the average farm experience reveals that the food secure households (18.4%) are more experienced in farming activities compared to the food insecure category (13.8%). The difference of about five years could improve knowledge in productive farming activities. Poverty incidence increases with increase in years of experience with an exception of respondents with 10-20 years' experience. Reason for this may be due to the use of crude farm implements where modern equipment will achieve greater efficiency.

The years of schooling reveals an increase in the percentage value from those who had no formal education to respondents with secondary school education for both categories of food security. It is however, worthy to note that the incidence of food insecurity for farmers without education (37.14%) doubles those farmers with primary education (18.46%) and triples farmers with secondary education (12.74%). Farmers with higher educational qualification recorded the lowest incidence of food insecurity. This is an indication that formal education can improve knowledge and practices of farming. The average income for food secure and food insecure categories are ₦92,579 and ₦77,666 respectively an indication that the food secure households earn more income comparatively. Incidence of food security result shows a decrease in food insecurity incidence with increase in household total income. This emphasized that increased income will improve food security status. The food insecurity incidence reduced with increase in farm size from 0.33 to 0.12 for household heads with farm size less than or equal to 0.5ha and 1.5ha. It then increased to 0.14 for household size between 1.51 ha and 2 ha of farmland and later decline to 0.08 ha for farmers having above 2hactares of farmland.

Household food diversity status is an aggregate of the number of unique food groups consumed by household members over a given period. It is measured based on the economic ability of a household to access a variety of foods. The food diversity status was examined by considering the varieties of food available to the farming households and this ranges from cereals, legumes, vegetables, root and tubers, fruits, meats, eggs, fish, to milk among others. The households were categorized into high dietary diversity for farmers who consume wide varieties of food; intermediate dietary diversity for those farmers between high and low dietary diversity and low dietary diversity for the farmers that consumes less food varieties within their households as presented in Table 2

For both categories of food security, the intermediate food dietary diversity accounted for the highest percentage value. In the food secure category, 21.05 and 19.74 percent of respondents consume high and low dietary food pattern. Comparatively, 18.39 percent of the food insecure household come high food dietary pattern while 24 percent attested to consume low food dietary pattern. It is worthy to note that more of the food secure category has a higher food diversity relative to the food insecure households who equally recorded the higher percent for households with low food diversity.

Table 2. Households level of food consumption diversity

Food dietary categories	Non –food secure Freq.	Percent	Food secure Freq.	Percent
Low food dietary	21	24.14	30	19.74
Intermediate food dietary	50	57.47	90	59.21
High food dietary	16	18.39	32	21.05
Total	**87**	**100.00**	**152**	**100.00**

Source: Field Survey, 2018.

Table 1. Profiled socioeconomic characteristics of the respondents.

Socio-eco variables	Food secure Freq.	Percent	Mean (Std.Dev)	Food insecure Freq.	Percent	Mean ±Std.Dev	Food insecurity Incidence
Age							
<=30	7	4.61	47 (10.23)	12	13.79	45 (13.01)	0.3157
31-40	38	25		27	31.03		0.0615
41-50	57	37.5		18	20.69		0.1066
51-60	39	25.66		18	20.69		0.1929
>60	11	7.24		12	13.79		0.0031
Sex							
Female	33	21.71		25	28.74		0.1381
Male	119	78.29		62	71.26		0.0689
Marital status							
Married	130	85.53		73	83.91		0.1182
Single	10	6.58		7	8.05		0.1272
Widowed	10	6.58		3	3.45		0.1666
Divorced	2	1.32		4	4.6		0.0526
Household size							
< = 5	64	42.11	7(2.54)	32	36.78	8 (3.43)	0.1354
6 – 9	57	37.5		25	28.74		0.1341
> 9	31	20.39		30	34.48		0.1298
Farming Experience							
<=10	52	34.21	18.4(10.34)	43	49.43	13.8(8.29)	0.1052
10 -20	42	27.63		31	35.63		0.0268
21-30	38	25		9	10.34		0.1914
31-40	18	11.84		4	4.6		0.2272

Socio-eco variables	Food secure Freq.	Percent	Mean (Std.Dev)	Food insecure Freq.	Percent	Mean ±Std.Dev	Food insecurity Incidence
>40	2	1.32					0.5000
Years of Education							
<=0	25	16.45	8.4 (5.38)	17	19.54	8.3(5.11)	0.3714
1- 6	44	28.95		21	24.14		0.1846
7-12	62	40.79		40	45.98		0.1274
13&above	21	13.82		9	10.34		0.0357
Total income							
<=20000	1	0.66	92,579	24	27.58	77,666	0.3333
20001-40000	35	23.03	(62,955)	20	22.99	(68,575)	0.2140
40001-60000	40	26.32		17	19.54		0.2080
60001-80000	13	8.55		14	16.09		0.0588
>80000	63	41.45		12	13.79		0.0353
Farm size							
<=0.5	3	1.97	2.1(1.41)	3	3.45	2.3(1.61)	0.3333
0.51-1.0	53	34.87		26	29.89		0.1772
1.1-1.50	16	10.53		8	9.2		0.1250
1.51-2.0	39	25.66		24	27.59		0.1428
>2.0	41	26.97		26	29.89		0.0883
Total	**152**	**100.00**		**87**	**100.00**		

Source: Field Survey, 2018

Results of the challenges of food insecurity encountered by the respondents are presented in Table 3. Food price volatility in terms of changing of prices of food bought recorded the highest percentage for both categories of food security and this is followed by the effects of climate change on food availability. Among the food secure households, 57.89% of the farmers claimed invasion of herdsmen on their farm posed a great threat to output hence, its effect on their food security status while only 36.78 farmers in the food insecure category were affected by herdsmen invasion. Also, high cost of input recorded 76.97 and 57.47 percent of the farmers for food secure and food insecure households respectively.

As expected the food secure households have less representations of those who encountered challenges relative to their counterparts in the following areas; food availability (32.89%), pest and disease infestation of planted crops (59.21%), access to credit facilities (21.05%), availability of land for farming activities (30.26%), access to food supply either through own production or from other sources (36.18%) and labour availability for effective farming operations (32.89%). The investigation into these problems therefore created the need to make sustainable solutions to identified challenges to improve household food security in the study area.

Table 3. Food Insecurity challenges encountered by respondents.

Food Insecurity Challenges	Food secure Freq	Percent	Non-Food secure Freq	Percent
Food availability	50	32.89	40	45.98
Food price volatility	140	92.11	85	97.7
Pest and diseases infestation	90	59.21	54	62.07
Short falls in staple food	91	59.87	50	57.47
Access to credit facilities	32	21.05	43	49.43
Land availability	46	30.26	38	43.68
High cost of input	117	76.97	50	57.47
Changes in seasonal agriculture	123	80.92	73	83.91
Change of climate	131	86.18	75	86.21

Food Insecurity Challenges	Food secure Freq	Percent	Non-Food secure Freq	Percent
Access to food supply	65	42.76	36	41.38
Access to farm implements	55	36.18	37	42.53
Invasion of herdsmen	88	57.89	32	36.78
Labour availability	50	32.89	51	58.62

Source: Field Survey, 2018

The distribution of the respondents based on the adopted coping strategies for food security is presented in Table 4 as revealed by the results, the most common strategies used mostly by both categories of food security status considered are getting means to extra sources of income which ranked highest for both categories followed by reduction in the size of meals taken at the household level. For the food secure households, reduction in the number of meals taken per day ranked 3rd with a weighted mean score (WMS) of 2.08. Exchanging of a particular food for another and working in order to receive payment in kind accounted for 4th and 5th rank with respective WMS of 1.9 and 1.87. Among the lowest ranked strategies adopted by the food secure category are disposing of household assets for money (12th), depending on others for charity (13th) and reducing household members by enforcing them to live with other family (14th) with corresponding WMS of 1.30, 1.28 and 1.17 respectively.

On the other hand, for the food insecure category working for payment in kind ranked 3rd (2.06 WMS), borrowing of food from friends and relatives for consumption purposes ranked 4th (2.04 WMS) while reduction in the number of meals taken per day is 5th (2.03) on the rank. The lowest ranked strategies used by the food insecure categories include selling off household assets with WMS of 1.40 ranked 12th. The 13th rank goes to efforts at reducing household members by sending some of them away to reside with other family outside the household, this has a WMS of 1.35 while the least adopted coping strategies is household dependence on charity from family and relatives for food supply (14th rank) with a WMS of 1.31. The result

reveals the different measures used by the farmers to manage food security situations they found themselves.

Table 4. Distribution of the coping strategies adopted by respondents.

Coping strategies	Food insecure					Food secure				
	Never	Always	Sometimes	WMS	Rank	Never	Always	Sometimes	WMS	Rank
	Freq (%)	Freq (%)	Freq (%)			Freq (%)	Freq (%)	Freq (%)		
Reduction in the number of meal per day	33 (37.93)	18 (20.69)	36 (41.38)	2.03	5	54 (35.53)	31 (20.39)	67 (44.08)	2.08	3
Skip food consumption for an entire day	59 (67.82)	10 (11.49)	18 (20.69)	1.52	10	114(75.00)	10 (6.58)	28 (18.42)	1.43	11
Reduction in size of meals	22 (25.29)	31 (35.63)	34 (39.08)	2.13	2	50 (32.89)	19 (12.50)	83 (54.61)	2.21	2
Purchase food on credit	34 (39.08)	15 (17.24)	38 (43.68)	2.04	4	91 (59.87)	20 (13.16)	41 (26.97)	1.67	6
Borrow food from a friends or relatives	49 (56.32)	6 (6.90)	32 (36.78)	1.80	8	111 (73.03)	5 (3.29)	36 (23.68)	1.50	9
Send household member elsewhere	70 (80.46)	3 (3.45)	14 (16.09)	1.35	13	137 (90.13)	3 (1.97)	12 (7.89)	1.17	14
Sales of farm implement	62 (71.26)	10 (11.49)	15 (17.24)	1.45	11	104 (68.42)	14 (9.21)	12 (7.89)	1.53	7
Household migration out of the area	57 (62.52)	9 (10.34)	21 (24.14)	1.58	9	105 (69.08)	22 (14.47)	25 (16.45)	1.47	10
Consume immature crop	78 (89.66)	6 (6.9)	3 (3.45)	1.13	15	138 (90.79)	7 (4.61)	7 (4.61)	1.13	15
Exchange one type of food for another	37 (42.53)	22 (25.29)	28 (32.18)	1.89	6	65 (42.76)	37 (24.34)	50 (32.89)	1.90	4
Dependent on charity	69 (79.31)	9 (10.34)	9 (10.34)	1.31	14	127 (83.55)	6 (3.95)	19 (12.5)	1.28	13
Worked for payment in kind	37 (42.53)	7 (8.05)	43 (49.43)	2.06	3	74 (48.68)	23 (15.13)	55 (36.18)	1.87	5
Borrow money for food	45 (51.72)	10 (11.49)	32 (36.78)	1.85	7	106 (69.74)	13. (8.55)	33 (21.71)	1.51	8
Sold household assets	66 (75.86)	7 (8.05)	14 (16.09)	1.40	12	126 (82.89)	5 (3.29)	21 (13.82)	1.30	12
Find extra sources of income	5 (5.75)	16 (18.39)	66 (75.86)	2.70	1	15 (9.87)	31 (20.39)	106 (69.74)	2.59	1

Source: Field Survey, 2018 Figures in parentheses are percentages.

On factors influencing food security among the farming households, the Logit regression estimates revealed the determinants of food security among the respondents in Table 5. The chi-square was statistically significant and positive on the overall variables used in the model which implied the goodness of fit. Five out of the nine variables significantly influenced household food security. These variables include age, household size, being married, farming experience and total income. Age and being married positively influenced food security status of the household at 1% level of significance. This implies that increase in age of the respondents will increase the probability of the household to be food secure. This may be due to the fact that many households at old age receive remittances and support from children living outside the household in addition to the income they get from their farming activities. In addition, an increase in number of married households will also raise the probability of being food secure. The reason for this cannot be far-fetched as income source may not be limited to only the house head, the support from the spouse can help to augment and cater for other household needs.

Household size and total income also determine the household food security at 10% level of significance both negatively and positively. Increase in the size of the household will increase the tendency of the household to be more prone to food insecurity by 12.8%. This is because the consequent increase will increase household demand relatively, hence increased expenses. On the other hand, an increase in the household total income will increase the probability of the household being food secure. As expected, increase in household income will increase access to food and its availability. Farm experience also determines household food security status positively. This is an indication that as years of farming activities increases the tendency to be food secure at the household level will also increase. This is because there will be increased knowledge, hence increase in productive farming activities which will consequently raise household income level.

The predicted marginal and elasticity of probability of the factors influencing the food security status of farming household is presented in Table 6. The estimates revealed that the probability of being food secure would increase by 1.2 percent for a unit increase in age, 30.7 percent for a unit increase in those married and 1.0 percent for a unit increase in farming experience. However, the probability of the household being food secure would decrease by 3.1 percent increase in members of household. It is worthy of note that farming households are more responsive to changes in marital status relative to other factors influencing food security in the study area.

Table 5. Logit regression estimates for determinants of food security status of the respondents

Food sec	Coef.	Std. Err.	Z
Age	0.049288***	0.020156	2.45
Sex	0.095719	0.34372	0.28
Household size	-0.12779*	0.077986	-1.65
Being Married	1.267642***	0.341862	3.71
Years in school	0.053031	0.033073	1.60
Farm experience	0.041928**	0.020729	2.02

Food sec	Coef.	Std. Err.	Z
Coop membership	0.511	0.336988	1.52
Farm size	-0.15286	0.149844	-1.02
Total income	6.52E-06*	3.71E-06	1.76
_cons	-3.76952***	0.973673	-3.87
LR Ch2	44.27		

Source: Logits model estimates

Table 6. Predicted Marginal and Elasticity of factors that determine food security status

variable	dy/dx	ey/ex
Age	0.0120	0.9681
Household size	-0.0311	-0.4109
Being Married *	0.3067	0.4043
Farm experience	0.0102	0.2947
Total income	1.59E-06	0.2693

Source: Logits model estimates.

VI. Conclusion

The paper examined food security issues among maize farmers in south western Nigeria. Findings revealed that more households were relatively food secure in the study area. A fairly large household size was observed and minimal farm size which was an indication that the farmers were small holders' farmers. A major portion of the respondents were within the average consumption of diversity of foods and increase in household size increases the chances of family being food insecure while increased income and being married enhance household food security status. In view of these facts, it is recommended that farming households should be encouraged to engage in more income generating activities. Also, they should be enlightened more about birth control measures to stem the rate at which household members increase in number. A family planning policy which reduces fertility rate hence, household size especially among larger households should be encouraged to enhance food security status of the farming households in the study area.

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