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Original Research Article

Food Insecurity and Coping Strategies among Female Headed Households in Rural Areas of Southeast, Nigeria

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ABSTRACT

Food insecurity and coping strategies among female headed households in rural areas of South East, Nigeria were studied. The specific objectives of the study are to determine the socio-economic characteristics of female headed household; identify causes of food insecurity among female headed households; ascertain the determinant factors to household food security status among female headed household; analyze the coping strategies adopted by female headed households and identify the limiting factors to female headed household in attainment of food security.120 respondents were selected using multi stage random sampling procedure. Questionnaire was used to collect the data. Percentage responses and Logit regression model were used to determine the research objectives. The results revealed that the most of the respondents were aged, widowed and moderately educated. Also, natural disaster was the major cause of food insecurity and reduction in meal frequency was a popular cooping strategy adopted by the household. Furthermore, age of household, level of education, income level, and membership of social organization were the determinants to households' access to food security. Finally, the major limiting factors to the attainment of the farmers' food security were poor access to credit and extension services. The needs to enhance the women's access to education, credit and extension services were recommended.

Key Words: Food insecurity, Coping strategies, Female headed, Household, Rural areas

INTRODUCTION

Food security is a situation "when people at all times have physical and economic access, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (Alaimo, *et al;* 2006; FAO, 2007). The task of sustaining food security at the country level and household level according to studies is still a major challenge for many developing countries (Amaza, *et al;* 2006, Davis, 2009, FAO, 2013). For instance, casa of malnutrition, dietary- related diseases and other negative effects of food insecurity in most developing countries of sub Saharan Africa and South East Asia to be précised are well documented ( ). T o give credence to the aforementioned discuss, Food and Agriculture Organization (FAO; (2013) and World Bank, (2013) reported that between the period of 2010 and 2012, an estimate of about 870 million people in the developing countries were food insecurity. Food insecurity, a reverse of food security as asserted by Davis, (2009) is uncertainty in access to enough food for an active and healthy life. This impasse is prominent in rural areas where farming is predominantly

their major occupation (Amaza, *et al* 2006). The food insecurity as asserted by Alaimo, *et al* (2002) and Dixion, et al.(2011) is caused by uncertainty of climate, poor performance of the agricultural sector and poverty. In most agrarian societies in developing countries, women are predominantly operating either as helpers to their husbands in their farms, labourers and a times farmers for the case of female headed households (Babatunde, 2008).

A female-headed household (FHH) could be of two types *'de jure'* and „*de facto*". A *de jure'* female-headed household exists where the head of the household is single mother, divorced or separated (Bridge, 2001, Ume, *et al;* 2016). On the other hand, a „*de facto*" female-headed household is when the head of the household is a female due to the fact that the male head is absent throughout the year or for a longer period. In this case, the woman becomes the main decision maker and economic provider of the household (Dauda, 2014). Several studies have attributed food insecurity in this household heads to different forms of discriminations and poor access to productive inputs, assets and services (World Bank, 2013, Dauda, 2014). Furthermore, the absence of male labour result in decline in output or shifts in production toward less nutritious crop that requires less labour and increased reliance on child labour which in turn has further implication for the family and for the human capital of the country (Buvinic and Guputa, 2004). The above scenarios have not only deepened female headed households' vulnerability to food insecurity and the twin poverty but considerably reduce their contributions to overall national development (Vincent, 2006).

In Nigeria and many other developing countries, to cushion the effects of food insecurity among the household structure, government, non-governmental organizations and international organizations have instituted policies and programmes with aim of enhancing agricultural productivities (Babatunde, 2008). In Nigeria, chiefly among the successive programmes by Nigeria, although some are not purely gender are "Women in Agriculture" of Agricultural Development Programme (ADP), National Economic Development Strategies (NEEDS), Family Support Programme, Green Revolution (GR) and Go Back to Land (Vincent, 2006, Ume, et al 2016). These programmes had the mandates to strengthen rural farmers' access to improve farm participation in decision making, access to improved farm inputs and tools and technical assistance, traditional thrift and saving and improved access to credit as key to alleviate poverty (Buvinic and Guputic, 2004).

Nevertheless, studies revealed that the success of these poverty alleviation programmes had been hampered by lack of financial support, corruption, failure to target the required population and human resources, war, and civic strife (Katepa-Kallala, 1999, World Bank, 2013). In effect, many of this household structure is food insecure with consequences of perpetuating in them socioeconomic inequalities and limitation of their potentials for socio and economic advancement, reduction in both capacity and attitude to work, corruption, low life expectancy, high mortality rate, hunger and malnutrition (World Bank, 2007).

These female headed households in order to alleviate the consequences of food insecurity, adopted several coping strategies (Davis, 2009). In most developing countries of the sub Saharan Africa, adopted decreased frequency and quantity of food intake, compromised diet in relation to food quality, food preference and food substitution, changes in food store, sale of assets and borrowing food or money (Babatunde, 2008; FAO, 2008, World Bank, 2011). However, these various aspects of coping behaviours (definition, sequence of importance or severity, short-term versus long-term changes) may differ between locations (e.g. urban versus rural) and within a location (fishing versus agricultural

community in rural area) (Babatunde, 2008). It is based on these premises that this study was conceptualized in order to among others to understand how the female household in study area responds to food insecurity and the coping strategies they adopt. This is imperative as several other studies have been centred on assessing the female headed households' food insecurity levels (Burinic and Gupta, 2013), constraints to achieving food insecurity by these women (Babatunde, 2008) and comparison of food insecurity among male and female household (Chhetric and Maharajan, 2006).

Specifically, the objectives of the study are to determine the socio-economic characteristics of female headed household; identify causes of food insecurity among female headed households; ascertain the determinant factors to household food security status among female headed household; analyze the coping strategies adopted by them and identify the limiting factors to female headed households in attainment of food security.

MATERIALS AND METHODS

The South East Nigeria was the main focus. The zone lies between latitude $5^0$9' and $7^0$75'N of equator and longitude $6^0$85' and $8^0$46' East of Greenwich Meridian. It has a total land mass of 10,952.400hectares. The zone has population of 16,381.729 people (NPC, 2006). The zone is made up of five states; Abia, Anambra, Ebonyi, Enugu and Imo States. It lies within the rainforest and derived savanna region of the country and bordered in the North by Benue and Kogi States, in the West by Delta and Rivers States, in the South by Akwa Ibom State and in the East by Cross River State. South east states have two major seasons in the year, the rainy seasons which last from the month of April - October and the dry season that lasts from November to March. The temperature of the area varies between 18^0C-34^0C. About 60-70% of the inhabitants engage in agriculture mainly crop farming, agricultural produce marketing and animal rearing. Other non-agricultural activities engaged by people for sustenance include civil service, petty trading, vulcanizing, driving, carpentry, mechanics and others.

Multistage random sampling technique and purposive selection were used to select states, Local Government Areas, communities and respondents. In stage 1, three out of five states in South East Nigeria were selected. In the second stage, ten (10) Local Government Areas (LGA) out of sixteen (16) were selected from each of the state. This brought to a total of thirty LGAs. In stage 3, four (4) towns will be selected from each of the Local Government Areas. In stage 4, one (1) village each was selected from each town. In stage 5, one (1) was selected from each village, totally one hundred and twenty (30 single mothers; 30 widows; 30 divorced and 30 women with their husband living in a distant place) respondents.

Data were collected from primary and secondary sources. Primary source includes the use of questionnaire and oral interview. The questionnaire was used to gather information on farmers' socio-economic characteristics such as farming experience, educational level and membership of organization. Furthermore, information was collected on female headed household food insecurity strategies, the constraints encountered by the female households in attainment of their food security. The secondary information was collected through review of related literature, journals, conference papers and other periodicals. The data collected were analyzed using descriptive statistics such as percentage and frequency distribution for objective i, ii, iii and v. Logistic regression model was used to determine objective iv.

Model Specification

Household is food secure, if in a given time if he she always has enough food to provide to its members in a day for the entire period. Otherwise, the household is considered as food insecure. Since the dependent variable (having enough daily

ration) is dichotomous, we used a binary logistic regression model to assess the determinant factors that influence the odds ratio of the household food status. The odds ratio is the ratio of the probability that a household would always have enough daily rations for its members to be food secure (Pi) to the probability of a household not always having enough food to be food insecure (1 − Pi). The dependent variable used in the study is a dummy variable that takes the value of one, if the daily ration is always sufficient for household members (food secure); 0 otherwise (food insecure). We estimated sufficient daily rations as a function of several independent variables, as presented in Table 1.

The logistic the relationship between the household food security status variable (FSS) and its explanatory variableis specified as follows :

In [Pi/1(1-Pi)]= $\beta_0+\beta_1X_{1i}+\beta_2X_{2i}+$ …….$+\beta_{17}X_{17I}$ ……..*(1)*

Table 1: Description of Variables Used in the Regression Model

Dependent variable FSS, food security status (Y)	1 if ratio is always enough for household members, 0 otherwise
Independent variables	
FHHAge (X_1)	Number of years of age
FHH, level of education (X_2)	1 if household head is literate, 0 otherwise
FHH, family size (X_3)	Number of household members
Labor (X_4)	1 if food shortage is cause by labour, 0 otherwise
FHH Income level(X_5)	1 if food shortage is cause by income level, 0 otherwise
FHH Extension access (X_6)	1 if food is cause by lack of access TO extension contact 1; 0 otherwise
FHH membership of organization Farm inputs (X_7)	1 if food shortage is cause by non membership of organization = l, 0
FHHLand access (X_8)	1 if food shortage is cause by lack of access to land = l; 0, otherwise
FHH Farming Experience (X_9)	1 if food shortage is cause by lack of Farming experience = l; 0, otherwise

where subscript *i* denotes the *i*-th observation in the sample, *P* is the probability of the outcome, *β0* is the intercept term and *β1, β2, ...,β17* are the coefficients associated with each explanatory variable, *X1*, *X2*, ..., *X17*.

The estimated coefficients do not directly indicate the effect of change in the corresponding explanatory variables on the probability (p) of occurring. Rather, the coefficients reflects the effect of individual explanatory variables on the odds ratio of the dependent variable (i.e. the household being food insecure).. The explanatory variables included in the modelare:

X_1 = Age (in years), X_2= Level of Education (year), X_3 =Income Level(N), X_4 = Household size (NO), X_5 = Access to Extension Service(N), X_6 = Membership of Organization (Member =1, Non-Member = 0), X_7 = Farming Experience, a = Intercepts, b_1-b_6 = Regression Estimates and Σ = Error term

RESULTS

Table 2: Distribution of Respondents According to Socioeconomics Characteristics

Age	Frequency	Percentage
15 – 35	20	16.7
36 -56	35	29.2
57 – 77	60	50
78 and above	5	4.1
Form of FHH		
Married women with Husbands outside	22	18.3
Widows	62	57.7
Divorced	4	3.3
Single Mothers	10	8.3
Household Size		
1-6	30	25
7-12	80	66.7
13-18	10	8.3
Farming Experience		
1-10	20	16.7
11-21	60	50
22-32	40	33.3
Off Farm Income		
Yes	100	83.3
No	20	16.7
Memberships of Organ.		
Yes	80	66.7
No	40	33.3
Access to Credit		
Yes	12	10
No	108	90
Access to Extension Services		
Yes	12	66.3
No	108	90
Farm Size		
Less 1 ha	45	37.5
11-2.1	35	31.2
22-3.2	20	20.0
Above 3.3 ha	10	11.3
Education		
Non Formal	40	33.3
Primary	60	50
Secondary	15	12.5
Tertiary	5	4.2

Source, Field Survey, 2017

Table 2 shows the Socioeconomics Characteristics of the sampled female head headed farmers.

Table 2 showed that majority (54%) of the female headed households was above 56 years. However, 46% of the respondents were below 56 years. Also, Table 1 revealed that most (57.7%) of the respondents were widowed, followed by those whom their husbands left them in rural area and gone to urban area for greener pasture (18.3%) and the least (3.3%) were single mothers. Furthermore, 66.7% of the sampled female household head had household size of 7-12 persons, followed by 25%; 1-6 persons, while the least 83%; 13-18 persons. In addition, 83.3% of the respondents had years of farming experience above 10 years, while 16.7% had less than 11 years. This implies that most of the female headed households were well experienced in farming. More so, majority (83.3%) of the sampled respondents engaged in off farm income and only 16.7% do not. Majority (66.7%) of the sampled farmers as contained in Table 6 were members of social networks such as cooperatives, church organization, age grade and social clubs, while only 33.7% do not belong to any organization. As well, 90%; of the sampled farmers had no access to credit, while only 12%; had access. This implies that farmers in the study area used their personal saved money in accomplishing their farming activities.

In addition, majority (37.7%) of the respondents operated on farm size less than 3.2 hectares, while only 8.3% operated above 3.3 hectares. The implication is that most of the farmers in line with a *priori* knowledge were small scale farmers and this could threaten their food security status. Moreover, Table 2 showed that 66.7% of the female headed household had formal education, while only 33.3% had no formal education. The implication is that most farmers in the study area are lettered, hence could easily comprehend extension education for agricultural development. . As well, 66.7% of the female headed households had no access to extension services, while only 33.3% had access. This implies that the female headed households had poor extension services out reach.

Table 3 shows the sources of households' food

Table 3 Distribution of respondents according to Sources of Households' Food

Household Food	Frequency	Percent
Own production only	42	35
Own production and market purchase	100	83.3
Market purchase only	80	66.7
Others	40	33.3
Total	120	100

***Multiple Responses**
Source; Field Survey, 2017

Table 3 indicated that 83.3% of the respondents derive their source of food consumed from own production and market purchases as the primary source of food consumed in the households. The market purchase only was the second source of households' food supply and shown by 66.7% of the total respondents.

The household food availability status is reported in Table 4.

Table 4: Female Household Food Availability Status

Variable	Frequency	Percentage
Fear that food will run out	82	68.3
Number of meals per day (%)	52	43.3
Number of days meat or fish taken per week (%)	48	40
Ration always sufficient for household members (%)	78	65
Total	120	100

Source; Field Survey, 2017.
***Multiple responses**

Table 5: Coping Strategies Adopted by Female headed households.

Strategy	Frequency	Percentage
Decrease in meal frequency	65	54.17
Sale of farm assets and land	70	58.33
Over reliance on remittance	72	60
Withdrawal of children from school	60	50
Reduction in other expenditure	80	66.67
Off farm income	55	45.82
Food aid	82	68.33
Migration	35	29.17

Multiple responses
Source: Field Survey, 2016

Table 4 showed that 68.3% of the respondents reported that they feared running out of food in the coming days. The average daily meal number was 43.3%, which is less than the normal three meals

per day. The average meat or fish intake was 40%.Also, only 65% of respondents reported that their daily rations had been always enough for their members.

Table 5 showed the strategies of coping food insecurity as adopted by the farmers

Table 5 showed the strategies of coping food insecurity as adopted by the farmers in the study area were decrease in meal frequency (54.17%), sales of farm asserts (58.3%), over reliance on remittance(60%), withdrawal of children from school (50%), reduction in other expenditure (66.7), food aid (68.33%), off farm income (45.82%) and migration (29.17%).

Table 6 shows the logistic regression analysis of the determinant factors to household food security status among female headed household

Table 6: Logistic Regression Analysis

Variable	Coefficient	Standard Error	Z statistics	Probability
Constant	7.589	30.515	4.021***	0.9876
Age	0.181	0.423	-2.336**	0.7890
Level of Education	2.143	8.330	3.887***	0.6754
Income Level	0.051	0.107	2.098**`	0.4321
Household size	1.410	2.930	2.078**	0.5789
Access to Extension Services	-0.019	-2. 049	-2.030**	0.0876
Membership of Organization	0.052	0.057	1.097*	0.5421

Log-likelihood = -84. 6588
LR chi^2 (12) = 125.59***
Number of cases correctly predicted = 120(84.5%)
McFadden R2 = 0.3842
Source: Field Survey,, (2017)

As expected, the estimated coefficient of level of education (2.143) was positive and highly significant at 1% alpha level as shown in Table. This confirmed to the *apriori* expectation. Extension services (- 0.019) had a negative coefficient but statistically significant at 5% probability level. This result was not in conformity to *apriori* expectation. The coefficient of age of the farmer (0.181) was statistically significant at 5% and directly related to food security Status among female headed household. The result comformed to *apriori* expectation. Membership of farmers' cooperative (0.057) was positive and significantly related to economic efficiency at 1.0% alpha level. This result concurred with *apriori expectation.* The coefficient of farmers' income (0.051) had a positive relationship to the dependent variable and was significant at 5% level of probability. This was in agreement with *apriori* expectation that the higher the household's income the more her food security status. The coefficient of household size (0.051) had direct effect of the household food security status and was significant at 5% risk level. This was in line with *apriori* expectation that household of large members , the more possible availability of family labour to execute farming activities.

Table 7 showed the causes of food insecurity among female headed households in the study area.

Table 7: Identify Causes of Food Insecurity Among Female Headed Households.

Variable	Frequency	Percentage
Natural disaster	80	66.67
Low agric-productivity	70	58.34
Food prices	69	57.50
Income Inequality	50	41.67
Health Issues	58	48.34
Educational level	30	25
Limited farm Input access	79	65.84
Poverty	45	37.5
Political Instability and	29	24.17
Poor Management	46	38.34

***Multiple responses**
Source: Field Survey, 2016.

Table 6: showed that the causes of food insecurity among female headed households in the study area were natural disaster (66.67%), limited farm Input access (65.84), low agric-productivity (58.34%), food prices (57.50%), health issues (48.34), income inequality (41.67%), poor management (38.34%), poverty (37.5%),

Educational level (25%) and political instability (24.17%)

DISCUSSION

Table 1 indicated that most of the farmers were aged. The implication is that the female headed households are less likely to have dependents but rather depended on their children in attainment of food security (Ume, *et al*; 2018). In addition, female headed households that are widows and those married women may not have problems of attaining food security as they are likely to have remittances from their family members as well enjoy land tenancy right of their husbands in their farming business compared to other forms of female headed households (FAO, 2010). Table 1 showed that most of the female headed household had large household members. Tanko, (2005) reported that large household size tends to exert more pressure on consumption than the labour it contributes to production. This could be true especially where the populations of the members are more of dependent ones like aged men and women, children and physically challenged. Furthermore most of the households as shown in Table 1 were well experienced, hence can overcome intricacies in their farming, which could boost their food security status (Ume, *et al*.2016) Furthermore, *Unammah*, (2003) opined that an experienced farmer is expected to have insight and ability to diversify her production and minimize risks of food shortages. The finding showed that large proportions of the households engaged in one or more off- farm activities to support their earnings from farming. Off farm income according to Iheke, (2010) helps to offset liquidity constraints in her farming activities for high productivity. This is feasible only if such money is plunge back into farming. Furthermore, such money could as well be used for family consumption and to off-set market risks (Sijims, 2003). The majority of respondents reported being membership of organization as shown by the table above, could enjoy services such as training and access to credits as provided by the organization in order to enhance her members' farm outputs (Getal, et al 2011). Poor access of the female headed households to credit as indicated in Table 1 could be linked to high interest rate of the loan, collateral, short repayment period and bureaucratic procedures involved in procuring loan from formal source of loan. Also, credit is used by farmers to procure farm inputs as well as to hire labour to boost farm productivity (Salimon, et al 2006). As well, credit according to FAO, (2007) has the potential to enhance efficient resource allocation, permit application of technologies, reduces post harvest wastes and stabilizes farm input prices. As well, the poor access to land by this family structure could be related to the fact that land is culturally the right of men in most societies in sub-Sahara Africa. However, the few female headed household that has access to land could be linked to their husbands' inheritance, leased or purchased (Dixon, et al 2011).

In addition, most of the respondents had western education. Education attainment according to Iheke,(2010) is capable of making individuals to be prudent in resource use in order to enhance their outputs. This finding is in consonance with Ekome, et al (2010), who opined that educational status makes one to be more objective in evaluating innovations which could positively influence his/her productions. Moreover, the poor extension outreach as contained in the table could be attributed to poor motivation of the change agent and wide extension agent - farmer's ratio (Rogers, 2002, Asiabaka, 2003). Extension services help to enhance farmers' access to innovation and technical assistance in order to boost their food security status (Unammah, 2003). Nevertheless, Getal *et al* (2011) opined that in most countries of Africa, extension personnel are seldom given in service training and are infrequently linked to research but persistently spread the same message continually to the same farmers.

This scenario has adverse effect on agricultural development of most concerned developing countries.

Table 3 revealed the sources of households' food. The domestic food production alone donot play significant role in food security in the study area, as they (female household heads) still depend on market source for certain foods that they cannot produce (FAO, 2007). Also, although the majority of households were engaged in farming, almost all households were net purchasers of food. Most of the households do not produce sufficient quantities to cover their consumption needs over the season. Some of them sell part of their production to cover the production expenses and other needs such as payment of children's school fees and off- setting debts (World Bank, 2013).

Table 4 showed the female household food availability status. Studies showed that some female household and members ate meat or fish only during the weekly market day, once or twice a week. Thus, though they intend to purchase meat, they do not always have access to markets where meat is available for sale and the cost of meat is often high. According to surveys conducted on household food budgets in South East states of Nigeria by the National Root Crop Research Institute (NRCRI), Umudike. Abia State, Nigeria was of the view that over 85% of daily caloric consumption came from roots and tuberous crops in 2004, 80% in 2005 and 87% in 2006. The research further revealed that in 2005, 64% of the population consumed less than the minimum caloric requirement of 2,100 calories per day for an adult population, as defined by the World Health Organization, while in 2006, about 58% of the population consumed less that this minimum requirement (Unammah, 2003). These statistics indicated a high prevalence of food insecurity in the region. It is worthy to note that the period between June–July is period of scarcity and often characterized of hunger, as most households that depend on their own production for food may have already finished their stocks and relied solely on the market for food (FEWS, 2008). In Nigeria, an average household in Nigeria depended on market purchases for 87% of its food (Babatunde, 2008).

Table 5 revealed that the coping strategies adopted by female headed households in the study area. The decrease in meal frequency was most adopted by the most households. Studies showed that the rural households resorted to this measure especially when the natural shock on the production system last for over extended period (Ume, et al, 2018). World Bank, (2013) reported that decrease in meal frequency is common during lean period which is common immediately after planting of crops. In addition, household used money from remittance in coping for food insecurity. Remittance helps poor families to deal with negative economic shock, increase their savings, better access to health and education and increase in entrepreneurship (Salimon, 2006).

More so, substantial number of the respondents reported withdrawal of children from school as method of coping food insecurity strategy. Salimon, (2008) cited the need for domestic responsibilities including care of young ones, which releases the mother to take to more ruminative works particularly poorer households as reason for withdrawal of children particularly girl child from school .Besides, the respondents used reduction in other expenditures in coping food insecurity. World Bank, (2011) asserted that poorer households mostly in the rural areas of developing countries spends more than 75 % of their income in food and the remaining 25 percent in other expenditures. Off- farm income also as shown in Table 5 as means of coping with food insecurity could help not only to improve the calorie consumption but also the dietary quality and micro-nutrient supply (Chant, 2008). Moreso, some of the respondents used food aid to battle the ugly scourge of food insecurity. Food aid as asserted by World Bank, (2013) is the provision of food and

related assistants to tackle hunger either in emergency situations or to help with deeper longer term hunger alleviation and achieve food security.

The Logistic regression analysis as shown in Table 6 indicated that the negative relationship between the age of the female headed household to food status could imply that as the age of the household advances, there is the likelihood of a decrease in household food secure. This finding is synonymous with Kateka – Kalela, (2005), who reported decrease in mental and manual strength in implementing strenuous farming activities, leading to decrease in farm output. Furthermore, Ume, *et al*;(2018) reported that old households has more probability of being food insecure since they have many dependent populations under their care. Conversely, Dauda, (2014) opined that younger household heads are more energetic than older ones and could operate in challenging jobs within the labour market to enhance their food security status.

Furthermore, the positive sign of the coefficient of level of education of female headed households to the dependent variable could be attributed to the fact that educated female headed households have the likelihood of attaining improved financial resources, which in turns raises their farm productive capacity. This is because such households have the necessary knowledge and information to facilitate optimization of their farm outputs for a high income to accrue (Ume, *et al*; (2018). Furthermore, women with education and income-earning capability may have more autonomy in household decision making that could be translated to better health and nutrition of the women and their children (Vuren, 2003). Besides, the coefficient of the female headed household heads' income had direct relationship with food security, as studies show that household heads' income is regarded as the most critical determinant of their food security. This is because low-income households are more likely to encounter food insecurity as compared to middle income and wealthier households (Dixon *et al* 2011). Also, the sign identity of the female headed household size as indicated in Table 6 could be linked to the use of members of the household in farming for increased output, which could transcend to high income when marketed (Ume, *et al*; 2018). Nevertheless, Amaza *et al* (2009) reported that the higher the number of inactive individuals (dependent population) in the household, the higher the burden for active individuals in the provision of food, which tantamount to increases in the probability of such household being food insecure. Moreover, the negative sign of the coefficient of access to extension services, which is contrary to a *priori* expectation could be associated with poor motivation of the change agent which affects significantly their performances (Amaza *et al.,* 2002). The positive sign of the coefficient of membership of organization (such as social club, cooperatives and among others) could be linked to its ability of providing her members with training, farm inputs and credits in order to maximize their outputs for higher income to accrue (Iheke, 2010). In the other hand, Asiabakah,(2003) reported that a situation where members of the organization are overwhelmed with organizational activities to the expense of their primary job(farming), negative relationship will occur, which could result in food insecurity for the affected household.

Table 6 showed that natural disaster was one of the causes of food insecurity among female headed households. The low income headed households are usually affected by natural disaster and this could partly because of most poor people resides in areas that has high risk of natural disaster (Bridget, 2001, Amaza, et al 2006). Furthermore, low agricultural productivity was reported by the sampled farmers as a factor responsible for their food insecurity. The low agricultural productivity could be as result of land degradation in form of land depletion, soil erosion and soil fertility depletion, timeless and irregularity of rainfall and other climatic factors (FAO

2007). In addition, limited farm input access was reported by the respondents and according to Sijms (2009), farmers' inability to afford yield – enhancing inputs could result in low productivity, in effect food insecurity results.

Furthermore, the respondents were of the opinion that cost of food prices affected their food security status. Tanko, (2005) reported that when the cost of food price is high, many poor female households will have high propensity to consume than to save, resulting in recycling of poverty. Moreover, income inequality is one of the causes of the female headed house households' food insecurity as indicated in Table 6. Vincent, (2009) opined that poor household members are unable to consume sufficient food because they are usually unemployed, have low income and inadequate transfer mechanisms.

More so, poverty was reported by the respondents to be responsible for their food insecurity in the study area. Poverty as asserted by Ume, *et al.,* (2016) could lead to malnutrition, hunger, starvation, illiteracy and reduction in life expectancy Furthermore, disease infection such as malaria, tuberculosis and HIV/AIDs was cause of their food insecurity by the respondents. For instance, Varen (2003) cited the effect of HIV/AIDs epidemic on households' food production to include decrease in economic active people, lack of assets and skills due to adult mortality, burden to care for the family infected by the disease and the effect of malnutrition.

Educational level of household has effect on household food security status and according to Sijms, (2009), educated household head has the likelihood of attaining improved financial resources, which in turn raises their productive capacity. Also, educated people are prudent in management of food demand in their households, whereas low level of formal education among the households make the introduction of improved agricultural technologies by extension agents very difficult, resulting in low food security status (Drene and Srinivasan, 2012).

Table 7 indicated that the farmers encountered the problem of poor assess to labour in attainment of their food security. The high cost of hired labour could be orchestrated by urban drift by the able bodied youths in search of white collar jobs. The table more - so opined that the respondents had problem of poor access to land. This could be related to the customary land law which favours men more than women. In effect, most female headed households resorted to farming in lease or purchased land and this situation is capable of threatening their food security through limiting their farming scope (Ume, *et al*;2016).

Moreover, the farmers complained about poverty as one of the constraints to food security attainment. Studies inferred that female headed households carry "double burden'' (handling domestic work and role of main income earning simultaneously) which could be responsible for poverty among the family structure (Ogundara and Ojo, 2004, World Bank, 2008). Also, the female headed households' poverty linked syndrome according to World Bank (2004) can also be related to lack of support from the state and social network.

In addition, the household complained about poor access to extension services as indicated in Table 7. This could be linked to low level of education, smaller farm size and extension workers are often men and who may like to work with male headed households only (World Bank, 2013). Besides, poor access to credit was encountered by the by sampled farmer. Shariff and Khor (2008) reported that in most household, poor access to credit could be correlated to high-interest rate and administrative bottlenecks involved in loan procurement from formal financial institution. This is capable of influencing their farming scope and technologies usage, and in effect low production and productivity.

CONCLUSION AND RECOMMENDATIONS

Based on the results of the research, it was observed that female headed household in the study area were aged, widowed, memberships of organisation, educated and engaged in off farm income. Also, the major sources of food consumed by the female household were from own production and market purchases and from own production. Furthermore, the major prevalence of food insecurity by the household was fear running out of food in the coming days and their daily rations had been always enough for their members. Logistic regression model analysis result shows that age, level of education, income level, and membership of social organization were the determinant factors that influence female household food security status. As well, natural disaster, low productivity of food prices and poverty were among the causes food insecurity in the study area. Female headed households adapted reduction in meal frequency, over reliance on remittance, reduction in other expenditure and food aid as coping mechanisms against food insecurity. Moreover, the major limiting factors to the attainment of food security among female headed households were poor access to credit facilities, poor access to extension services and poor access to education,

Based on the results, the following recommendations are proffered

1. There is need to ease female headed household access to credit through micro finance banks and commercial banks at low interest rate and no collateral
2. Government should subsidize cost of inputs to help this family structure reduce their production cost and for high income.
3. The government should provide infrastructures like good road network and improved storage facilities in order to reduce the constraints faced by the farmers.
4. Government and non-governmental organizations should intensify efforts on importance of family planning and advocate for small family size.
5. There is need to educate female headed households through increased school enrolment and participation in adult literacy programmes.
6. Households should be encouraged to intensify crop production by adopting the new farming technology.

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