

ANALYSIS OF FOOD SECURITY IN FARMING HOUSEHOLD OF MUBI NORTH LOCAL GOVERNMENT AREA OF ADAMAWA STATE, NIGERIA

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ABSTRACT

The study investigated effects of family size on household food security in some selected villages of Mubi North Local Government Area of Adamawa State, Nigeria. Multistage sampling technique was employed to select 120 respondents for the study. Structured questionnaire were used in collecting information from the respondents. The data were subjected to descriptive statistics, Household Food Insecurity Access Scale and regression analysis. The results of the study revealed that majority of the respondents were male (63.00%) who were married (72.50%) and within the age bracket of (30-39 years) with 43.33% having family size of 5 – 8 person per household. The result also revealed that 55.00% were moderately food insecure, who employed coping strategies of using part of savings, getting money from cooperatives and relying on assistance from friends and family to absorb the shocks of food insecurity. The result further revealed that education, farm size and monthly income are the determinants of food security of the farming households in the study area. The study concludes that farming household are moderately food secure. The study recommended that government and non-government agencies should intensified effort on improvement of formal education, loans accessible to the farmers and advocate small family size in rural area.

Key Words: Food Security, Household, Family size, socio-economic, Mubi North

INTRODUCTION

Securing already produced food is one of the most pressing current issues in the world today. World Bank defined food security as a situation that all people at all times have access to sufficient, safe, and nutritious food to maintain a healthy and active life. Food insecurity has presented a huge challenge to all levels of governments in developing nations as extent literature reported increasing growth of hunger, especially in most rural areas. According to Food and Agriculture Organization there are about 11 million undernourished people in developing countries (FAO, 2010) and this has cause a high burden of malnutrition and its consequences in these regions. It may jeopardize the achievement of the Sustainable Development Goals (SDGs) aim to end hunger, achieve food security and improve nutrition and promote sustainable agriculture by year 2030. In addition, Mutisya, *et al.*, (2015), articulate food security as a human

right, which needs urgent attention. Despite this recognition, millions of people in sub-Saharan Africa and Nigeria in particular suffer from extreme hunger and malnutrition. However, sub-Saharan Africa faces the most severe challenges in securing its food condition mainly due to sluggish income growth, high poverty rates and poor infrastructure, which hampers physical and distributional access (FAO, 2011). In addition, sub-Saharan Africa is a region with lowest agricultural productivity and vulnerability to climate change is high, and by 2030, population growth, and hence food demand, is projected to increase the most in the region.

Food security is indispensable prerequisite for the survival of mankind and its economic activities including production of crops and animals. Household food insecurity is associated with poor nutritional health (Cook, *et al.*, 2004 and Cook and Frank, 2008). World Bank (2016) reported that about two thirds of the

poor in sub-Saharan Africa's Low Income Countries (LIC) live in rural households, of which agriculture is the dominant source of livelihood. This implies that agriculture plays a key role in the provision of food security and income. Increasing growth of agricultural output is central to boosting income in these countries. This requires significant public investment in rural public goods to strengthened markets and promotes the adoption of new technologies (World Bank, 2016). In general, food security is defined as a condition "when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO 2015). This means that food security includes freedom from both famine and chronic malnutrition. Also, about 795 million people are estimated to be undernourished globally (FAO, IFAD, WFP, 2015). Bonnard (1999) identified food security to incorporate four major elements namely, food availability, food accessibility, utilization and stability of food access. The author reiterate that food security is a complex phenomenon attributable to many factors that vary in importance across geographic and social boundaries and the concept is multi-dimensional, providing valuable insights into the nature and extent of a population's food situation. Also Gahukar, (2011) observed that security is best assured when food is locally produced and made available on a continuous basis at an affordable price (maximizing stability in flow of supplies), regardless of climate and other variations. But most farmers in rural areas of developing nations lack the capacity to produce food, making them vulnerable to food insecurity situations. World Bank defined food insecurity as 'the lack of capability to produce food and to provide access to all people at all times to enough food for an active and healthy life'.

The main objective of the study was to examine the effect of family size on the household food security in some selected villages of Mubi North Local Government Area of Adamawa State of Nigeria. The specific objectives were to: i. Determine the Socio-economic characteristics of the respondents ii. Determine the food security status of the respondents iii. Identify the food security coping

strategies of the respondents and iv. identify the determinants of food security among the respondents

METHODOLOGY

The study area

The study was conducted in Mubi North Local Government Area of Adamawa State, Nigeria. It is located between latitude $10^{\circ} 10^1$ and $10^{\circ} 50^1$ N of the equator and longitude $13^{\circ} 10^1$ and $13^{\circ} 30^1$ E of the Greenwich meridian. The area has a mean annual temperature of 32.36°C , it has an average annual rainfall ranging between 900 mm and 1050 mm with a distinct dry season which begins in October and ends in April, while wet seasons begins in May and ends in October. It shares common boundaries with Cameroun and Mubi South to the east, Hong local government to the south and Michika local government to the west. Mubi North local government consists of four districts namely: Mubi, Ba'a, Fali and Mayo - Bani. It has an estimated land area of 871.9 km^2 and an estimated population of 202,500. The major economic activity of the people is farming, dominant crop cultivated in the area are rice, maize, cowpea, sorghum, groundnut and sugar cane and the major livestock reared in the area are cattle sheep, goat, poultry and pig.

Sources of data

Primary data were used for the study and it was collected with the aid of questionnaires administered to the respondents by trained enumerators under the supervision of the researcher.

Method of data collection

A multi stage sampling technique was applied for the selection of respondents for the study. In the first stage, two villages each were purposively selected out of the four district in the study area, these are; Digil, Hurida, Bahuli, Vimtim, Muchalla, Kiriya, Muva and Betso. The selection of these villages in the districts were purposive because preliminary survey revealed farming household are the dominant residents in these villages. In the second stage, Random sampling was used to select 120 farming households proportionate to the size of the villages.

Data analysis

The data were analyzed with the use of descriptive statistics, Household Food Insecurity Access Scale (HFIAS) score and binary logistic regression. The descriptive statistics used include the frequency distribution and percentages which were employed for the analysis of socio-economic characteristics of the household and coping strategies, while HFIAS was used to ascertain the food security status and logistic regression to analyze the determinants of food security in the study area.

Household Food Insecurity Access Scale (HFIAS)

HFIAS was used to determine the food security status of the household. The HFIAS is a continuous measure of the degree of food insecurity (access) in the household in the past four weeks (30 days). First, a HFIAS score variable was calculated for each household by summing the codes for each frequency-of-occurrence question. After summing the frequency-of-occurrence codes, the data were coded as 0 for all cases where the answer to the corresponding occurrence question is “No” (i.e., if Q1 = 0 then Q1a = 0, if Q2 = 0 then Q2a = 0, etc.). The maximum score for a household will be 27 (if the household response to all nine frequency-of-occurrence questions; rarely coded 1, sometimes coded 2 and often coded with response code of 3); the minimum score will be 0 (the household responded “No” to all occurrence questions, frequency-of-occurrence questions is skipped by the interviewer, and subsequently is coded as 0). The higher the score, the more food insecurity (access) the household experienced. The lower the score, the less food insecurity (access) a household experienced. FAO has established a cutoff point of 0-2 to indicate food secure, 3-10 to indicate moderately food insecure and 11-27 to indicate severely food insecure as adopted by Coates, (2007), Adebayo (2012), Fumane, (2013) and Ntwenya (2015).

$$HFIAS = Q1_a + Q2_a + Q3_a + Q4_a + Q5_a + Q6_a + Q7_a + Q8_a + Q9_a \dots(1)$$

Also Average and the prevalence of food insecurity was also obtained using the following:

$$\text{Average HFIAS} = \frac{\text{Sum of HFIAS Score in the Sample}}{\text{Number of Household sampled}} \dots\dots\dots(2)$$

Binary logistic regression model

A binary response function (food secure and food insecure) was specified and estimated by the logistic procedure. The binary logistic specification is suited to models where the endogenous variable is dichotomous, which in this case are the households who are food secure and those who are food insecure. The binary Logit model has been widely used in order to explore the determinants of food security in many studies for example Bayene and Muche (2010), Arene and Anyaeji (2010). In order to facilitate analysis of the data, a value of 1 was assigned to the farm households who are food secure and 0 to those who are food insecure. The parameter of the logistic regression model was estimated with the Maximum Likelihood Estimation (MLE) technique. The logit specification then provides a model of observing the probability of a household being food secure. Hence, the model was specified explicitly as follows:

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + e_i \dots\dots\dots (3)$$

Where,

Y = Food security status (1 if household *i* is food secure and Y = 0 if household *i* is food insecure)

X₁ = Age (years)

X₂ = Gender (dummy)

X₃ = Education (years of formal education)

X₄ = Farm size (hectares)

X₅ = Family Size (in number)

e_i = Error term

RESULTS AND DISCUSSION

Socio economic characteristic of the respondents

The result of the socio-economic characteristics of the respondents is presented in Table 1. Majority of the respondents were married between the age of 21 and 25 years. Only 4.17% married between the age of 16 and 20 years, while 34.17% married between the age of

26 and 30 years. The mean age of marriage was 23.7 years. This implies that early marriage was a dominant factor in the study area. This support the findings of Ntewanya *et al.*, (2015) that young people in rural area get married earlier and become involved in adult responsibility. Majority (30%) of small scale farmers are aged between 30 and 39 years. This could be regarded as middle age. Only (17.50%) were young (20-29 years), while 18.84% could be regarded as fairly old i.e. 50-59 years. The mean age of the respondents was 44years. This result suggests that respondents in the study area are medium to slightly old people.

Majority (65%) of the respondents were male, while 35% were female. This indicates that there are more male headed household in the study area than the female headed household. This corroborate with the findings of Gahukar (2011) who found that Majority of the farming household in Osun State are males. Table 1 further revealed that majority (72.50%) of the respondents was married. Given the very low rate of single (10%), widowed (15%) and separated (2.50%). This implies that majority of the respondents will have additional responsibilities to their spouses and children. Only (23.33%) of the respondents did not have any form of education. In essence, most of them (76.67%) had one form of education or the other. This shows that majority of respondents were literate, might enhance their food security status by adoption of

improved farm practices and in turn improve their output.

Table 1 also revealed that majority (43.33%) of the respondents had between 5 and 8 children with mean size of 7.32. This could be regarded as large family size. However, it is likely that these children will be used as source of manual labour in the household, also the age at marriage will have an impact on family size. The implication of this is that the quantity of food intake will be affected and dependency ratio will be affected. The larger the family size the lesser food availability to each person within the household and also nutritional status is affected. The income level was also investigated and the result shows that majority (50.83%) of the respondents fell within income class of < N10,000 with mean value of N 11,395.6. This is in line with FAO (2001) report that household must have sufficient income to purchase the food they are unable to grow. Farm size is the total area (ha) cultivated by each respondent. The result showed that majority (74.16%) of the respondents cultivated between 1 and 2 ha with the mean size of 1.65ha. Also result showed that a sizeable proportion of the respondents (19.17%) cultivated farm land between 3 and above 5 hectares. This suggests that majority of the respondents were small scale farmers. The implication of this to food security is that food production will largely remain at a small scale level and this can lead the respondents to diversity into non-farm activities in other to be food secure.

Table 1: Distribution of Respondents According to Socio-economic Characteristics

Variable	Frequency	Percentage
Age at Marriage		
16-20	5	4.17
21-25	74	61.66
26-30	41	34.17
Total	120	100.00
Age range		
20-29	21	17.50
30-39	36	30.00
40-49	28	23.33
50-59	22	10.84
Above 60	13	10.33
Total	120	100.00
Gender		
Male	78	63.00
Female	42	35.00
Total	120	100.00
Marital status		
Single	12	10.00
Married	87	72.50
Widowed	18	15.00
Separated	3	2.50
Total	120	100.00
Education		
No formal education	28	23.33
1-6	30	25.00
7-12	51	42.50
Above 12	11	9.17
Total	120	100.00
Family size		
1-4	46	38.33
5-8	52	43.33
9 and above	22	18.54
Total	120	100.00
Monthly income		
≤10,000	61	50.83
11,000-15,000	27	22.50
16,000-20,000	18	15.50
≥21,000	14	11.67
Total	120	100.00
Farm size		
1-2	89	74.16
3-5	23	19.17
>5	8	6.67

Source: Field Survey, 2017.

Food security status

The result of food security status of the respondents is presented Table 2. The result revealed that majority (55%) of the respondents were moderately food insecure, 41.66% was food secure, while 3.34% were severely food insecure. A food secure household experiences none of the food security condition. A moderately food secure household sacrifices more frequently by

eating a monotonous diet but does not experience any of the three most severe conditions. A severe food insecure household has started cutting back on meal size, running out of food and going to bed hungry. In other words, 3.34 percent of the respondents experienced the severe condition in the last four weeks. This result is contrary to the findings of Fumen (2013) who found that majority of the household in Kwakwatsi province of South Africa were Food insecure.

Table 2: Food security Status of Respondents

Status	Frequency	%
Food Secure	50	41.66
Moderately Food Secure	66	55.00
Severely Food Secure	4	3.34
Total	120	100.00

Source: Field Survey, 2017.

Coping strategies of respondents

The result of the coping strategies of respondents is presented in Table 3. The result shows the coping strategies employed by respondents in the study area when they do not have enough to eat. The frequency of use of various coping strategies was ranked. Using part of saving was ranked 1st with mean score (1.92). This indicates short term household food availability. Getting money through cooperative was ranked 2nd with mean score (1.86). This shows that respondents increased their access to food by these strategies. Relying on helps from friends and family for food was ranked 3rd with mean score (1.76). This shows that respondents starts to depend on the others for consumption in the face of inadequate access to food. Other coping strategies employed included; reducing

the quantity of food to be eating ranked 4th mean score (1.72), Relying on less preferred less expensive food ranked 5th mean score (1.65) and reducing number of meals to be taken was ranked 6th (1.61). The result shows that respondents increases short term household food availability. However, working in exchange ranked 7th with mean score (1.31), working in exchange for money ranked 8th with mean score (1.20). Borrowing money ranked 9th mean score (1.10), sending household member to eat elsewhere was ranked 10th and lastly selling personal belonging ranked 11th. This implies that respondents in the study area employed different coping strategies in other to be food secure. This finding is contrary to the findings of Adebayo, (2016) who ranked borrowing money first as the most coping strategy applied by household in Osun State, Nigeria.

Table 3: Distribution of Respondents According to Coping Strategies employed

Coping strategies	Mean score	Rank order
Borrowing money	1.10	9 th
Using part of savings to buy food	1.92	1 st
Relying on less preferred less expensive food	1.65	5 th
Reducing the quantity of food to be eating	1.72	4 th
Getting money through cooperative	1.86	2 nd
Reducing number of meals to be taken	1.61	6 th
Relying on helps from friends and family	1.76	3 rd
Working in exchange for food	1.31	7 th
Working in exchange for money	1.20	8 th
Sending household member to eat some elsewhere	0.41	10 th
Selling personal belongings	0.37	11 th

Source: Field Survey, 2017.

Determinants of food security status

The result in Table 4 shows the determinants of food security status of respondents in the study area. The result shows that year of formal education (X_3) has a coefficient of 1.777 and it is significant at 5% levels. Farm size (X_4) with coefficient of 1.130 and it is significant at 10% family size (X_5) with

coefficient of -0.317 and it is significant 5%. This indicates an inverse relationship with household food security. Monthly income (X_6) with coefficient of 1.105 and it is significant at 1%. The positive sign of coefficient value shows direct relationship. This implies that for every unit increase in years of formal education, farm size, monthly income there is likelihood increase in

household food security. However, the implication of family size with inverse

relationship indicates that as family size decreases household food security increases.

Table 4: Logit Result Showing Determinants of Food Security Status

Variable	Coefficient	t-value
Age (X ₁)	0.086	2.177
Gender (X ₂)	0.448	1.027
Education (X ₃)	1.777	0.012**
Farm size	1.130	0.087***
Family size	-0.317	-3.566**
Monthly income (X ₆)	1.105	0.532*

Source: Computer Print out *Significant at 1%, **Significant at 5% and ***Significant at 10%

CONCLUSION AND RECOMMENDATION

Based on the findings, majority of the respondents are food insecure and large family size has a negative influence on household food security. The study established that respondents engaged in different coping strategies. It is recommended that Government and non-government organization should intensify effort towards educating the farmers and making farm lands accessible. There is also need of loans accessible to improve productivity to curb food insecurity problems.

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