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EFFECTS OF SOCIO-ECONOMIC VARIABLES ON FOOD SECURITY STATUS OF URBAN FARMING HOUSEHOLDS IN MUBI NORTH METROPOLITAN OF ADAMAWA STATE, NIGERIA.

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ABSTRACT
Achieving food security and reducing hunger requires comprehensive measurement for proper identification of the food insecure, the severity of food insecurity, its causes, and progress in reducing food insecurity. The study analyzed the food security status of households in a township of Mubi North Metropolitan. Multi-stage sampling technique was used to select 225 respondents in Mubi Township of Mubi North Local Government Area of Adamawa State, Nigeria. Data was collected using a structured questionnaire. The method of data analysis employed was the Household Food Insecurity Access scale (HFIAS) developed by the USAID to determine the food security status of households in Mubi Metropolitan. The result of the findings revealed that food insecurity is mostly associated with the female headed household, those that have no formal education and among low income household earners. The result further shows that approximately 63.60% of households were categorized as food secure, 15.50% as mildly food insecure, 10.90% as moderately food insecure and 10.00% as severely food insecure. The study recommends that agricultural education be promoted in the study area to encourage people to engage in farming/gardening as a source of generating extra income, especially among female-headed households.
Key Words: Food Security, Urban, Farmers Households, Mubi North

INTRODUCTION

Food security is a concept that has developed considerably over the years. It is a complex issue that characterizes the current world economy (Mohapatra *et al*., 2010). The United Nations defines food security as a condition in which all people at all times have access to enough food needed to live an active and healthy life (FAO, 2010). Food insecurity includes aspects such as limited access to food intake, hunger and vulnerability (Devereux, 2000). Research (FAO, 2010; Richardson, 2010) indicates that food insecurity has been increasing throughout the world, and that; hunger and malnutrition remains a serious problem especially in developing countries. The Food and Agriculture Organization (FAO) (2010) reported that in 2010 almost one billion people in the world were undernourished, which is 40% higher than the preceding two decades. Increased incidents of chronic hunger are mainly in developing countries (Goodall, 2009). Food insecurity and poor nutrition has been found to be prevalent amongst the rural and urban poor. The cause of food insecurity is found to be the lack of nutritional balance because households cannot afford to consume a healthy diet (Tounkar and Omotor, 2010). The issue of food security relates to the problem of poverty evident in many parts of the world. The World Bank (2011) estimated that worldwide, one in five people live in a condition of poverty, with an income of US$1/day or less. An empirical study conducted by Mwaniki, (2011) found that in developing nations the cause of food insecurity is closely related to the inability of households to access sufficient and adequate food due to absolute poverty, and this in turn resulted in major health issues and loss of human potential.

Africa is regarded as the most food-insecure continent in the world, and for decades hunger has always been a serious problem in the continent (Bwalya, 2013). The United Nations' Human Development Report (UN, 2012) reported that one in four households in Sub-Saharan Africa cannot access adequate food. Achieving food security is therefore still a major challenge as the Sub-Saharan region might not be able to reach the Millennium Development Goals of halving the percentage of hunger by 2015, despite various reported policy implementations and improvements in economic development

(Bremner, 2012). The challenge of food security is exacerbated by the rapid rise in the population resulting in a need for increased quantities of food to feed millions of households. The rise in the cost of food is another risk factor to household food insecurity because the majority of the Sub-Saharan countries import food as agricultural development is still relatively low due to scarce resources (United Nations, 2012). The importance of research in untangling this issue can never be understated.

METHODOLOGY

The Study Area

The study was conducted in Mubi North Local Government Metropolitan of Adamawa State Nigeria. It is located between latitude 10^{o} 10^{1} and 10^{o} 50^{1} 0f the equator and longitude 13^{o} 10^{1} and 13^{o} 30^{1} of green which meridian. The area has a mean annual temperature of 32.36^{o} (Adebayo and Tukur, 1999), in addition the area has an average rainfall of 900 to 1, 050mm with a distinct dry season which begins in October and ends in April while the wet season begins in May and ends in October. It shares common boundaries with Cameroon and Mubi South to the east, Hong Local Government to the South and Michika Local Government to the west. Mubi North Metropolitan consists of four political wards namely: Lokuwa, Kolere, Sabon-Layi and Yelwa. The Local Government has an estimated land area of $871.9km^2$ and an estimated Population of 177,785. The major economic activity of the people is farming. The dominant crop cultivated in the area includes rice, maize, cowpea, sorghum, groundnut, sugar cane etc. Major livestock reared in the area are cattle, sheep, goat, poultry and pig.

Source of Data and Sampling Techniques

Primary data was used derived with the use of structured questionnaire mainly from the field survey. Four political wards were purposively selected because pre-field survey indicated that there exist urban farming household in the study area. Random sampling was used to select political units and Snowballing was used to select the respondents for the study.

Data Analysis

The data were analyzed with the use of descriptive statistics and Household Food Insecurity Access Scale (HFIAS) score. The descriptive statistics used include the frequency distribution and percentages which were employed for the analysis of socio-economic characteristics of the urban farmers, while HFIAS was used to determine the food security status of the urban farmers. 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 is "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. (Frongillo and Simeon, 2003 and Fumane, 2013)

HFIAS = Q1a + Q2a + Q3a + Q4a + Q5a + Q6a + Q7a + Q8a + Q9a

i.e Sum of the frequency-of-occurrence question response code. Similarly, the indicator of average Household insecurity Access Scale Score was calculated using the household scores above:

Average

$$\text{HFIAS} = \frac{Sum\ of\ HFIAS\ Score\ in\ the\ Sample}{Number\ of\ Household\ sampled}$$

The final indicator is a categorical indicator of Food Insecurity Status. Following Coates *et al*., (2007) and Fumane, (2013), the Household Food Insecurity Access Prevalence (HFIAP) Status indicator was used to report household food insecurity (access) prevalence and make geographic targeting decisions. The HFIAP indicator categorizes households into four levels of household food insecurity (access): Foods secure, mild, moderately and severely food insecure. Households was categorized as increasingly food insecure as they respond affirmatively to more severe conditions and/or

experience those conditions more frequently. First, a HFIA category variable is calculated for each household by assigning a code for the food insecurity (access) category in which it falls. The data was coded for frequency-of-occurrence as 0 for all cases where the answer to the corresponding occurrence question was "No" (i.e., if Q1 = 0 then Q1a = 0, if Q2 = 0 then Q2a = 0, etc.) prior to assigning the food insecurity (access) category codes. The four food security categories were created sequentially, in the same order as shown below, to ensure that households are classified according to their most severe response.

HFIA category: 1 = Food Secure, 2 = Mildly Food Insecure Access, 3 = Moderately Food Insecure Access, 4 = Severely Food Insecure Access

HFIA category = 1 if [(Q1a = 0 or Q1a = 1) and Q2 = 0 and Q3 = 0 and Q4 = 0 and Q5 = 0 and Q6 = 0 and Q7 = 0 and Q8 = 0 and Q9 = 0]

HFIA category = 2 if [(Q1a = 2 or Q1a = 3 or Q2a = 1 or Q2a = 2 or Q2a = 3 or Q3a = 1 or Q4a = 1) and Q5 = 0 and Q6 = 0 and Q7 = 0 and Q8 = 0 and Q9 = 0]

HFIA category = 3 if [(Q3a = 2 or Q3a = 3 or Q4a = 2 or Q4a = 3 or Q5a = 1 or Q5a = 2 or Q6a = 1 or Q6a = 2) and Q7 = 0 and Q8 = 0 and Q9 = 0]

HFIA category = 4 if [Q5a = 3 or Q6a = 3 or Q7a = 1 or Q7a = 2 or Q7a = 3 or Q8a = 1 or Q8a = 2 or Q8a = 3 or Q9a = 1 or Q9a = 2 or Q9a = 3]

The prevalence of different levels of household food insecurity (access) was also obtained using the following:

HFIA

$$\text{Prevalence} = \frac{Number\ of\ Household\ with\ Category\ HFIAP}{Total\ Number\ of\ Household\ HFIAP} \text{ X } 100$$

RESULTS AND DISCUSSION

Gender of Household

The relationship between gender and household food security is presented in Table 1. The results obtained suggest that gender plays a vital role in enhancing household food security, because food security varies substantially between male-headed households (MHH) and female-headed households (FHH). MHH (57.10%) were more food secure than FHH (37.70%). Food insecurity is mostly prevalent in FHH with mildly, moderately and severely food insecurity of 11.60%, 10.10% and 40.60% respectively than MHH of 7.70%, 10.90% and 24.30%. D'Haese *et al*. (2011) observed that MHH experience less food insecurity than FHH; because women usually do not have sufficient access to productive resources and also have low educational levels. Gebre (2012) found increased vulnerability to food insecurity in households headed by females in Ethiopia. This is because women are not engaged in income-generating activities for food consumption. Furthermore, FHH spent a large proportion of their income on food than MHH; however, they are still worse off in terms of food insecurity (De Cock, 2012).

Age of the Household Head

Table 2 indicates that for each age bracket, about half of the participants were food secure. The condition of food insecurity varies with age. The mildly food insecurity category showed that the level of food insecurity decreases with an increase in age. The incidence of severe food insecurity is higher for the working-age bracket of 41-50 (30.00%) and 51-64 (25.00%) and lower for those who are 65 years and older at 6.70%. The results imply that older household heads are more food secure than younger household heads. This is because older household heads in need can apply for the state's old age pension grant and some might have retirement funds with less household members to support. The results are consistent with similar studies (De Cock *et al.*, 2013 and Haile *et al*., 2005) which found high incidences of food insecurity in households headed by young people. This is because older household heads are likely to have better access to land distribution compared to younger household heads; thus improving food security for older household heads. Mwita *et al*. (2011) concluded that those households headed by people who are over 65 years of age are more food secure because they have more experience in social and physical environment as well as subsistence farming activities.

Household Size

From Table 3, approximately 53.80% of households with 5 to7 members are food secure. The results obtained do not necessarily indicate that food insecurity increases with the rise in household size. Households with 2 to 4 members

actually experienced high incidences of severe food insecurity than those with more than 8 members (30.10% and 14.50% respectively). The difference in the level of food insecurity is that, larger household sizes have more people who are involved in income-generating activities. The findings are in line with (Battersby, 2011) which showed a weak link between household size and food security. This is because food security decreased with an increase in household size.

Marital Status of Household

Households with married couples (54.10%) are more food secure than those with unmarried heads (37.50%). Severe food insecurity is mostly linked to people who are not married (20.30%) compared to married people (43.50%). The difference in the percentages is that people who are not married are most likely to be single parents with less support structures from other family members. The result is consistent with a similar study by Cancian and Reed (2009), where household headed by people who are not married were likely to rely on the earnings of one adult, thus increasing their likelihood of food insecurity.

Educational Attainment

Household food security was seen increasing with the educational attainment of the household head. Food insecurity is mostly frequent in households headed by people with lower levels of education and no formal schooling. This is because better educated people are able to improve the quality of labour for generating income. The findings are in line with Sakyi (2012) who indicated that severe food insecurity is directly linked with household headed by people with low educational levels and no formal education.

Employment Status

Households wherein the head was employed are more food secure (65.50%) than those headed by unemployed people (56.60%). Incidences of food insecurity are higher in households headed by unemployed people with mildly, moderately, severely at 10.00%, 13.30% and 20.10% respectively, compared to those headed by employed people at 5.00%, 20.00% and 9.50%. These findings are in line with those of McLntyre *et al.* (2012) which indicated that the likelihood of food insecurity is high in households headed by people who hold part-time jobs such as seasonal workers. Unemployment is regarded as a contributing factor to household food insecurity (FAO, 2012).

Household Income

The household income was categorized into six income groups. The results indicate that there is a strong relationship between food security and household income. Food security improves with a rise in household income. About 42.80% of households earning between ₦4001-₦6000 per month are more food secure compared to those earning ₦2000 and less at 41.60%. The level of severe food insecurity is mostly prevalent in households that earn less income (<₦2000) at 33.40%, and those with no income (25.00%). Households which earn more than ₦6000 did not experience severe food insecurity. The results are in line with Rudolph *et al.* (2012) who found a clear correlation between household income and food security: households in low income class experienced high incidences of food insecurity at 50% compared to households in high income class at 20%. The results are also similar to those of Oluyole *et al.* (2009), were it was observed that the proportion of the food secure tends to increase with a rise in household income.

The Labour Force

The labour force is a measure of the number of people in a household who are able to work (economically active). Households with more members who are economically active are generally more food secure than those with less economically active members. A total of 60.00% are severely food insecure because these households have no members who are economically active, those who are able to work and make the necessary means to attain food. The findings are similar to those of Haile *et al*. (2005), wherein a rise in the number of economically active members in a household, was found to be leading to a rise in productivity thereby increasing household food security.

Table 1: Socio-economic and Food Security Status of the Respondents

Variable	Food Secure		Mildly Food Insecure		Moderately Food Insecure		Severely Food Insecure	
Gender	N	%	N	%	N	%	N	%
Male	78	57.10	27	24.30	15	10.90	9	7.70
Female	43	40.60	36	37.70	21	11.60	11	10.10
Age								
<40	15	60.00	2	8.00	3	12.00	5	20.00
41-50	25	50.00	6	12.00	4	8.00	15	30.00
51-64	10	50.00	2	10.00	3	15.00	5	25.00
>65	8	53.30	3	20.00	3	20.00	1	6.70
Household								
1	3	100.00	0	0	0	0	0	0
2-4	30	60.00	4	8.00	6	12.00	10	20.00
5-7	35	70.00	3	6.00	2	4.00	10	20.00
>8	3	42.80	1	14.20	2	28.50	1	14.50
Marital Status								
Married	40	54.10	8	11.40	10	14.20	12	20.30
Otherwise	15	37.50	5	12.50	3	7.50	17	43.50
Education								
Primary	10	40.00	5	20.00	3	12.00	8	28.00
Secondary	30	60.00	4	8.00	6	12.00	10	20.00
Tertiary	12	42.80	6	21.40	4	14.20	6	23.60
No School	3	42.85	1	14.30	1	14.30	2	28.57
Employment								
Employed	50	65.50	4	5.00	16	20.00	10	9.50
Unemployed	17	56.60	3	10.00	4	13.30	6	20.10
Income								
<2000	25	41.60	6	10.00	9	15.00	20	33.40
2001-4000	15	50.00	4	13.30	6	20.00	10	16.70
4001-6000	3	42.80	1	14.20	1	14.20	2	28.80
6001-8000	2	66.60	0	0	1	33.40	0	0
>8001	0	0	1	50.00	1	50.00	0	0
No Income	6	75.00	0	0	0	0	4	25.00
Labour								
0	0	0	0	0	2	40.00	3	60.00
1	4	26.80	1	6.60	2	13.30	8	53.30
2	25	50.00	2	4.00	3	6.00	20	40.00
3	8	40.00	3	15.00	4	20.00	5	25.00
4	7	46.60	1	6.60	2	13.30	5	33.50

Source: Field Survey, 2016.

The next subsection looked at the categorization of household food security by using the HFIAP indicator. The Household Food Insecurity Access Prevalence (HFIAP) indicator was used to observe household food insecurity prevalence (Coates *et al.*, 2007). In the study the HFIAP indicator categorized households into four main levels of food security status (food secure, mildly, moderately and severely food insecure) depending on how they respondent to the nine-frequency-of-occurrence questions.

Categories of Food Security

The next subsection looked at the categorization of household food security by using the HFIAP indicator. The Household Food Insecurity Access Prevalence (HFIAP) indicator was used to observe household food insecurity prevalence (Coates *et al.*, 2007). In the study the HFIAP indicator categorized households into four main levels of food security status (food secure, mildly, moderately and severely food insecure) depending on how they respondent to the nine-frequency-of-occurrence questions. The household food security status was measured and the results are presented in Table 9. Based on the HFIAP classification measure of food insecurity, about 63.60% of the sampled households were classified as food secure, 10.00% as mildly food insecure, 15.50% as moderately food insecure and 10.90% as severely food insecure. The study shows that a large proportion of households are food insecure at 10.00%.

Table 2: percentage distribution of food security level

Category	N	%
Food Secure	70	63.60
Mildly Food Insecure	11	15.50
Moderately Food Insecure	12	10.90
Severely Food Insecure	17	10.00

Source: Field Survey, 2016.

Responses of Metropolitan Households to the nine HFIAS Questions

Table 10 represents the responses to each of the nine HFIAS questions. The share of affirmative responses relating to each question is observed in order to assess whether the sequence of severity is attained by the HFIAS questionnaire. The highest share of the sampled population revealed that they 'worry about food', making the question the lowest determinant for household food security on the scale. This is followed by those who reported being 'unable to eat preferred foods', meaning that they eat food they really do not desire when they get hungry. The smallest proportion of the participants indicated that they 'go to sleep hungry' or 'go a whole day and night without eating'. This usually happens when there is no food in the household. The most serious condition of severe food insecurity is experienced in the last three questions of the HFAIS questionnaire (Coates *et al.*, 2007). Table 11 shows the responses to each of the last 3 questions; about 20.40% reported that they had nothing to eat, followed by those who went to bed hungry at 20.40% and then those who went the whole day and night without eating at 20%. These three conditions either occurred rarely, sometimes or often.

Table 3: Response of household to the nine HFIAS questions

	Option							
	No		Rarely		Sometimes		Often	
HFIAS Questions:	N	%	N	%	N	%	N	%
Q1: worry about food	55	50.00	33	30.00	10	9.09	2	1.81
Q2: Unable to eat preferred food	60	54.54	30	27.27	17	15.45	3	2.72
Q3: Eat just a few kind of food	66	60.00	26	23.63	15	13.63	3	2.72
Q4: Eat food they really do not want	65	59.09	21	19.09	22	20.00	2	1.81
Q5: Eat a smaller Meal	79	71.81	18	16.36	12	10.90	1	0.90
Q6: Eat fewer meals in a day	80	72.72	20	18.18	8	7.27	1	0.90
Q7: No food of any kind in a household	82	74.54	18	16.36	8	7.27	2	1.81
Q8: Go to sleep hungry	86	78.18	15	13.63	9	8.18	0	0.00
Q9: Go a whole day and night without eating	90	81.81	10	9.09	8	7.27	2	1.81

Source: Field Survey, 2016**.**

Table 4: last three HFIAS questions

	No experience	Experience hunger
No food of any kind in a household	74.54%	25.46%
Go to sleep hungry	78.18%	21.82%
Go a Whole day and night without eating	81.81%	19.19%

Source: Field Survey, 2016.

Conclusion and Recommendations

By using the Household Food Insecurity Access Scale measure (HFIAS), it was possible to identify the level of food insecurity for each individual household in Mubi North Metropolitan. The socio-economic and demographic characteristics affecting household food security were established. The findings from this study revealed that gender, household size, marital status and household income were important factors that can predict household food security in the study area. Food insecurity was a serious problem in female-headed household because the majority cannot access sufficient food. This is because they have larger household sizes and have low educational attainment. Furthermore, households with stable income such as salaries and wages are generally more food secure than households who rely on other sources of income (social grants and help in kind). From the HFIAS categorization measure the socio-economic and demographic variables such as gender, age, marital status, education employment status, household income and the labour force had an impact on mildly, moderately and severely food insecurity of some households in the study area. The study recommends that, the household size was a significant determinant for household food security; therefore, it is important to educate the community about family planning in order to encourage households to plan for smaller family sizes, particularly for female-headed households. Entrepreneurial programmes are also needed in the area to encourage households to grow their own food and sell it. This can be a good incentive for generating extra income that is needed in the household.

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