FOOD SECURITY STATUS AND ITS DETERMINANTS AMONG FARMING HOUSEHOLDS IN MICHIKA LOCAL GOVERNMENT AREA, ADAMAWA STATE, NIGERIA

[1]Bulus, G., [1]Filli F.B., and [2]Columba C.
[1]Department of Agricultural Economics and Extension, Federal University Wukari, Taraba State, Nigeria.
[2]College of Agriculture, Science and Technology Jalingo, Taraba State, Nigeria
Corresponding Author's E-mail: godiyabulusdd@gmail.com

ABSTRACT
The study assessed the food security status and its determinants among farming households in Michika Local Government Area, Adamawa State, Nigeria. The occurrence of Boko Haram insurgency in the area is believed to have impacted their food production activities and, by implication, their food security status. A multistage sampling procedure was used to select the respondents for the study. Data were collected through a structured questionnaire and were analyzed using the food security line, the food security index and binary logistic regression. The results showed that only 29.7% of the respondents were food secure, whereas the majority (70.3%) were food insecure. The mean food security index for food-secure households was 1.53, and for food-insecure households it was 0.57. Per capita daily calorie consumption among respondents was 2199.51kcal, which is lower than the FAO recommended value of 2710 Kcal. Five factors were found to significantly influence respondents' food security status in the study area. These were farm size (0.98) at P≤0.1, level of education (0.11) and household size (-0.002) at P≤0.05, access to credit (3.1) and household income (0.002) at P≤0.01. Coping strategies included eating less-preferred foods. The study concluded that there is a high level of food insecurity, which may not be unconnected with the Boko Haram insurgency ravaging the area. It was recommended, among other things, that adequate security be provided to prevent future occurrences and that measures be implemented to improve the food security of farming households in the area.
***Keywords**:* Boko-Haram, Farmers, Food Security, Insurgency, Michika

INTRODUCTION
All people at all times need access to preferred foods that meet dietary requirements for an active and healthy life (FAO, 2002). It is emphasized that the access must be void of any physical, social or economic restrictions to food that is sufficient in supply, safe for consumption and nutritious qualitatively. Essentially, food security can be described as a phenomenon relating to individuals. It is the nutritional status of the individual household member that is the ultimate focus, and the risk of that adequate status not being achieved or becoming undermined. The latter risk describes the vulnerability of individuals in this context. As the definitions reviewed above imply, vulnerability may occur both as a chronic and transitory phenomenon. Useful working definitions are described below. Food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food which meets their dietary needs and food preferences for an active and healthy life. Household food security is the application of this concept to the family level, with individuals within households as the focus of concern. Food insecurity exists when people do not have adequate physical, social, or economic access to food as defined above (Konandreas *et al.,* 2000).

Whether viewed globally, nationally, within states or regions, or in relation to local communities, food security is an essential, universal dimension of household and personal well-being. The deprivation of basic needs, as represented by food insecurity and hunger, is undesirable and may also be a precursor to nutritional, health, and developmental problems. Monitoring food security can help identify and understand the basic aspects of the population's well-being and identify population subgroups or regions with unusually severe conditions.

In the literature, there are basically two approaches to measuring food security. These are qualitative and quantitative approaches. The quantitative approach includes the Food and Agriculture Organization (FAO) method, the Household Income and Expenditure Survey (HIES), and the Food Intake Survey (FIS). The factors and processes assumed to causally influence household food security have been used to assess the index's validity and relevance.

Generally, households facing a food shortage do not sit back in despair. To combat food shortages, households engage in food-acquiring activities or change their eating behavior; these responses are known as food-coping strategies. Devereux (2001) defines coping strategies as a response to adverse events or shocks. The definition by Snel and Staring (2001), captures the broad notion of coping strategies, namely that "all the strategically selected acts that individuals and households in a poor socio-economic position use to restrict their expense or earn some extra income to enable them to pay for the basic necessities (food, clothing, shelter) and not fall too far below their society's level of welfare" (Eluhaiwe, 2008). The latter definition implies that coping strategies involve a conscious assessment of alternative plans of action. This does not necessarily mean that their choice of strategies is always successful in achieving their intended objectives. Researchers have developed a method for assessing coping strategies known as the coping strategy index. The basic idea of using the coping-strategy index tool is to measure the frequency of the Food Coping Strategy (how often the coping strategy is used) as well as its severity, what degree of food insecurity does the strategy suggest (Maxwell *et al.,* 2003). The type of Food Coping Strategy to be used is determined by the severity, type, and duration of the food stress. Hence, household coping behavior provides an earlier and much clearer signal of the actual level of distress, varying from poor variety to hunger.

Generally, there is no universal set of Food Coping Strategies; however, they tend to follow a similar pattern and can be grouped into four categories: altering the diet, food rationing, food-seeking strategies, and altering the household, as proposed by Kruger *et al.* (2008). There is therefore a need to empirically assess the food security status of farmers in Michika Local Government. The specific objectives were to describe the socioeconomic characteristics of household heads, assess the respondents' food security status using mean per capita food expenditure and per capita daily calorie intake approaches, determine factors influencing food security, and identify the coping strategies employed by farming households in the study area.

METHODOLOGY

Study Area

The study was conducted in the Michika Local Government Area of Adamawa State, Nigeria. It is located between Latitude 10°37′N to $10^0$54'N and Longitude 13°23′E to 13^0 69'E of the Greenwich meridian. The Local Government Area was created in 1976 and is located in the northern axis of the state, and it is bordered on the east by the Republic of Cameroon. On its Northern border is the Madagali Local Government, while it shares a border to the west with the Askira/Uba Local Government Area of Borno State (Figure 3.1). To the south, it is bordered by the Mubssi North and Hong Local Government Areas. Annual rainfall ranges between 912 and 1223mm and lasts for 5-6 months. The projected population of the local government is estimated at around 375,000 people as of 2025, based on a 2.7% annual growth rate from the 2006 population census (National Population Commission, 2025).

Sources and Type of Data

Primary data was used mainly for the purpose of this study. It was collected through the administration of a questionnaire to respondents in the study area by trained enumerators.

Sampling Procedure and Sample Size

A multistage sampling procedure was used in selecting respondents for the study. The first stage was the random selection of four wards out of the eight wards in the local government area. Secondly, eleven communities were purposively selected for the selected wards based on the prevalence of Boko Haram activities in the communities. Lastly, one hundred and fifty-one (151) farming households were randomly selected from the eleven selected communities as respondents for the study. The distribution of the questionnaires includes both crop and livestock farmers in the study area.

Table 1: Selection of respondents for the study

S/N	Districts	Villages	Farmers	Sample
1	Bazza	i. Bazza Marghi	59	18
		ii. Kudzum	34	10
2	Michika	i. Anguwan Layi	51	15
		ii. Michika	62	19
		iii. Bokka	49	15
3	Nkaffa	i. Wuro Gayandi	49	15
		ii. Wula	21	6
		iii. Mboruro	49	15
4	Futu	i. Futudu	64	19
		ii. Himike	17	5
		iii. Vukague	46	14
Total	**4**	**11**	**501**	**151**

Source: Field Survey, 2023

Method of Data Analysis

Food Security Index by Household Food Expenditure

The food security line was estimated as two-thirds of the mean per capita monthly expenditure of all respondents. Households were then classified into their food security status as food-secure and food-insecure households based on the food security line. The formula is given as;

$$FS_i = \frac{per\ capita\ food\ expenditure\ for\ the\ ith\ household}{\frac{2}{3} mean\ per\ capita\ food\ expenditure\ of\ all\ households} \quad \ldots\ldots (1)$$

Where:

$FS_i = Food\ Security\ Index$

$FS_i \geq Food\ secure\ ith\ household$

$FS_i < Food\ insecure\ ith\ household$

Food Security Index (FSI) by Per Capita Daily Calorie Intake

The approach taken for determining the food security index was the identification and aggregation procedures. Identification is the process of defining a minimum level of nutrition necessary to maintain healthy living. This is referred to as the 'Food Security Line', below which people are classified as food insecure and subsisting on inadequate nutrition. The food security line used in this study was based on the daily recommended calorie intake of 2710 Kcal (Babatunde *et al.,* 2007). In order to generate food security indices, the nutrient content of the food items consumed was used to derive calorie availability, and this served to achieve objective iii of this study. The Food Security Index was calculated using the relation;

$$Z_i = \frac{Household\ daily\ per\ capita\ calorie\ and\ consumption\ (x)}{Household\ daily\ per\ capita\ calorie\ and\ requirement\ (y)} \quad \ldots\ldots (2)$$

For a household to be food secured, Zi must be greater than or equal to 1 (Zi > 1). If Zi is less than 1 (Zi < 1), the household is food insecure. The quantities of crops produced, purchased, and received as gifts were converted from kilograms to calories. Purchased and received as gifts were converted to kilocalories, then to calories consumed per day per household, and finally compared with the standard (2710 kcal).

Binary Logistic Regression Analysis

The logit model, due to its simplicity in interpreting the coefficients, was used to determine the factors influencing the respondents' food security status in the post-insurgency era. The dependent variable in this case, food security status, is a binary variable which takes a value of one (1) for food-secure households and zero (0) for food-insecure households.

$$P_i = f(Z_i) = 1 + \frac{1}{1+e} - (\propto + \sum \beta_i X_i) \quad \ldots\ldots (3)$$

Where Pi is the probability that an individual is food secure given Xi (the explanatory variables), α and β are parameters estimated. The log odds of the probability that an individual is food secure are given by:

$$\text{Log}\left(\frac{P_i}{1-P_i}\right) = Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + U_i \quad (4)$$

The explanatory/independent variables are:
Z_i = Food Security Status of the household (where 1 is food secured households, and 0 is a food-insecure household)
X_1 = Age of Household Head (in years)
X_2 = Level of formal education of household head (0 = Never school, 1 = Primary, 2 = Secondary, 3 = Tertiary)
X_3 = Household Size (number)
X_4 = Farm Size (Ha)
X_5 = Credit access (where access=1, and no access=0)
X_6 = Membership of Farmers Association (where membership=1, and non-membership=0)
X_7 = Household Income (Farm + Non-Farm Income) (N)
X_8 = Dependency Ratio (number of non-working age household members/number of working age household members)

Likert Scale

The Likert scale model is a widely used technique in agricultural research to measure attitudes, perceptions, and awareness levels. A 4-point Likert scale was used to measure the coping strategies adopted by farming households in periods of inadequate food in the family. The scale points used included:
Very often=4; Often=3; Rarely =2 and Never=1

$$\bar{X} = \sum {}^{X_1}/_{N}$$

Where;
$\bar{X}$ is the mean score calculated for an observation
x is the score on points of an observation
N = Number of occurrences
$\sum$ = Summation sign

RESULTS AND DISCUSSION

3.1: Socio-economic Characteristics of Paddy-rice Retail Marketers

The result in Table 2 shows the mean age of household head as 37 with a standard deviation of 11.8. The age range of 36.8 ± 7.3 years suggests that the household heads have the physical strength and energy required for the demanding task of farming.

A mean household size of 8 persons per household, as shown, indicated that farmers in the study area had the means to engage in farming to provide for their families and might have been taking advantage of family labour availability. This is consistent with the study by Abah *et al.* (2015), which found that large household size can be a source of cheap family labor. The result shows a mean farming experience of 17 years, suggesting that farmers in the study area have the requisite experience to promote efficiency and profitability. Males constituted 63.6% of the respondents, whereas females were 36.4%, corroborated by Emodi and Agwu (2018), that the dominance of males over females in farming could be tedious and energy sapping for females. Furthermore, females have domestic chores to contend with, which may be too numerous and demanding to allow them time to participate effectively in farming activities.

The result for marital status shows that while 83.3% of the responding household heads were married, 9.9% and 2.1% were widowed or divorced, respectively, bringing the total to 85.3% of respondents who were married or had been married. This suggests that being married or having experience in marriage entails the responsibility of providing for one's family, which helps explain their involvement in farming, as corroborated by Emodi and Agwu 2018. The result for educational status indicated that about 86.8% of the marketers have had some form of education and are therefore literate, making the technicalities of modern farming easy to understand and apply to improve performance. This is in line with studies by Zalkuwi (2019), which show that a farmer's level of education is significant in his decision-making process.

Table 2: Socio-economic characteristics of farming household heads

Variable	**Min.**	**Max.**	**Mean**	**Std. dev.**
Age (years)	20	67	37	11.8
Household size (number)	1	23	8	4
Years of experience in marketing (years)	5	44	17	9.3
	Frequency		**Percentage**	
Sex				
Male	96		63;6	
Female	55		36.4	
Marital Status				
Single	7		4.6	
Married	126		83.4	
Widowed	15		9.9	
Divorced	3		2.1	
Level of education				
None	20		13.2	
Primary	13		8.6	
Secondary	42		27.8	
Tertiary	76		50.4	

Source: Field Survey Data (2023)

Food Security Status of the Respondents

The food security status of farming households in the study area is presented in Table 3. The result indicates majority (70.31%) of farming households were food insecure, while only 29.69% were food secure. This contradicts the report of Olayiwola *et al.* (2017), who observed that the majority of respondents (58.7%) were food secure. The mean food security index for food-secure households, as shown in Table 4, was 1.53. The maximum was 3.57, while the minimum was 1.01. For the food-insecure households presented in Table 5, the mean food index was 0.53, ranging from 0.1 to 0.9. Comparing the mean food insecurity index for the two categories, 1.53 for food secure households and 0.53 for food insecure households, reveals a wide gap.

To determine the Daily Recommended Calorie Requirement of each farming household, the FAO (2007) standard of 2710 Kcal/day was used. On average, the food-insecure households consumed 57% less than their daily calorie requirements, while the food-secure households consumed 53% in excess of their daily calorie requirements. Per capita daily calorie consumption among respondents, as shown in Table 6, was estimated to be 2199.51kcal, which is lower than the FAO-recommended value of 2710 Kcal. This shows that most households in the study area are food insecure.

Table 3: Food Security Status by mean per capita food expenditure of the Respondents

Variables	Frequency	Percentage
Food secure	45	29.69
Food insecure	106	70.31
Total	151	100

Source: Field Survey, 2023

Table 4: Distribution of Food Security Index of Food Secure Households

Food security index	Frequency	Percentage
1.0-1.29	15	39.50
1.3-1.49	9	23.70
1.5-1.69	4	10.60
1.7-1.79	4	10.60
1.8-1.89	2	5.30
1.9-2.99	2	5.30
3.0 and above	2	5.30
Total	38	100
Minimum	1.01	
Maximum	3.57	
Mean	1.53	

Source: Field Survey, 2023

Table 5: Distribution of Food Security Index of Food Insecure Households

Food Insecure index	Frequency	Percentage
0.1-0.29	17	18.90
0.3-0.49	23	25.60
0.5-0.69	17	18.90
0.7-0.89	16	17.80
0.9-0.99	17	18.90
Total	90	100
Minimum	0.10	
Maximum	0.90	
Mean	0.53	

Source: Field Survey, 2023

Table 6: Per capita daily calorie Consumption of Respondents

Per calorie (Kcal)	Frequency	Percentage
200-500	14	10.90
501-1000	29	22.70
1001-1500	22	17.20
2001-2500	21	16.40
2501-3000	14	10.90
Above 3000	28	21.90
Total	128	100
Minimum	269.79	
Maximum	9700.83	
Mean	2199.51	

Source: Field Survey, 2023

4.4 Factors Influencing Food Security Status of Farming Households

To identify factors influencing the respondents' food security status, the socio-economic characteristics of the households were regressed on their food security indices, and the results are reported in Table 7 (coefficients) and Table 7 (Marginal effects). The result showed that five variables: household size, farm size, access to credit, years of formal education, and household income were relevant and significantly influenced the food security status of the farming household in the study area. With the exception of household size, which showed a negative relationship with food security, all other variables were positively associated with food security.

The diagnostic test result in Table 8 revealed that the hat square was not statistically significant. Also, the models included in the variable were correctly specified at 86.72%. The Pearson chi-squared test was not statistically significant, which explained the stability of the pseudo R^2. Similarly, the Variance Inflation Factors (VIFs) for all variables are less than 10. The model therefore fit the data analysis and interpretation of the results.

Education (X_2)

Years of formal education attained by the household head positively influence respondents' food security status. This could be obvious, since education provides individuals with opportunities that can lead to income. Also, educated individuals have access to white-collar job-s and other income generating activities when compared to uneducated ones. This makes the food more secure than the latter. The marginal effect of a 1-unit increase in the years of formal education of respondents increases the probability of food secured by 0.02. This corroborates the findings of Abul and Heidi (2018), who found a positive relationship between education and food security in Ghana.

Household Size (X_3)

This variable negatively affects respondents' food security status. The coefficient on the variable is negative and statistically significant at the 5% level. This indicates that the larger the household size, the lower the probability of the household being food secure. The value of the marginal effect implies that if household size increases by 1, the household's probability of being food secure decreases by 0.06, holding all other variables constant.

Farm size (X_4)

The cultivable farm size of the respondents positively influences food security status. The coefficient on the variable is positive and statistically significant at the 10% level. This could be expected because, ceteris paribus, cultivating a large farm size results in higher output and therefore more food for consumption in the study area; hence, more secure households. The value of the marginal effect indicates that when a farming household increases its farm size by 1 unit, the household's probability of being food secure increases by 0.23, all things being equal.

Access to Credit (X_5)

This variable was found to positively influence respondents' food security status and was statistically significant at the 1% level. This might be obvious because credit serves as a consumption-smoothing mechanism, providing households with temporal relief from the effects of food insecurity, as pointed out by John *et al.* (2013).

The value of the marginal effect indicates that when a household obtains credit, the household's probability of being food secure increases by 0.69.

Household Income (X_7)

This variable positively influences the food security status of farming households in the study area. The variable has the expected sign and is significant at 1% level of probability. This could be expected because, all things being equal, an increase in income means an increase in food consumption. The value of the marginal effect indicates that if household income increases by ₦1, the household's probability of being food secure increases by 0.002.

Table 7: Factors Influencing Household Food Security

Variables	Coefficient	Standard error	Z
Age	0.0074	0.0243	0.30
Level of education	0.1101	0.0488	2.25**
Household size	-0.2895	0.1214	-2.38**
Farm size	0.9832	0.5289	1.86*
Access to credit	3.0982	0.7033	4.41***
Membership of association	0.8572	0.6413	1.32
Household income	0.0021	0.0005	4.21***
Dependency ratio	-0.0049	0.0063	-0.78
Constant	-3.1003	2.5304	-1.23
LR chi2(8)	101.09		
Prob > chi2	0.0000		
Pseudo R^2	0.5822		

***, **, *= Significant at 1%, 5% and 10% respectively

Source: Field Survey, 2023

Food Security Coping Strategy

The food security coping strategies reported by the respondents in Table 7 revealed that eating less preferred food (Mean=3.54) was very often the primary coping strategy. This means that the majority of respondents very often consume an unbalanced diet to counteract the negative effects of hunger due to the non-availability of a balanced diet for one reason or another. Other important food insecurity coping strategies often used were buying from the market (3.14), borrowing of money (3.47), consumption of seed stock for next year cropping season (3.27), reduced number of meals for adults 93.48), skipping meals (3.23), work for food or money (2.89), send out children for paid job (2.95), sale of livestock (3.34), gathering wild food (3.38), sales of asset (3.47), and migration to cities in search of greener pastures (2.69).

Table 7: Food Security Coping Strategies by the Respondents

Coping strategies	Very often	Often	Rarely	Never	TS	Mean	Remark
Buying from market	62(48.40)	43(35.60)	23(18.00)	0(0.00)	402	3.14	Often
Eating less preferred food	74(57.80)	49(38.30)	5(3.90)	0(0.00)	453	3.54	V. often
Borrow money or food from friends/relatives	83(64.80)	22(17.20)	23(18.00)	0(0.00)	444	3.47	Often
Consumption of seed stock for next year	67(52.30)	40(31.30)	9(7.00)	12(9.40)	418	3.27	Often
Reduced number of meals for adults	88(68.80)	22(17.20)	9(7.00)	9(7.00)	445	3.48	Often
Skipping meal	62(48.40)	34(26.60)	32(25.00)	0(0.00)	414	3.23	Often
Work for food or money	48(37.50)	45(35.20)	9(7.00)	26(2.30)	371	2.89	Often
Send out children for paid jobs	39(30.50)	43(33.50)	23(18.00)	23(18.00)	377	2.95	Often
Sale of livestock	71(55.50)	43(33.50)	0(0.00)	14(11.00)	427	3.34	Often
Gather wild food like hunting/scavenging	74(57.80)	40(31.20)	14(11.00)	0(0.00)	432	3.38	Often
Sale of assets like land	83(64.80)	22(17.20)	23(18.00)	0(0.00)	444	3.47	Often
Stealing	0(0.00)	0(0.00)	2(1.60)	126(98.40)	130	1.02	Never
Migrate to cities	39(30.50)	45(35.20)	9(7.00)	35(27.30)	344	2.69	Often

Source: Field Survey, 2023, Figures in parentheses are percentages

Key: mean 0.5-1.49= Never, 1.50-2.49=Daily, 2.50-3.49= Often, and 3.50-4.00= Very often

CONCLUSION AN RECOMMENDATIONS

The study concluded that the level of food insecurity recorded may be linked to the disruptive activities of Boko Haram, limiting agricultural activities and livelihood-supporting engagements of farmers in the Michika Local Government Area of Adamawa State.

Based on the findings of the research, the study makes the following recommendations:

ii. There is a need to increase extension service delivery in the study area to assist farmers from cooperative groups and provide access to credit to counter the effect of temporary setbacks in agricultural and non-agricultural income-generating activities.

iii. There is a need for the government to provide adequate security to enable farmers to continue their normal production activities.

iv. Since most households have access to food security, the government should broaden pro-poor policies, such as the School Feeding program, to cover large numbers of poor households in the study area.

v. Families should be educated by the government, private individuals and religious organizations on the need for birth control.

vi. Food insecurity coping strategies adopted by the farming households have a short-term effect. Therefore, there is a need to increase food production volume and improve access to more sustainable, income-generating activities.

REFERENCES

Abah Daniel Abah, Abu Godwin Anjeinu, Ater Peter Iorhon (2015). Analysis of the Performance of Paddy Rice Marketing in Benue State, Nigeria *Journal of Agricultural Science and Engineering*, **1**(3): 143-152

Abul, A., and Heidi, A. (2018). Food Insecurity in Conflict Affected Regions in Nigeria: results from the North East, North Central, and South-South Zones. World bank Collaborative study.

Babatunde, R. O., Omotesho, A. O., and Sholatan, O. S. (2007). Socio-economic Characteristics and Food Security Status of Farming Household in Kwara State, Nigeria. *Parkistan Journal Nutrition.* 6: 49-58

Devereux, S., (2001), 'Poverty, Livelihoods & Famine', paper prepared for the Ending Famine in the 21st Century Conference, 27 February-1 March 2002, Institute of Development Studies, University of Sussex, UK.

Eluhaiwe, P.N. (2008). The Central Bank of Nigeria Partnership with Alliance for Green Revolution in Africa(AGRA): Conceptual Issues, Operations and Prospects for Food Security in Nigeria. In Central Bank of Nigeria Economic and Financial Review, 48(4).

Emodi, A.I. and Agwu, E.A. (2018). Influence of marketers' Socio-Economic Characteristics on Rice Production in South East Nigeria. *Production Agriculture and Technology.* **14**(2) 111-120

Food and Agriculture Organization (FAO) (2002). The State of Food Insecurity in the World 2001. Rome

Food and Agriculture Organization (2007). Developing Food-Based Dietary Guidelines-A manual from the English-speaking Caribbean.

John, K. M. K., Demi, M. S., and Ditchfield, P. K. A. (2013). Analysis of Food Security Status of Farming Household in the Forest Belt Central region of Ghana. *Russian Journal of Agricultural and Socio-Economic Sciences.* 1(13):1-17

Konandreas, P., Sharma, R. and Greenfield, J. (2000). The Uruguay Round, the Marrakesh Decision and the role of food aid. In E. Clay. & O. Stokke, eds. Food and Human Security. London: F Cass

Kruger, R., Schonfeldt, H.C. and Owen, J.H. (2008). Food-Coping Strategy Index Applied to a Community of Farm-Worker Households in South Africa. Food Nutrition Bullettin 29(1):13-14 DOI: https://doi.org/10.177/156482650802900101

Maxwell, D., Watkins, B., Wheeler, R. and Collins, G. (2003). The Coping Strategies Index. Field Methods Manual. Nairobi, Kenya: Care and World Food Progarmme.

National Population Commission (2025). National population projection based on 2006 population census.

Olayiwola, S. A., Tashikalma, A. K. and Giroh, D. Y. (2017). Analysis of Food Security Status and Coping Strategies among Rural Households in Oluyole Local Government Area of Oyo State, Nigeria. *FUW Trends in Science & Technology Journal*, 2(1A): 28-32

Snel, E. and Staring, R. (2001). Poverty, Migration, and Coping Strategies: An Introduction. *European Journal of Anthropology*, 38: 7-22

Zalkuwi J. (2019) Economics analysis of rice marketing in Mubi North Local Government Area of Adamawa State, Nigeria. *Nigeria Agricultural Science and Technology,* **11**(4): 356-359