Assessment of the Causes and Socio-economic Consequences of Food Insecurity in Katsina State, Nigeria

Adamu Ahmed Wudil[1*] and Abubakar Haruna[2*]

Strategy and Performance Management Department, Bank of Agriculture, Kaduna State, Nigeria.
E-mail: adamwudil@gmail.com

Abstract: This study Assessed the Causes and Socio-Economic Consequences of Food Insecurity in Katsina State, Nigeria. Applying Malthusian population theory and Descriptive statistics techniques of frequency and simple percentages in the presentation and analysis of data. In addition, logistic regression was used to check the robustness of the analysis. The population of this study covers the entire household population of Katsina State. Non-probability sampling method was used to select a sample of 90 respondents, who are farmers in the study area (at least 10 from each of the 3 political senatorial zone of the state). The study found that food availability, Food accessibility and food stability have negative and significant impact on food insecurity among household Katsina State. The result also revealed that food utilization has positive and significant impact on food insecurity among household in Katsina State. Lastly, the result shows that determinants of food insecurity have positive and significant relationship with food insecurity with 0.613% degree of association with corresponding probability value of Pearson correlation reads 0.004 which is less than 0.05. The study concludes that food availability, food accessibility, food utilization and food stability were the major determinants of food insecurity among household in Katsina State. Thus, the study recommends that since food insecurity incidence increases with increase in household size, efforts should be made at improving programmes and policies that will ensure a proper family planning which will reduce the number of children to that which the household can adequately cater for.

1. Introduction

Nigeria has suffered from food insecurity and poverty as indicated in an estimate that put the number of hungry people in Nigeria at over 53 million, which is about 30 percent of the country's total population of roughly 150 million; and 52 percent live under the poverty line (Ajayeoba, 2010). These are matters of serious concern largely because Nigeria was self-sufficient in food production and was indeed a net exporter of food to other regions of the continent in the 1950s and 1960s (Ajayeoba, 2010).

A nation is food secured when food is available and accessible in sufficient quantity and quality for a productive livelihood for every individual. The increasing issue of food insecurity, particularly in Africa has been greatly attributed to wars, conflicts, natural disasters and bad governance (Umar, 2014).

Globally, there is enough food for all, but more than 780 million people are chronically undernourished (FAO, 2001). Millions of people in developing world simply cannot obtain the food they need for a healthy and productive life. Much of the scholarly debate on agricultural growth and poverty in Nigeria have followed the general trend of regressing measures of poverty against agricultural output per head and a time trend (World Bank, 2009). This is based on the knowledge of agricultural production landscape in Nigeria.

The socio-economic and production characteristics of farmers, inconsistent and unfocussed government policies, the poor infrastructural base, all interact in a synergism to asphyxiate the sector, resulting in low production, high prices of food items, inflation, underdevelopment and concomitant poverty (Umar, 2014). The place of agriculture in an agrarian society cannot be overemphasized given its importance in the life of human beings. Agriculture is expected to ensure adequate supply of food to the people. Millions of people in developing world simply cannot obtain the food they need for a healthy and productive life (Ayantoye, 2011). Similarly, agriculture is expected to produce a high level of agricultural raw materials for the industries, save the industry and the nation from high costs of importation, produce excess for the local demand (for food and raw materials) for export. Agriculture should continually generate employment for the people as well as a high level of returns for the farmers.

The performance of agriculture in Nigeria has not been able to match the expectation ascribed to the sector in the development process. At independence, agriculture sustained the Nigeria economy and held the promise of a vibrant agrarian economy (Akpan, 2009). In fact, according to Adeboye (1991), agriculture contributes about 67% in the 1960-1961, of the Gross Domestic Product (GDP). In the 1999–2000, agriculture contributed between 40–42 percent to the GDP. The Civil War (1967-1970) and the emergence of petroleum in the early 1970s scuttled the production foundation of agriculture through lack of visionary planning for sustainable development. The sector is yet to regain its central role in the economy.

The Global Hunger Index, published by the International Food Policy Research Institute (IFPRI) 2004, ranks developing countries according to their performance on three indicators: proportion of undernourished as a percentage of the population, prevalence of underweight children under five and child mortality. On a scale of 0-100, with 0 indicating the absence of hunger in a given country, Nigeria's 2008 ranking was in the 10-19 range, labeled "serious" The population segments with the highest vulnerability to food insecurity include poor

farming households in the Sudan-Sahelian zone of Northern Nigeria and the, humid forest zones of Southern Nigeria, and pastoralists scattered over Northern Nigeria. The Sudan-Sahelian zone is particularly drought-prone, the humid forest zones are particularly flood-prone, and pastoralists commonly face fodder and water deficits due to low rainfall situations in the North (World Food Prize, 2010).

It is on the above premise that, this study seeks to assess the causes and socio-economic consequences of food insecurity in Katsina state with a view of proffering solution on how to combat the menace of food insecurity into food security.

2. Review of Empirical Studies

Hussain, *et al.* (2016) examined the determinants of food insecurity in Katsina state, Nigeria. They employed an ordinal logit regression approach to analyze the determinants of food insecurity among farming households in katsina state. The farming household food insecurity level in the study area was very high with the majority of the households being less food secure and more than one strategy was used to cope with periods of food shortages. They recommended that farming households be provided with opportunities for livelihood diversification, access to credit, market linkages and training on post-harvest handling to enhance their food security.

Abdullahi, *et al.* (2015) analyzed the determinants of food security status among rural farm households in North-western Nigeria using logit regression model. The study showed that age, extension contact, source of labour and per capita income were the main determinants of food security in the study area. The result of marginal effect also shows that the probability of food security among the households is more responsive to a change in age than to extension contact, source of labour and per capita income.

Ahmed, *et al.* (2015) undertook an empirical analysis of socio-economic characteristics and food security situation among semi-urban households. The Study analyzed the socio-economic characteristics and food security situation among semi-urban households in Biu and Bama Local Government Areas in Borno State, Nigeria. Well-structured questionnaire was used to source information from 198 randomly selected households. Descriptive statistics, Cost-of-Calorie Function (COC) and Logit model were used to analyze the data. The study revealed that mean age of respondents was 45 years and they spent an average of 8 years in formal education. Also, mean monthly income level

was about N40,000 and assets base was at an average of N194,000. The food security line was found to be N66.17 per day per adult equivalent and 44% of the households were food secure. Significant and positive variables in explaining the variation in food security status include education, farm size, income, contacts with extension agents, cooperative membership, family labour, assets, farm enterprise, farming experience and food diversity. Child dependency ratio and gender though significant, negatively influence food security. Results also showed that crop production, monthly wages and petty trading were the major sources of income in the study area. The study, therefore recommended improvement of wage-earning capacity, more income diversification opportunities and increased awareness to family planning facilities were proffered.

Ahmed (2015) examined the determinants of household food security and coping strategies in Blue-Hora, Borana zone, Oromia, Ethiopia. Ordered logit regression model was fitted to analyze the potential variables affecting food insecurity in the study area. Among 14 explanatory variables included in the logistic model, 6 of them were significant at less than 5% probability level. These are; cultivated land size, livestock holding and improved seed, sex of household head, soil fertility status and non-farm income.

Ojogho (2010) examined the determinants of food security among arable farmers in Edo state, Nigeria, using binomial logit model. The education level of farmers, household size, output level of household and per capita income of the household are the major determinants of food insecurity in the area while the probability of a household being food insecure is due to household size, household dependency ratio, sex of household head, age and the level of education of the household head.

Mukhtar (2011) used binary choice modeling technique to analyze determinants of food insecurity in Nigeria. Among the variables considered are; household income, educational qualification, gender, size of household, assets owned by households and access to credit. The study revealed that the factors that determined the likelihood of some selected households to become food insecure in Nigeria includes household income, gender of head of household, household size, educational status of head of household, total number of assets owned by households and access to credit facilities by households. Almost all the determinants of food insecurity in the study have conformed to economic theory with exception of access to credit.

Olagunju, *et al.* (2012) undertook an empirical analysis of determinants of food insecurity in Ogbomosho metropolis of Oyo state, Nigeria using binary

logit model. Socio-economic variables such as asset holding (mainly cultivated land, farm income, non-farm income and household production enterprises) and access to services like credit are found to be important correlates which affect household food security favorably in the study area. While controlling for all other variables, households with better access to credit, education, extension agents and cooperative membership are found to have significantly higher food security and so more likely to be food secure. However, among demographic variables considered in the study, only age was found to have a negative and statistically significant effect on household food security. Contrary to usual expectation, the coefficient of farm income, dependency ratio, family and hired labour were not statistically significant. These may imply that household headship has not yet enhanced households' capabilities to adopt better production technologies accept technical advice from extension workers and diversify their source of income which would have reduced the risk of food insecurity among households.

Babatunde, Omotesho and Sholotan (2007) analyzed the socio-economics characteristics and food security status of farming household in kwara state, Nigeria using logit regression model. The study has shown that the socio-economic variable of the farm households are importants determinants of their food security or insecurity status. The study showed that household's income, quantity of food from own production, education of household's head and the household's size are importants determinants of food security among rural households. The also showed that household's head education is one of the significant determinants of food security.

3. Research Instruments and data collection

3.1. Questionnaire

Closed ended questionnaires is used in this study. In the closed ended questionnaires, there were two sections. Section A, ask about personal information of the household farmers in katsina state. Section B ask questions about the causes, determinant and socio-economic consequences /of food insecurity in Katsina state areas.

3.2. Method of Data Analysis

Logistic regression was used in analyzing the data. The profile of the respondents is also analyzed by use of frequency and percentage distribution.

3.3. Research Population

The study focused on the causes and socio-economic consequences of food insecurity in katsina state. Thus, the population of this study covers the entire household population of Katsina State.

3.4. Sample size

This study intends to use non-probability sampling method and use a sample of 90 respondents, who are farmers in the study area (at least 10 from each of the 3 political senatorial zone of the state).

3.5. Sampling Procedure

The main sampling technique that was used in this study is purposive sampling and simple random sampling technique. The justification for using purposive sampling method stem from the fact that, the target respondents that could best answer the research questions are household that engage in farming activities, for they have indepth knowledge as to the status of food security in the area under study. Moreover, simple random sampling is then used to choose 90 household farmers in the area and administer the questionnaire among the respondents. The rationale for using simple random sampling technique is because, it gives equal chance to all the members of the population to participate in the study (Osuala, 2007).

3.6. Sources of Data

The study uses quantitative primary data. This source took the form of original data collected during the study from the respondents in the field to meet the research objective. Questionnaire was used as the main instrument for this study.

4. Results and Discussions

Table 1
Questionnaire Distribution and Response

Response	Frequency	Percentage (%)
Distributed questionnaires	384	100.00
Returned questionnaires	361	94.01
Rejected questionnaires	9	2.49
Retained questionnaires	352	91.67

Source: Field work, 2019

A total of 384 questionnaires distributed to the target households among which only 352 were retained and used for data analysis which represent 91.67% of the total questionnaire returned and this constitutes the sample of the study which give an effective response of the study. This rate is considered sufficient considering the Sekaran's (2003) argument as cited in (Bambale, 2013) that response rate of 30% is acceptable for surveys (Bartlett, Kotrlik, & Higgins, 2001; Hair *et al.*, 2010).

Table 2
Socio-Economic characteristics of the Respondents

Variables	*Frequency*	*Percentage (%)*
Gender:		
Male	188	53.41
Female	164	46.60
Age:		
20-30 Years	58	16.48
31-40 Years	137	38.92
41-50 Years	118	33.52
51-above	39	11.07
Marital Status:		
Single	38	10.80
Married	187	53.125
Divorced	53	15.05
Widow	74	21.02
Educational Qualification:		
Primary	22	6.25
Secondary	73	20.77
Tertiary	134	38.06
Others	123	34.94
Household size:		
1-4	36	10.23
5-9	158	44.89
10-14	127	36.08
15-above	31	8.81
Occupation:		
Farming	122	34.66
Trading	99	28.13
Salary earner	58	16.48
Others	73	20.74

Source: Fieldwork, 2019.

4.1.   *Logistics Linear Regression Model*

Logistics linear regression method was used to investigate the determinants of household food insecurity in Katsina state. The result of the analysis is presented thus:

Table 3
Regression Result

Variable	Coefficient	Std. Error	t-statistic	Prob
Constant	2.373535	0.929076	2.5547264	0.0781
FAV	-0.222378	0.012815	-17.35294	0.0002**
FAC	-0.190988	0.0644671	-2.962565	0.0440*
FUT	0.209516	0.020041	10.248462	0.0013**
FST	-0.424991	0.120018	-3.5410605	0.0039**

Source: Researcher's Computations Using SPSS V.21

** (*) indicates significance at 1% and 5% levels respectively

$R^2 = 0.541$

$R^{-2} = 0.537$

F-stat. = 97.399

Prob.(F-stat)=0.0000

FIs= 2.373+0.222FAV+0.191FAC+0.209FUT+0.42FST

The above result revealed that, holding the other explanatory variables constant, the magnitude of food insecurity bedeviling households in Katsina state will be 2.373 on average. However, the result shows that there exist a negative and statistically significant relationship between food insecurity and food availability with corresponding p-value coefficient ($p < .01$). This further means that as food availability increase in Katsina state, the magnitude of food insecurity among household decrease by 22% or 0.22 units. The result also shows that there is a negative and statistically significant impact of Food accessibility on food insecurity among household in Katsina with the corresponding p-value < 0.05. This result goes with reality and with the *a priori* expectation and theoretical underpinnings. Moreover, tremendous literature reviewed reaffirms the findings such as the work of Mesfin (2014) and Ahmed (2015).

However, the result indicates food utilization has positive and statistically significant impact on food insecurity among household in Katsina with corresponding p- value < 0.01. But, this outcome may sound surprising and it goes against the reality. Meanwhile, it is possibly due to the fact that, there are

inadequate storage facilities in Katsina state to fully and adequately preserve the food from decay and spoilage. This is why the result indicates a positive relationship and another reason may be attributed to the data utilized in the study which was elicited from respondent's opinion, and hence they are human whose response may be altered and change at any moment.

The magnitude of eta squared for the coefficient of determinants of food insecurity variables used in this study was large (eta=0.08) based on Cohen (1988) formulation. Moreover, the result also indicates a negative and statistically significant relationship between food stability and FIs with corresponding p-value coefficient (p<0.01). The impact size coefficient eta squared=0.04 revealed medium effect size (Cohen, 1988).

The coefficient of determination R^2 reads 0.541 indicating a strong explanatory power of the explanatory variables on the dependent variable. The value of F-statistic reads 97.399 indicating that overall model is statistically significant as revealed also by its probability value =0.0000 (p<0.05).

Table 4
Correlation result

Variable	*r*	*Prob*
FIs	0.613	0.004**
Determinants of food insecurity		

Source: Researcher's Computations Using SPSS V.21
** (*) indicates significance at 1% and 5% levels respectively

Table 4 reveals the correlation result between food insecurity and its determinant, in which case, the result shows that determinants of food insecurity has positive and statistically significant association with food insecurity with 0.613% degree of association with corresponding probability value of Pearson correlation reads 0.004 which is less than 0.05. This reaffirmed the findings of Mefsin (2014) and Ahmed (2015) who posits that food availability, accessibility, utilization and stability significantly affect food insecurity. However, the result refuted the assertion of Robert, James and Thomas (2013) who found significant association between food insecurity and its determinants.

5. Conclusion

This study assesses the causes and socio-economic consequences of food insecurity in katsina state, Nigeria. For this purpose, Malthusian population theory was applied

and Descriptive statistical techniques of frequency and simple percentages was used in the presentation and analysis of this study. Moreover, logistic regression was used to assess the impact of the independent variable on the dependent variable. The results indicated that that food availability, accessibility, utilization and stability are the major determinant of food insecurity in Katsina state. There exist a negative and statistically significant relationship between food insecurity and food availability with corresponding p-value coefficient (p<.01). This further means that as food availability increase in Katsina state, the magnitude of food insecurity among household decrease by 22% or 0.22 units. The result also shows that there is a negative and statistically significant impact of Food accessibility on food insecurity among household in Katsina with the corresponding p-value <0.05. This result goes with reality and with the *a priori* expectation and theoretical underpinnings. Moreover, tremendous literature reviewed reaffirms the findings such as the work of Mefsin (2014) and Ahmed (2015).

However, the result indicates food utilization has positive and statistically significant impact on food insecurity among household in Katsina with corresponding p- value <0.01. But this outcome may sound surprising and it goes against the reality. Meanwhile, it is possibly due to the fact there are inadequate storage facilities in Katsina state to fully and adequately preserve the food from decay and spoilage. This is why the result indicates a positive relationship and another reason may be attributed to the data utilized in the study which was elicited from respondent's opinion, and hence they are human whose response may be altered and change at any moment.

The magnitude of eta squared for the coefficient of determinants of food insecurity variables used in this study was large (eta=0.08) based on Cohen (1988) formulation. Moreover, the result also indicates a negative and statistically significant relationship between food stability and FIs with corresponding p-value coefficient (p<0.01). The impact size coefficient eta squared=0.04 revealed medium effect size (Cohen, 1988).

Conclusively, the variables used in this study (notably; food availability, food accessibility, food utilization and food stability) were found to be the major determinants of food insecurity in the study area.

5.1. Recommendations

Based on the findings of the study, the following recommendations are made in an attempt to improve the food security status of households and therefore, the regional and national food security status.

(i)   Since food insecurity incidence increases with increase in household size, efforts should be made at improving programmes and policies that will ensure a proper family planning which will reduce the number of children to that which the household can adequately cater for.

(ii)   Government should provide basic inputs and farm implements such as fertilizers, tractors/animal drawn equipment, improved seeds, among others in order for households to increase their food production levels to make food available, since food availability was one of the significant determinants of food security in the study area.

(iii) Food accessibility should be improved by provision of good rural transportation system that would assist farmers to convey their farm produce to the market at cheaper cost.

(iv)   Provision of good and adequate storage facilities that will improve food utilization should be given utmost priority so as to improve the food utilization capacity in the study area.

(v)   Farming should be encouraged to make food available couple with legislation that will fight against hording of food.

References

Abdullahi, Hassan and Ayanlere (2015). Determinants of food security among rural farm households in North-Western Nigeria.

Adeboye, J. B. (1991). The historical background of agricultural development systems in Nigeria, in the training manual of the NAERLS/FACU/ARMTI specialized workshop on the Roles of subject matter specialists in the ADPs, held at NAERLS, ABU, Zaria. May 20-24.

Ahmed (2015). Determinants of household food security and coping strategies: The case of Blue-Hora District, Borana zone, ohomia Ethiopia

Ahmed, F.F. & Naphtali, J. (2015). Socioeconomic characteristics and food diversity amongst high income households: a case study of Maiduguri metropolis, Borno state, Nigeria. *American Journal of Social and Management Sciences,* 5(1), 19-26.

Ajayeoba, A. (2010). Concerning Food Security in Nigeria: a West Africa Insight of 1st December Farming, A Publication of Centre for Democracy and Development. Pp. 3-4.

Akpan, E.O. (2009). Oil resource management and food insecurity in Nigeria. Paper prepared for presentation at the European Report on Development (ERD) Conference in Accra Ghana 21st-23rd May, pp. 119-121

Ayantoye, K., Yusuf, S.A., Omonona, B.T. &Amao, J.O. (2011). Food Insecurity Dynamicsandits Correlates among Rural Households in SouthWestern Nigeria. *International Journal of Agricultural Economics and Rural Development,* 4(1), 43-55.

Babatunde, Omotesho and Sholotan (2007). Socio-Economic characteristics and food security status of farming households in Kwara State, North central Nigeria.

Food and Agriculture Organization (FAO), (2001). The state of food and agriculture. Retrieved July 30, 2010 from *http://www.fao.org/docrep/003/x9800e/x9800e00.htm*. Food and Agriculture Organization (FAO), (2005). The Impact of HIV/AIDS on food security." Committee on World Food Security, 27 Session, Rome.

Hussain (2016). Determinants of food insecurity among farming households in Katsina State, North western Nigeria: An ordinal logit regression approach.

International food policy institute (IFPRI) (2004). Development strategies and food and Nutrition security in Africa. An assessment, 2020 discussion paper 38.

Mesfin, W. (2014). Determinants of Households Vulnerability to Food Insecurity in Ethiopia: Econometric analysis of Rural and Urban Households. *Journal of Economics and Sustainable Development*, 5(24). Retrieved from *http://www.iiste.org/Journals/index.php/JEDS/article/view/17506/17926*

Mukhtar Mustapha (2011). Determinants of food insecurity in Nigeria: Application of Binary choice modeling technique.

Olagunju, F.I., Oke, J.T.O., Babatunde, R.O. & Ajiboye, A. (2012). Determinants of Food Insecurity in Ogbomoso Metropolis of Oyo State, Nigeria Production Agriculture and Technology, 8(1), 111-124.

Okuneye, P. A. (2002). Rising cost of food prices and food insecurity in Nigeria and its implication for poverty reduction. *Economic and Financial Review, Central Bank of Nigeria,* Vol., 39 No. 4.

Ojogho, O. (2010). Determinants of food insecurity among arable farmers in Edo State, Nigeria"

Robert, James and Thomas (2013). Determinants of household food security in Sekyere-Afram plains District of Ghana."

Umar, A. (2014). The strategy for ensuring food security in Taraba state.

Wikipedia (2013). History of Katsina State. *www.google.com*

World Bank (2009). Gender and food security. *http://siteresources.worldbank.org/* (Accessed 6th March, 2010).

World Food Prize (2010). Solutions for the World's smallholders. World Food Prize 2010 Global Youth Institute.