



Analysis of Food Security Status among Rural Farming Families in Jigawa State, Nigeria

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ABSTRACT

This study was designed to analyze the food security status among rural farming families in Jigawa State. The study utilized multistage random sampling technique to obtain a sample of 184 respondents. Primary data were collected using structured questionnaire with the help of well-trained enumerators. Data were analyzed using descriptive statistics and food security index. Results revealed that rural farming households head were predominantly male (71.7%) and most (79.9%), were married with one level of education or another (67.4%). The mean age for the households' head was 42 years and the mean household size was 10 persons per household. The mean for farming experience and annual farm income of the respondents were 21.9 years and ₦32,238 respectively. Using the recommended calorie required approach, the study revealed that 30.4% and 69.6% of the households were food secure and food insecure respectively. The perceived coping strategies in cushioning the effects of food insecurity include consumption of less preferred food, reduction in quantity and quality of food consumed, borrowing money to buy food, sales of some assets. Based on the recommended energy level of 2, 900 Kilocalories per person per day, it could be concluded that the study area is food insecure since a higher proportion of the sample households are food insecure. The study therefore recommends that formal education be promoted by government and other stakeholders as a means of improving food security as it opens up more income earning opportunities for the farming households especially in the non-farm sector, farmers should be encouraged by government and nongovernmental organizations to increase their food crop production by providing subsidized farm inputs, increase in access to credit facilities, this is necessary for increased per capita food availability that is necessary for food security, enlightenment programmes on health education and birth control measures should be directed at the farming households, this is to reduce the large family size observed in the area which could have effects on household food security, food insecurity coping strategies adopted by the households can only minimize its the impact therefore household heads should adopt more sustainable approaches such as, engaging in income generating activities such as petty trading and other off-farm activities.

Keywords: *Food Security, Farming Families, Rural Jigawa, Nigeria.*

INTRODUCTION

The idea of food security was presented for the first time at the world food conference in 1974, viewed solely from the perspective of having adequate availability of food on a national scale. Today, it is a condition in which all people have access at all times to enough food for an adequate nutritional quality for a healthy and active life (Tollens, 2000).

Food security is a term commonly linked to hunger and food access related issues (West African insight, 2010). The main goal of food security is for individuals to be able to obtain adequate food needed at all times and to be able to utilize the food to meet the body needs (Nnadi *et al.*, 2012).

In Nigeria the percentage of food insecure household was reported to be 18% in 1996 and over 40% in 2005 (Sanusi *et al.* 2006). Agricultural growth is particularly effective in reducing hanger and malnutrition (FAO, 2012). The agricultural growth rate relative to population growth is said to be low in Nigeria (Word Bank, 2008). Agriculture is reported to grow at a rate of 2.5% per annum as against 3.5% per annum of population growth rate, thus resulting to food insecurity in the nation (Icheria and Kabill, 2012).

A household is said to be food secure if it can reliably gain access to give in sufficient quantity and quality food for household members to enjoy a healthy and active life (Barret, 2002). Household food security depends substantially on household income and asset (or wealth) of the states. A low-income household is more likely to suffer food shortages than a wealthier household. The relationship between a household's food security states and its purchasing power is far from static it changes over time (Aliber, 2009). Household food security will only be stable when there is good food availability at relatively low prices.

Food insecurity is a major development problem that is caused by myriad of factors in the global, regional, national and local spheres of human life. Several efforts have been put in place to alleviate food security, globally, nationally and even locally (Icheria and Kabill, 2012).

It is obvious that Nigeria is endowed with both physical and human resources and fertile land to produce food for their entire population and even marketable surplus for exports but, nevertheless, food has been imported to support the insufficient domestic production. However, the farming households in Nigeria are poor and subsistence farmers and their food security status always varies (Nnadi *et al.*, 2012).

The supply side approach of measuring food security (e.g. measurement of total food production and availability and food Balance sheet) commonly used in Nigeria only focuses on food availability at the macro or national level and does not satisfactorily capture what happens in terms of food availability, access and utilization at the households and individual levels (Akinyele 2009, Liverpool-Tasie *et al.* 2011, Adebayo 2010, Oruche, 2012.). This study would be able to provide latest information regarding food security status of rural households. The objectives of this study, therefore, were to:

- i. describe the socio-economic characteristics of the rural farming families,
- ii. determine the food security status of the rural farming families, and
- iii. Identify the coping strategies employed among food insecure farming families in cushioning the effects of food insecurity.

METHODOLOGY

Description of the Study Area

Jigawa State is located in the North-Western part of the country between latitude 11⁰N to 13⁰N and longitude 8⁰E to 10.15⁰E, Kano State and Katsina State border Jigawa to the West, Bauchi state to the east and Yobe State to the Northwest. Jigawa state shares an international border with Zinder region in the republic of Niger. The state has a total land area of

approximately 22, 410 square kilometers with a population of 4,361,002 (NPC, 2006). The economy of Jigawa State is largely characterized by informal sector activities with agriculture as the major economic activity. The dominant ethnic groups in the state are Hausa and Fulani. Major crops produced in the area include: millet, wheat, sorghum, rice and cowpea.

A tropical wet and dry climate prevails over the state and it has two distinct seasons; wet and dry seasons. The wet seasons lasts between May and early October while the dry season lasts between November and April. The total amount of rainfall ranges from 600mm in the north to 1000mm in the southern part of the state. Average temperature of the state is 29⁰C with 21.2⁰C as minimum temperature occurring between November to February and 31.3⁰C as maximum temperature occurring between March and April. Relative humidity is highest in August with 80% and low in January through March with 23-30%.

Sampling and Data collection

A multi-stage sampling procedure was used to select one hundred and eighty-four (184) respondents for the study. In the first stage two local government areas (LGAs) from each of the four agricultural zones in the State was randomly, selected. Dutse and Jahun in Zone I, Kaugama and Auyo Zone III, Ringim and Taura in Zone II, Kazaure and Roni in Zone IV were selected.

In the second stage, 5% of the list of villages in each of the LGAs were randomly selected. The last stage also involved a random sampling of 10 % of the population of rural farming households from each of the villages selected make a total of one hundred and eighty-four (184) respondents as sample size for the study. Primary data were used for the study. The data were generated using structured questionnaire administered to the respondents with the assistance of trained enumerators.

Data Analysis

Data collected for the study were analyzed using descriptive statistics such as frequencies, percentages, standard deviation and food security index. The food security index is given as follows:

$$Z_i = Y_i/R \dots \dots \dots (1)$$

Where:

- Z_i = Food security index of the household
- Y_i = Daily per capita calorie intake of rural farming households
- R = Recommended per capita daily calorie intake (2,900 kilo calorie)
- Z_i = 1 for Y_i greater than or equal to R
- Z_i = 0 for Y_i less than R

To obtain per capita daily calorie intake, daily calorie intake of each household was divided by its household size. To determine recommended per capita calorie intake of the households the FAO (2000) standard of 2,900 kilo calorie was used.

The household, daily calorie requirement was estimated by first of all categorizing members of each household into different age group based on the fact that different age groups have different calorie requirements. The daily energy (calorie) requirements of various compositions of the households were converted into adult equivalent using the equivalent scales as shown in Table1.

Table 1: Recommended Daily Energy Intake and Equivalent Scale

Age Category (Years)	Average Allowance Per Day	Equivalent Scale
Children(<6)	1150	0.4
Children(6-18)	2250	0.7
Adults(>18)	2900	1

Source: FAO Stat (2000).

Total household composition or calorie requirement was obtained by multiplying the total number of adults in each household by the recommended calorie requirement of 2,900 kcal. The total foods requirement for children was converted to adult equivalent; this was done by multiplying the total number of children below the age of six (6) years in each household by recommended daily calorie Requirement of 2,900 kcal and a conversion factor of 0.4 to obtain their adult equivalent.

The total number of children between the ages of 6 to 18 years in each household was also multiplied by the Recommended Daily Requirement of 2900 kcal and a conversion factor of 0.7 to obtain their adult equivalent. The total daily calorie requirement for each household was obtained by summing up the requirement for the three age groups estimated in Table 1.

Households' daily food consumption (daily calorie intake) was obtained from household own food production and purchase to supplement own food production. The data on actual food consumed (maize, rice, sorghum, cowpea and millet) by each household per week were obtained and converted into kilogram. The energy content of 1kg of each food stuff was obtained from literature as shown in Table 2.

Table 2: Cereal Equivalent Conversion Ratios

Food Crop	Calorie/kg
Maize	3,590
Rice	3,640
Sorghum	1,190
Millet	2,891
Cowpea	3,340

Source: FAO Stat (2000)

The total quantity of each food (in kilogram) consumed was then multiplied by the energy content. The total kilocalories of maize, sorghum rice, millet and cowpea consumed by each household were summed up and divided by 7 (days in a week to obtain the actual daily calorie intake).

Additionally, the head count ratio of food security was calculated for the sample households based on food security line. The headcount ratio (H) measures the percentage of the population of households that are food insecure/secure (Seid, 2007)

The Head Count ratio (H)

$$H = M/N \text{ ----- (2)}$$

Where:

M = Number of food insecure/secured households

N = Number of households in the sample

RESULTS AND DISCUSSION

Table 3. Socio-Economic Characteristics

Socio –Economic Characteristics	Frequency	Percentage	Mean	Min	Max	Standard
Deviation						
Sex						
Male	132	71.7				
Female	52	2				
Marital status						
Single	8	4.3				
Married	147	79.9				
Divorce	11	6.0				
Widow	18	9.8				
Level of education						
Primary	16	8.7				
Secondary	23	2.5				
Tertiary	15	8.2				
Qur'anic education	56	30.4				
Never been to school	60	32.6				
Adult	14	7.6				
Age (Years)						
21 - 30	49	26.6	41.7	21	85	14.069
31 – 40	38	20.7				
41 – 50	51	27.7				
51 - 60	23	12.5				
61 –85	23	12.5				
Household size (Person)						
1 - 5	45	24.5	9.61	1	30	5.73
6 - 10	66	35.9				
11 -20	63	34.2				
21 – 30	10	5.4				
Total annual income (Naira)						
1001 - 10,000	44	24.0	32,238	1,000	600,000	60628.79
10,001 - 20,000	55	29.9				
20,001 – 30,000	42	22.8				
30,001 - 40,000	14	7.6				
40,001 - 50,000	16	7.1				
50,001 - 600,000	13	8.6				
Farming experience (Years)						
5 - 15	6	3.1	21.85	5	70	13.128
16 – 26	61	33.1				
27 - 37	38	20.7				
38 - 48	21	11.4				
49 – 59	20	10.8				
60 – 70	38	20.7				

Source: Field Survey, 2018.

Table 3 shows the socioeconomics characteristics of respondents in the study area. The results of the finding show that the majority of the respondents were males (71.7%) while only 28.3% were females. According to Ziervogel *et al.*, (2006) men, have easier access to farmland through paternal inheritance than women in Nigeria but this is not so in the study area. About 67% of the households' head have one level of education or the other ranging from primary education (8.7%), secondary education (12.5%) and tertiary education (8.2%) adult education (7.6%), Qur'anic education (30.49). About 32.6% of the households' head have no education at all. According to Babatunde *et al.*, (2007) education is a social capital which could impact positively on household's ability to take good and well-informed production and nutritional decisions. The table further showed that 27.7% of the household heads were between the ages of 41 and 50 years 26.6% were within 21 to 30 years' age group while 20.7% were between the ages of 31 and 40 years. Hence they are energetic to cultivate large size farms for increased food production and engage in off-farm jobs so as to increase household income.

Majority of the respondents (79.9%) are married; and the average household size was 10. This implies that most of the farmers had large household sizes which could probably serve as an insurance against shortfalls in the supply of farm labor. According to Sule, Ogunwale and Afala (2002) household size, this plays important role in family labor provision in the agricultural sector.

The results also revealed ₦32, 238 as the average annual income which implies that majority of the respondents (76.6%) were low income earners considering the magnitude of their total monthly income from farming which was their major occupation and that might have affected their food security status. The result further showed that majority (63.5%) had at least 27 years of exposure to farming experience which could have exposed them to the skills and knowledge of their chosen profession.

Food Security Status of Rural Farming Families

Table 4 presents the summary statistics of food security indices among the sampled households.

Table 4: Summary Statistics of Food Security Status in the Study Area

<i>Variables</i>	<i>Mean</i>		
	<i>Food Secure</i>	<i>Food Insecure</i>	<i>Total</i>
<i>Percentage of Households</i>	30.4	69.6	100
<i>Number of Households</i>	56	128	184
<i>Food security index (Z)</i>	1.52	0.57	
<i>Head count Ratio (H)</i>	0.30	0.69	

Source: Field Survey, 2018

The results showed that the study area could be regarded as food insecure given the fact that only 30.4% of the populations were able to meet the recommended calorie intake of 2900 Kcal per capita per day while 69.6% could not. The mean food security index of food secured household was 1.52 and 0.57 for the food insecure household.

Coping Strategies Employed Among Food Insecure Farming Families in Cushioning the Effects of Food Insecurity

Table 5 presents the coping strategies employed by households in cushioning the effects of food insecurity.

Table 5: Coping strategies employed among food insecure farming families in cushioning the effects of Food Insecurity.

Coping Strategy	Frequency	Percentage	Rank
Consumption of Less Preferred Food	50	27.2	1 st
Reduction in quality and quantity of food consumed	27	14.7	2 nd
Diversion of money meant for other purposes to buy food	26	27.2	3 rd
Borrowing money to buy food	23	14.7	4 th
Reduction in Number of Meal	21	11.4	5 th
Sales of some Assets	20	10.9	6 th
No Response	17	9.2	7 th
Total	184	100.0	

Source: Field Survey, 2018

The Table indicated that the major coping strategies employed by households include consumption of less preferred food (27.2%), reduction in quality and quantity of food consumed (14.7%). Due to high food prices and lower income, household resort to the consumption of less preferred food and less expensive food so as to feed and produce more food. (Ibrahim *et al.*, 2009).

Other coping strategies employed by the households include reduction in the number of meals per day (11.4%), Diversion of money, meant for other purpose to buy food (14.7%), Borrowing money to buy food, (12.5%), sales of some assets (10.9%). According to Amaza *et al.*, (2008) household assets is considered one of the measures of household resilience, which cushions the effects of adverse circumstances such as crop failure or drought on household food security.

CONCLUSION AND RECOMMENDATIONS

Based on the recommended energy level of 2900 Kilocalories per person per day, the study concluded that a higher proportion of the sample households are food insecure. From the respondents' opinion consumption of less preferred food, reduction in quantity and quality of food consumed, borrowing money to buy food, sales of some assets were major coping strategies employed to cushion the effects of household food insecurity.

It is therefore recommended that farmers should be encouraged by government and nongovernmental organizations to increase their food crop production by providing subsidized farm inputs, increase access to credit facilities. This is necessary for increased per capita food availability that is necessary for food security. Enlightenment programmes on health education and birth control measures should be directed at the farming households.

This is to reduce the large family size observed in the study area which could have effects on household food security.

Food insecurity coping strategies adopted by the households can only minimize its impact, therefore, there is a need for households to adopt more sustainable approaches such as engaging in income generating activities such as petty trading and other off-farm activities.

REFERENCES

- Adebayo, A.A. (2010). Food security status in Nigeria: Pre and post economic deregulation review. *International journal of economic development research and investment*, 1(1), 132–150.
- Akinyele, I.O. (2009). Ensuring food and nutrition security in rural Nigeria. An assessment of the challenges information needs, and analytical capacity. *IFPRI*, 7 (NSSP Background Paper).
- Aliber, M. (2009). Exploring statistics South Africa's national household Surveys as Sources of information about food security and subsistence Agriculture. Pretoria: Human Science Research Council.
- Amaza, P.S., Umeh, J.C., & Adejobi A.O. (2008). Determinants and measurement of food security in Nigeria: Some empirical policy guide. Contributed paper prepared for presentation at the International Association of Agricultural Economists Conference, gold coast, Australia.
- Babatunde, R.O., Omotosho, O.A., & Sholatan, O.S. (2007). Factors influencing food security status of rural farming households in North Central Nigeria. *Agricultural Journal*, 2(3):351-357
- Barret, C.B. (2002). Food security and food assistance programme. *Handbook of Agricultural Economics*, 2(4): 2-21.
- Food and Agriculture Organization FAO. (2000). Food and Agricultural Indicators, Country, Nigeria. Prepared by ESSA 2000.
- Food and Agriculture Organization FAO. (2012). World Food Programme, IFAD. The state of Food Insecurity in the World 2012. Rome: FAO; 2012.
- Ibrahim, H., Uba-Eze, N.R., Oyewole, S.O. and Onuk, E.G., (2009). Food security among urban households: A case study of GwagwaLada Area council of the Federal capital territory Abuja, Nigeria. *Pakistan Journal of Nutrition*. 8(6). 810-813.
- Icheria, J.N. & Kabill, B. (2012). Household food insecurity and coping strategies among small farmers in Tharaka Central Division, Kenya.
- Liverpool-Tasie, L. S., Kuku, O., and Ajibola, A. (2011). A Review of literature on Agricultural Productivity, social capital and food security in Nigeria: The Nigeria Strategy support program (NSSP). *IFPRI*, pp.1–53.
- National Population Commission, Census Report, NPC. (2006).30-35.

- Nnadi, F.N., Chikaire, J., C.D., Okafor, O.E., Echefama, J.A., and Utazi, C.O. (2012). Role of women in improving household food security in Owerri North area of Imo State, Nigeria. *Scholar link Research Institute Journal*, 3(5): 839-844.
- Oruche, E.N. (2012). Impact of the National special programme for food security on livestock farmers in Ideato South Local Government Area of Imo State, Nigeria. (2012), 251–258.
- Sanusi, R.A., Badejo, Catherine A. and Yusuf B.O. (2012). Measuring household food insecurity in selected local government areas of Lagos State and Ibadan, Nigeria. *Pakistan journal of Nutrition* 5(1): 62-67, 2006m (Faisalabad/Pakistan) (60%).
- Seid, F.F. (2007). Food insecurity and its determinants in Amhara Region M.Sc. thesis, Department of economics, Addis Ababa University, Ethiopia.
- Sule, O., Ogunwale, F., & Afale. D. (2002). Rural livelihood and food consumption pattern among households in Oyo State, Nigeria: Implications for food security and poverty eradication in degraded economy. *Journal of Social Sciences*, 11 (2). 127-132.
- Tollens, F. (2000). Food security: Incidence and causes of food insecurity among vulnerable groups and coping strategies, in CTA (2000): Food insecurity in ACP countries, proceedings of a CTA seminar, pp 27-50.
- West African Insight. (2010). Concerning food security in Nigeria. December 2010.
- World Bank. (2008). The fourth Tokyo international conference on Africa development
- Ziervogel, G., Nyong, A., Osman, B., Conde, C., Cortex, S., & Downing, T. (2006). *Climate variability and change implication for household food security. AIACC working paper. No.20. An electronic publication of the AIACC project. Retrieved from: www.aiaccproject.org (Accessed on 15th June, 2009).*