



## SOCIO-ECONOMIC DETERMINANTS OF EXPENDITURE ON FOOD BY FARM HOUSEHOLDS IN KADUNA STATE, NIGERIA.

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### Abstract

*Food accessibility means that there is the economic power to obtain food. This study therefore identified some factors that determine expenditure on food by farm households in Itara, Makarfi and Giwa Local Government Areas of Kaduna State, Nigeria. A 3-stage random sampling technique was used in selecting a total of two hundred and twenty-two respondents. Primary data were generated using field interview and structured questionnaires. The analytical tools employed were descriptive statistics, and Multiple Regression analysis. The socio-economic characteristics of household heads like age, household size, educational status, years of experience in farming, farm size, farm income, were analyzed. Average age of respondents was 42 years with an average of 8 persons per household. About 46% of respondents had no formal education with average farm income of ₦174, 590.909 per year with an average farm size of 2 hectares. A quantitative determination of the dependence per capita expenditure on food by farm households showed that access to micro credit, farm income and non-farm income were the main determinants of households' expenditure on food. Agricultural education through adult literacy programmes should be intensified, farmers also need to be encouraged to engage in all year round (rain and dry seasons) farm production to enhance constant access to both farm and non-farm income.*

**Key words:** Food accessibility, determinants, expenditure, households

### Introduction

In spite of the fact that food availability has increased along with the growing human population there are still 800 million people globally suffering from malnutrition (FAO, 1993). This problem is not as a result of insufficient food production and inadequate distribution but of the financial inability of the poor to purchase food of reasonable qualities to satisfy their needs (FAO, 1993). Furthermore, FAO (2005) asserted that about 800 million people or 20% of the developing world population are chronically undernourished. Most of these people are in

South Asia and Sub-Saharan Africa. In addition, millions of other people in affluent societies do not have enough food to meet their basic needs. And millions more experienced prolonged hunger during part of the year or suffer birth defects, growth retardation, mental deficiency, lethargy, blindness or death because they do not have the diversity of food necessary to meet their total needs. Food and Agriculture Organisation (FAO) has projected that unless the root causes underlying food security are addressed by 2010, 700 to 800 million persons worldwide will be chronically undernourished. In Sub-Saharan Africa alone,



clinically undernourished will increase from 200 to 300 million people in the next 15 years.

One of the major tasks facing Nigerian agriculture is the provision of adequate and stable food supply to meet the requirement of a growing population. Nigeria produces enough food to meet the calorie needs of her population, but there is strong evidence that the national food production as in the recent past failed to keep pace with the population growth and has been declining in per capita terms, despite efforts by government to stimulate food and agriculture production through various measures and incentives (NPC, 2001). Closely related to production is consumption or utilization which is one of the pillars of food security.

Food consumption has been a subject of research all over the world. It is especially meaningful in developing countries where food expenditures account for a relatively large share of household income. Studies of food consumption shed light on food related national policies. They provide estimates of how food consumption is affected by changes in price, income and taxation policies (Dome and Ekara, 2005). According to Ojo (2005), the production of food in Nigeria has not increased at the rate that can meet up with the food demand of increasing population. On the other hand, farm households' food consumption pattern depends on many factors. These factors affect food availability and how each food could be processed and stored. The broad objective of this study is to analyze the socio-economic determinants of expenditure on food by farm households in Kaduna State.

The specific objectives of this study are to:

- i. describe the socio-economic characteristics of respondents;
- ii. determine factors influencing expenditure on food by farm households;

### Methodology

This study was conducted in Kaduna State, located in the Northern Guinea Savanna

ecological zone. It occupies about the central portion of the Northern Guinea Savanna and shares common borders with Kaduna, Niger, Kano, Bauchi, Plateau States. To the South, it shares border with the Federal Territory, Abuja. The global location of the state is between longitudes 16° 00' East of the Greenwich Meridian and between latitudes 10° 00' and 12° 30' North of the equator. The state occupies an area of about 48,473.2 square kilometers (NBS, 2006). It has a population of 5,066,300 (NBS, 2006); and a projected population of 6,527,620 in 2019.

Agriculture is the major occupation of the people. Farming is mainly traditional in nature, though this is gradually giving way to modern methods. Crops produced in the state include cotton, groundnuts, soybean, maize, yams, beans, guinea corn, rice, pepper, rice, cassava etc. The state is one of the leading producers of ginger, sugarcane and maize in the whole country (Kaduna State Government, 2000). The cropping pattern in the area is dominated by mixed cropping, although sole cropping is also practiced, but farmers keep livestock like cattle, goats, sheep, donkey and poultry.

### Sampling Procedure

Kaduna State is divided into 3 agricultural zones by the Kaduna State Agricultural Development Project (KADP) in accordance with ecological characteristics, cropping practices and project's administrative convenience (Kaduna State Government, 2000). The zones are Miga, Sardauna and Lere. The population for this study comprised all farm households in Kaduna State. A three-stage random sampling technique was used in selecting the sample for this study. The first stage involved a random selection of Miga zone out of the three agricultural zones in the state. Stage 2 involved a random selection of Local Government Areas (LGAs). From the LGA 10 villages were randomly selected for this study. The third stage involved a random selection of 30 households in each of the



selected villages. Out of the 300 farm households selected for the study only 222 supplied complete data that were analyzed.

were collected based on 2009 farming season activities.

**Data Collection**

Primary data were used for this study. Primary data on the agricultural operations of the farmers were collected from the field using structured questionnaire. Data on socio-economic variables, food production, consumption, expenditure, and household level indicators were collected. These data

**Analytical Techniques**

The analytical tools that were used to achieve the research objectives include descriptive statistics and Multiple Regression Analysis. **Descriptive statistics such as percentages, frequency distribution tables, arithmetic mean and coefficient of variation were used.**

**Multiple Regression Analysis**

Step-wise form of multiple regression analysis was used for the study. The change in R<sup>2</sup> value as a result of stepwise inclusion of factors measures the proportion of variation in the dependent variable (expenditure on food) that each factor induced. The eight equations used were expressed as follows:

- $Y = \beta_0 + \beta_1 X_1 + e_i \dots \dots \dots (1)$
- $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + e_i \dots \dots \dots (2)$
- $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e_i \dots \dots \dots (3)$
- $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e_i \dots \dots \dots (4)$
- $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e_i \dots \dots \dots (5)$
- $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e_i \dots \dots \dots (6)$
- $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + e_i \dots \dots \dots (7)$
- $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + e_i \dots \dots \dots (8)$

Where

- $Y_1$  = Household expenditure level on food per year (Naira)
- $X_1$  = Access to micro credit/loan (0, 1)
- $X_2$  = Household farm income (Naira)
- $X_3$  = Household non- farm income (Naira)
- $X_4$  = Household size (No.)
- $X_5$  = Household annual crop production (kg grain equivalent)
- $X_6$  = Farm size (Ha)
- $X_7$  = Ownership of livestock (tropical livestock unit) 1 tropical livestock unit is equivalent to 250kg live weight.

- $X_8$  = Household head's educational level (years)
- $e_i$  = error term

Estimated beta coefficient was used to compare the relative importance or strength of the explanatory variables in explaining variability in expenditure on food.

$$B_j = \frac{C_j S_{x_j}}{S_y} \dots \dots \dots (9)$$

Where:

- $B_j$  = Beta coefficient
- $C_j$  = Regression coefficients of  $X_j$
- $S_{x_j}$  = Standard deviation of  $X_j$
- $S_y$  = Standard deviation of dependent variable  $y$ . (Olayemi, 1998)



**Table 1: Description of Explanatory Variables in Modeling Determinants of Expenditure on Food.**

Variables	Description
Expenditure on Food (Y)	The amount of money spent per household per year measured in Naira.
Access to credit (X <sub>1</sub> )	This was measured as a dummy (0 or 1)
Household Farm income (X <sub>2</sub> )	This is the total income accruing to the household from farming activities (crop and livestock production). The <i>a priori</i> expectation is that there is a positive relationship between farm income and expenditure on food.
Non-farm Income (X <sub>3</sub> )	This is the total income from other sources apart from farming.
Household Size (X <sub>4</sub> )	Summation of the number of wives, children, relatives and dependants living in a household at the time of investigation.
Annual Crop production (X <sub>5</sub> )	Total crop production by the household in kg grain equivalent. Availability of food is one of the important food security indices. Therefore the more a household annual crop production the lower the expenditure on food <i>ceteris paribus</i> .
Farm size (X <sub>6</sub> )	It is the size of the respondents' farm in hectares. It is expected that a household with more land will produce more crops and more marketable surplus thereby reducing expenditure on food.
Ownership of livestock (X <sub>7</sub> )	The number of livestock owned by household at the time of study. One tropical Livestock unit is equivalent to 250 kg live weight.
Educational level (X <sub>8</sub> )	This was measured in years of schooling by farm household head. It is expected that as the years of education of household heads increases so does his range of work-related skills and ability to acquire new skills. Thus, it is expected that higher education will be associated with higher crop production, more commercially oriented agriculture. Therefore a highly educated household head is expected to spend more on food.

## RESULTS AND DISCUSSION

### Age of household heads

The age of a farmer determines the quality and quantity of work he can do on his/her farm. It is an important measure of farm productivity. Table 2 shows that majority of the respondents examined were within the age bracket of 41-50 years, the average age of household heads was 42 years. About 4% were above 60 years; this implies that the farm households were active and productive. This agrees with Jibowo (1996) who reported that this group is very productive. Babatunde *et al.*, (2007) found out that the older the

household head, the lower the probability that the household would be food secure.

### Household size

In subsistence agriculture as practised in the study area, household size is very important as it determines, to a large extent, the supply of labour to the farm. However, large households with many dependants (children and the elderly) could be of little or no advantage to the farming household. Table 2 shows that majority (50%) of farm households have family size of between 6-10 people, with an average of 8 persons per household.



### Household heads' educational status

Education in agricultural production will assist the farmers to accept and test innovations available to him. It will enhance his ability to make informed and accurate decisions on the management of the farm. The study revealed that about 26% of farmers attended primary school and this constituted the highest educational qualification obtained by the largest group of respondents. However, about 46% had no formal education. The implication of lack of education by household head, according to NBS (2007), is that such a household is more likely to be poorer than the average and, by extension, lack the basic needs such as essential food needed for healthy living.

### Household farm income

The income from farming is a major determinant of per capita household expenditure and food security status. About 57% of the respondents had farm income between N100, 000 to N200, 000 per year (Table 2). The reason for this low income could be due to the fact that farm households usually satisfied their food needs before the excess were sold in the market. The result also shows that average farm income was N174, 590.909 per year.

Babatunde *et al.*, (2007), found out that the higher the farm household head's income, the higher the probability that the households would be able to have access to more food. This could be expected because increased income, other things being equal, leads to increase access to food.

### Farm size

Farm size is the total land cultivated by household head in hectares. Farm size is an important fixed factor in agricultural production. This is because it determines, to a large extent, the level of agricultural production (i.e. small or large scale production). The size of the farm cultivated

by a farmer is a function of population pressure, family size, labour availability and experience of the farmers (Imonikhe, 2010). Apart from these factors, source of farm land ownership determines to a large extent the farm size of farming household. As indicated in Table 2; majority (38%) had farm size between 2.0-2.9 hectares; with an average of 2 hectares. The result implies that most of the farmers were small scaled despite the large family size, young and energetic household heads. Small farm size impedes productivity, crop diversification and, consequently, availability of food to farm households.

### Determinants of Expenditure on Food by Farm Households

Empirical results of the determinants of expenditure on food by both beneficiaries and non-beneficiaries were obtained by means of multiple regression analysis. Several factors are known to influence expenditure on food by farm households. The purpose of this analysis was to determine the extent to which these important factors explain the variability of expenditure on food by beneficiaries and non-beneficiaries. These factors (independent variables) were access to microcredit, household farm income, non-farm income, and household size, annual crop production, farm size, ownership of livestock and educational level of household head. Step-wise form of regression analysis was used as outlined in the methodology.

The coefficient of access to credit, farm income, non-farm income, household size, ownership of livestock and educational level were positive (Table 3). This means that as these variables increase, the per capita expenditure on food increases. Further analysis showed that the coefficient of annual crop production and farm size were negative; implying that as these variables increase, the per capita expenditure on food decreases. It also means that these factors have negative impacts on the per capita household expenditure on food.

Three variables were statistically significant at 1% level of probability. The predicted



coefficient of access to credit was significant and positive. In conformity with the *a priori* expectation, this result showed that microcredit scheme has positive impact on the farm households' expenditure on food which may enhance their food security status *ceteris paribus*. Households' farm income and non-farm income were positive and significant. This indicates that income is a major determinant of per capita expenditure on food. This finding is in agreement with the findings of Ogundele *et al.*, (2004) in which they identified income as a major determinant of household expenditure on food and hence their welfare.

On the other hand, the step-wise regression analysis (Table 3) showed that the overall value of the coefficient of determination was about 53% of the variability in expenditure on food of the respondents. Non-farm income contributed the highest (22%) of the variability, thereby making it the greatest single contributor to the expenditure on food by farmers.

Table 3 also showed that farm income has the highest beta coefficient of 7.31; it means that a one standard deviation change in the independent variable leads to 7.31 standard deviation change in the dependent variable. The beta coefficients for significant variables can thus be ranked as:  $X_2 > X_3 > X_1$

**Table 1: Socio-Economic Characteristics of Respondents**

Age of Household Heads	Frequency	Percentage
21-30	50	22.5
31- 40	48	21.6
41-50	85	38.3
51-60	31	14.0
>60	8	3.6
Mean (42.189)		
Educational Status		
No formal Education	102	46.0
Primary Education	57	25.7
Secondary Education	24	10.8
Post Secondary education	39	17.5
Household Size		
1-5	66	29.7
6-10	110	49.6
>10	46	20.7
Mean (8.19)		
Farming Experience		
1- 10	30	13.5
11-20	71	32.0
21-30	61	27.5
31-40	41	18.5
>40	19	8.5
Mean (16.43)		
Household Farm Income		
100,001-200,000	126	56.7
200,001-300,000	40	18.0
300,001-400,000	17	7.7
>400,000	38	17.1
No farm Income	1	0.5
Mean (₦174,590.909)		



Age of Household Heads	Frequency	Percentage
Farm Size		
1.0-1.9	43	19.5
2.0-2.9	85	38.6
3.0-3.9	69	31.4
>4.0	25	11.5
Mean (2.0 ha)		

Source: Data analysis

Table 2: Estimated Regression Coefficients for Expenditure on Food by Farm Households

Independent Variables	Reg.Coeff.	S.E	T-Values	Sig. T
Constant	102897.48*	22685.88	3.747	0.0002
Access to credit ( $X_1$ )	31053.01*	15912.80	2.080	0.039
Farm Income ( $X_2$ )	0.230*	0.044	5.460	0.000
Non-Farm Income ( $X_3$ )	0.187*	0.036	5.670	0.000
Household Size ( $X_4$ )	3843.67	2634.98	1.459	0.146
Annual Crop Production ( $X_5$ )	-0.95	1.197	-0.79	0.428
Farm Size ( $X_6$ )	-2133.25	8744.74	-0.24	0.807
Ownership of Livestock ( $X_7$ )	18.25	142.92	0.13	0.898
Educational Level ( $X_8$ )	1683.23	1346.95	1.25	0.213

Computation from Field survey

\*T-value significant @ 1% level of probability

S.E = Standard Error

Table 3: Result of Step-wise Multiple Regression Analysis on Expenditure on Food by Farm Households

Variable	$R^2$	$R^2$	F-Value	$\beta$ - Coefficient
Access to Credit ( $X_1$ )	0.100	0.096	24.360	4.353
Farm Income ( $X_2$ )	0.207	0.200	28.546	7.31
Non-Farm Income ( $X_3$ )	0.222	0.212	20.761	4.974

Data analysis

## CONCLUSION AND RECOMMENDATIONS

### Conclusion

Regular income is the single most important determinant of per capita expenditure on food such that an improvement in farm income and

other economic activities will necessitate an improvement in expenditure on food. The study concludes that farmers need to be engaged in all year round farm and non-farm economic activities to enhance constant access to income.



## Recommendations

Based on the findings of this study, the following recommendations were made in an attempt to improve the economic activities of farmers towards the improvement of food expenditure patterns of farming households in the study area in particular and at the national level in general.

1. Agricultural education through adult literacy programmes should be intensified, as about 46% of respondents had no formal education.
2. Farmers need to be encouraged to engage in an all year round (rain and dry season) farm production to enhance constant access to both farm and non-farm income. This could be done through improved access to better food production technologies.
3. Farmers need to increase and or maximize the available farm size by engaging in all year round farming in order to produce more for consumption and the market.

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