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DETERMINANTS OF FOOD SECURITY STATUS AND INCIDENCE OF FOOD INSECURITY AMONG RURAL FARMING HOUSEHOLDS IN IJEBU DIVISION OF OGUN STATE NIGERIA

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ABSTRACT

This study examined the determinants of food security status and incidence of food insecurity among farming households in Ijebu Division of Ogun State. A sample of 120 farming households was drawn using multistage sampling procedure and the data were analysed using descriptive statistics, food security index and logit model. The study showed that majority of the household heads fall within the age range of 20-60 years and the incidence of food insecurity increases with increase in age of household head. Food insecurity incidence was higher among female headed households. Further revelation showed that majority of the respondents are married and the food insecurity incidence is highest among the married respondents. Household heads with no formal education had the highest food insecurity incidence while those with tertiary education had the lowest food insecurity incidence. Household food insecurity incidence increases with increase in household size. Household food insecurity incidence increases with increase in the farming experience of the household head. Food insecurity incidence of households whose heads are cooperative members was found to be lowest. Using the food security index, the survey related that 59.2% of the respondents were food secure while 40.8% were food insecure. The logit model revealed that the socio-economic characteristics of the farming households such as age (10%), education (10%), household size (1%) and farming experience (5%) are the significant factors influencing the food security status of the farming households in the study area. Effort should be made at improving programmes and policies that will ensure a proper family planning especially in the rural area which will reduce the number of children to that which the household can adequately cater for. Nutrition-oriented programmes should be organized in attempt to improve the food substitution knowledge of the farming households.

Key words: food security, food insecurity, rural farmers, socio-economic variables, Ogun State

INTRODUCTION

Food is indispensable to life as it is a major supplier of nutrients required for human survival (FAO, 1989). According to World Bank (1986), food security was seen as ac-

cess by all people at all times to sufficient food for an active and healthy life. FAO (1989) was of the opinion that food security is the physical and economic access to adequate food for all household members, with-

out undue risk of losing the access. The International Conference on Nutrition (1992) also defined food security as a state of affairs where all people at all time have access to safe and nutritive food to maintain a healthy and active life. The United State Agency for International Development (USAID, 1992), having considered broad perspectives on the meaning of food security came out with fundamental concepts of various definitions of food security, among which is 'food security is when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life'.

The prominent yardstick for measuring food security has been found to be average intake of food calories and protein intake per day (Olayemi, 1995). But this according to him will often hide certain inequality in the intra household distribution of food intake such as those that may arise from gender, age and socio-cultural practices. Hoddinotl (2001) highlighted measures of household food security outcome to be individual intake, household caloric acquisition dietary diversity and indices of household coping strategies.

Therefore, the problem of food security entails various elements in different countries such as might involve a lack of available food product, a lack of technical ability to distribute the food, problem of food availability, affordability and accessibility through convectional food channels hence, on the national level, per capital growth of production of major food in Nigeria has not been sufficient to satisfy the demand of an increasing population (Kormawa, 1999). The result is a big gap between national supply and national demand for food. Progress in agricultural sector has also re-

mained unsatisfactory (Abdulahi, 1999). Common staples in most Nigeria homes are insufficient and do not provide a balanced diet, as such malnutrition is prevalent in most home.

Food insecurity has been defined as a lack of access to nutritionally adequate diet in a household or country. Among developmental problems facing Nigeria, food insecurity ranks topmost. The level of food insecurity has continued to rise steadily since 1980s. It rose from about 18% in 1986 to about 41% in 2004 (Sanusi *et al*, 2006). The daily per capital calories supply as a proportion of recommended requirement was 90% between 1988-1990, and 85% between 1992 and 1996 (FOS, 1999). According to FAO (2000), Nigeria was able to reduce the prevalence of undernourishment by less than 3% between 1979 to 1981 and 1996 to 1998. The prevalence dropped from 44% to 8% between these periods. However, the average per capita daily calorie intake remained 2050 kcal during the 1979-81 periods while the diet comprised 64% cereals and root and tubers (Agboola *et al.*, 2004). Nutrition food expenditure data showed that almost two thirds of total expenditure of households in 1980 was on food. This food share rose by about 10% points by 1985, but dropped during the period 1985-1992. In subsequent four year period, 1992-1996, a further drop of 5% points took place. The figures were 63.4%, 74.1%, 72.8% and 63.6% for 1980, 1985, 1992 and 1996 respectively. Also, trend revealed that the incidence of poverty increased sharply both between 1980 and 1985 and between 1992 and 1996. The figures were 27.2%, 46.3%, 42.7% and 65% for 1980, 1985, 1992 and 1996 respectively. The figure for 1996 was translated to 67.1 million (Agboola *et al*, 2004).

Agriculture is one of the most important sectors of Nigeria economy. This is because it contributes more than 30% of total annual GDP, employs about 70% of the labour force, accounts for over 70% of the non-oil export and perhaps, the most important, provided 80% of the food needs of the country (Adegboye, 2004). Given the role of agriculture in Nigerian economy, food insecurity and poverty could be attributed to poor performance of the agricultural sector, which in turn created food availability and accessibility problems at the household and national levels. In other words, the poor performance of the sector directly creates supply shortage and indirectly creates demand shortage by denying the household access to sufficient income.

As the food situation worsened a number of agricultural development institution were set up and special programmes and projects were launched, with the aim of improving on food supply situation in the country. Some of these programmes include: National Accelerated Food Production Programme (NAFPP), Agricultural Development Project (ADP), Operation Feed the Nation (OFN), River Basin Development Authority (RBDA), National Seed Service (NSS), Agricultural credit Guarantee Scheme (ACGS), Directorate of Food Road and Rural Infrastructures (DFRRI), Green Revolution (GR), Rural Banking Scheme (RBS), Agricultural Land Development Authority (NALDA), National Fadama Development Projects (NFDP), Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB), Nigerian Agricultural Development Fund (NADF). According to Idachaba (2004), empirical records of many of these programmes and projects are not impressive enough to bring about the expected transformation of the agricultural

sector.

In the early 2000s, Nigeria made some progress in the area of per capita daily calorie intake and proportion of undernourished people. The per capita daily calorie intake increased from 2050 kcal between the 1997-81 period to 2430 kcal in the 1989-91 period and to 2700 kcal between the 2000-02 period, though cereals, root and tubers accounted for 65.3% of the diet in 2000-02 compare to 64% in 1979-81 period (FAO, 2005). This figure represents 11% increase in per capita daily calorie intake between 1991 and 2002. Also, the proportion of undernourished people decreased from 13% in 1990-92 to 9% in 2000-02 (FAO, 2005). The poverty level according to Kpakol (2005) also fell from 70.8% in 2003 to 54% in 2005.

The performance of factors influencing food security status of rural farming households in north central Nigeria was assessed by Babatunde and his associates in 2007 (Babatunde *et al.*, 2007). They utilized a three stage random sampling techniques to obtained a sample of 94 farm households in year 2005. Using the calorie intake approach; they found that 36% and 64% of the households were food secure and food insecure, respectively. The food insecurity gap showed that the food insecure household fell short of the recommended of calorie intake by 38%, while the food secure households exceeded the recommended calorie by 42%.

Food security at household level is a subset of the national level and it requires that all individuals and households have access to sufficient food either by producing it themselves or by generating sufficient income to demand of it (Okunade *et al.*, 2004). Food availability is a function of the combination of domestic food stock, commercial food

imports, as well as the underlying determinants of each of these factors. The use of the term availability is often confusing since it can refer to supplies availability at both household level and at a more aggregate (regional and national) level. However, the term is applied most commonly in reference to food supplies at a regional or national level (Okunade *et al.*, 2004).

Literature and experience have shown that in Africa as well as in Nigeria food security has mostly remained a bone of contention to the existence and survival of mankind (Okuneye, 1997). The economy development of a nation is dependent on factor endowment. This includes the non-human resources and human resources. The productive capacity of human resources is however a function of how well fed they are. Food problem with regard to quality and quantity is one of the characteristics of developing country like Nigeria. Nigerian agriculture is dominated by the small scale farmers who produce the bulk of food requirements in the country. The majority of these farmers are in rural area and are deprived of basic amenities including the sub-standard health care, absence of portable water, prevalence of poor sanitation, low level of literacy, diseases among others, the productivity of most household is reduced and their ability to utilize food to their maximum satisfaction is hampered. According to Omonona (2007), the concern for food security and nutritional well being in an economy is predicted by role of human element in economic development. This shows while at national level, food is of economical and political significant especially in issues relating to national security, maintaining political stability and ensuring peace and stability among the populace.

The dimensions of food security make it clear that the concept of food problem is a complex one with many dimensions. At one level the concern is with national food security which is ability of the countries to produce or import sufficient food in all year to meet their requirement for both private and public distribution. At another level the concern is more with the problem of malnutrition. The levels of nutrient requirement have been determined by World Health Organization (WHO) and the Food and Agricultural Organization (FAO). The basic minimum requirement has been found to be 65 grams of protein, 2500kcal of energy per capita intake of which if consumed otherwise leads to a state of malnutrition. Many empirical results have been obtained on food security level of households in Nigeria. Most of these studies including (Babatunde *et al.*, 2007; Isaac, 2007; Olarinde and Kuponiyi, 2005), agreed that many households in Nigeria are food insecure.

A school of thought for instance, believes that there is enough domestic production of food in Nigeria and that the problem with food security lies in poor storage, marketing and distribution arrangement which greatly reduce available market supplies of food. The variant of this school believes that there is enough aggregate production but that the observed food security problems are the result of unequal economic access to available food in unequal distribution of income and wealth (Omonona, 2007). It is thus interesting to ask and find answers to questions like: What is the food security status of the rural farming households in the study area? What are the determinants of household food security? What are the constraints that hinder food security? This study is therefore aimed at finding solutions to all these problems. Specifically, this study describes the socio-

economic characteristics of the households, examines the incidence of food insecurity among households, determine the food security status of the rural farming households in the study area and assess the factors that influence food security status of the farming households in the study area.

RESEARCH METHODOLOGY

The Study Area

This study was conducted in Ijebu Division of Ogun State. Ogun state is bounded in the west by republic of Benin, in the south by Lagos State and shares boundary with Oyo State in the north and Ondo State in the east. The State has an estimated land of about 16,409.26 square kilometers {approximately 1.9% of Nigeria's total land mass}. The total population of the State is 3,751,140 (NPC, 2006). The study area is located in the lowland, semi deciduous forest belt of Nigeria. The topography is generally undulating while the overall altitude ranges between 122m-152m above sea level. Ijebu-North Local Government Area of Ogun State was chosen because it has over 30% of the population of Ijebu Division. Ijebu -North local government is blessed with water and vegetal resources. The Local Government is located at the north central part of Ogun state, bounded in the north by Lagelu local government of Oyo state, in the east by Ayedade local government of Osun State; Ikenne local government is to the west; and Odogbolu and Ijebu North East to the south east and south west respectively. The Local Government has 11 political wards, namely Atikori, Oke-Agbo, Ojowo/Japara, Oke-Sopen, Ome, Oru-Awa-Ilaporu, Osun and Ago-Iwoye urban I, Ago-Iwoye urban II, Ako-Onigbagbo Gelete, and Mamu/Ehin-Etiri. The main ethnic groups of the people in the study area are Yoruba though, there are some Igbo

and Hausa but are minute in number. The total population of the local government is 280,520 (NPC, 2006). The main economic activities of the local government are farming, saw milling and transportation services. Ijebu-north tropical wet and dry climate are characterized by high rainfall, high temperature and relative humidity. The main annual rainfalls range between 1,200 and 1,500mm with the peak of rainfall often reached in the month of June and August. The mean minimum temperature is about 23°C around February while the mean maximum temperature is about 32°C around March. The wet season concentrates between March and October or early November.

Sampling Technique

The target populations of this study were farming households in Ijebu-North Local Government Area. Multistage sampling technique was employed in selecting the sample needed for the study. The first stage was the random selection of six wards out of the eleven wards in the Local Government Area. The second stage was the purposive selection of two villages known for farming from each ward. The last stage involved a random selection of ten farming household heads from each of the villages selected in stage two. This gave a sample size of one hundred and twenty (120) farming household heads used for the study.

Analytical Procedures

Descriptive statistics such as frequency, mean and percentages were used to analyze the socio-economic characteristics and constraints to food attainment of the respondent.

Food Security Index

The food security index was used to examine the food security status of farming house-

hold in the study area. This was specified below:

$$F_i = \frac{\text{Per capita food expenditure for the } i\text{th household}}{\frac{2}{3} \text{ mean per capita food expenditure of all household}} \quad (1)$$

Where F_i = food security index

$F_i \geq 1$ = food secure i th household

$F_i < 1$ = food insecure i th household

A food secure household is that whose per capita monthly food expenditure fall above or is equal to two-third of the mean per capita food expenditure of all households in the study sample. On the other hand, a food insecure household is that whose per capita food expenditure falls below two-

third of the mean monthly per capita food expenditure (Omonona et. al., 2007).

Logit Regression Model

Logit model was used to analyze the relationship between the food security status and its determinants.

$$\Pr[Y_j = 1 / X_j] = \frac{1}{1 + \exp(-\beta_0 - \beta_j X_j)} \quad (2)$$

$$\Pr[Y_j = 0 / X_j] = 1 - \Pr[Y_i = 1 / X_j] \quad (3)$$

It is a logit model because

$$\Pr[Y_j = 1 / X_j] = F(\beta_0 + \beta_j X_j) \quad (4)$$

Explicitly, this model can be linearized as:

$$F_i = + \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \mu_i \quad (5)$$

$F_i = 1$ if household head is food secure, 0 if otherwise

X_i is the vector of explanatory variables and β_i is the vector of parameters.

The logit model computes the maximum likelihood estimated of β_i given the non-linear probability distribution of the random error μ_i .

The explanatory variables are:

X_1 = Household income (Naira)

X_2 = Family size (number of individuals)

X_3 = Age of household head (yrs)

X_4 = Sex of household head (male =1, female= 0)

X_5 = Farm size (Hectare)

X_6 = Quantity of food produced (kg)

X_7 = Number of years of farming (years)

X_8 = Number of years of education (years)

X_9 = Membership of cooperative (access =1, non-access=0)

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents and Food Insecurity Incidence.

The summary statistics of the socio-economic characteristics of the farm household are presented in Table 1. In both the food secure and non food secure groups, household heads within the range of 41-60 years constituted a relatively high percentage of the population while those within the age range of 61-80 years have the lowest percentage. In general, a major percentage of household heads fell within the age range of 20 to 60 years. The food insecurity incidence increased with increase in age from 0.63 to 0.74 for households whose heads were between 20 and 60 years of age, it then declined to 0.13 for household heads between 61-80 years. The decline in the food insecurity incidence of household with heads over 60 years of age may be as result of additional income from adult children of the household. From the table, food insecurity incidence is higher in female headed households than in male headed households with 0.71 for the female headed households and 0.12 for the male headed households. This may be as a result of lower dependency ratio observed in male headed households where both the head and spouse engaged in income generation activities while in the female headed households, the dependency

is mainly on the head who are either widow or unmarried.

The findings further showed that the incidence of food insecurity was highest among the married household heads with an incidence of 0.62. This may be due to increase in responsibility, as a result of marriage. In term of level of education, household with no formal education constituted the largest proportion of the food insecure household with a percentage of 67.3% while constituting the lowest proportion of the food insecure groups with a percentage of 6%. As one moves from households headed persons with no formal education, food insecurity incidence decreases with those with tertiary education having the lowest food insecurity incidence. This may be as a result of increase in household's income as the educational level of the household head increases. The food insecurity incidence ranges between 0.26 for households with 1-5 members and 0.50 for households with 6-10 members. This connotes that the incidence of food insecurity increases with increase in household size and this could be as a result of increase in the dependency ratio in the households. Households whose heads had farming as their major occupation had the highest food insecurity incidence of 0.46. The food insecurity incidence of households whose heads cultivated below 1 hectare of land had a food insecurity incidence of 0.42, which

was the highest and the food insecurity incidence was observed to be decreasing with increase in the size of land cultivated by the household head. Households, whose heads had farming experience that was below 10 years had a food insecurity incidence of 0.39, while those whose heads had farming experience of above 40 years, had an incidence of 0.01. This implies that the household's food insecurity incidence decreases with increase in the farming experience of the household head. Households whose heads are cooperative members, had a food insecurity incidence of 0.13 while those whose heads does not belong to any cooperative society had a food insecurity incidence of 0.38. This implies that cooperative societies could help in boosting the household's food security status when the household head becomes a member.

Food Security Status of Farming Households

According to FAO (1989), food security is the physical and economic access to adequate food for all household members, without undue risk of losing the access. Food security index which is per capita food expenditure for the i th household divided by $2/3$ mean per capital food expenditure of all households, was used to determine the food security status. Household with food security index (F1) greater or equal to one was considered food secured.

The monthly mean per capita food expenditure for the total household is N 1900.98 and the $2/3$ mean per capital food expenditure for all the household is N1267.32 (see Table 2). The food security incidence for the secured household is 0.59 while that of the non food secured household is 0.41 (see Table 3). This implies that 40.8% of the farming households in the study area were food insecure while 59.2% were food secure.

Factors Influencing Food Security Status

The factors influencing food security of the farming households in the study area were analyzed using logistic regression model. The result of the model is given in the Table 4. The result shows that years of education, years of farming, age and family size are the significant factors influencing the food security status of the farming household in the study area. Education, age and farming experience are statistically significant and positively related to the food security status of the farming households. This implies that household with highly educated head are more likely to be food secure than those with low level of education. This also follows for age and farming experience, implying food security is assured with increase in age and farming experience. For age, the positive coefficient is contrary to expectation and this could be as a result of additional income from adult children in the household.

DETERMINANTS OF FOOD SECURITY STATUS AND INCIDENCE OF FOOD...

Table 1: Socio-economic Characteristics of the Respondents

Characteristics	Food insecure		Food secure		Food Insecurity Incidence
	Frequency	Percentage	Frequency	Percentage	
Age					
20-40	18	36.7	30	42.3	0.63
41-60	23	46.9	30	42.3	0.74
61-80	8	16.3	11	15.5	0.13
Total					0.59
Sex					
Female	42	85.7	59	83.1	0.71
Male	7	14.3	12	16.9	0.12
Total					0.42
Marital status					
Single	2	4.1	1	1.4	0.01
Married	39	79.6	65	91.5	0.62
Divorce	5	10.2	2	2.8	0.03
Widow	3	6.1	3	4.2	0.02
Total					0.20
Educational level					
No formal					
Primary	33	67.3	6	8.5	0.78
Secondary	11	22.4	37	52.1	0.35
OND/NCE	5	10.2	24	23.8	0.28
HND/BSC	0	0.0	3	4.2	0.10
Total	0	0.0	1	1.4	0.00
					0.37
Household size					
1-5	6	12.2	34	47.9	0.26
6-10	36	73.5	37	52.1	0.50
11-15	7	14.3	0	0	0.27
Total					0.34
Farm size					
< 1.0	28	57.1	49	69.0	0.42
1-1.99	0	0	5	7.0	0.00
2.-2.99	9	18.4	6	8.5	0.27
3 and above	12	24.5	11	15.5	0.30
Total					0.25
Farming experience					
Below 10	26	53.1	25	35.2	0.39
10-20	9	18.4	30	42.3	0.09
21-30	7	14.3	5	7.0	0.06
31-40	5	7.0	5	7.0	0.03
Above 40	2	8.5	6	8.5	0.01
Total					0.14
Cooperative member-ship					
Member	10	20.4	11	15.5	0.13
Non member	39	79.6	60	84.5	0.38
Total	49	100.0	71	100	0.26
Total					

Source: computed from field survey, 2011

Table 2: The Food Insecurity Line for the Households

Deciles	Means per capital food expenditure MPCFE ((N)
First	599.03
Second	870.50
Third	1027.50
Fourth	1152.35
Fifth	1462.96
Sixth	1836.11
Seventh	2222.10
Eighth	2547.50
Ninth	3273.90
Tenth	4017.83
Total	19000.98
2/3 MPCFE	1,267.32

Source: computed from field survey, 2010.

Table 3: Household Food Security Status

Food security status	Frequency	Percentage
Non food secured	49	40.8
Food secured	71	59.2
TOTAL	120	100.0

Sources: computed from field survey, 2010.

Table 4: Factors Influencing Food Security Status of Farming Households

Variable	Coefficient	Standard Error	T- value
Constant	2.3812**	1.1846	2.01
Household income	0.4103	0.3598	1.14
Family size	-0.777***	0.1143	-6.80
Age of respondent	0.2993 *	0.1645	1.82
Sex of respondent	0.6992	0.5257	1.33
Farm size	-0.1135	0.1621	-0.70
Quantity of food produced	0.1517	7.580	0.02
Farming experience	0.3074**	0.1450	2.12
Years of education	0.1475***	0.0520	2.83
Cooperative membership	0.2025	0.4308	0.47

Log likelihood = -214

* = significant at 1%, ** = significant at 5%, *** = significant at 10%.

Source: computed from Field survey, 2011.

SUMMARY AND CONCLUSION

The study showed that majority of the household heads fall within the age range of 20-60 years and the incidence of food insecurity increases with increase in age of household head. It also showed food insecurity incidence was higher in female headed households than male headed households. The findings revealed that that majority of the respondents were married and the food insecurity incidence was highest among the married respondents. Household heads with no formal education had the highest food insecurity incidence while those with tertiary education had the lowest food insecurity incidence. The study revealed that higher educational status of household head increased food security status of farming households. Households with family size of between 1 and 5 had the highest food insecurity incidence. Membership of cooperative societies was found to boost food security status of farming households. Using the food security index, the survey revealed that 59.2% of the respondents were food secured while 40.8% were not food secured. This study revealed that the socio-economic characteristic of the farming households were important factors influencing their food security status. The significant ones were age of household head, number of years of education, family size and farming experience.

RECOMMENDATIONS

On the basis of the findings from this study, the following recommendations are suggested:

1. Since food insecurity incidence increases with increase in household size, effort should be made at improving programmes and policies that will ensure proper family planning especially in

the rural area which will reduce the number of children to that which the household can adequately cater for.

2. Nutrition-oriented programmes should be organized in attempt to improve the food substitution knowledge of the households.

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