DETERMINANTS OF FOOD SECURITY AMONG RURAL FARMING HOUSEHOLDS IN OGUN STATE, NIGERIA

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ABSTRACT

The study assessed the determinants of food security among farming households in Ogun State; it examines the sustainability strategies adopted by the sampled household to sustain their livelihood and food security status. Primary data used for the study were derived from a three-stage sampling survey of 200 randomly selected farming households in 8 farming communities. Food security index and logit regression model were used to analyse the data. The results show that about 70% of the farming households were food secured. Dependency ratio (-0.26) and household size (-0.45) were found to aggravate probability of household food insecurity condition, while educational status of household head (1.39), farm size (0.19), membership of cooperative society(0.54), access to credit (1.06) and access to food on credit (0.70) enhance household food security status. Engaging in other off-farm activities was the most common coping strategy of the households to sustain their livelihood and escape food insecurity.

Keywords: Farming Household, Food Security Index, Food Security, Coping Strategies, Sustainability, Sustainable Livelihood

INTRODUCTION

Poverty goes beyond income poverty; It can be simply described as a condition of unsustainable livelihood. It is the denial of choices and opportunities for living a tolerable life (United Nations, 1997). Sustainability, in the context of livelihood of farm households mean the ability to maintain and improve food security status of a rural household while maintaining and enhancing the means of livelihood. The fundamental challenge the world faces today is ensuring that millions of households living in poverty have access to enough food and sustainable livelihood to maintain a healthy life. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base. Food is one of the most basic human needs. Along with oxygen, water, and regulated body temperature, it is a basic necessity for human survival. However, food is much more than just nutrients, it is at the core of humans' cultural and social beliefs about what it means to nurture and be nurtured (Oriola, 2009). Generally, whatever is consumed to provide energy and nourishment for the human body for an active and healthy life is termed food (Okolo, 2004). While there are national data on food security, information on rural food security and poverty are not readily available especially in Nigeria (Babatunde *et. al,* 2007).

Food security is a term that emerged following the 1980s shift in food policy debate from food supply to food demand and the emergence of new emphasis on food entitlement, sustainability, vulnerability, risk and access (Maxwell and Slater, 2003). The term has been defined in various ways. However, food security indicates the availability of and access to food by those in need (Okunmadewa, *et. al,* 1990). According to Omonona and Agoi (2007), the committee on world food security defined food security as physical and economic access to adequate food by all household members without undue risk of losing the access. Food security has been identified as having food availability, food accessibility, utilization and stability of food access as its elements (Gross, *et. al* 1999; Okuneye, 2002; Obamiro, *et al*, 2003; Amaza *et.al*, 2006; Titus *et.al*, 2007; and Watts, 2013). 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 for it.

Scarcity of production resource is one of the major problems facing farmers in rural areas. Putting emphasis on the importance of sustainability in the use of scarce factors of production will put farm households on the path of attaining food security; Sustainable rural livelihoods can only be achieved if resources are themselves used in sustainable ways. Maintaining objectivity in decisions about what constitutes sustainable use is likely to be an enormous challenge, particularly in areas where people are already extremely vulnerable, food insecure and have few options other than increased use of resources.

Food insecurity remains a fundamental challenge in Nigeria. Despite the Food and Agriculture Organization (2004) enlisting Nigeria among countries faced with serious food insecurity problems, the vision of the country to have physical and economic access to food on a continuous basis still remains a mirage (Adeyeye, 1997). The population of food insecure households in Nigeria was 18% in 1986 (Babatunde *et. al;* 2007) but had increased to 40% in 2005 and higher in the subsequent years (Sanusi *et al*, 2006, Enete *et al*, (2008)).

Food insecurity may be chronic, seasonal, or temporary/transitory, and it may occur at the household, regional, or national level (Maxwell, 1996). Food insecurity or lack of access to nutritionally adequate diet in a household or country can take various forms. For example, chronic food insecurity exists when food supplies are persistently insufficient to supply adequate nutrient for all individuals. Transitory food insecurity occurs when there is a temporary decline in access to adequate food because of instability in food production, food price increases or income shortfalls (Omonona and Agoi, 2007).

The economic development of a nation is known to be dependent on its factor endowment and this includes both the non-human and human resources. The productive capacity of the human resources is however a function of how well fed they are. Food problem, with regards to quality and quantity, is one of the characteristics of developing countries like Nigeria (Omonona and Agoi, 2007). Hunger and malnutrition adversely affect the livelihood and well-being of a massive number of people and inhibiting the development of many poor countries (Gebremedhin, 2000). The World Health Organization recommends an intake of between 2500 – 3400Kcal of energy per person per day. It was recommended that an individual should consume between 65-86g crude proteins per day out of which 35g (or 40%) must be animal protein (Babatunde and Qaim, 2010). Many Nigerian have energy intake that is far below the minimum recommended daily per capita intake and the factors responsible are not well known, hence, predisposing people to the challenge of food insecurity.   This study, therefore, examined the determinants of food security among farming households in Ogun state, Nigeria and the coping strategies adopted by the farming households in the event of adverse food security conditions.

METHODOLOGY

This study was conducted in Ogun state, south-western Nigeria. It borders Lagos State to the South, Oyo and Osun states to the North, Ondo State to the east and the republic of Benin to the west. The State has a land area of 16,409.26 sq. kilometers and total population of 3,751,140 residents (Ogun State Central Department of Statistics, 2008).
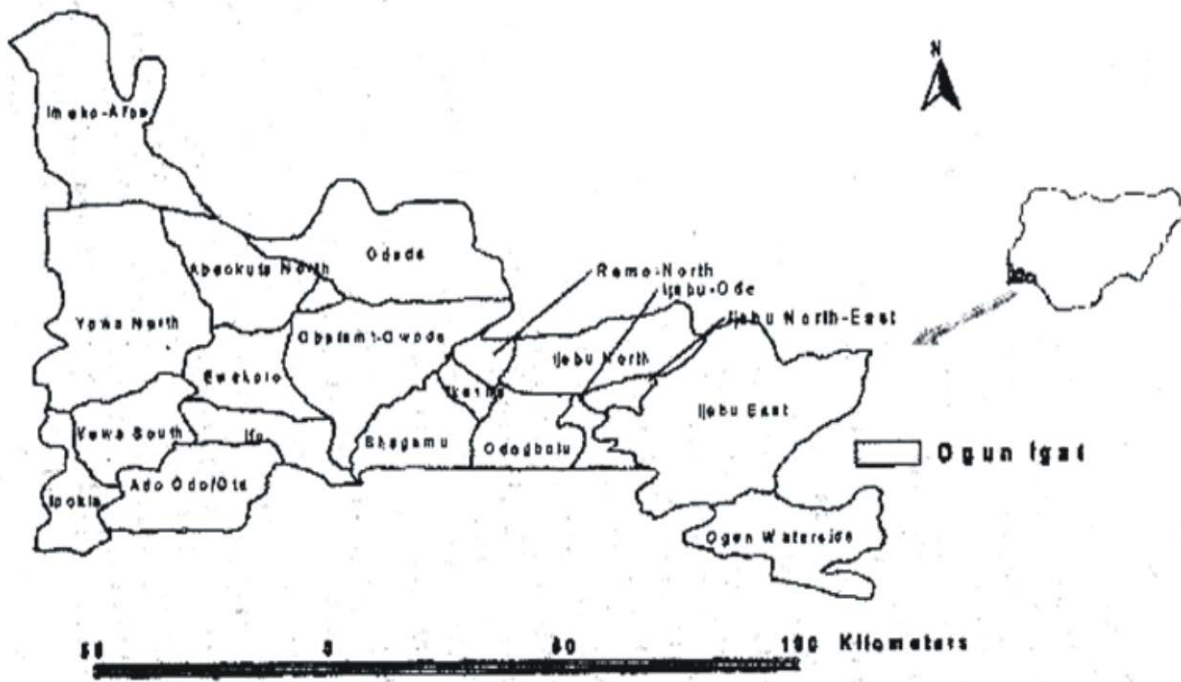
Fig. 1: Map of Ogun state showing 20 Local Government Areas

Primary data were used for this study and they were derived from a 3-stage sampling survey of 200 randomly selected farming households in 8 local government areas which include: Odeda, Obafemi/Owode (Egba division), Yewa-North, Ado-odo/Ota (Yewa division), Ijebu-North, Ijebu-ode (Ijebu division), Ikenne, and Remo-North (Remo Division). The survey instrument was a structured questionnaire that was designed to collate data on age, gender and income of the household heads and other household characteristics such as total household income, food consumption and expenditure as well as expenditure on other non-food items.

Analytical techniques

Determinants of Food Security in the Study Area

To identify the factors influencing the food security status of the farming households, a two-stage analysis was done. In the first stage, the adoption of the food security index was used to classify the households according to their food security status using the food security line determined by their expenditure on food (following Omomona and Agoi, 2007). In the second stage, a logit regression model was specified. In the model, food security status of the households was a function of a set of independent determinants. Any household whose per capita monthly food expenditure fall above or is equal to the food security line is food secure. On the other hand, a food insecure household is that whose per capita food expenditure falls below the food security line. The index is given by:

$$Fi = \frac{\text{per capita food expenditure for the ith household}}{\frac{2}{3}\text{mean per capita food expenditure of all households}}$$

Where:

Fi = food security status

When   Fi $\geq$ 1 = food security of the ith household

Fi < 1 = food insecurity of the ith household

Based on the results from the food security index, the logit model was regressed to identify the determinant of food security among farm households. The implicit form of the model is given as:

$$Z_i = \beta X_i + U_i$$

Where:

Z_i = the food security status of the ith household (1 = food secured, 0 if otherwise)

X_i = Vector of explanatory variables

β = Vectors of the parameter estimates.

U_i = the error term

The explanatory variables included in the model are:

X_1 Age of household head (years)

X_2 Gender of household head (X_2)

X_3 Dependency Ratio

X_4 Marital Status (Dummy)

X_5 Household size (Number)

X_6 Educational status of household head (years)

X_7 Primary Occupation of household head (Dummy)

X_8 Total monthly household income (N)

X_9 Farm size (Ha)

X_{10} Membership of Cooperatives Society (Dummy)

X_{11} Access to Credit/Loan facilities (N)

X_{12} Years of experience in farming (years)

X_{13} Amount of food purchased on credit (N)

The prevailing coping strategies employed by the respondents against food insecurity were identified using descriptive statistics. A set of possible coping strategies were listed from which the respondents picked the strategy (ies) most applicable to them. The data collected were then ranked in descending order to see the strategies most utilized.

RESULTS AND DISCUSSIONS

Socio-economic Characteristics of Respondents

The result in table 1 show that over 50% of the respondents are not more than 50 years old representing the active age group, while about 37% of the respondents are aged over 50 years. Majority (96%) of the respondents are male, while the remaining 4% are female. Table 1 further shows that only 13% of the respondents have no formal education at all while majority (87%) of the respondents had formal education; having at least the basic primary education. Of the formally educated population, 34% have not more than primary education while 33.5% of the respondents have secondary education. The remaining 19.5% are educated up to tertiary level. Also, majority (49%) of the sampled farm households are composed of between 4 – 6 members; 27.5% represent households with 7-9 members and large sized families of between 10 and above account for 19% of the sample.

Furthermore, as much as 55.5% of the respondents have farming as their major occupation while the remaining 45.5% engage primarily in other jobs but have farming as a secondary job. About 43% of the respondents have been involved in farming for over 2 decades. About 24% of the farmers have 5 – 10 years farming experience while about 31% of the farmers have experience spanning between 11 – 20 years. Table 1 also shows that majority (81.5%) of the farmers cultivate small farmlands of not more than 2 hectares while only 7% cultivated large farm lands of about 5 hectares and above.

Food Security Status of the Farming Households

Households are profiled into food secure and food insecure groups based on their per capita food expenditure. The food insecurity line is defined as two- third of the mean per capita food expenditure of the total households studied. The food insecurity line for the study is calculated as ₦ 9,000:00 per month based on the 2008 World Bank revised purchasing-power parity (PPP) figure of $1.25 (Ravallion *et. al*, 2009; 2010). Household whose per capita expenditure falls below ₦ 9,000 are categorized as being food insecured while households whose mean per capita food expenditure equals or greater than the food security line (N9,000) are food secured. The result presented in Table 2 shows that about 70% of the surveyed farming household is food secured, while the remaining 29.5% are food insecure.

Table 1: Socio-economic Characteristics of the Farming Households in Ogun State.

Age -Group of Household Head	Egba Division Frequency (Percentage)	Remo Division Frequency (Percentage)	Ijebu Division Frequency (Percentage)	Yewa Division Frequency (Percentage)	Ogun State Frequency (Percentage)
Below 30 years	9 (18.0)	6 (12.0)	4 (8.0)	3 (6.0)	22 (11.0)
31-40 years	23 (46.0)	12 (24.0)	13 (26.0)	7 (14.0)	55 (27.5)
41-50 years	7 (14.0)	21 (42.0)	16 (32.0)	4 (8.0)	48 (24.0)
51-60 years	7 (14.0)	6 (12.0)	8 (16.0)	15 (30.0)	36 (18.0)
Above 60 years	4 (8.0)	5 (10.0)	9 (18.0)	21 (42.0)	39 (19.5)
Sex					
Male	47 (94.0)	50 (100.0)	46 (92.0)	49 (98.0)	192 (96.0)
Female	3 (6.0)		4 (8.0)	1 (2.0)	8 (4.0)
Single	1 (2.0)	5 (10.0)	1 (2.0)	1 (2.0)	8 (4.0)
Education					
No Formal Educ.	13 (26.0)	6 (12.0)	5 (10.0)	2 (4.0)	26 (13)
Primary	13 (26.0)	28 (56.0)	8 (16.0)	19 (38.0)	68 (34)
Secondary	11 (22.0)	9 (18.0)	29 (58.0)	18 (36.0)	67 (33.5)
Tertiary	13 (26.0)	7 (14.0)	8 (16.0)	11 (22.0)	39 (19.5)
Household Size.					
1-3	5 (10.0)	4 (8.0)	1 (2.0)		10 (5.0)
4-6	40 (80.0)	25 (50.0)	22 (44.0)	10 (20.0)	97 (48.5)
7-9	4 (8.0)	14 (28.0)	14 (28.0)	23 (46.0)	55 (27.5)
10-12	1 (2.0)	7 (14.0)	6 (12.0)	16 (32.0)	30 (15.0)
Above 12			7 (14.0)	1 (2.0)	8 (4.0)
PrimaryOccupation					
Farming	31 (62.0)	16 (32.0)	29 (58.0)	35 (70.0)	111 (55.5)
Otherwise	19 (38.0)	34 (68.0)	21 (42.0)	15 (30.0)	89 (44.5)
Experience in Yrs					
Below 5 years	3 (6.0)		1 (2.0)	1 (2.0)	5 (2.5)
5-10 years	23 (46.0)	8 (16.0)	3 (6.0)	14 (28.0)	48 (24.0)
11-15 years	6 (12.0)	4 (8.0)	10 (20.0)	4 (8.0)	24 (12.0)
16-20 years	4 (8.0)	12 (24.0)	15 (30.0)	7 (14.0)	38 (19.0)
Above 20 years	14 (28.0)	26 (52.0)	21 (42.0)	24 (48.0)	85 (42.5)
Farm Size (Ha)					
Below 1 ha	29 (58.0)	25 (50.0)	17 (34.0)	14 (28.0)	85 (42.5)
1-2 ha	15 (30.0)	16 (32.0)	23 (46.0)	24 (48.0)	78 (39.0)
3-4 ha	3 (6.0)	8 (16.0)	3 (6.0)	9 (18.0)	23 (11.5)
5-6 ha	3 (6.0)	1 (2.0)	4 (8.0)	3 (6.0)	11 (5.5)
Above 6 ha			3 (6.0)		3 (1.5)

Table 2: Food Security Status of the Farming Households in Ogun State.

Household Food Security Status	Frequency	Percentage (%)
Food Secured	141	70.5
Food Insecured	59	29.5
Total	**200**	**100**

Factors Influencing Food Security Status among Farming Households

The result of the logit regression is presented in table 3. Seven of the thirteen variables analyzed were found to be significant determinants of food security status among rural households in the study area. These variables include: dependency ratio (-0.256) having a negative coefficient and significant at 1% level. Household size (-0.449) also having a negative coefficient and significant at 1% level. These imply that large household size and increased dependency ratio aggravate probability of household food insecurity condition. The coefficient of Educational status of household head (1.386) was positive and significant at 1% implying increased education would result in increase in food security status. Farm size coefficient (0.192) is significant at 5% and is positive, indicating that as farm size increases, more food is produced both for consumption and sale to earn more money, resulting in increased food security. Membership of Cooperative Society's coefficient (0.542) showed a positive coefficient and was significant at 10%. Also the coefficient for access to food on credit was also positive and significant at 1%. These imply that increase in both variables would enhance the likelihood of farming households being food secured. The coefficient for the amount of food purchased on credit was positive and significant at 5%, this implies that an increase in the amount of food purchased on credit would increase probability of household food security status.

Table 3: Factors influencing the food security status of farming households

Variable	Coefficient	T-value
Constant	0.434	0.356
Age of household head	- 0.047	- 0.301
Gender of household head	- 0.182	- 0.297
Dependency Ratio	- 0.256***	- 2.652
Marital status of household head	- 0.126	- 0.317
Household size	- 0.449***	- 4.735
Educational status of household head	1.386***	3.064
Primary occupation	- 0.449	- 1.371
Total monthly household income	- 0.000035	- 1.006
Farm size	0.192**	1.978
Membership Cooperatives Society	0.542*	1.911
Access to food on credit	1.061***	2.777
Years of experience in farming	0.201	1.807
Amount of food purchased on credit	0.701**	2.238

Log likelihood function: -158.927

Chi-squared: 82.468

Degree of freedom: 13

Coping Strategies of Sampled Food Insecured Farming Households

The prevailing food security coping strategies adopted by the farming households in the study area are presented in the Table 4 using the rank score method. The rank score shows the frequency and percentage of households using a particular strategy and the extent to which such strategy is utilized. The result shows that some coping strategies were adopted by the responding households in dealing with the food security situation. Most utilized is the practice of engaging in other small-scale productive activities recording 94.5% adoption. Also widely adopted are purchase of less expensive or less preferred food, backyard crop and livestock farming having 94%, 90.5% and 89.5% adoption respectively. A significant percentage (83.5%) of the households also prefers to consume crop and livestock foods in alteration as well as allow children to eat first (84.5%). Other strategies adopted are eating wild fruits, reducing or rationing quantity of food consumed, buying food on credit, borrowing food or borrowing money to buy food, and skipping meals within the day. However, a negligible 6% and 6.5% subscribe to the sale of assets and mortgaging and / or sale of domestic assets while 10% of the respondents engage in picking up left-over food at social functions.

Table 4: Coping Strategies Adopted by Respondents in the Event of Food Insecurity Conditions.

Coping Strategies	Frequency of Use		
	Not Effective (%Frequency)	Effective (%Frequency)	Very Effective (%Frequency)
Engaging in additional small scale productive activities	11 (5.5)	68 (34.0)	121 (60.5)
Eating less expensive food	12 (6.0)	123 (61.5)	65 (32.5)
Backyard crop farming	19 (9.5)	74 (37.0)	107 (53.5)
Backyard livestock farming	21 (10.5)	74 (37.0)	105 (52.5)
Allowing the children to eat first	31 (15.5)	137 (68.5)	32 (16.0)
Short term alteration in crop and livestock	33 (16.5)	51 (25.5)	116 (58.0)
Eating wild fruits	43 (21.5)	135 (67.5)	22 (11.0)
Reducing/rationing consumption	73 (36.5)	75 (37.5)	52 (26.0)
Selling labour power	85 (42.5)	96 (48.0)	19 (9.5)
Skipping meals within a day	87 (43.5)	83 (41.5)	30 (15.0)
Buying food on credit	105 (52.5)	51 (21.5)	44 (22.0)
Short term labour migration	113 (56.5)	68 (34.0)	19 (9.5)
Borrowing food/money to buy food	119 (59.5)	70 (35.0)	11 (5.5)
Short term migration of household members	123 (61.5)	60 (30)	17 8.5
Eating once a day	152 (76.0)	43 (21.5)	5 (2.5)
Skipping meals for a whole day	179 (89.5)	15 (7.5)	6 (3.0)
Picking up left-over food at social functions	180 (90.0)	20 (10.0)	0 (0)
Mortgaging and sales of domestic assets	187 (93.5)	7 (3.5)	6 (3.0)
Selling of assets	188 (94.0)	6 (3.0)	6 (3.0)

Figures in parenthesis are percentages.

CONCLUSION AND RECOMMENDATION

The study has shown that majority of the households in Ogun State are food secure however, the sustainability of their livelihood measured by their food security is observed to be positively influenced by factors such as educational status of household head, farm size, access to cooperative credit/loan facility and access to consumption credit while such factors as dependency ratio and household size have negative effect of food security. Coping strategies most adopted is the practice of engaging in other small scale productive activities. Also, widely adopted are purchase of less expensive or less preferred food, backyard crop and livestock farming.

A number of specific policy implications can be extracted from the results of the study. These include: the need to promote sustainable livelihood among rural households through job-creating programmes and policy of Government, such as National Directorate of Employment (NDE), Graduate Internship Scheme (GIS) and National Poverty Eradication Programme (NAPEP) in the rural areas in order to reduce farmers' dependency ratio hence, empowering the rural households to be food secured.

Education as a social capital has the ability of helping the farming households with a better decision making process in terms of their consumption and sustainable and efficient farming decisions. Thus, it is essential to increase households' awareness to the importance of education. Farming households should be encouraged to attain at least basic education. Nutrition-oriented programs should also be implemented to improve on the food substitution capabilities of the households.

Government through the Ministry of Rural Development should embark on enlightenment campaign on the importance of family planning in order to reduce cases of large farming households and the need for households to join membership of Cooperative Societies in order to have access to loan facilities.

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