

Effect of livelihood activities on food security among farmers in Oyo East Local Government Area of Oyo State, Nigeria

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Abstract. This study examined different livelihood activities and food security situations of the Nigerian's major farm households considering rural farmers in Oyo East Local Government Area of Oyo State as case study. The study made use of a sample of 120 farm households selected across 11 villages in the Local Government Area with the number of households selected proportionate to the size of each location. Primary data used was obtained through a well-structured questionnaire administered to selected respondents. The analytical tools used are descriptive statistics and tobit model. Results showed that only 69.2% of the farm households were food secure. Cassava, yam and their products were shown to contribute immensely to the food security status of the farm households. The constraints faced by farm households in the production of major staple foods were mainly those of poor access to credit facility, high cost of storage equipment and inadequate infrastructure. Despite these constraints, farmers contribute and stored food stuffs during surplus which enhanced their household food security status. The study therefore recommends that strategy should be adopted by farming households in the provision of enabling environment that will support private sector initiative in marketing and post-harvest handlings of staple foods.

Key Words: Rural households, Food security, Livelihood activities, OLS, Nigeria.

Introduction.

Problem statement. Nigeria is the most populous country in Africa with an estimate of 150 million people (National Population Commission 2006). Approximately 68% of this population consists of women and children with over 70% residing and securing their livelihood in the rural areas (Maziya-Dixon et al 2004). The Nigeria agriculture is of notable relevance in the country's economic development and growth. It contribute more than 48% of the total annual GDP, employs about 68% of the labor force, account for the over 70% of the non-oil exports and provides over 80% of the food need of the country (Adegboye 2004). Despite this notable roles, food insecurity rank top most among the developmental challenges facing Nigeria (Babatunde et al 2007). The level of food insecurity has continued to rise in Nigeria since 1980 (FAO 2000). It rose from about 18% in 1986 to about 41% in 2004 (Sanusi et al 2006). Recently, Nigeria made some progress in the area of per capita daily calorie intake and the proportion of undernourished people. Also, the proportion of undernourished people decreased from 13% in 1990-1992 to 9% in 2000-2002 (FAO 2005). They involve country to make progress towards achieving the Millennium Development Goal number one (to eradicate extreme poverty and hunger). However, the current utilization of food items especially maize and soybean for bio fuel production as well as the fear of an anticipated drought in the country and inadequate rainfall witnessed in some part of the country during the 2008 rainy season, have led to the problem of food shortages and soaring prices of food items in Nigeria and indeed globally. This represents a major threat to the continuous progress of the country making to achieve of the Millennium Development Goal number one. In addition, the situation cannot be unconnected with a detrimental impact on the

livelihood of Nigerians especially the low income earners and rural dwellers. As observed by Schuh (2002), food security is a poverty problem. Thus, the lack of food is due to the inadequate means to acquire it and not due to short fall in food production. This implies that the increase in the price of food items will erode the purchasing power of rural households and ultimately plunge them into extreme poverty and hunger.

However, an effective management of available resources through an efficient resource allocation pattern will enable a farming household get as much income as possible from its production and consequently improve its economic access to food required by its members (Mohammed & Omotosho 2004). Food security refers to the ability of a household to secure, either from its own production or through purchases, adequate food for meeting the dietary needs of all its members (Maziya-Dixon et al 2004). The FAO (2002) enlisted Nigeria as a country among other countries faced with serious food insecurity problem. The vision of Nigeria to have physical and economic access to food on a continuous basis has therefore continued to remain a mirage (Adeyeye 1997).

A crucial issue in the development of a nation is the availability of food for the populace. Hence, food security becomes important in any consideration of the sustainability of the wealth of a nation. Being a crucial factor of economic growth and development of a nation, food security has involved a global concern that calls for the need to evolve strategies that are workable and sustainable for minimizing or possibly eliminating the obstacles against full realization of universal food security (Onyido 1997). In the light of this, a foremost step towards remedying any food security problem would be to examine its characteristics nature among those affected. However, the concept of food insecurity is complex and goes beyond the simplistic idea of a country's inability to feed its population. On the other hand, livelihoods described the capabilities access and activities needed to sustain a means of living, including ways to obtain food; therefore, it is essential to support and protect livelihoods, as well as help the vulnerable meet the immediate basic needs for food in order to reduce food insecurity (IFRC 2007).

In developing countries, rural woman and men play different roles in guaranteeing food security for their household and communities. Rural livelihood diversification is defined as the process by which rural households construct an increasingly portfolio of activities and assets in order to survive and improve their standard of living. People diversify by adopting a range of activities. Thus income sources may include farm income, non-farm income, and wages of exchange labor on other farms i.e. within agriculture including payment (Ellis 2000).

Rural livelihood strategies are often heavily radiant on the natural resource base. Ellis (1999) on discussing rural livelihood diversity in developing countries noted that gender is an integral and inseparable part of rural livelihoods. He further argued that men and women have differences in assets, access to resources and opportunities. Women rarely own land, may have lower education due to discriminatory access as children, and their access to productive resources as well as decision-making tend to occur through the mediation of men. These inequalities in control of livelihood activities limit women's food production and thus reduce their yields, income and the availability of food for the household. Looking at livelihoods provides a richer and more detailed picture of how poor families cope with a variety of risks and shocks in meeting basic needs. Livelihood systems are maintained by a range of on-farm and off-farm activities, which together provide a variety of procurement strategies for food and cash. A household's total resources are based not only on its productive activities and endowments, but also on its legal, political and social position within. Livelihood systems imply a concept of sustainable food security, where the benefits of today are balanced with the benefits of tomorrow.

According to UNICEF's 3990 report of 1996 on the cause of malnutrition was demonstrated that food is the only factor in malnutrition equation and that in addition to dietary in-take and diversity health and disease, material and child care are also important determinants. Also in the past women's livelihood activities and their contribution to family upkeep were not acknowledged and recognized (Bullock 1991). Food insecurity is generally associated with fluctuation in household income, a

consequence of livelihood activities, household own-food production and food prices. In Nigeria's society, men and women play important role in her food security. The need to provide satisfactory information on food security levels of (rural) households calls for the assessment of all their livelihoods activities as well as the contribution to household food security. This study therefore examines the livelihood activities of (rural) men and women with a view to ascertain their contribution to their household food security. Specifically, it identifies the socio-economic characteristics and livelihood activities of farmers in the study area as well as determining the factors influencing household food security of farmers in the study area.

H₀: There is no significant relationship between selected socio-economic characteristics of farmers and household food security status.

The contribution made by livelihood which is a means of earning money in order to live has been ignored by policy makers who have chosen to focus their activities on agriculture (Ellis 1999). The international Federation also recognizes that food security is an outcome of livelihoods. Livelihoods describe the capabilities, assets, and activities needed to sustain a means of living and ways to obtain food (IFRC 2007).

The food security of poor households is dynamic and influenced by a range of factors. The poor live in changing world to which they must constantly adapt and are often unprepared for the changes. There is a constant struggle to meet basic daily needs. Furthermore, their daily needs consist of more than food; vital non-food needs such as shelter, clothing and health compete with food needs in terms of a household's resource allocation (Frankenberger 1996).

Empirical findings. According to Fakayode et al (2009) in a study carried out in Ekiti State, he found out that few of the respondents' households (12.2%) are food secured, while most of them (87.8%) are food insecure at different level of food insecurity. The belief that majority of households in Nigeria are not faced with serious food insecurity problem is an erroneous one. Most of the nation's households are farmers in the rural areas who are food insecure measuring high on the food insecurity scale. This is evidenced by the food security categories of farm households in the study. Another study conducted by Ibrahim et al (2009) revealed that majority of the farming households are food insecure and the production of crop enterprises based on an efficient allocation of resources is recommended by the optimal farm plan which would improve the food security status of the food insecure households. This agrees with the findings of Fakayode et al (2009).

Okuneye (2009) observed the rising cost of food prices have roots in policies and programmes of past governments. In particular, after the SAP, not much attention was paid to agricultural and food production; according to the report of the World Bank loan which was withdrawn from the Agricultural Development Programmes (ADPs) as well as the Federal Government counterparts funding in 1996/97 are major causes of rise in food prices in Nigeria today. Whereas large arguments can be advanced that subsidies go to the unintended beneficiaries. Excellent arguments also exists to support the need for incentives to agriculture in developing countries especially Nigeria. With lack of adequate feeder roads, storage facilities, effective extension service delivery system, credit facilities and agricultural research, among others, Nigeria has no checks and balances to withstand the penalty of loans withdrawal from the World Bank and Federal Government counterpart funding for the ADPs. Provision of the facilities mentioned above within a regime of consistent positive policies for agriculture will not only lead to increased food production with attendant fall in prices but also serve as a poverty reduction mechanism in Nigeria. Furthermore, political stability was also recommended for self-sufficiency in food production to be attained. Lastly, the study conducted by Adio (2000) on food security status of farming households in Oyo State revealed that energy intake was about 97% carbohydrate (from plant and animal products) and about 28% protein (from plant and animal products), this implies a short fall of 18% and 11% in carbohydrate and protein intake respectively in three years. This situation depicts food insecurity. Based on the result, general livelihood pattern also indicated that farmers who produce more of the food consumed in the study area have the least disposable income to cater for life's basic

needs; this implies that, as this trend continues, the farmers will have less money to cater for the household resulting in them having less resources, poorer accommodation, transportation and health, consuming more of the unbalanced diets and generally remaining in the ultimate vicious cycle of poverty.

Material and Method. The study was carried out in Oyo East Local Government Area (L. G. A) of Oyo State. The location experiences moderate rainfall of about 1500mm per annum. Oyo town lies between latitude 07¹ North and longitude 03¹ West on the world map. Farming is the major occupation of the people living in this environment while trading, civil service are the non-farm activities. The Local Government shares boundaries with other Local Governments; at the North by Atiba, East by Afijio, West by Oyo West and south by Afijio. Oyo East L. G. A consists of ten wards which are located at a distance from one another. The study employed a multi-stage random sampling technique for the selection of the representative sample (sample size); the first stage involved a random selection of five from the identified ten wards. Second stage involved a random selection of eleven villages from the initial five wards selected. Then, households were randomly selected from eleven villages; this was done proportionately with respect to the number of households in each location; thus a total of a hundred and twenty (120) respondents were selected and used for this study.

Information was collected through the use of a well-structured questionnaire which was administered to the respondents through one on one interview; data collected was based on 2009/2010 cropping season. The data was analysed using frequency distribution tables, percentages and mean values as descriptive statistical tools while Tobit model was employed as inferential statistical tools to test the hypothesis.

Food Security Index

The households were classified into food secure and food insecure households using food security index as earlier used by Omonona & Agoi (2007); this was used to establish the food security status of various households. It is given by:

$$F_i = \frac{\text{Per capita food expenditure for the each household}}{2/3 \text{ means per capita food expenditure of all households}}$$

where F_i = food security index
 when $F_i \geq 1$ = food secure each household
 $F_i \leq 1$ = food insecure each household.

A food secured household is therefore those whose per capita monthly food expenditure fall above or is equal to two-third of the mean per capita food expenditure. 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.

Tobit Model Specification

$$Y_i^* = BX_i + e_i$$

$$Y_i^* = 0, \text{ if } Y_i = 0$$

$$Y_i^* = Y_i \text{ if } 0 < Y_i \leq 1$$

Where Y_i^* is the limited dependent variable, which represent the food security indices;

Y_i^* is the observed dependent variable;

X_i is the vector of independent variables;

B is a vector of unknown parameters;

e_i is a disturbance term assumed to be independent and normally distributed with zero mean and constant variance σ and $i = 1, 2, \dots, n$;

n is the number of observations.

Results and Discussion.

Factors influencing food security status of the respondents. Table 1 presents Tobit regression estimate from the fitted model in which the response variable is the food security status of the respondents while the explanatory variables are the selected

attributes (socio-economic characteristics) of the respondents; the coefficient of farmers age is -0.0224 and is statistically significant ($P < 0.1$); meaning that age is a significant factor in determining the food security status of farmers in the study area. The negative sign of the coefficients implies that a unit increase in age of the farmers will lead to 0.0224 decreases in the food security status of the farmers; this thus suggests that as farmers grow older, they tend to be less productive and thus less food secured. Meanwhile, the estimated coefficient of household size is -0.224 and is statistically significant ($P < 0.01$); this means that a unit increases in the household size will decrease the food security level by 0.224; large household size could not generate labor supply to household probably because of old age and increase the number of infants.

The coefficient of educational levels of farmers is -0.000327 and it's not statistically significant at any level; the result implies that educational status is not a significant factor in determining the food security status among the farmers in the study area. The coefficient of gender is -0.253 and it's not significant at any level; the negative value of the coefficient connotes that the level of food security will be reduced by 0.253 for the male farmers; this suggests that female respondents are less food secured than the male counterparts. The coefficient of the farmers' income is 0.000328 and it's statistically significant ($P < 0.01$); this suggests that an increase in income increases the food security status of the farmers.

Table 1

Tobit estimates of food security status and selected respondents' socio-economic characteristics

<i>Variables</i>	<i>Coefficient</i>	<i>Standard error</i>	<i>t-value</i>
Constant	3.147	0.438	7.184
Age	- 0.224E-01*	0.647E-02	-3.465*
Household size	-0.224*	0.301E-01	-7.442*
Educational level	-0.327E-03	0.316E-03	-1.036
Gender	-0.253	0.194	-1.308
Income	0.328E-03*	0.668E-04	4.927*

* - statistically significant at $P < 0.01$; Sigma = 0.775, significant at $P < 0.01$.

Sources of food items consumed and the food security status of the respondents. Table 2 revealed the major source of food items consumed by households in the study area.

Table 2

Distribution of respondents by source of food items consumed

<i>Food items</i>	<i>Frequency (Produced)</i>	<i>Frequency (Purchased)</i>
Garri	73 (60.8%)	47 (39.2%)
Rice	0 (0.0%)	120 (100.0%)
Cowpea	10 (8.3%)	110 (91.7%)
Yam	74 (61.7%)	46 (38.3%)
Cassava	105 (87.5%)	15 (12.5%)
Yam flour	54 (45.0%)	66 (55.0%)
Palm oil	12 (10.0%)	108 (90.0%)
Vegetable oil	29 (24.2%)	91 (75.8%)
Pepper/Tomatoes	99 (82.5%)	21 (17.5%)
Maize	96 (80.0%)	24 (20.0%)
Meat/Fish	1 (0.8%)	119 (99.2%)

Source: Field survey 2010.

Majority of the respondents produced the following food items: garri (60.8%), yam (61.7%), cassava (87.5%), maize (80.0%), pepper/tomatoes (82.5%) and partly yam flour (45.0%) while the following food items were purchased by most of the respondents:

rice (97.5%), cowpea (91.7%), palm oil (90.0%), vegetable oil (75.8%) meat/fish (99.2%) and partly yam flour (55.0%); this implies that most respondents in the study area are producers of most of the staple food items consumed in the study area; this suggests accessibility of food in their various households; however, the food items they could not produce were purchased.

In the same vein, Table 3 revealed that 30.8% were food insecure while 69.2% were food secure based on the food security index constructed (that is 2/3 mean per capita food expenditure).

Table 3

Food security status of the respondents

<i>Food security status</i>	<i>Frequency</i>
Food insecurity	37 (30.8%)
Food security	83 (69.2%)

Source: Field survey 2010.

Constraints encountered in households' food security. Table 4 revealed the constraints faced by the respondents in ensuring household food security in the study area. The result indicated poor access to credit facilities and cost of storage equipment as severe constraints to food security in the study area. Poor access to credit facilities is an important factor determining acquisition and involvement in large scale activities which has significant influence on income generating activities. Also, household purchasing power would be eroded in case of high cost of food items thereby reducing access to food; this was in line with Dada & Adedoyin (2006) who stressed that without stable and gainful employment, households lack the capability to access adequate food always.

High cost of storage equipment affects the availability of food items which may lead to food insecurity. Also, poor storage facility, high cost of food item, low processing capacity and poor marketing channel were only mild in the study area. Majority (63.3%) of the respondents were faced with problem of poor storage facility which is mild and only 36.7% were severe; this implies that storage facilities is still available which minimizes the loss of farm produce. The costs of food consumed by the respondents were high in which 85.8% were mild and 14.2% were severe.

Low processing capacity affects the availability of variety of food items. 55% were mild and 45% were severe based on the result obtained. Poor marketing channel tends to discourage availability of household food; thus 85.8% of the respondents were in a mild situation while only 14.2% were severe. This tends to discourage availability of household food security.

Majority of the respondents (97.5%) were faced with the problem of health and this is in a mild case with only 2.5% accounts for severe condition. Lack of inputs was part of the constraints faced by the respondents in ensuring food security; 85% were mild and 15% were severe conditions; this will negatively affect the yield and availability of food items thereby leading to household food insecurity. In most cases, poor transportation network in the study area is mild with 77.5%; this shows that poor transportation of farm produce which is usually faced by farmers is mild and thus makes it easier for the transportation of farm produce. The problem of inadequate infrastructure such as good road, health centre, electrification and potable water supply was mild; these are parts of the identified constraints militating against the attainment of household food security among the respondents in the study area; only 12% are in a very severe condition. This corroborates the assertion of Adio (2000) that transportation of marketable farm produce, health centre and free flow of information has been insufficient and difficult.

Table 4

Distribution of respondents by constraints against household food security

<i>Constraints</i>	<i>Frequency (Very severe)</i>	<i>Frequency (Severe)</i>	<i>Frequency (Mild)</i>	<i>Total</i>
Poor access to credit facility	-	67 (55.8%)	53 (44.2%)	120 (100%)
Poor storage facility	-	44 (36.7%)	76 (63.3%)	120 (100%)
High cost of food items	-	17 (14.2%)	103 (85.8%)	120 (100%)
Low processing capacity	-	54 (45.0%)	66 (55.0%)	120 (100%)
Poor marketing channels	-	17 (42.0%)	103 (85.8%)	120 (100%)
Cost of storage equipment	15 (12.5%)	93 (77.3%)	12 (10.0%)	120 (100%)
Health problem	-	3 (23.0%)	117 (97.5%)	120 (100%)
Lack of inputs	-	18 (15.0%)	102 (85.0%)	120 (100%)
Poor transportation network	-	27 (22.5%)	93 (77.5%)	120 (100%)
Inadequate infrastructure	12 (10.0%)	15 (12.5%)	93 (77.5%)	120 (100%)

Source: Field survey 2010.

Socio-economic characteristics of the respondents. Table 5 presents the distribution of respondents by socio-economic characteristics. It was revealed that majority (30.8%) of the respondents were within the age group of 51-60 and above 60 years respectively with mean age of 53 years; which suggests that most of the respondents are fairly old and leaving their productive stage. It was further revealed that 17.5% are female and 82.5% are male; meaning that most of the households in the study area are male headed. Then, it was also shown that majority (58.3%) of the respondents was Muslim, Christians and traditional worshippers account for 38.3% and 3.3% respectively of the respondents. Then, majority (70.0%) of the respondents was married. The result also revealed that 47.5% and 38.3% of the respondents have household sizes between 1-5 and 6-10 members respectively; the estimated mean value for household size is 6 members; this suggests that most households have responsibility bestowed on them; on the other hand, members of households can be useful and may contribute to family labor for both farm and non-farm sectors.

It was also shown that majority 66.7% and 27.5% of the respondents have the number of dependants on the household head ranging between 1-5 and 6-10 members respectively with mean value of 8.81; approximately 9 members; this suggests that most households are likely to be less food secure. The result also revealed that 32.5% of the respondents have no formal education, 26.7% accounts for respondents with adult and primary education respectively. The low level of literacy among the respondents is likely to hamper good livelihood opportunity in both formal and non-formal sectors of the economy; thus capable of endangering household food security. The result also shows that the majority (90.8%) of the respondents engage in farming as their primary occupation while only 9.2% engage in non-farming activities. Most of the respondents (45.0%) engage in trading as their secondary occupation, while 15.8% engage in casual labor; 13.3% also engage in civil service.

It is worth mentioning that only 1.6% of the respondents are full housewives; this suggests that rural women nowadays have other means of empowering themselves; this finding agrees with Ogunwale (2000) that the era of full housewife is gradually fading away even in the rural areas; this may probably be as a result of economic realities, the need to provide for their children or support their husbands in providing for the families. Few respondents are also found to be artisans.

The findings also shows that 75.0% consumes food thrice per day, 22.5% twice and 2.5% whenever hungry; this implies that the rural farmers are able to afford three meal in their household probably as a result of the self-catering. It was also revealed that most (37.6%) of the respondents spent between ₦7,501 and ₦11,000 monthly on food, about 20.0% spent between ₦11,001 and ₦14,500; 18.3% spent between ₦14,501 and ₦18,000; 12.5% spent between ₦4000 and ₦7,500 while 10% spent ₦18,001 and above. The mean monthly expenditure was estimated as ₦11,636.67.

Table 5

Distribution of respondents by socio-economic characteristics

<i>Socio-economic characteristics</i>	<i>Frequency</i>	<i>Socio-economic characteristics</i>	<i>Frequency</i>
Age		Level of education	
≤ 30	5 (4%)	No formal education	39 (32.55)
31–40	14 (11.5%)	Adult education	32 (26.7%)
41–50	27 (22.4%)	Primary	32 (26.7%)
51–60	37 (30.8%)	Secondary	13 (10.8%)
> 60	37 (30.8%)	Tertiary	4 (3.3%)
Mean (53 years)		Major occupation	
Gender		Farming	109 (90.8%)
Male	99 (82.5%)	Non-farming	11 (9.2%)
Female	21 (17.5%)	Secondary occupation	
Religion		None	8 (6.7%)
Christian	46 (38.3%)	Civil service	16 (13.3%)
Islam	70 (58.3%)	Trading	54 (45.0%)
Traditional	4 (3.3%)	Sewing	5 (4.2%)
Marital status		Hair plaiting	3 (2.5%)
Single	7 (5.8%)	Hired casual labour	19 (15.8%)
Married	84 (70.0%)	Poultry keeping	13 (10.9%)
Widow	18 (15.0%)	Full housewife	2 (1.6%)
Divorced	11 (9.2%)	Food consumption rate per day	
Household size		Once	0 (0.0%)
1–5	57 (47.5%)	Twice	27 (22.5%)
6–10	46 (38.3%)	Thrice	90 (75.0%)
11–15	13 (10.9%)	Whenever hungry	3 (2.5%)
16–20	4 (3.3%)	Expenditure on food items per month (₦)	
Mean (6 members)	-	4000–7500	17 (12.5%)
Number of dependants on household head		7501–11000	45 (37.6%)
1–5	80 (66.7%)	11001–14500	24 (20.0%)
6–10	33 (27.5%)	14501–18000	22 (18.3%)
11–15	7 (5.8%)	Above 18000	12 (10.0%)
Mean (8.81)	-	Mean (₦11, 636.67)	

Source: Field survey 2010.

Conclusions. Farmers often resort to their indigenous practices and strategies in an attempt to ensure food security. This is done through various livelihood activities of rural farmers in ensuring food security. The following conclusions are made on the basis of findings of this study. There are a lot of constraints that hinder the effective contribution of farmers to household food security in the study area. Despite these constraints, farmers are still doing their best in contributing to household food security. They are actively involved in farm and non-farm income generating activities which help to cater for themselves and their families. As a result of this, farmers contribute and stored food stuffs during surplus which enhanced their household's food security status.

Based on the key findings of this study, the following recommendations were made:

- Farmers should be encouraged to have additional source of income towards attaining food security;
- Farmers should be encouraged to form cooperatives group which will enhance their access to credit facilities to enable them to boost their income generating activities since income is significant;

- Strategy should be adopted in the provision of enabling environment that will support private sector initiative in marketing and post-harvest handlings of staple foods.

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