

Determinants of Food Security Status of Yam-Based Farmers in Orhionmwon Local Government Area of Edo State, Nigeria

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Abstract – This study examined the socio-economic determinants of food security status of yam-based farmers in Orhionmwon Local Government Areas of Edo South, Senatorial District of Edo State which were purposively selected based on the intensity of yam-production in the area. One hundred and twenty (120) registered yam-based farmers from the Edo State Agricultural Development Programme (EADP) list of contact farmers were randomly selected, data were collected using structured questionnaire and interview schedule. The data were analysed using frequency count, percentages and logit Regression model. The findings showed that (80.8%) of the respondents were males whilst females accounted for (19.2%), the mean age of the respondents was 50 years, with mean farming experience of between 11 – 20 years. The results of the study indicated that three socio-economic variables included in the logit model such as farm size, farm income and off-farm income were positive and significant in explaining variation in the food security status of the households. The study further recommends that farmers should help themselves by forming/joining co-operative societies in order to secure loans for farm improvement and social infrastructures should be provided by government to help boost-off-farm income.

Keywords – Food Security, Determinants, Yam-Based Production and Farm Households.

I. INTRODUCTION

Food security exists, when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life[1]. Apart from this definition, the term food security has been defined in other ways. Reference [2] identified thirteen groups of definitions of food security. Few of such definitions are reviewed hereafter; World Bank defined it as access by all people at all times to enough food for healthy and active life. Food security is also defined as the physical and economic access to adequate food for all household members, without undue risk of losing the access. A definition endorsed by the International Conferences on Nutrition, states that food security is a state of affairs where all people at all times have access to safe and nutritious food to maintain a healthy and active life.

Food security is a multidimensional concept and its major components are (a) availability of food (b) access to food (c) quality and nutritional adequacy of food and (d) utilization of food. Food insecurity can therefore be a failure of one of these factors or some combination of these factors. Food security is an essential foundation for

meeting various Millennium Development Goals (MDGs) related to hunger, child mortality, mental health, disease, gender equality and primary education [3]. Availability of sufficient food at the country or local levels does not mean that all people within that geographical unit are food secured. Food security implies that food intake must be adequate in both qualitative and quantitative terms. However, the issue of quality of diet has received little attention in the food security debate at all levels [4].

The Bali declaration reaffirms that food security should be a fundamental goal of developmental policy as well as a measure of its success, food security describes a situation in which people do not live in fear of starvation and hunger. It is, estimated globally that around 850 million men, women and children are chronically hungry due to varying degree of poverty [5]. An estimated 820 million of the above figure live in developing countries, the very countries expected to be most affected by climate change.

Since the source of livelihood of majority of the poor in the rural areas is agriculture, alleviating food security problems entails boosting agricultural production. Yam production may be one of the means of tackling this problem of food insecurity among farmers in the country. This is because yam being a staple food item is rich in carbohydrate and it is preferred by many along the west coast of Africa. The crop, thus, has enormous economic potential for producers. Finally, Nigeria being the largest producer of the crop can take advantage of this high demand to become the highest exporter of the crop, thereby leading to high foreign exchange earnings.

II. OBJECTIVES OF THE STUDY

The main objective of this study was to examine the determinants of food security status of yam based farmers in Orhionmwon Local Government Area of Edo State, Nigeria.

In order to achieve this main objective, the specific objectives pursued were to;

- 1) Examine the social-economic characteristics of the respondents, and
- 2) Estimate the food security status of the rural households in the study area.

III. LITERATURE REVIEW

Reference [6] asserts that food security at the global and regional levels is attained when the world produces

enough food to meet the needs of the fast growing populations; there are no barriers to international food trade so that nations can supplement their production with imports at relatively stable prices and where necessary establish security reserves to safeguard against production deficits or sharp increase in prices. However, meeting these challenges in the world scenario is not an easy work. Therefore, [7] is of the opinion that global food security will remain a worldwide concern for some time to come.

It has been argued that substantial progress has been made in reducing the food insecure population globally, but food security problem is more chronic and endemic in developing regions especially in Asia and Sub-Saharan Africa. Reference [3] indicates that over 852 million people were estimated to be undernourished worldwide in 2000-2002 including 815 million in developing countries, 28 million in the countries in transition and 9 million in the industrialized countries. Sub-Saharan Africa has been known to be a region facing deep structural economic problems, political conflicts and various forms of social malaise. It is hoped that the regional and sub-regional collaborative bodies such as the African union (AU) the new partnership for African development (NEPAD), the economic community of West African States (ECOWAS), the African Peer Review Mechanism (APRM) etc, can promote the use of common currency market integration, lower trade tariffs and exchange idea and information for good governance. These are essential for the attainment and sustenance of food security.

In the Nigerian context, there are two major sources of food supply. These are domestic food production and food imports. Reference [8] reported that cassava and yam were the most produced crops. Although most of the crops recorded annual increases in output, their aggregates were inadequate to meet annual demand. Indeed, Nigeria's domestic food production has for many years fallen short of demand. It is observed that between 1994 and 2001 for which fairly constant data are available, Nigeria's domestic food production increased from 86.70 million tones in 1994 to 103.86 million tones in 2001. Food demand which was consistently above domestic production rose from 87.23 million tons in 1994 to 110.37 million tons in 2001. Thus the disparity between domestic food production and food demand in the country resulted in food short falls which increased dramatically from 0.53 million tones in 1994 to 6.91 million tones in 2001.

Yam (*discorea spp*) a tropical root and tuber crop, occupies a pre-eminent position as a food crop, next only to cereals and grains legumes and it is staple food of over 20% of the world population. Reference [9] reported that global production of yam has been estimated to be 20 tonnes a year. The greater part of this output is derived from West Africa with Nigeria providing about half the world's total. The author further affirmed that yam is also important in parts of South East Asia and Oceania, and in the Caribbean and neighboring parts of tropical America. In spite of its economic importance, yam (*discorea spp*) has not received that attention that it deserves with regards to its quantitative and qualitative contributions to food security in Nigeria in particular and the world at large.

IV. RESEARCH METHODOLOGY

4.1 Area and scope of study

This study was conducted in Edo State Nigeria., the state is created from the defunct Bendel State in the Midwestern part of Nigeria on august 27, 1991. According to the nation population census 2006, Edo State has a population of 3,233,366 (comprising 1,633,946 males and 1,599,420 females) accounting for 2.30% of Nigeria's total population [10]. The State is in the rainforest zone with annual rainfall of 1,300mm – 2,300 mm per annum.

The target population of this study were farm households whose cropping system is yam-based, that is, the house derive more than 50% of their farm income from the sale of yams harvested from their farms.

4.2 Sampling Procedure and Methods of Data Collection

A multistage sampling process was adopted in selecting yam-based farmers within the yam producing areas of Edo South.

The first stage involved purposively selecting one-block out of the seven blocks making up Edo-South Agro-Ecological Zone. This was based on the researchers' prior knowledge of the intensity of yam production activities, population of yam producers and the availability of market for yam products in the study area. The second stage involved a proportional sampling of five (5) villages from Orhionmwon block and finally thirty (30) EADP contact farmers from each village.

In all, 150 yam-based farmers were interviewed in the LGA using trained enumerators. However, for analysis only 120 copies of the questionnaire were found adequate and useful for the study.

4.3 Model Specification

The determinants of food security status among farm households in the study areas were estimated using logit regression model. Reference [11] specified the logit model as:

$$\text{Logit}(Y) = \text{Natural log}(\text{odds}) = \ln \frac{\pi}{1-\pi} = \alpha + \beta x$$

Ln = natural log

Y = dependent variable

π = probability of interested outcome

α = intercept parameter

β = regression coefficient and

x = independent variable

For multiple predictors ($x_1, x_2, x_3, x_4, \dots$) a complex logistic regression for y is as follows

$$\text{Logit}(Y) = \ln \frac{\pi}{1-\pi} = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k + u(\text{error term})$$

Where x_1 = sex of household head (dummy x_1)

x_2 = age of household head (years)

x_3 = educational level of household heads

x_4 = household size

x_5 = farm income (Naira)

x_6 = off-farm income (Naira)

x_7 = farm size (hectares)

x_8 = farming experience (years)

x_9 = house ownership (house owner = 1;

non-house owner = 2).

$\beta(1-9)$ are unknown parameters to be estimated.

The standard error test and the student t test at 5% level ($P < 0.050$) was used to test the reliability of the individual logit coefficient.

V. RESULTS AND DISCUSSION

5.1 Socio-Economic Characteristics of Respondents

Results of the socio-economic characteristics of farm households presented in Table 1 indicate that (80.8%) of the households were male headed while females headed 19.2% of sampled households. This result further attest to the facts that males owned and controlled most farm-lands in the survey area. This could be due to social, cultural and economic limitation which patrimonial society like ours imposes on women. However, there is a gradual trend towards the prevalence of female headed households in third world countries [3]. The average age of farmers in the study area was about 50 years. This agrees with [12] that estimated the average age of West Africa farmers to be 50 years and above. Also 92.5% of those sampled confirmed that they were married. This forms majority of the sample respondents, corroborating the findings of [13], that society places high value on marriage with married people assumed to be more responsible than the unmarried. The results further showed that 2.5% had no formal education, 16.7% had secondary education while, 16.7% had tertiary education. The moderate level of education in rural areas is a rapidly emerging trend and is thought to have positive influence on the caloric intake of households members, as an appreciation of nutritive values of food is expected to be positively correlated with level of education. This view is also buttressed by [14]. Another advantage that might be enjoyed by the respondents due to their level of education is the development of their curiosity to adopt and utilize technologies which could increase agricultural production and productivity. Finally, further advantage on the side of moderate educational level is the prospect of getting better off-farm jobs.

The mean farm size was estimated to be 1.35ha, farm size is expected to be positively related to food security. Reference [15] observed that there are three million small-holder farming families across Ghana and Nigeria, 90% of whom cultivate less than 2.5ha and this agrees with 1.35ha of this study. The small farm size cultivated is a strong pointer to food insecurity, on the average .households in the study area had a mean farming experience of 6 years. Experience in farming is desirable to improve skills and knowledge of farming operations, especially where such skills and knowledge are modern and this will in the long run impact positively on food security status.

The study further found that (52.5%) of the household heads owned their houses. This could be of economic relief to the household heads while (47.5%) did not have houses, about (71%) of the households had household size between one and eight person on head count basis, with the mean value of 7 people. The relatively high household size could pose a threat to the nutritional need of the

household members, especially the low-income group and this is particularly so if the increase in household size translate into increasing number of children who do not necessarily contribute to the total household income.

Finally, with respect to crop farming status, 54.2% of the surveyed households heads were farming on part-time basis, while 48.8% did farming on full-time basis. The long rung advantage of part-time farming is that income can be sourced from off-farm jobs and can help in the event of crop failure and natural disaster. It therefore acts as mitigation strategy against adverse condition.

Table 1: Socio-Economic Characteristics of Respondents

Category	Frequency	Percentage	Mean (\bar{x})
Sex:			
female	23	19.2	
Male	97	80.8	
Total	120	100	
Age (yrs)			
30 & below	4	3.3	
31 – 40	13	10.8	
41 – 50	46	38.3	49.67
51 – 60	46	38.3	
61 – 70	11	9.2	
Total	120	100	
Marital status:			
Married	111	92.5	
Single	5	4.2	
Widow(er)	4	3.3	
Total	120	100	
Educational Level:			
No formal education	3	2.5	
Primary education	20	16.7	
Secondary education	77	64.2	
Tertiary education	20	16.7	
Total	120	100	
Farm size (ha)			
1h & below	49	40.8	
1.1 – 2.0	38	31.7	
2.1 – 3.0	15	12.5	
3.1 – 4.0	11	9.2	1.35
>4.0	7	5.8	
Total	120	100	
Farming Experience(yrs)			
1 – 10	35	29.2	
11 – 20	58	48.2	
21 – 30	24	20.2	14.58
>30	3	2.5	
Total	120	100	
House ownership:			
Non-owner	57	47.5	
House owner	63	52.5	

Total	120	100	
Household size	26	21.7	
1 – 4			
(range) 5 – 8	59	49.2	
9 – 12	35	29.1	7
Total	120	100	
Crop farming status:			
Part-time	65	54.2	
Full-time	55	45.8	
Total	120	100	
Cropping pattern:			
Sole cropping	25	20.8	
Mixed cropping	95	79.2	
Total	120	100	

5.2 The Determinants of Households Food Security Status

The Regression Results

The results of the logit regression model presented in Table 2 showed that three (3) variables were significant in the model. These are farm size ($P < 0.05$) with odd ratio 1.2772; farm-income ($P < 0.05$) with odd ratio of 1.526 and off-farm income ($P < 0.05$) with odd ratio of 1.355. The overall model has a chi-square statistic of 18.06 and overall percentage classification of 62.6%.

The implication of this result is that only the three aforementioned variables had effect on the food security status of the target households. Farm size was a positive indicator of food security. Households with larger farm size were about two times more likely to be food secured than households cultivating small farm sizes, this is in accordance with *a priori* expectation. The households' farm income had a positive and significant effect on food security status of the respondents as the product market is a function of consumers' income. Empirical evidence from [16] recognized income as crucial to the development of sound food and nutrition policies for a country. Household with farm income were likely to be 1.5 times more food secured than household without farm income.

The respondents' off-farm income also had a positive and significant effect on the household food security status. This agrees with *a priori* expectation that there are risks associated with farming and this off-farm income can be used to mitigate food insecurity shocks and financing of feeding during slack periods before harvest. Although the other variables included in the model were not significant and do not deserve further discussion, the sign carried by these factors, are worth-noting. For instance, the respondents age, level of education and household size were negatively signed. This implies that an increase in these sets of factors decreases the probability of an household being food secured while positively signed sets of factors would raise the probability of an household being food secured.

Table 2: Logit regression estimates of factors influencing food security status of farm households in the study area

Variables	Coefficient	Standard error	t-statistics	Odd ratio
Constant	-0.625	1.802	-0.347	0.535
Sex	0.191	0.605	0.316	1.210
Age	-0.029	0.028	-1.036	0.971
Education	-0.254	0.382	-0.665	0.776
Farm size	0.572*	0.210	2.724	1.772
Farming experience	0.027	0.031	0.871	1.028
House ownership	0.065	0.471	0.563	1.303
Household size	-0.008	0.089	-0.090	0.992
Farming-income	0.403*	0.176	2.290	1.526
Off-farm income	0.344*	0.155	2.219	1.353

Omnibus Test of model coefficient (χ^2) = 18.06 of = 0; $P < 0.50$ coefficient of determination (R square = 0.223) overall percentage classification = 67.65

VI. CONCLUSION AND RECOMMENDATIONS

The study has shown that three variables were positive and significant towards attaining food security in the study area, they are viz; farm size, farm income and off-farm income. In order to reduce food insecurity problem confronting the rural farming households especially of calorie inadequacy in the study location, the need for the applicability of the moderate level of education of the people by appreciating and addressing their dietary imbalance and improving nutritive components of their food, cannot be over emphasized. Since the population of yam farmers was ageing and the proportion of full-time farmers was low, government should intensify effort to empower the youth in the rural areas for farming.

Farmers should empower themselves by forming cooperative societies. Programme like farm settlement scheme should be revitalized and given serious attention. Farm size had significant and positive influence on the food security status of the farmers, therefore farmers should be encourage to increase their farm size and equally be empowered to embark on large-scale commercial yam production.

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AUTHOR'S PROFILE



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