DETERMINANTS OF FOOD SECURITY AMONG HOUSEHOLDS IN DEKINA LOCAL GOVERNMENT AREA OF KOGI STATE, NIGERIA

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Abstract

This study was carried out to examine the determinants of food security status among households in Kogi State, Nigeria. Questionnaires were administered to elicit information from randomly selected 120 respondents from the three districts in Dekina LGA. The study employed both descriptive statistics and logistic regression in analysing the data. The study revealed that 62% of the respondents are food insecure, 65% of the household heads are married and 93% of the respondents are within ages 25-60. The result of the logistic regression model shows that four: age, sex, household income and household food expenditure per person out of the eleven variables included in the model were significant. Since food security increases with increase in household income, expenditure per person, government should increase the wages and salaries of her employee which will have a strong impact on the household food security since they are mostly in paid employment. We specifically recommend that the federal and state government should ensure that the N18,000.00 minimum wage is implemented at the local government level since most of the residence are employed at this level.

Keywords; food security, determinants, logistic regression

1.1 INTRODUCTION

The fight against hunger and food insecurity is one of the biggest challenges global societies have been facing in the last decades (Pieters, Guariso and Vandeplas 2013). Though Nigeria is the most populated country in Africa and also regarded as the giant of Africa, yet majority of households are food insecure, especially the rural farming households. Several evidences have suggested that majority of the world's food insecure live and work in the rural areas (IFAD, 2001). The problem of food and nutrition security in Nigeria has not been adequately

and critically analysed, despite various approaches at addressing the challenges. (Abdullah, 2015).

Food security is a broad concept which encompasses issues that relate to the nature, quality and security of the food supply as well as issues of food access. The world has been facing the paradox of widespread food insecurity, amid net food surpluses (Iram & Butt, 2004).

Food utilization which is typically reflected in health status is determined by income, quality and quantity of dieting intake which on the other hand is determined by dietary knowledge of the household as to the nature diet (state) of food that provide balance diet. Family size, health status, gender, age income and dietary knowledge are the underlying determinant of food utilization. (Omonona & Agoi 2007).

Food is one of the basic necessities of life and as such there is need to ensure availability and accessibility of food in desired quantity. The problem of food security in Nigeria as a whole has not been adequately and critically analysed and solved despite various approaches in addressing the challenges not has been done in selected study area

The problem of food security has become so endemic that it poses a problem (hunger, starvation) to the economic development of the country. This is because food is needed to keep people healthy and energetic so as to be fit to enable them carry out their normal business activities more productively. Food security is also linked to nutrition and health status, this is because food insecurity leads to ill-health which in turn fight against national development by reducing productivity through loss of man power and labour hours which also has its potentialities of pushing people deeper into the dungeon of poverty. It is against this background that seek to analyse the determinants of food security among the households in Dekina Local Government Area of Kogi state, Nigeria.

2.0 LITERATURE REVIEW

2.1 Meaning of Food Security

Food security for a household means access by all members at all times to enough food for an active, healthy life. Food security include at a minimum the ready availability of nutritionally adequate and safe foods, and an assured ability to acquire without resorting to emergency food supplies, scavenging, stealing, or other coping strategies USDA(2008).

At the 1996 World Food Summit, convened by the Food and Agriculture Organisation of the

United Nations, participants agreed that food security means that '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'(FAO,1996). This definition is mostly accepted by many people and adopted by many government to be the best description of food security. Thus, Napoli, De Muro and Mazziolta (2011) brought four interlinked components from that definition. The first relates to the availability of food in any country or household through any means. The second relates to access to food by people or households. The third has to do with utilization while the fourth has to do with stability and sustainability over time.

The National Food Security Programme in Nigeria defines food security as the physical availability and ability of individuals to have or afford the food at a reasonable cost (NFSP, 2001). USDA Bureau for Africa sees food security as a situation when all people at all times have access to sufficient food to meet their dietary needs for a productive and healthy life (USDA, 1997),

2.2. Empirical Literature

There is a vast literature on the determinants of food security. Feleke, Kilmer and Gladdwin (2005) examined determinants of food security in southern Ethiopia at the household level. They employed the use of logistic regression analysis which they applied on data collected from 247 sample households in southern Ethiopia. The study found that seven factors: technological adoption, farming system, farm size, land quality, household size, per capita aggregate production, and access to market out of the nine factors they included in the model were statistically significant determinants of food security. Among these, technological adoption, farming system, farm size, land quality are supply side factors. Based on their result of full/reduced model and the magnitude of changes in conditional probabilities of food security, they concluded that the supply-side variables are more powerful determinants of food security than the demand side variables.

Sekhampu (2013) studied the determinants of food security status among households receiving government grants in a township of *Kwakwatsi,* South Africa based on a household survey using questionnaires. A Logistic regression model was estimated based on this data with the household food security status (that is food secure and insecure) as the dependent variable and a set of demographic variables as explanatory variables. It was found that about 38 per cent of the sampled households are food secure. The results of the regression analysis

showed total household income, household size, employment and marital status of the household head, employment status of the spouse as important determinants of food security in the area. Household size and the marital status of the head of household were negatively associated with household food security. The age, gender and educational attainment of the household head were not significant predictors of household food security status.

Bashir, Schilizzi and Pandit (2012) studied the determinants of rural household food security for landless households of the Punjab in Pakistan by collecting data from 576 landless households. They employed the use of logit regression and descriptive statistics model to analyse. The research reviewed that about 27% of the sample households were food insecure. Household monthly income, household head's head education were positively impacting household food security while household's heads age and family size had negative impact on household's food security.

Similarly, Muktar (2011) used the logit regression model to study the determinants of food insecurity in Nigeria. The result obtained showed that household income, educational qualification, gender, size of household, assets owned by households and access to credits are among the major determinants of food insecurity.

Irohibe & Agwu (2014) studied the determinants of food security status among farming households in rural areas of Kano state, Nigeria. Data collected were analysed using percentages, mean score, logistic regression. Using the food security index approach, the study revealed that 74% of the respondents were food secure while 26% were food insecure. The results of the logistic regression revealed that educational level were significant determinants of food security. Also, the major effect of food insecurity on the households include reduction in household income/ savings due to increased expenditure on food (M= 3.58), amongothers.

Owolade (2013) examined the determinants of food security among rural livestock farmers in south western Nigeria using primary data. They employed descriptive statistics and binormial regression in analysing the data collected. The study found that majority of the respondents were male and married. About 46% of them completed secondary education. They also found that a large proportion of them practice extensive system of livestock production.

Omotesho (2007) investigated food security and poverty in kwara state using discriminant analysis. Their studies revealed that accessibility to health facilities, household size, farm size and household expenditure on food were the major determinants of food security status. Non-farm income was a major determinants of household being non poor.

Arene & Anyaeji (2010) examined determinants of food security among households in Nsukka metropolis of Enugu State, Nigeria. It was found that about 60 per cent of the households are food insecure, using expenditure method of estimating food security status. Further analysis using the binary logistic regression method identified income and age of household head as important determinants of food security.

Abdullahi (2015) examined the determinants of food security status among rural Farm households in Kaduna State, Nigeria using logistic regression model to analyse the data collected through interview guide administered to 120 respondents. It was revealed that four out of the seven variables included in the model were significant. The determinants of food security in the study area were age, extension contact, source of labour and per capita income of therespondents.

Omotesho (2006) investigated the determinants of food security among the rural farming household in Kwara state, Nigeria using primary data conducted on 165 farmers. They employed the use of logistic regression model and descriptive statistics for their analysis. The study showed that about one third of the rural farming households sampled were food insecure and that farm size of the household, gross farm income, total non-farm income and household size are the significant determinants of rural household food security in the study area.

With primary data collected from survey of clients of non-profit food assistance agencies in selected southern states Onianwa & Wheelock (2006) examined the analysis of the determinants of food insecurity with severe hunger. They employed two stage process involving the application of the Rasch measurement scale and the logit model as the estimation technique. The result revealed that for both household with children and household without children, income was a significant predictor of food insecurity with severe hunger.

Abdulla (2015) Omotesho (2008) investigated the determinants of food security among the rural farming household in Kwara state, Nigeria They conducted questionnaire on 140 households and used descriptive statistics such as mean, standard deviation, percentages,

frequencies, ANOVA and chi square to analyse the data and ordered logit regression model. The survey result shows that about 23% of sampled farmers were food secured.

Sultan & Adiqa (2011) carried out a study on the determinants of food security at household level in Pakistan using Logistic regression procedure. The analysis found that place of residence, educational attainment level of household heads and dependency ratio has significant impact on food security while social capital and employment do not affect food security significantly.

Asmamau, Budusa and Teshager et al (2015) analysed the vulnerability to food insecurity among households in three different agro-ecological zones within the rural districts of Sayint in South Wollo, Ethiopia. The study employed depth and severity of food insecurity measurements adopted from poverty gap measurement approaches. Findings indicates that oxen ownership, livestock ownership and access to off-farm employment opportunities are the most significant determinants of a household's vulnerability to food insecurity.

3.0 METHODOLOGY

3.1 Data Collection

The data used for the work is primary data. Questionnaire were administered to respondents (the targeted audience), which is the rural household of Dekina Local Government Area. The sample of this study is made up of one hundred and twenty (120) households from three (3) communities. Since Dekina is a very large LG.A, it will be difficult to cover the whole L.G.A within the stipulated time frame of this study and that led to the choice of the three (3) major communities representing the three (3) districts of the L.G.A. Anyigba represent Okura District, Dekina represent Dekina District, while Abocho will be used for Biraidu District. Forty (40) questionnaires were administered to forty (40) respondents in each of the three (3) communities giving each of the area equal participation and the respondents shall be randomly selected.

The sampling technique used for the study was the random sampling. This was because the whole population has equal chance of being faced with food insecurity. The selection was done at random by selecting some household not minding the difference in their socio-economic characteristics. To ensure appropriate findings, the instrument used for data collection was structured questionnaire which were administered to households. Information were collected on age, occupation and sex of household head as well as other

household characteristics including monthly income, household composition, dependency ratio (number of non-working members divided by the number of working household members).

3.2 The Model

This work adopts the work of adapted the works of omonona et al (2007) and omotesho et al (2007)

The cumulative logistic probability model can be economically specified as;

$$Pi = F(Zi) = \frac{1}{1 + e^{-Z1}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (i)$$

Where $Zi = Pi + P_2Xi$

Therefore, $Pi = f(Zi) = \frac{1}{1 + e^{-(\hat{a}_1 + Ó\hat{a}_1Xi)}}$

Where Pi is the probability that an individual is being food secure given Xi

Xi represents the ith explanatory variables

$\hat{a}_1$ and $\hat{a}_2$ are regression parameters to be estimated

e is the base of the natural logarithm

For ease of interpretation of the coefficients, a logistic model could be written in terms of the odds and log of odd. The odds ratio is the ratio of the probability that an individual or household would be food secure (Pi) to the probability of a household would not be food secure $(1 – P_1)$. That is

$$\left\{\frac{Pi}{1 - Pi}\right\} = e^{Zi} \quad \ldots\ldots\ldots (3)$$

If we take the natural logarithm of equation (3), we obtain

$$\left\{\frac{Pi}{1 - Pi}\right\} = Zi, = \hat{a}_1 + \hat{a}_2X_2 + \hat{a}_3X_3 + \hat{a}_4X_4 \ldots + \hat{a}_nX_n$$

if the disturbance term Ui is taken into account, the logit model becomes

$$Zi = \hat{a}_1 + \underline{Ó}^{n} \hat{a}_1 \underline{X} + Ui$$

$$I=1$$

Where the explanatory variables (Xi) are as follows: X_1 = Sex (SEX), X_2 = Educational attainment of the respondents (EDUATT), X_3 = Employment status (EMPSTAT), X_4 = Dependency ratio (DEPR), X_5 = Household income (HHINC), ,X_6 = Household food expenditure (HHFDEXPP), X_7= Household farm size (FARMSZ), X_8 = Age (AGE), X_9 = Family size (FAMILYSZ), X_{10} = Ownership of assets (OWNASS), X_{11}= marital status (MARSTA)

3.3 Variable Construction

In order to find the determinants of food security at household level in Dekina L.G.A, we used food security as dependent variable and income of the household, dependency ratio, employment status, educational attainment of household, social capital, family size, farm size, household expenditure per person as explanatory variables.

Dependent Variable

- **Food Security Index:** The household will be classified into food secure and food insecure households using food security index. This will be used to establish the food security status of various households given by;fi = Per capital food expenditure for the ith householdmean per capita food expenditure of all households.Where Fi = Food security index**.** When fi $\geq$ = Food secure ith household**,** Fi $\leq$ = Food insecure ith household

  Afood secure household is that whose per capita monthly food expenditure fall above or equal to the mean per capita food expenditure of the total households, and will be assigned the value of "1" and if "0" otherwise.

Independent Variables

- **Household Income:** Household income is measured by taking sum of income of all residents in each household.
- **Dependency Ratio:** Defined as the ratio of the non-earning (young and the aged)

persons of the family to the working members of the household. It is expected to decrease the probability of food security of the household.

- **Social Capital:** Measured by taking into account the payments received by a household in form of cash from relatives, non-relatives, non-governmental organization (NGOs) and trusts in case of emergencies. This variable takes the form of a dummy variable. Household that received payment will be assigned the value of 1 and 0 otherwise.

- **Educational Attainment Level of Head of the Household:** It will be divided in two categories and was assigned the value of "1" for primary, secondary and adult literacy education and the value of "2" for tertiary education (ND, NCE, B.Sc etc.) and "0" for illiterates.

- **Employment Status:** We divided employment into paid employee (non-agric), self employed (non-agric), self-employed (agric) and unpaid family workers. We also used the dummy variables for employment status assigning value "1" for paid employee (agric), "2" for self-employed (non-agric), "3" for self-employed (agric) and "0 unpaid family workers.

Others are family size and age of household, ownership of assets.

3.4 Data Analysis

There are many statistical modes which can be used to establish the relationship between our dependent variable (food security) and the independent variables (household characteristics). Since the dependent variable is dichotomous and the use of probit and logit models is recommended for use (Gujarati, 2003).

Since the two are similar and most applicable, it is difficult to choose between logit and probit. The only reason why many researchers tend to choose logit over the probit is due to its simplicity in interpretation. Therefore, this study employs the logit model following the footstep of these researchers. That is, it is a binary variable which will take a value "1" if a household is food secure, zero (0) otherwise. Thus, this work shall employ the use of descriptive statistics such as tables, percentages, measures of central tendency and the Logit model for analyzing the data.

4.0 DATA ANALYSIS AND RESULT PRESENTATION

Out of the 120 questionnaires distributed, one hundred and ten (110) were returned and analyzed.

4.1 Level of Food Security

Table 4.1 Level of Food Security

Food Security	Frequency	Percentages
1	42	38
0	68	62
total	110	100

Source: field survey, 2014

The table above shows the level of food security among the households in the study area. Households are grouped into food secure and food insecure based on their per capita food expenditure. The value of "1" is assigned to food secured household and "0" for the food insecure household. The food insecure line is defined as the mean per capita food expenditure of the total households studied. This is computed from the data obtained from the field survey. The households whose per capita expenditure fall below N231.88 are designated as food insecure while households whose mean per capita expenditure is equal to or greater than the mean per capita expenditure N231.88 are food secure.

About 38 percent of the household are food secured while 62 of percent the household studied are food insecure. This shows that majority of the households do not take the right quantity and quality of food and may not have access to it due to some factors like low income and inadequate infrastructural facilities.

4.2. Socio-economic Characteristics of the Respondents in the Study Area

4.2.1 Age of the Respondents

Table 4.2.1 Distribution of Respondents According to Age

Age	frequency	percentage
25-40	62	55
41-60	40	38
61and above	08	07
Total	110	100

Source: Field Survey, 2014

Table 4.2 above reveals that about 55% of the respondent's ages are between the age of 25-40 while 38% of the respondents fall between ages 41-60 and 07% are within the range of age 61 and above. In general, majority of the households heads fall within the age range of 25-60 years which is the active labour force of the country.

4.2.2 Sex of Household of the Respondents

Table 4.2.2 Distribution of Respondents According to Sex

Sex	frequency	Percentage
Male	87	79
Female	23	21
Total	110	100

Source: Field Survey, 2014

Table 4.3 above shows that 79% of the respondents are male while 21% of the respondents are female. From the data collected sex has no impact on food security because both the male and the female household heads exhibit both food secure and food insecure depending on their income level. Some households headed by women are food secured as the ones headed by men.

4.2.3 Marital Status of Respondents

Table 4.2.3 Distribution of Respondents According to Marital Status

Marital Status	frequency	percentage
Married	71	65
Single	39	35
Total	110	100

Source: Field Survey, 2014

From the analysis above, 65 percent of the respondents are married while 35 percent of the respondents are single. The married households tend to be more food secured than the unmarried households.

4.2.4 Employment Status of Respondents

Table 4.2.4 Distribution of Respondents According to Employment Status

Marital Status	frequency	Percentage
Paid employee (non agric)	74	66
Self Employed (non agric)	24	22
Self Employed (agric)	07	07
Unpaid family workers	05	05
Total	110	100

Source: Field Survey, 2014

Table 4.5 above shows the distribution of respondents according to employment status. A higher percentage (66%) of the respondents is paid employee while some are employed by the government others are involved in some casual jobs and they combine this with farming. Alittle percentage (7%) of the respondents is only involved in agriculture.

4.2.5 Educational Qualification of Respondents

Table 4.1.5 Distribution of Respondents According to Educational Qualification

Marital Status	frequency	Percentage
Primary, Secondary and Adult Education	46	42
Tertiary Education(NCE, ND, BSc etc)	54	49
Illiterate	10	09
Total	110	100

Source: Field Survey, 2014

The analysis above reveals that only 09 percent of the respondents have no level of education at all while 42 percent have either primary, secondary or adult education while 49 percent has tertiary education which may be NCE, ND, B.Sc. etc. This result shows that majority of the respondents have one level of education or the other but still food insecure which may be due to the high rate of unemployment in the country.

4.3 Presentation and Discussion of Regression Result

Table 4.3 Probit Model Result

Variable	Coefficient	Std. Error	z-Statistic	Prob.
HHFEXPP	0.022145	0.005809	3.812196	0.0001
HHINC	2.73E-05	1.40E-05	1.943250	0.0520
MARSTA	-0.822309	0.678733	-1.211536	0.2257
OWNASS	-0.352350	0.628890	-0.560272	0.5753
SEX	-1.697621	0.641130	-2.647857	0.0081
SOCCAP	0.817859	0.533056	1.534283	0.1250
FARMSZ	-0.513162	0.736238	-0.697006	0.4858
FAMILYSZ	-0.155216	0.159841	-0.971064	0.3315
EMPLSTA	-0.380665	0.440229	-0.864699	0.3872
EDUATT	-0.087161	0.487366	-0.178841	0.8581
DEPRAT	0.183030	0.364031	0.502786	0.6151
AGE	-0.088013	0.032338	-2.721651	0.0065
Mean dependent var	0.381818	S.D. dependent var		0.488056
S.E. of regression	0.257006	Akaike info criterion		0.568022
Sum squared resid	6.473126	Schwarz criterion		0.862620
Log likelihood	-19.24122	Hannan-Quinn criter.		0.687513
Avg. log likelihood	-0.174920			
Obs with Dep= 0	68	Total obs		110
Obs with Dep= 1	42			

The estimation in table 4.2.1 above depicts that household food expenditure per person (HHFDEXPP), household income (HHINC), sex (SEX), age (AGE) have statistically significant bearing on food security status of households at 5% confidence level. Other determinants such as household income (HHINC), marital status MARSTAT, ownership of assets (OWNASSET), social capital SOC, farm size, Family size employment status and dependency ratio (DEPR) are statistically insignificant.

Some determinants like household expenditure per person, household income, social capital, and depreciation ratio showed positive sign meaning that increase in any of these variables will lead to an increase in food security. Apart from dependency ratio all others are in conformity with a priori expectation. The more the household expenditure per person, household income, the more they are food secure, likewise households that have other means of income in form of donations from NGOs, gifts from relatives etc tend to be more food secured (social capital), the larger the farm size, the more food secured keeping other factors unchanged, the households.

On the other hand, marital status, ownership of assets, family size, farm size, educational attainment, employment status, age and sex has negative signs. Apart from family size and age, other variables are not in line with a priori expectation, it shows that households that are headed by female and single either divorced or widowed etc is as food secured as households headed by male and married men/women. The negative sign for the ownership of assets is an indication that household heads are subsistence farmers and may not value the need for assets such as storage facilities and mechanized tools. Educational attainment and employment status seem not to have bearing with food security in this area probably because most of the household heads are literate and have one job or the other. Age and family size has negative relationship showing that as one gets older the less food secured. Those within ages 31- 50 usually occupy higher position with corresponding high income while between the ages of 51-60, households are getting retired. At age 60 and above households are expected to be retired and their income will be reduced which will increase food security. The result shows that food security decreases by 0.155 as family size increases by one unit. Increase in family size has negative effect on food security.

SUMMARY, CONCLUSIONAND RECOMMENDATION

5.1 Summary ofFindings

This work examined the determinants of food security among households in Dekina LGA of Kogi State. We employed the use of both descriptive statistics and logit model which is a binary model to analyze the data obtained from our field survey.The work has shown that about 62% of the households are food insecured meaning that majority of the households do not take the right quantity and quality of food and may not have access to it due to some factors like low income and inadequate infrastructural facilities.

Also, the socioeconomic characteristics of the respondents revealed that majority of the households heads fall within the age range of 25-60 years which is the active labour force of the country. Sex and marital status have no significant impact on food security. Majority of the household heads are in paid employee (non agric) and the literacy level is high.

The logit regression result revealed that household food expenditure per person, household income, sex and age have statistically significant bearing on food security status. Other determinants such as marital status, ownership of assets, social capital, farm size, Family size and employment status are statistically insignificant. It was also revealed that increase in some of the determinants like household expenditure per person, household income, social

capital, will lead to an increase in food security. On the other hand, marital status, ownership of assets, educational attainment, employment status, family size, farm size, age and sex has negative relationship with the dependent variable in the study area.

5.2 Recommendation

Based on the findings of the study, the following recommendations are made:

Since food security increases with increase in household income, expenditure per person, government should increase the wages and salaries of her employee which will have a strong impact on the household food security since they are mostly in paid employment. We specifically recommend that the federal and state government should ensure that the N18,000.00 minimum wage is implemented at the local government level since most of the residence are employed at this level.

We also recommend that government should create more employment opportunities, make funds available to individuals to enable them go into large scale farming. Also, government should subsidize inputs like fertilizer, tools and so on to make them affordable.

Finally, Government should make policies targeted at alleviating poverty of the populace by providing them with the necessary basic amenities.

5.3 Conclusions

In this study, we attempted to capture the socioeconomic factors on food security among rural households of Dekina LGA. The study identified a number of determinants that appear to be significant risk factors to food security. In particular, household income, expenditure per person, family size, social capital, stood out as the major determinants of food security. Further studies should be carried out in other parts of the State

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