

AN ASSESSMENT OF THE CONTRIBUTION OF NON-FARM INCOME TO HOUSEHOLD FOOD SECURITY IN MAKURDI LOCAL GOVERNMENT OF BENUE STATE, NIGERIA

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Abstract: The study assessed the contribution of non-farm income to household food security in Makurdi Local Government area, Benue State of Nigeria. This is with view to analyzed household factors that influence food security. Purposive and simple random samplings were used to collect data from 110 household head in the study area using a well structure questionnaire. Descriptive statistics, food security index, logit regression model and Wald test were used to analyze the data collected. Analysis of the non-farm income activities embarked upon by household identifies that almost all the respondents were engaged in business center (29). The study revealed that age of household head (0.114), income of the household head (0.0001) and numbers of non-farm activities (1.005) were positive and significant influencing households' food security. Furthermore, 77.1% of the respondents were found to be food secured while 22.9 % were not food secured. Household with non-farm income activities were found to be more food secured (80.4%) than household with no non-farm income activities (28.5%). The study recommends that the household should diversify production into other non-farm activities to earn more and increase their food security status.

Keywords: household, non-farm income, food security.

1. INTRODUCTION

A necessary condition for the survival of any economy over time is its ability to organize the production of food. Challenges are still facing most countries in sub-Saharan Africa and how to feed their ever increasing population. Agriculture has become the most embraced activity that guarantees food supply to man, amongst other benefits. Agriculture which is the main source of income for about 90% of the rural population in the region has not been a sufficient vehicle for solving the household-level malnutrition and food insecurity, because of low productivity and other hostile agro-ecological factors. Reducing hunger and food insecurity has therefore remained an essential part of the international development agenda since the world food summit in 1996 and 2001 (Babatunde et al., 2007).

Food security at the household level is a balance between availability and access to sufficient food (Abdulhi and Delgado, 2002). One of the possible path ways out of the vicious circle of food security in sub-Saharan Africa is the promotion and establishment of non-farming working in the rural (Barrett et al., 2001). Evidence provided suggests that most rural communities in Africa derive about 42% of their income from rural non-form activities. A high share considering that only about 10% of this rural labor force is employed in the non-farm sector (Lanjouw and Feber, 2002). Addressing food insecurity in Africa through the increased food production may be inadequate, so effort must be geared towards

improving returns of farmers through expansion of off-farm employment opportunities Lanjouw (2001). The potential role of the off-farm section deserve particular consideration, small holders farm house holds usually maintain a portfolio of income source with off-farm income being a major components (Barrett et al., 2001). Food security is a situation where household are not at risk of losing the access to safe nutritional food to maintain a healthy and active life. Household are thus, food secure when they have year round access to the quality and varieties of foods to their members needs for healthy life (Omonona and Agoi, 2001). Nigeria started witnessing her first signs of food problems during the civil war of 1967-1970, when agricultural sector was neglected and food imports as well as other types of imports were deliberately curtailed to save resource for survival.

Non-farm income activities include trading in food stuff such as maize, beans, rice and other grains, soap manufacturing, small scale agro processing of groundnuts, commerce, transports services, gathering and sale of firewood, charcoal production, wage work baskets and repair service. Non-farm work apart from being a directs measures of enhancing access to food in the deficient household, also makes it possible for the poor to seize the opportunities opened to them in the rural sector while ensuring food securities for those who cannot earn a living as well (Holden et al., 2004). Household that has started a non-farm enterprise show a significant increase in all measures of well-being. Non-farm income source play an important role in strengthening the food security and economic viability of household (Thomas and Leatherman, 1990). Reducing food insecurity in the developing world beginning from the household continues to be a major public challenges in Nigeria and other developing countries. Almost one billion people worldwide are undernourished, many more suffer from micro nutrient deficiencies and the absolute numbers tend increase further especially in sub-Saharan Africa (FAO, 1983). Existing studies on non-farm income have been general and have not addressed the issue of non-farm income to household food security in Makurdi, Benue of Nigeria. This creates the need for a study that analyses the assessment of non-farm income to household food security in the study area.

Objectives of the study: The broad objective of the study was to assess the contribution of non-farm income to household food security in Makurdi Local Government area of Benue state, Nigeria. The specific objectives were to:

Describe the socio-economic characteristics of the respondents in the study area.

Identify the non-farm activities embarked upon by the household in the study area.

Determine the food security status of household in the study area.

Assess the determinant of household food security in the study area.

2. MATERIAL AND METHOD

The study area: This study was conducted in Makurdi local government area of Benue state of Nigeria. The State lies between longitude $6^{\circ} 35'E$ and $8^{\circ} 10' E$ of the Greenwich and latitude $6^{\circ} 30' N$ and $8^{\circ} 10' E$ of the Greenwich and latitude $6^{\circ} 30' N$ and $8^{\circ} 10' N$ of the equator, at an elevation of 97 meters above sea level in the southern guinea savannah agro ecological zone. It is located at the north western part of Benue state, it borders in the north with Gumer Local Government area of the west with Gwer and Gwer west Local Government areas to the south. Makurdi was founded about 1927 and was selected as the Benue state capital in 1976 following the division of Benue-plateau state into two States. Makurdi Local Government is made of 11 council ward. Its population at 2006 census was 300,399 for both male and female. The economic activity usually carried out in Makurdi is fishing, farming, trading of food and provision of service. Like in any parts of Nigeria, Makurdi Local Government area has two major seasons: the raining season and the dry season.

Population and sampling: The population for this study comprised household in Makurdi Local Government, the Benue State capital. Makurdi Local Government was purposively selected for this study because of high percentage of household in non-farm income activities. Simple random technique was used to selects 10 households each from the 11 council wards giving a sample size of 110.

Data collection: Data for this study were collected from primary source using a well- structured questionnaire, which was designed to capture necessary information in line with the research questions. The information included household expenditure, consumption plan and farm income, socio-economic characteristics institutional and contextual variables of household within the study area.

Method of data analysis: The data collected for this study were analyzed using both descriptive and inferential statistics. Descriptive statistics like mean, percentage and frequency distribution were used to describe the socio-economic characteristics while food security index was used to determine the food security status and logit regression model was used to assess the determinant of household food security.

Empirical specification: The food security index which classifies household into food secure and food insecure which is used to establish the food security status of the various household and it is specifies as follows:

$$Fi = \frac{\text{per capita food expenditure for the } i^{\text{th}} \text{ household}}{\text{mean per capita expenditure of all household}} \times \frac{2}{3}$$

Where;

Fi = food security index

Fi ≥ 1 the household is food secure

Fi < 1 the household is classified as food insecure.

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

Logit regression model: Based on the household food security status, the determinants of food security in the study area were estimated using an econometric approach, the logit regression model for identification of factors that influence positively for otherwise, the food security status in the study area as a dichotomous dependents variables. The model used various household resources as factor influencing food security status. The model is expressed as follows;

$$Pi = \frac{1}{1 + e^{\beta_0 - \beta_1 X_1 + \dots + \beta_K X_K}}$$

Where;

Pi = probability that food secure occurs

B₀ = constant term

β_i = (i = 1,2,.....k) regression coefficient to be estimated

X_i = (I = 1, 2k) independents variable

I = ith observation

Let Z_i = β₀ + ∑β_kX_k

Then Pi = $\frac{1}{1 + e^{-z}}$

As Z_i range from -a to +a, Pi ranges from 0 to 1 and Pi is a non-linearly related to Z_i. The logit of the unknown binomial probabilities i.e the logarithm of the odds, are modeled as a linearly function of the X_i. In estimable form, the model is expressed as logit (Pi) $[\frac{p^1}{1-p^1}]$

$$B_0 = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \dots + \beta_k X_k + U_i$$

The unknown parameter β_i are usually estimated by maximum likelihood thus, the model is explicitly expressed as

$$Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \dots + \beta_k X_k + U_i$$

Where;

Z_i = food security status of ith household

B₀ = constant term

β_i (I = 1,2,.....7) = vector of the parameter to be estimated

X₁ = age of household head (years)

X_2 = gender of the household head (1 if male and 0, if female)

X_3 = household size (numbers in the household)

X_4 = marital status of household head (1 if married and 0, if not married)

X_5 = household income from non- farm works (₦)

X_6 = educational level of household (numbers of years spent in school)

X_7 = types and numbers of non-farm activities

U_i = independents distributed error term

3. RESULT AND DISCUSSION

Socio-economic characteristics of the household head in the study area:

The socio-economic characteristics of the respondents are presented in Table 1. The results showed that majority (85.3%) of household heads falls within the age range of 21-60 with the mean of 49 years. This indicates a very active population and strong working force. This will likely increase the income of household thereby giving them affordability to food stuff and hence increase food security. The results on gender show that male constitute 59.6% of the respondents while the female constituted 40.4% of the respondents. This confirms the facts that most of the household in the study area are headed by males than females.

Analysis on the level of education of the respondents revealed a high level of literacy among the respondents, 20.2% had secondary education, 3.7% had primary education and 70.6% are educated to the polytechnic and university level while 5.5% do not show none formal education. There is higher tendency for households with high level of education to be food secured. People of high educational attainment are highly status conscious. This has direct influence on occupation and income. The results is consistent with the findings of Babatunde et al. (2007) who state that education is a social capital that could influence positively household's ability to take good and well informed production and nutritional decisions.

The results on the marital status of respondents showed that 77.1% are married and 18.3% are either divorced or widowed, only 4.6% are single. Widowhood and singlehood are likely causes of food insecurity in household. Analysis of occupation of respondents reflects their economic basis. Generally, the occupational status of the household in many aspects affects their decision making, financial capability and reasoning. However, in the study conducted, it was really difficult to differentiate people along the dividing lines of occupation in Makurdi town. This was so because many people who would have been known to be core civil servants also engage in other sources of livelihood such as business, trading and farming. The results obtained showed that 44.0% are civil servants, 8.3% are farmers, 34.9% are traders while 12.8% do different kinds of business ranging from sales, small scale manufacturing, wage labor etc. one's sources of livelihood is a determining factor to the daily choices and nutritional decisional making process. From the results, there is an indication that lots of households are engaged in one occupation or the other and as such a means of sustenance to meet their food demand.

Furthermore, the result of household size revealed that 4-6 and 7-9 members form a greater proportion (56.0% and 30.3%). Household with less than 3 or 3 members constitutes 3.7%. Household with a small number suggest the optimal household size on food security consideration. Also the household size determines the working size and number of wage earners in the household. Analysis on the income of household heads showed that more proportion (52.3%, 39.4%) earned between ₦ 21,000.00 to ₦100,000.00 food security decline with increase in income. Usually, a household utilizes its income to take care of the housing, feedings, clothing, education and other competing needs. Household income plays a very crucial role in the household, if it is low household preference and demand is affected but as income increases it increases the general well beings of the household and thus, its food security status. The results is consistence with the work of FAO (1996) that the largest group of the hungry comprises of the members of household with low and variable income, limited access, few marketable skills and few powerful advocates to act on their behalf. The distribution of income of adult wage earners show that more proportion of adult wage earners (98.2%) earn higher between ₦20,000.00 to ₦100,000.00 while only 1.8% earn above ₦100,000.00. the results show that income of adult wage contribute to over all household income such that food become more accessible. When capital is scarce, income from wage can contribute to higher agricultural input yield by relaxing liquidity constraints. This is in agreement with findings by Makinde (2000).

Non- farm income activities embarked upon by household in the study area:

In the study conducted, a lot of household in the area were found to engage in numerous non-farm income activities such as wage labor, repair of implements, traders of all kinds of goods, transportation service, artisans, livestock and poultry producers/sellers, business center etc. The distribution of respondents reflecting the non-farm income activities and the level of their participation is presented in table 2. The results revealed that the following activities had a larger participation, business center (29), trader (20), sale of water, drink and snacks (17), shop owners sale of provision (16) and food vendors (13). The results also revealed that sale of building materials (5), manufacturing of soap/pomade (5), events planner (3) repair of implement (3) bakery (3), firewood/ charcoal sellers (3), had the least participation. Also, seven household were not involved in any non-farm income activities of any kind. Dietary quality is significantly higher among household that generate additional income from non-farm income activities. Non –farm income is an important fact in household economics and therefore also in food security since it allows greater access to food. Many source of income may also prevent rapid rural/urban migration as well as natural resource degradation through over exploitation (Shaffer, 2002).

Food security status of the respondents:

The food security statuses of the respondents are presented in table 3. The result on factors influencing household food demand show that income of the respondents was (16.5%); family size (8.3%), price (11.0%), season (3.7%) and factors (0.9%) were identified as playing major role in the household food demand decision according to the respondents. The result implies that size of household, income and price of commodities are the major factors influencing household food decision in the study area. This is consistent with the opinion of World Bank (1991) that food security is associated with high food price and inadequate income or poverty. The result of household frequency to feeding revealed that 0.9% of the respondent feed once, 24.8% of the household feeds irregularly and 51.4% of the household feeds twice or thrice. This means that 51.4% of the respondents have adequate food at all time. This result is in agreement with the World Bank (1990) who viewed the concept of food security as encompassing overall improvement in the accessibility of all people to sufficient food supplies at all time for the development of a healthy and productive life at all time of the year. Household food security status shows 77.1% of the respondents are food secured while 22.9% of the respondents are not food secured in the study area. The distribution of household head with no non-farm income activities and household with non-farm income revealed that household with income activities are more food secured (80.4%) than food insecure (19.6%) as compared to household with no non-farm income activities. About 28.5% of the respondents with no non-farm income activities are food secured and 71.4% of the household are food insecure for those that have no non-farm income activities. The results indicate that income gotten from non-farm activities play a vital role in the income status of the household and thus, increase the household food security. This result agree with the findings of FAO (1996) that found that the largest group of the hungry comprise of the members of household with low and variable income, limited assets, few marketable skills and a few powerful advocate to act on their behalf.

Determinants of household food security:

The logistic regression model was used to access factors that influence food security. The results are presented in table 4. The performance of the model in terms of goodness of fits was good. The non-significance of Hosmer-lemeshow chi-statistics ($\chi = 4.9918$; $p > 0.05$) implies that there is no significant difference from the standard model. The result further shows that the coefficient of age (0.114), income of household head (0.0001), number of non-farm activities (1.003) were positive and statistically significant at 1%. This implies that increase in age, income of household head and non-farm income activities tends to increases the probability of the household being food secured. Decrease in food insecurity with age of household head is likely a result of additional income from adults' children who are expected to be part of the labor force. The result agrees with findings of Sanusi et al. (2006) who found that food insecurity incidence to decrease with increase in the age of household head. Furthermore, food security increases with increase in income of household head. The result suggests that household income has a direct impact on food security status, as household with relatively high income strive better than those with less income. This agrees with the findings of Agboola et al. (2004) and Babatunde et al. (2007) who found income to be directly related to food security status in the household head.

4. CONCLUSION AND RECOMMENDATIONS

The study revealed that variables such as age, income of household head, non-farm activities, and income of adult wage earners increased the household food security. The study further found that household perception, income, price and family size ranked highest as factor influencing the demand for food in the study area. The study showed that, the respondents engage in different non-farm activities with business center to have high frequency. It also revealed the comparison between household who engage in non-farm income activities and those household that do not engage in any non-farm income activities. The study recommends household diversification into other non-farm income activities to earn more and increase their food security as it shows that those with non-farm income are more food secured.

Table 1: Distribution of respondents based Socio-economic characteristics (n=109)

Variables	Frequency	Percentage	Mean
Age			
20-40	28	25.7	
41-60	65	59.6	49.92
>60	16	14.7	
Sex			
Male	65	59.6	
Female	44	40.4	
Education			
Non formal	6	5.5	
Primary	4	3.7	
Secondary	22	20.2	14.01
Tertiary	77	70.6	
Marital status			
Married	84	77.1	
Single	5	4.6	
Widow/widower	20	18.3	
Major occupation			
Civil servant	49	44.0	
Farming	9	8.3	
Others	14	12.8	
Trader	38	34.9	
Household size			
≤ 3	11	10.1	
4-6	61	56.0	
7-9	33	30.3	5.76
≥ 10	4	3.7	
Household income			
≤20000.00	4	3.7	
20001.00-60000.00	57	52.3	
60001.00-100000.00	43	39.4	68413.00
≥ 100001.00	5	4.6	
Wage earners income			
≤20000.00	48	44.0	
200001-60000.00	56	51.4	
60001.00-100000.00	3	2.8	30317
≥100001.00	2	1.8	

Source: Field survey, 2011.

Table 2: Distribution of respondents reflecting the non-farm income activities (n=109)

Non-farm income activities	Frequency
Business center	29
Traders	20
Sale of water/drinks/snack	17
Shop owners (provision)	16
Food vendors	13
Sale of grain and tuber	12
Clothing and shoe sellers	12
Livestock poultry rear ers / seller	11
Small scale producers	10
Barbing and hair making salon	10
Wage labor	9
Artisan	9
Pharmacy/dispensary operators	8
Transportation service	6
Sale of building equipment	5
Manufacturers of soap/ pomade	5
Repair of implements	3
Bakery	3
Firewood/ charcoal sellers	3
Events planners	3
No non-farm income activities	7

Source: Field survey, 2011.

Table 3: Distribution of respondents based on household food security status

Variables	Frequency	Percentage
Factors influence food demand		
Income	18	16.5
Family size	9	8.3
Price	12	11.0
Season	4	3.7
Others	1	0.9
Household frequency of feeding		
Once	1	0.9
Irregular	27	24.8
Twice/thrice	56	51.4
Food security status		
Food insecure	25	22.9
Food secure	84	77.1
No non-farm income activities		
Food insecure	5	71.5
Food secure	2	28.5
With non-farm income activities		
Food insecure	20	19.6
Food secure	82	80.4

Source: Field survey, 2011.

Table 4: parameter estimates of logistic regression of determinant of food security of household.

Variables	Coefficient	SE	Wald	Df	Sig	Exp(B)
Constant	7.261	2.667	7.413*	1	0.006	0.001
Age	0.114	0.042	7.263*	1	0.007	1.120
Household size	0.117	0.201	0.337	1	0.562	0.890
Education	0.012	0.141	0.007	1	0.931	1.012
Income of household	0.000	10.000	4.828*	1	0.028	1.000
Non-farm activities	1.003	0.357	7.887*	1	0.005	2.727
Income of wage earners	0.0001	0.0001	1.651***	1	0.199	1.000
Hoosmer and lemeshow χ^2	4.918					0.766

*, **, *** wald test significant at 1%, 5% and 10% respectively.

Source: Field survey, 2011.

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