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Determinants Of Food Security in Female-Headed Households Involved In Individual Tenure System in Abia State, Southeast Nigeria

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ABSTRACT: *This study on determinants of food security in male and female-headed households involved in individual tenure system in Abia State, Southeast Nigeria was carried out to determine the quantities of cassava demanded and supplied by gender in individual tenure systems in the area and identifying the factors affecting food security of female-headed cassava-based farming households under individual tenure system. A multi-stage random sampling technique was adopted for this study while data were collected through primary sources. The sample size consists of male and female headed households for individual tenure respectively making a total of 234 cassava farming household respondents. Descriptive statistics as well as multiple regression technique were employed in analyzing the field data. Male headed households demanded and supplied more cassava tubers than the female headed households. Again, quantity of cassava tubers demanded were higher than that supplied in male headed households than their female counterparts. Results show that farm income, farm size, farming experience, membership of co-operative organisation, access to credit, extension contact and extent of produce commercialization were factors that affect food security among female headed households involved in Individual Land Tenure System. Land policies should be aimed at making land free for female headed farm households for farming.*

KEYWORDS: Food security, Tenure system, Abia State

INTRODUCTION

World Bank (1986) and Gurkan (1995) defined food security as access by all people at all times to enough food for active and healthy life. According to World Food Summit (1996), food security is the peoples' right to define their own policies and strategies for the sustainable production, distribution and consumption of food that guarantees the right to food for the entire population, on the basis of small scale of production, respecting their own cultures and the diversity of small scale, fishing and indigenous forms of agricultural production, marketing and management of rural areas, in which women play a fundamental role. According to them it implies equitable access to food. It also refers to both access to the supply (or availability) of food and to the entitlement to food i.e. the resources, financial, natural and human ability to obtain food.

Mkandawire and Maltosa (1993) defined food security as the absence of hunger and malnutrition. Temu and Msuya, (2004) stated that food security is the guarantee of the physical availability of and economical accessibility to sufficient food (produced with bioenvironmental and sustainable social methods) in terms of quantity (amount, distribution,

calories) and quality (safe, nutritious, balanced), while cultural admittance for all people at all times means having healthy and active lives to preserve human places and degrees.
The food security situation of a country is the summation of food prospects of individual households (Noadson, 1986 as cited by Hahn, 1989). Food security has been identified to incorporate food availability, food accessibility, utilization and stability of food access as the elements (Bonnard, 1999).

Food availability is achieved when a sufficient amount of food is constantly available for all members of society. This kind of food can be obtained through household production, local production, storage, imports or food aids.
Food availability is a function of the combination of domestic food stocks, commercial food imports, food aid, and domestic food production, as well as the underlying determinants of each of these factors.

Household food and nutrition security relies heavily on rural food production and this contributes substantially to poverty alleviation. Consequently, the first pillar of food security is sustainable production of food (Odurukwe; Matthews-Njoku and Ejioku-Okereke, 2006). Individuals have sufficient access to food when they have adequate incomes or other resources to purchase or barter to obtain levels of appropriate foods needed to maintain consumption of an adequate diet / nutrition level (USAID, 1992). Food utilization refers to suitable biological uses of food that depend on a household knowledge of techniques for storing and processing food and basic principles of nutrition and caring for children (Sustainable Development Department, 2006).

Gender is especially important to food security, as women and men have different roles and resources when it comes to food production, different decision- making roles over food consumption and nutrition, and different coping skills when it comes to emergencies. Understanding these differences is crucial to effective food security programs. Gender analysis is a tool that can examine these differences so that policies and programs can identify and meet the different needs of men and women to ensure effective food security. Gender relations determine household food security, well being of the family, planning, agricultural production and many other aspects of rural life (Frischmuth, 1997). Bashir (1996) mentioned that the factors contributing to food problems in Nigeria varies from man-made problems to natural forces.

Legal or social restrictions prevent many women from owning or inheriting land, water rights or livestock, borrowing money or making decisions regarding the use of family assets (IFPR, 1995). This has a direct and detrimental impact on their ability to manage food production and security.

Gurkan (1995) pointed out that food production, general economic and social development variables as determinants of food security. He further explained that, consistent improvement in yield and labour productivity, upgrading the quality of human resource, instituting virile agricultural research and extension, system and providing price and non-price incentives for the adoption of new technology as the panacea to food insecurity.

Bigsten *et.al*., (2003) using panel data were of the view that land ownership, education, type of crops, dependency and location are determinants of poverty in Ethiopia. Haddad, Kennedy

and Sullivan (1994) identified indicators that can be used as predictors for food insecurity at the household level as to include; asset ownership, household size and dependency ratio. Emenyonu *et.al*., (2006), in estimating the level of food insecurity in Owerri West Local Government area, Imo state, analysing data from 64 farming households observed that, marital status, educational level, household size, farm size, farming experience, social organization and household income were significant while age and sex were not significant. In analysing the food security situation among urban households in Nigeria,

Omonona *et.al*., (2007) observed that the food insecurity incidence increases with increase in age of household heads, higher in female headed households. Studies of determinants of food security by gender in selected land tenure systems is limited. Therefore it became imperative to identify the determinants of food security by gender in female-headed households in Abia state, southeast Nigeria.

MATERIALS AND METHODS

There are three agricultural zones in Abia state. Multi-stage random sampling was used in the selection of respondents. Firstly, three(3) agricultural zones were selected. Secondly, two(2) Local Government Areas were purposively selected from each of the agricultural zones making 9LGAs, this was due to their predominance in cassava cultivation. This was followed by a random selection of two(2) villages from each of the LGAs. A proportionate sampling was then used to select the respondents from the sampling frame compiled by the Abia Agricultural Development Programme extension agent. The proportionate sampling model is stated as follows:

$N_h = N_n (n/N)$

Where,

n_n = sample to be selected from each stratum
N_n = population of farmers in each stratum
n = required sample size for the study
N = total population of farmers in all the strata

Five and eight male and female headed cassava farming households respectively were selected from each of the 18 communities making a sample size of 234 farming households (comprising 90 male headed households and 144 female headed cassava farming households under individual tenure). Data were collected by the use of primary and secondary sources. Primary data were sourced by using structured questionnaire. Secondary sources of data were obtained from current literature. Data were collected on socio-economic characteristics of the farmers such as age, gender, years spent in school (level of education), household size, years of farming experience, extension contact, membership of association, inputs, prices, produce consumed, stored and sold, farm income of a household, farm size of a household, land ownership pattern etcetera. However, aggregate supply and demand was done in tonnes. Since the selected households are farmers, it became necessary to factor in their local production into aggregate supply. This was done to enable the study obtain aggregate food supplied both internally and externally. The quantities supplied and demanded were obtained from two main sources the quantity obtained from local production and the one reserved by the farming household for consumption from their farm produce (quantity supplied). Food anticipated for consumption and entering the household through production and disappearing was presumed to have been consumed. This include the actual consumption, food donations,

quantity of food sold food expenditure and food losses (quantity demanded).Though some households had both individual and communal lands, but data were restricted to individual tenure systems which is most predominant. Farmlands obtained by rent, outright purchase and inheritance were classified under individual tenure.

Data were analysed using multiple linear regression model involving the use of ordinary least square estimation technique as well as simple descriptive statistical tools such as mean, frequency, percentages. The multiple linear regression model employed is expressed as follows:

$QFS = f (X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, e)$ …… eqn_1

Where,

QFS = Food security level of the household head (1-SS/DD; 1= food secure; <1=food insecure).

X_1 = Age of household head of household head (years)

X_2 =Farm income of a household head (Naira)

X_3 =Farm size of a household of household head (ha)

X_4 =Farming experience of household head (years)

X_5 =Membership of co-operative society of household head (number of associations)

X_6 =Level of education of household head (number of years spent in school)

X_7 = Household production enterprise of household head (dummy variable, 1 if farm enterprise alone and 0 if otherwise)

X_8 = Access to credit of household head (dummy variable,1 for easy access and 0 for no access)

X_9 = Household head's access to extension agents of household head (number of visits per annum)

X_{10} =Extent of produce sales by household head (value of farm produce sold in naira)

X_{11} = Labour use of household head (man days)

e = error term

It is expected a priori that the coefficients of $X_2, X_3, X_4, X_5, X_6, X_8, X_9, X_{10}, X_{11} > 0$; $X_1, X_7 < 0$.

Four functional forms were fitted to the data. These include the linear, semi-log, double log and the exponential functions. The function that gave the best fit was selected based on the magnitude of the coefficient of the multiple determination (R^2), the size and signs of the estimated coefficients and the statistical significance of the parameter estimates.

RESULTS AND DISCUSSION

1: Quantity of cassava tubers demanded by Gender in Individual tenure systems.

Table 1: Distribution of respondents according to Quantity of cassava tubers demanded by Gender in Individual land tenure systems.

Individual Quantity Dd(tonnes)	Male HH F	%F	Female HH F	%
4-10	3	3.33	5	3.47
11-17	5	5.55	7	4.86
18-24	9	10.00	10	6.94
25-31	12	13.33	86	59.72
32-38	47	52.22	24	16.67
39≥	14	16.67	12	8.33
Total	90	100	144	100
Mean	29.71		26.60	

Source: Field Survey data (2013)

Table 1 showed that (52.22%) of the male headed households had 32 to 38 tonnes of cassava tubers demanded while (59.72%) of the female headed households had between 25 to 31 tonnes of cassava tubers demanded. Only (3.33%) and (3.47%) of the male and female headed households demanded 4 to 10 tonnes of cassava respectively under individual land tenure system. However, the mean quantities of cassava tubers demanded were 29.71 and 26.60 tonnes for male and female headed households. This shows that the quantities of cassava tubers demanded were higher in male headed households than their female counterparts. This could be attributed to the larger farm household sizes obtainable in male farming households. This has implications for increased cassava production.

2: Quantity of cassava tubers produced or supplied by gender in individual land tenure systems.

Table 2: Distribution of respondents according to Quantity of cassava tubers supplied by gender in individual tenure systems.

	Individual			
Quantity suppl (in tonnes)	Male HH F	%F	Female HH F	%F
4-10	9	10.00	35	24.31
11-17	10	11.11	76	52.78
18-24	46	51.11	14	9.72
25-31	17	18.89	10	6.94
32-38	5	5.56	6	4.17
39≥	3	3.33	3	2.08
Total	90	100	144	100
Mean	20.87		14.94	

Source: Field Survey data (2013)

In Table 2, (51.11%) of the male headed households had 18 to 24 tonnes of cassava tubers supplied while (52.78%) of the female headed households had 11 to 17 tonnes of cassava tubers supplied. Only (3.33%) and (2.08%) of the male and female headed households supplied more than 39 tonnes of cassava tubers respectively under individual land tenure system. Table 2 also showed that the mean quantities of cassava tubers supplied were 20.87 and 14.94 tonnes for male and female headed households under individual tenure respectively. This shows that male headed households under individual tenure systems had higher quantities of cassava tubers supplied than their female counterparts. This could be attributed to the issue of access to land. Moreover, the gap between the quantities of cassava tubers demanded and that supplied by the farming households as shown in Tables 1 and 2 suggested that the quantity of tubers demanded is greater than the quantity supplied in the area. This is in line with the findings of Ajibefun (2003) who asserted that there is a wide gap between domestic food supply and food demand. This increases the level of food insecurity in the affected areas.

3: **Factors affecting Food Security Level in Female Headed Households involved in Individual Land Tenure System**

Table 3: Estimates of Multiple Regression result on factors affecting Food Security Level in Female Headed Households involved in Individual Land Tenure System

Variables	**Linear**	**Semi-log**	**Double log**	**Exponential**
(X_1) Age	-11.3895	-2.6718	-0.0747	-0.0096
	(-3.6335)**	(-1.3435)	(-1.2146)	2.5945)**
(X_2)Farm Income	18.9443	3.8812	0.0192	0.0067
	(1.1221)	(1.3079)	(2.9515)**	(1.3958)
(X_3) Farm size	17.9526	1.5613	0.0543	0.0072
	(1.1127)	(1.5573)	(3.2909)**	(1.1429)
(X_4) Experience	15.0065	2.8136	0.0921	0.0049
	(1.0429)	(2.8077)**	(2.9054)**	(1.5806)
(X_5) Coop. Membership	16.0385	3.8541	0.0892	0.0073
	(2.2903)*	(2.6398)**	(4.1296)**	(1.2586)
(X_6) Education	13.5913	1.6729	0.0529	0.0068
	(1.1357)	(1.2049)	(2.5433)*	(2.9565)**
(X_7) Enterprise	17.3385	2.4489	0.0667	0.0089

	(1.0906)	(1.1624)	(1.3002) (3.7083)**
(X_8) Credit Access	18.5091	3.8514	0.0745 0.0091
	(2.2049)*	(1.2566)	(3.4977)** (1.0964)
(X_9) Ext. Contact	17.9122	1.4467	0.0821 0.0074
	(1.1279)	(1.2039)	(2.5818)** (1.1364)
(X_{10}) Commercialisatn	-14.0021	-2.8713	-0.0667 -0.0091
	(-1.0684)	(-1.3911)	(-3.2857)** (3.3571)**
(X_{11}) Labour	11.1107	3.8164	0.0982 0.0083
	(2.9083)**	(3.7955)**	(1.2019) (3.6087)**
Constant	269.1164	203.0592	178.0052 123.4064
R^2	0.4933	0.4116	0.7439 0.6182
F-Value	11.8014	8.3152	35.5933 19.3793
SE	20.8705	18.1164	0.0306 0.3408
No. of Observations	144	144	144 144

Figures in Parenthesis are t-ratios: * = Significant at 5%; ** = Significant at 1%
Source: Field Survey Data (2011)

Table 3 shows that the double log function was chosen as the lead equation. The results showed that farm income, farm size, farming experience, membership of co-operative organisation, access to credit, extension contact and extent of produce commercialisation were significant at one percent while level of education was positive and significant at five percent. The implication is that these variables are important factors influencing the level of food security of female headed cassava farming households under individual land tenure system in Abia state. These variables apart from extent of produce commercialisation are significant and positively correlated with food security in Abia state. This indicates that they higher they are, the higher will be the level of food security and vice versa. Moreso, the significant and negative relationship between extent of produce commercialisation and food security level implies that the higher the magnitude of the variable, the lower the level of food security. This was confirmed by the findings of Bogale (2005) who showed that annual household income, amount of credit received, cultivated land size determined the level of food insecurity.

The coefficient of income was positive and significant at 1% level indicating that the higher the level of the farmer's income, the more food secure he will be. This is in agreement with

the findings of Population Survey (1995) which observed that 17% of households with incomes less than 50% of the poverty level were affected by some form of hunger, whereas the rate falls to 1.4% for those with incomes greater than the poverty level (Hamilton *et.al.*, 1997). Therefore, households that have access to better income opportunities are less likely to become food insecure than those households who had little or no access. As income determines the household's ability to secure food, it remains to be an important variable which explains the characteristics of food secure and food insecure households.

The coefficient of farm size was statistically significant at 1percent and negatively related to the level of food security. This means that an increase in farm size will lead to an increase in the level of food security ceteris paribus. This could be attributed to the fact that the larger the farm size, the higher will be the plant population density, then the higher the output. Moreso, farmers who cultivate larger farms sizes are able to produce more cassava roots and stems thereby leading to higher output as external inputs for increased output are usually outside the reach of farmers. In line with this, Doward (1999) found a significant positive relation between farm size and output.

The coefficient of farming experience was positive and significant at 1% implying that the more experienced the farmer is, the more food secure he will be. This suggests that experience improves the adoption of innovation and improved technology faster.
The coefficient of membership of co-operative organization was statistically significant at 1 percent and positively related to the food security level. This shows that the more the number of co-operatives societies a farmer belongs to, the higher will be the level of food security ceteris paribus. This is because co-operative societies serve as vehicles for rural transformation which could provide credit for their members and also educate them on a variety of issues.

The coefficient of access to credit was positive and significant at 1% implying that the more access the farmer has to credit, the more food secure he will be. Credit will enable the farmer purchase or rent farmland, procure the necessary farm inputs as well as hire more farm hands in his farming operations. This will enhance productivity and income of farmers. This will ultimately impact positively on food security level of households.

The coefficient of extension contact was positive and significant at 1% implying that the more the number of extension visits a farmer has, the more food secure he will be. Extension serves as a channel for the dissemination of new and improved techniques in agriculture. This is evident in the fact that information and knowledge is power. This indicates that if the farmers are well equipped with the innovations, their level of farming will be improved, thereby increasing productivity.

The coefficient of level of education was positive and significant at 5% implying that the more educated a farmer is the more food secure the farmer will be. Level of education influence farmer's adoption rate which agrees with Alene *et.al.*, (2000) who reported the relationship between farmer's rate of adoption of improved practices and food security in Ethiopia.

The coefficient of multiple determination (R^2) was 0.7439 implying that farm income, farm size, farming experience, membership to co-operative organisation, and access to credit,

extension contact, level of education and extent of produce commercialisation account for about 74.39% of the variations in food security level in the female headed households under the individual land tenure system. The F-ratio of 35.5933 was found to be significant at 1 percent which shows that the joint effect of all the included variables were significant.
However other variables which were measured but were not significant include age, household production enterprise and labour use. This implies that these variables had no influence on the level of food security, and hence they were ignored.

CONCLUSION

The quantity of cassava tubers demanded and supplied were more in male headed households than female headed farming households. Again, quantity of cassava tubers demanded were higher than that supplied. This has implications for food security. Moreover, income, farm size, farming experience, membership of co-operative organisation, access to credit, level of education, extension contact and extent of commercialization of farm produce were determinants of food security among female headed households under Individual land tenure system in the households.

RECOMMENDATION

Land policies should be aimed at making land free for female headed farm households for farming. This will enable them have larger farmlands for cassava cultivation. Policies should be targeted at promotion of co-operative formation, education of the girl-child, more access to credit and extension visits. This will assist them in agricultural production towards the enhancement of food security.

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