

DETERMINANTS OF FOOD SECURITY STATUS AMONG RURAL FARM HOUSEHOLDS IN NORTH-WESTERN NIGERIA

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ABSTRACT

This study was carried out to examine the determinants of food security status among rural Farm households in Kaduna State, Nigeria. Interview guides were employed to elicit information from randomly selected 180 respondents from 12 agricultural cells (villages) from two agricultural zones of Kaduna State. The result of the logistic regression model shows the factors that determine the food security status of the respondents in the study area. 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 the respondents. The result of marginal effect shows that the probability of food security among the farm households is more responsive to a change in age than to extension contact, source of labour and per capita income.

Keywords: Rural Farm households, Food security, Agricultural cells, Marginal effect.

Introduction

The FAO defines food security as access by all people at all times to safe and nutritious food needed to maintain a healthy and active life. Thus, food security involves not only food

production issues but also aspects of distribution, marketing and storage (FAO, 1995). Maxwell (1986) has proposed that a country and people are food secure when their food system operates efficiently in such a way as to remove through own production or through purchase of enough food for an active, healthy life. It has however been emphasized that food security is a necessary but not sufficient condition to obtain good nutritional status for an active healthy life. In addition to individuals simply having access to enough food, they must procure, ingest and digest it. Generally, whatever is consumed to provide energy and nourishment for the human body for an active and healthy life is termed as food (Okolo, 2004). Food security will therefore be achieved when the poor, the vulnerable, particularly women, children and those living in marginal areas have secure access to the food they want in the appropriate sufficient quantity and quality to cover the need of their daily ration and food preferences, in order to live a healthy, active live (Sengooba, 1994). A situation where this does not occur indicates food insecurity.

Food insecurity may be chronic or transitory. In chronic food insecurity, there is continuous inadequate diet and nutrition caused by household's inability to acquire food. It therefore afflicts households that persistently lack the ability to either buy food or produce their own. On the other hand, transitory food insecurity results from a temporary decline in households access to food mainly due to instability in food prices, production, household income or a combination of these factors. In Africa, food insecurity remains a fundamental challenge and both cases of food insecurity abound often existing together and jointly .

Given the critical roles of adequate food and nutrition in the development process and in supporting world peace and stability, greater attention has been paid to food and nutrition issues at the levels of national government especially in the less developed countries as well as by the international community (World Bank, 1986). The importance of agricultural development to attainment of the goal of economic development policies in Nigeria, which is to establish a balance self-reliant and dynamic economy cannot be overemphasized. Nigeria is still characterized by high reliance on food imports. Malnutrition is widespread in the entire country and rural areas are especially vulnerable to chronic food shortages, malnutrition, unbalanced nutrition, erratic food supply, poor quality food, high food costs and even total lack of food. This phenomenon cut across all age groups and categories of individuals in the rural areas. There is a high level of malnutrition among children in rural Nigeria; the figures differ with geopolitical zones, with 56 percent reported in a rural area of south-west and 84.3 percent in three rural communities in the northern part of Nigeria (IFPRI, 2009).

The problem of food and nutrition security in Nigeria has not been adequately and critically analyzed, despite various approaches at addressing the challenges. The food security status of Nigeria is seen from the fact that small holder farmers are the major producers of the food consumed in the country and these farmers have inadequate capacity to produce enough for the country's need (IFPRI, 2009). The federal Government of Nigeria in collaboration with state and Local Government as well as external agencies such as World Bank, International Fund for

Agricultural Development (IFAD) and African Development Bank (ADB) has initiated several programmes and projects like Agricultural Development Project (ADP), National Special Programme on Food Security (NSPFS), National Fadama Development Programme (NFDP) and Root and Tubers Expansion Programmes (RTEP) in order to assist farmers by providing an enabling environment for their production activities. By sponsoring these programmes and projects, government and donor agencies aimed to achieve food security by ensuring that all the residents in the country have physical and economic access to sufficient food at all times. Apart from the food sufficiency and security, other expected outcomes in all the programmes and projects include increased employment opportunity, reduced post-harvest losses, improved standard of living, improved quality of life and improved economic status of the farmers and rural dwellers in Nigeria (Ingawa, 2004).

This study was carried out to examine the determinants of food security status among rural farm households in Kaduna State, Nigeria.

Methodology

The study was conducted in Kaduna State, located in the Northern Guinea Savannah ecological zone. The state is located between latitude 9° N and 12° N and longitude 6° E and 9° E of the prime meridian. The state occupies an area of about 48,473.2 square kilometers (FOS, 2006). It has a population of 6,066,562 people (NBS, 2007). The state shares common border with Federal Capital Territory, Abuja in the South-East and six other states, namely; Katsina, Kano and Zamfara to the North-north; Nasarawa, Plateau to the Northeast, Niger to the Northwest. The climate varies from the north to the southern part of the state.

A multi-stage simple random sampling technique was adopted for this study. In the first stage, Maigana and Birnin Gwari zones were purposively selected because these zones are purely agrarian communities. In the second stage, two blocks were randomly selected from each of the two agricultural zones. In the third stage, three cells were randomly selected from each of the four blocks. Lastly, 10% of households in each of the twelve cells were randomly selected because the farmers are homogenous in terms of production pattern and this percentage can represent the whole population. A total of 180 farm households were used for the study.

The data required for this study were obtained from the farm households using structured questionnaire. The design of these instruments were guided by the general and specific objectives of the study. The data were collected by the researcher with the help of trained enumerators (who can speak the local dialect). The data collected include: socio-economic variables such as age, sex, marital status, farm size, membership of cooperative, household size, educational level as well as food production, consumption and expenditure, per-capita income, amount of credit received and extension.

Analytical Technique

A Logit Regression Model was used to identify the determinants of food security among the respondents. It is a binary choice model in which a dichotomous response variable is considered as the dependent variable (Pindick and Rubinfeld, 1991). The logit model was used for the study instead of linear probability and probit models because according to Gujarati (1995), the logit model guarantees that the estimated probabilities lie in the 0-1 range and that they are not linearly related to the explanatory variables. The logit model is based on the cumulative logistic distribution function expressed below:

$$P_i = E(Y = 1/X_i) = \alpha + \beta_i x \quad (1)$$

$$p_i = E \{ Y = 1/X \} = 1/1 + e^{-z} \quad (2)$$

For ease of exposition, $z_i = \alpha + \beta_1 x_1 + \beta_2 x_2 \dots \beta_n x_n$.

Where P_i = Probability of being food-secured.

The log of odds ratio or the logit (L) = $\text{Ln} \left\{ \frac{\text{the probability of being food-secured}}{\text{The probability of not being food-secured}} \right\} = z_i + u_i$

In order to obtain the value of z_i , the likelihood of observing the sample needs to be formed by introducing a dichotomous dependent variable Y_i such that Y is equal to 1 if the household is food secure and 0 if

otherwise. The independent variables hypothesized to determine the food security status among the households are specified as follows:-

X_1 = Age of household head (years)

X_2 = Years of education of household head (years)

X_3 = Extension contact (Number of contacts)

X_4 = Household size (Nos.)

X_5 = Farm size (ha)

X_6 = Source of labour (man-day)

X_7 = Household per capita income (₦aira)

β_i = The coefficients for the respective variables in the logit function.

Results and Discussion

Determinants of Food Security of Farm Households in the Study Area

The result of the logistic regression model in Table 1 shows the factors that determine the food security status of the respondents in the study area. It was revealed that four out of the seven variables included in the model were significant. These variables were age, number of extension contacts, source of labour and per capita income of the respondents. The coefficient obtained for age was negative and positive at 10 percent level of probability, suggesting that the older the age the more food insecure the respondents become. This implies that respondents with older age are more prone to food insecurity than those with youthful age. Older age translate into low productive activities which in turn, affects household livelihood improvement strategies.

The coefficient obtained for extension contact was positive and significant at 5 per cent. The implication of this is that increase in extension contact will increase the food security status of the respondents in the study area. This is similar to the result obtained by Amaza, P.S., Umeh, J.C., Helsen, J. and Adejobi, A.O. (2006). They reported that households that had access to extension agents have higher probability of food security than those who do not have access to extension agents and vice versa. This is because access to extension agents enhances the chances of households having access to better crop production techniques, improved inputs as well as other production incentives and these go to increase their output and hence raise their food security status.

The source of labour of the respondents was found to exert significant and positive influence on food security status of the respondents. This implies that the higher the labour use in the farm, the higher the probability that the households would be food secure. This is because increase in labour would increase productivity and these go to increase their output and therefore, improve their food security status.

The coefficient obtained for the per capita income of the respondents was found to be significant and positive on food security status. This implies that the higher the per capita income of the respondents, the higher the probability that the household would be food secure. This is because increase in income would increase access and its availability.

The coefficient of the household size was not negative. This implies that the large household size is associated with increased household consumption expenditure which reduces the money that could be used for production purposes.

The Chi-square was statistically significant and positive on the overall variables included in the model implying that the fit is good.

Based on the findings of this study, the hypothesis which states that there is no significant relationship between the socio-economic characteristics of farmers and their food security status is rejected while the alternative hypothesis which states that there is significant relationship between the socio-economic characteristics of farmers and their food security status is accepted.

Table 1: Logit regression estimates for determinants of food security status of the respondents

Variables	Coefficient	Standard Error	b/St.Er
Age (X_1)	-0.0339	0.0187	-1.813**
Educational level (X_2)	-0.0005	0.0354	-0.016 ^{NS}
Extension contact (X_3)	0.1244	0.0623	-1.996*
Household size (X_4)	-0.0102	0.0322	-0.318 ^{NS}
Farm size (X_5)	-0.0404	0.0280	-1.441 ^{NS}
Source of labour (X_6)	0.4508	0.1824	2.471*
Per capita income (X_7)	0.9750	0.4133	2.359*
Chi-square	28.07***		

*Significant at 5%

**Significant at 10%

***Significant at 1%

NS- Not Significant

Source: Computed from field survey data, 2013.

Predicted Marginal and Elasticity of Probability of Factors that Determine Food Security Among Farm Households

The marginal probability as well as the elasticity of probability of factors affecting food security status of farm households are computed respectively in Table 2. The analysis shows that the probability of being food secure would decrease by about 2 percent for a unit increase in age. The probability would increase by 1 percent for a unit increase in extension contact. The probability of being food secure would also increase for both source of labour and per capita income by 1 percent each for a unit increase in source of labour and per capita income respectively. In addition, the probability of food security among the farm households is more responsive to a change in age than to extension contact, source of labour and per capita income.

Table 2: Predicted Marginal and Elasticity of Probability of Factors that Determine Food Security among Farm Households

Factors	Marginal probability	Elasticity of probability
Age (X_1)	0.01787	0.84253
Extension contact (X_3)	-0.00581	-0.39132
Source of labour (X_6)	0.01050	0.78101
Per capita income (X_7)	0.00583	0.58058

Source: Computed from field survey data, 2013.

Conclusion

The study showed that age, extension contact, source of labour and per capita were the main determinants of food security in the study area. The result of marginal effect also shows that the probability of food security among the farm households is more responsive to a change in age than to extension contact, source of labour and per capita income

Policy Recommendations

Extension contact was positively and significantly related to food security status in the study area, therefore extension visit by the extension workers should be encouraged by the government, recruit and give them adequate extension trainings and provide them with necessary and sufficient working materials so as to extend them to the farmers to boost their agricultural production activities. Source of labour was positively and significantly related to food security status of the farmers, thus individual farmers should give more attention in their farm labour either through family, hire or both. Effective labour contributes to the output. As labour increases with other inputs, the output of production also increases. Per capita income was positively and significantly related to food security of the farmers, there is need to promote and boost households' income generation. Hence, provision of village infrastructures like motorable roads, water, electricity could increase the possibility of off-farm activities that could generate more income for the households. In view of the negative impact of the age of farmers on food security, there is need to encourage the youths in the village to participate vigorously in farming. To achieve the Millennium Development Goal of eradicating hunger in Nigeria, it is recommended that food security strategies should be designed in a way that would focus on and address the identified determinants. Specifically, government and farmers group should provide agricultural inputs to farming households at affordable prices and right time to be able to increase their food production.

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