

Household Coping Strategies and the Extent of Vulnerability to Food Insecurity: Lessons from Yam Farmers in Ekiti State, Nigeria

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How to cite this paper: Ayoola Ibukun Ogunyemi, Adewale Isaac Olutumise, Ademola Adegoro. (2022) Household Coping Strategies and the Extent of Vulnerability to Food Insecurity: Lessons from Yam Farmers in Ekiti State, Nigeria. *International Journal of Food Science and Agriculture*, 6(4), 379-388.
DOI: 10.26855/ijfsa.2022.12.004

Received: September 28, 2022

Accepted: November 5, 2022

Published: December 1, 2022

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Abstract

The study analysed the extent of vulnerability to food insecurity and household coping mechanisms among yam farmers in Ekiti State, Nigeria. Cross-sectional data were used with a 360-sample size. Multinomial logit model (MNL) and Feasible Generalized Least Square method (FGLS) were employed for the data analysis. The results of the FGLS model showed that 49.3% of the households in the study area enjoyed a stable level of food security, being food secure and low vulnerability to food insecurity. However, 30.23% of the population were undernourished and highly vulnerable; they are considered chronically food-insecure households. However, the study revealed that 11.01% of the food secure households may be food insecure in the future, if necessary, attention and intervention are not given by both households and the government. Again, 9.4% of the households that are currently experiencing food shortages may bounce back in the future. The findings of MNL revealed that the age of the household head, main occupation, household size, land size, net household income, and membership in a cooperative society was the main significant factors in yam farming households' decision to use coping strategies. As a result, it is recommended that leveraging the potential role of coping mechanisms already used by households during food shortages to reduce food insecurity should be considered and implemented as policy options.

Keywords

Feasibility Least Square Method, Multinomial Logit, Food Security, Vulnerability, Coping Strategies, Yam

1. Introduction

Food is critical in terms of human well-being and productivity [1]. It is an indispensable prerequisite for the survival of mankind and its economic activities. Attainment of food security has been a major challenge, especially in developing countries and it has been placed as a priority in achieving the most fundamental human rights. Given its significance as a critical factor in economic development, food security has been viewed as a major feature in the recognition of a nation's wealth sustainability [2, 3]. Food security is characterized as a situation in which all people have access to enough, secure, and nutritious food at all times to meet their food requirements to live an active and healthy life [4]. When food security is attained, the ideal environment for a more productive populace will thrive and people will be patriotic and contented [5]. Contrary to popular belief, farming households are the most vulnerable to food insecurity and poverty in Africa, especially smallholder farming households [6]. People's propensity to fall or remain below a pre-determined food security line is referred to as vulnerability. The food security line could be caloric-based (i.e., food requirement) or it could include all basic needs [7]. Therefore, the accumulation of events over time determines vulner-

ability. The likelihood of households being food insecure in the future is determined by their current socioeconomic circumstances, risk factors prevalent during the given timeframe, or other relevant issues, and their ability to handle the risks [8]. However, response to these adverse events or shocks is known as coping strategies. Food-coping strategies are the mechanisms used by households when meeting their needs are interrupted by one or a combination of factors such as drought, low wages, or high food prices [9]. The range of coping and adaptive strategies differs according to the particular conditions. Household coping strategies form a continuum ranging from risk minimization to risk absorption and, ultimately, risk-taking. Asset accumulation, investing, and income diversification are also part of risk management. Risk absorption necessitates the use of savings and current food supplies [10]. The final stage is risk-taking, which entails households taking desperate measures such as breaking up families by relocation, consuming survival or famine foods, and selling personal belongings [11-12]. The issue of hunger and food insecurity has global dimensions and is likely to continue and even worsen in the future unless immediate, decisive, and coordinated action is taken to address the situation [13]. From 2010-2012, there were still 820.7 million undernourished people worldwide; 805 million in the developing countries while 15.7 million in the developed countries [14]. However, in terms of the regions, African and sub-Saharan Africa have 218.5 million and 205.7 million undernourished people respectively [14]. Nigeria has an energy intake of 1730Kcal and an average protein supply of 64g per capita per day, which is far below the minimum recommended daily intake of 2500-3400Kcal [15]. This demonstrates that Nigeria is dealing with the problem of an unbalanced diet, which causes a variety of deficiency symptoms.

Also, a significant number of researches have been carried out on food insecurity in Africa most especially in Nigeria using diverse approaches and food-related variables. Most studies have advanced by linking food insecurity with farmers' efficiency, productivity, poverty and other welfare indicators [16-19, 1, 20-22]. It was also unveiled from the literature that recent studies focused on the vulnerability to food insecurity. The studies of [23-27] examined vulnerability to food insecurity either as a whole or in relation to other variables but none of the studies captured the dynamics in the food insecurity among the households. The study is unique in the sense that it does not only measure the extent of vulnerability but predicts the future transitory in between food secure and food-insecure households. This kind of research is very scarce in the literature especially in Nigeria and particularly among the yam-based households in the area.

Therefore, the policy relevance in this study unlike other studies in the literature is an eye-opener to the transitory future of food insecurity and the existing coping mechanisms to opt out of food insecurity. The factors influencing the preference for the coping strategies will assist in policy formulation that would address the dynamics in the future food insecurity both in Nigeria and other developing countries. Other rationales for this study are that efforts to ensure food security can be viewed as an investment in human resources that will result in a more productive society. Also, an understanding of the situation of food security at the household level and how people cope with food insecurity by adopting different mechanisms is very important. Such understanding allows policymakers to better plan and takes actions that address the specific problems in society. This study thus analysed vulnerability to food insecurity and household coping strategies adopted by yam farmers in Ekiti State, Nigeria. It specifically examines the extent of vulnerability to food insecurity among yam farming households and examines the factors influencing the choice of coping strategies employed by yam farmers.

2. Methods

2.1. Design and Sample

The research was carried out among yam farming households in Ekiti State, Nigeria. Yam is the most important staple food in Ekiti State. It is their primary source of income and food security. The state's climate is suitable for the agrarian activities of its large population, which grows crops such as cocoa, oil palm, and arable crops such as yam, maize, and cassava. Data were gathered from primary sources using a well-structured questionnaire and an interview schedule. For this analysis, a multistage sampling technique was used. The first stage involved the purposive sampling of two (2) Local Government Areas in each of the State's three (3) ADP Zones based on their agrarian nature and high yam tuber production, especially by migrant farmers. The second stage involved choosing four (4) communities from each of the Local Government Areas using a simple random sampling technique. In the third stage, fifteen (15) yam farming households from each of these communities were chosen at random. The total sample size was 360 people. Just 320 were recovered for use in the end.

Data collected were analysed using the Feasible Generalized Least Square method (FGLS) and multinomial logit model (MNL). Vulnerability to food insecurity was calculated using a three-step process following [28].

Each household's calorie consumption can be expressed as follows:

$$C_h = X_h\beta = \beta_1x_{h1} + \dots + \beta_2x_{h2} + \dots + \beta_ix_{h1} \quad (1)$$

Where β is a vector of parameters for the households.

When we consider all households in a single multivariate equation, we get:

$$C = X\beta = \begin{cases} \beta_1 x_{11} + \dots + \beta_2 x_{12} + \dots + \beta_j x_{hj} \\ \beta_i x_{h1} + \dots + \beta_2 x_{h2} + \dots + \beta_i x_{h1} \\ \beta_i x_{H1} + \dots + \beta_2 x_{H2} + \dots + \beta_i x_{H1} \end{cases} \quad (2)$$

Where $C = [c_1 \dots c_h \dots c_H]$ and $X = [X \dots X_h \dots X_H]$

The first step in the three-step generalized least squares (GLS) method is to estimate the multivariate equation and obtain estimates \hat{b} of the parameters that describe calorie consumption. While the residual component,

$$\begin{aligned} u &= [u_1 \dots u_h \dots u_H] \\ C &= [X\hat{\beta} + u] \end{aligned} \quad (3)$$

As a second stage, the use parameters, γ to determine their dependency on the same explanatory variables were expressed in the equation:

$$u = X\hat{\beta} + \varepsilon \quad (4)$$

Where ε is the residuals of equation (3), depicting residuals' properties that u does not have. Looking at the deterministic part of the equation (4) after heteroskedasticity has been corrected for, one can derive a consistent estimate of the household variance of food consumption $\hat{\sigma}_u^2$

In the last step, $\hat{\sigma}_u^2$ is used to compute each household's vulnerability to food insecurity. Assuming that vulnerability distributes normally, each household's probability of food insecurity is given by a determination of

$$v_h \sim N(E(u_h), \hat{\sigma}_u^2) \quad (5)$$

In addition, the multinomial logit (MNL) model was used to examine the factors influencing food insecure households' choice of coping mechanism in the study area.

As also depicted in [12, 29], the MNL model is expressed as follows:

$$P(y = j|x) = \frac{\exp(x\beta_j)}{1 + \sum_{j=1}^J \exp(x\beta_j), j=1, \dots, J} \quad (6)$$

where y denotes a random variable taking on the values $\{1, 2, \dots, J\}$ for a positive integer J , and let x denote a set of conditioning variables. In this case, y was the coping options or categories, and x will contain different household characteristics.

Differentiating equation (6) with respect to the explanatory variables yields marginal effects of the explanatory variables as follows:

$$\frac{\partial p_j}{\partial x_k} = P_j (\beta_{jk} - \sum_{j=1}^{j-1} P_j \beta_{jK}) \quad (7)$$

The marginal effects, also known as marginal probabilities, are functions of the likelihood. They calculate the predicted change in probability of making a specific choice in response to a unit change in an independent variable [30]. In developing the empirical model using multinomial logit estimation, the dependent variable was the coping mechanisms. The coping mechanisms were grouped into five categories as follows;

Y_1 = Casual Labour based coping mechanism, Y_2 = Asset-based coping mechanism, Y_3 = Food Adjustment based coping mechanism, Y_4 = Borrowing based coping mechanism, Y_5 = Assistance based coping mechanism.

However, the set of exogenous variables that were chosen as probable factors influencing the choice of coping mechanisms by rural households in the study area were:

X_1 = Age of Household Head (Years), X_2 = Education of Household Head, X_3 = Main Occupation, X_4 = Household Size, X_5 = Land Size, X_6 = Total Income, X_7 = Membership of Cooperative Society, X_8 = Extension Visit.

3. Results and Discussion

3.1. Vulnerability of Households to Food Insecurity

The result of the coefficient of determination (R^2) was 0.672, implying that 67.2% of the variations in the values of food consumption were explained by the explanatory variables (Table 1). Furthermore, several predictor's coefficients have the expected signs and are statistically significant. The results showed that the age of the household head has a significant negative correlation with food consumption. This meant that older families were more vulnerable and, as a result, more likely to face decreased food intake in the future. This is probably because the capability to access sufficient calories declines with age. The result is also in agreement with [31] that age has an inverse but significant relationship with calorie consumption. It was also shown that households with larger family sizes and a large number of dependants are more likely to be vulnerable in the future as shown in the negative relationship with expected consumption and variance. The expectation of food intake is significantly decreased when the household size is large. It is well

known that families with a large number of children are, on average, poorer. As expected, household assets and access to credit have positive correlations with the level of food consumption and variance of food consumption. The higher the household asset and access to credit, the higher the expected food consumption will be and such a household is not more likely vulnerable to food insecurity in the future. The result is also in agreement with previous studies [17, 31] who found out that household's asset and access to credit have a positive and significant relationship with calorie consumption. Education of household head has a positive correlation on the food consumption and the variance. The results showed that households with an educated head are not more likely vulnerable to food insecurity in the future. The finding concurs with Schultz's hypothesis that educated individuals are less vulnerable; they adapt more easily to changing circumstances. Household head participation in off-farm work and cooperative society is predicted to be less vulnerable to food insecurity. Off-farm work and membership in cooperative society have a strong positive correlation to food consumption and variance. This implies that participation in off-farm activities and cooperative society would increase household income; thereby make them less vulnerable to future food insecurity. The result did not show the effect of gender, extension visit and farm size on the distribution of future consumption. This is contrary to the findings of [32] that the higher the land size, the higher the expected food consumption will be. This may be as a result of the limited land size available to yam farmers in the study area.

Table 1. Regression Results of Expected per Capita Food Consumption

Independent Variable	Initial Model			FGLT Model		
	Coefficient	T-Value	P-Value	Coefficient	T-Value	P-value
Age of Household Head	-0.042 (0.005)***	-7.99	0.001	-0.068 (0.021)***	-3.18	0.001
Household Size	-0.317 (0.055)	-5.77 ***	0.001	-0.138 (0.065)**	-2.121	0.022
Value of HH Asset	0.005 (0.0018)**	2.93	0.012	1.917 (0.811)**	2.36	0.018
Education of HH Head	0.2415 (0.039)	6.04 ***	0.001	1.622 (0.802)**	2.02	0.014
Farm Size	0.009 (0.062)	0.15	0.677	1.332 (0.752)	1.77	0.322
Off-Farm Work	0.013 (0.003)***	4.09	0.001	0.164 (0.067)**	2.09	0.037
Gender	0.738 (0.152)	4.65	0.001	-1.06 (0.707)	-1.50	0.134
Membership of Coop	0.373 (0.124)***	3.00	0.002	0.120 (0.055)**	2.16	0.024
Distance to Market	-5.112 (3.461)	-1.47	0.141	0.006 (0.186)	0.03	0.971
Access to Credit	0.908 (0.099)***	9.14	0.001	0.373 (0.15)**	2.48	0.012
Main Occupation	-0.064 (0.027)	-2.37	0.018	0.383 (0.124)***	-3.08	0.001
Marital Status	0.857 (0.162)***	5.29	0.001	-0.138 (0.110)	-1.25	0.210
Farming Experience	0.039 (0.068)	-0.616	0.538	0.068 (0.121)	0.56	0.601

Extension Visit	0.112 (0.548)	0.205	0.837	-1.061 (0.707)	-1.50	0.134
Number of Dependant	0.184 (0.082)**	-2.24	0.037	-1.203 (0.420)**	-2.86	0.024
Observations =	320					
R²=	67.2%					

The extent of Vulnerability to Food Insecurity

The degree of vulnerability to food inadequacy for each household was calculated based on the mean estimation results and the above-estimated variance (Table 2). Households were considered as being food insecure when their vulnerability level exceeds some threshold. A value of 0.5 was used based on the vulnerability profile for rural households following, [33]. The vulnerability index is calculated for each household based on expected food consumption expenditure and its variance. The average likelihood of a household falling below the food security level is approximately 0.38. After calculating the vulnerability index for each household, households with a vulnerability index greater than or equal to 0.5 are classified as highly vulnerable, whereas households with a vulnerability index less than 0.5 are classified as low vulnerable. According to the findings, 11.01 per cent of respondents are likely to be vulnerable to food insecurity in the future. Also, about 9.4% of the sample households that are currently food insecure were observed to be able to change their situation in the future. However, 41.24 per cent of the sampled households were extremely vulnerable to food insecurity, with a vulnerability index of 0.78. The implication of this is that there is a need to give an urgent intervention to achieve food security in the study area.

However, as shown in Table 3, the vulnerability indicator was calculated using the expected food calorie consumption and its variance for each household, based on the categorization of respondents based on different levels of food status. About 49.3% of households in the study area enjoyed a stable level of food security, being food secure and low vulnerable to food insecurity. However, 30.23% of the population were undernourished and highly vulnerable. They are considered chronically food-insecure households. Also, 9.4% of households that are currently undernourished, tend to be food secure in the future (transient food insecure) and 11.01 per cent of households in the study region are currently food secure but are at risk of becoming undernourished (food insecure) in the future.

Table 2. Extent of Vulnerability to Food Insecurity

Current status	Highly Vulnerable $T \geq 0.5$		Low Vulnerable $T \leq 0.5$		Total	
Food Secure	11.01%	(0.68)	49.3%	(0.12)	60.31	(0.25)
Food Insecure	30.23%	(0.80)	9.4%	(0.22)	39.63	(0.58)
Total	41.24%	(0.78)	59.1%	(0.16)	100	(0.38)

* Numbers in parenthesis are the average probability of vulnerability

Table 3. Disaggregation by Different Food Status Transition

Food Security Category	Number of households	Percent
Permanent food secure	158	49.3
Transitory food secure	35	11.01
Transitory food insecure	30	9.4
Permanent food insecure	97	30.23

3.2. Factors Influencing the Choice of Food Insecurity Coping Mechanism

The multinomial logit model was estimated by normalizing one category called state or the baseline category. The reference point in this study was the least used coping mechanism (asset-based coping mechanism). Table 4 shows the maximum likelihood calculated multinomial logistic coefficients, which show the direction of the effect of the independent variables on the dependent variables. The likelihood ratio statistics, as shown by the value (115.97) of χ^2 statistics, were highly significant at 1%, implying that the model has a strong explanatory potential. This also suggests that the independent variables account for a reasonable proportion of the observed differences in food insecurity coping mechanisms. Statistically, a year increase in yam farmer's age increases the probability of households relying more on food adjustment based coping mechanisms, borrowing based coping mechanisms, assistance-based coping mechanisms and casual labour-based coping mechanisms. This implies that a household with an aged head would likely adopt any of these mechanisms rather than selling their assets to leave properties for their children. Also, an increase in household size would increase the probability of households choosing food adjustment-based coping mechanism overselling their

assets to cope with the current food insecurity challenges. i.e., a unit increase in household size increases the probability of household adopting food adjustment-based coping mechanism overselling their properties by 7.9%. A household head with a large farm size would likely adopt a borrowing-based coping mechanism in managing his large hectares of land than selling off their properties. A household would prefer to borrow either from relatives, friends, cooperatives or banks to cushion the challenge of food insecurity and payback after harvesting their farm produce than selling their properties. Again, a reduction in the total annual income would increase the likelihood of households adopting food adjustment based coping mechanisms, borrowing based coping mechanisms and assistance-based coping mechanisms over selling off their assets. However, an increase in the annual income of a household head would likely reduce the probability of the household depending on any of these mechanisms. This showed that households which manage to earn high income from any source are not likely to depend on food aid or assistance, borrow from friends or family or skip a meal for another. Likewise, participation in cooperative society would likely reduce the probability of households choosing food adjustment-based coping mechanism but increases the likelihood to adopt borrowing based coping mechanism. This is based on the fact that cooperative society allows households to build the concept of self-help, access financial assistance at concessional rates and obtain goods and services at low prices. Education and Extension visit was not significant at 5% in any of these coping mechanisms, this implied that there were no significant differences in terms of coping mechanisms adopted by households based on their level of education and extension services.

Table 4. Maximum likelihood estimates of factors influencing food insecurity coping mechanisms

Explanatory Variables	Food adjustment-based coping mechanism	Borrowing-based coping mechanism	Assistance-based coping mechanism	Asset-based coping mechanism
Age	0.3056 (0.001)***	0.2096 (0.001)***	0.5534 (0.001)***	0.0664 (0.018)**
Education	0.2023 (0.644)	0.3717 (0.028)**	-0.0853 (0.876)	-42.3248 (0.992)
Main Occupation	-0.5811 (0.242)	0.3130 (0.127)	-0.4830 (0.413)	-13.7540 (0.997)
Household size	0.7966 (0.001)***	0.9398 (0.570)	0.1998 (0.413)	-13.1838 (0.995)
Farm size	-0.5016 (0.498)	1.0802 (0.020)**	0.3411 (0.694)	32.4509 (0.995)
Total Annual Income	-1.91e-07 (0.026)**	-5.09e-06 (0.010)**	-3.89e-06 (0.038)**	0.00003 (0.999)
Membership of Cooperative Society	-3.5013 (0.015)**	3.9766 (0.002)***	-3.1211 (0.073)	-0.18733 (1.000)
Extension Visit	1.214 (0.243)	-0.6774 (0.253)	2.4120 (0.066)	-29.654 (0.998)

Figures in parenthesis are the P-Value, *** and ** were Significant level at 1% and 5%

Number of observations = 320

Prob >chi2 = 0.001

Log likelihood = -101.87

R² = 0.67.

Table 5 shows the marginal effects of the Multinomial logit, which calculates the predicted change in the likelihood of making a specific choice in response to a unit change in an independent variable.

The age of the respondent is found to be significant and positively influences assistance-based coping mechanisms and food adjustment-based coping mechanisms at 1% and 5% respectively. According to the findings, the probability of a household head choosing assistance-based and food adjustment-based coping strategies rises by 6.5 percent and 2.8 percent, respectively, with age. On the other hand, the results showed that the likelihood of a household head choosing a casual-labour based coping mechanism decreases by 24.22% with an increase in age. The possible explanation is based on the fact that older farmers have lesser strength and relies mainly on assistance from either their children/families or the government. However, younger farmers often engaged in casual labour after farm work to get more money and cater for their domestic needs and obligations in society. Also, education of household head was not found significant, implying that there was no significant difference in terms of coping mechanisms adopted by households based on their education level. Again, household size was found to be significant and positively influences households to choose casual labour-based coping mechanisms at a 5% level of significance. One extra person in the household increases the likelihood to adopt casual labour by 2.2%. This result suggested that the larger the household, the more the food demand

and the more the households participate in casual labour to feed the household members. However, household size was also found to be significant at a 5% level in influencing households to adopt adjustments in food consumption as a coping mechanism. To feed larger households requires more resources (income) which are lacking for many rural households in the study area. Hence, the larger the household, the more the odds to choose adjustment-based coping mechanism and this increases at 36% with an addition of one extra person in the household. This is in agreement with the study of [1].

Land size was found to be significant at 5% and influences negatively households to choose casual-labour based and food-adjustment based coping mechanisms. The results showed that a unit decrease in farm size increases the likelihood of choosing casual-labour based and food-adjustment based coping mechanisms by 16% and 45% respectively. This implies that households with small land have difficulties producing food that can feed the whole household and tends to rely on casual labour and food-adjustment based coping mechanisms. The possible explanation for this was that the majority of the respondents in the study area were migrant farmers who got their land through unsecured means (lease, rent, gift etc.) hence; they have no control over the use of land. Cooperative membership was found to be significant at 1% and positively influence households to opt for the borrowing-based coping mechanism by 53.3%. Being a member of a cooperative society allows households to build the concept of mutual self-help in everyday life. Once confronted with food insecurity, lending and borrowing food or money to buy food becomes easier among members of the same cooperative. However, being a member of a cooperative society was found to be significant and negatively influences both food adjustments based and casual labour-based coping mechanisms. The results showed that a unit decrease in membership of cooperative society increases the likelihood of choosing either food adjustments based or casual-labour based coping mechanisms. This implies that a household's head that does not belong to any cooperative society will rely more on food adjustment and casual labour-based coping mechanisms to cope with food insecurity challenges. The total annual income was found to be significant and negatively influence the household to opt for an assistance-based coping mechanism at 5%. This showed that households which manage to earn high income from any source are not likely to depend on food aid or assistance. Total household income was also found to be significant and negatively influence casual labour based at 1%. This implies that a unit increase in the total annual income decreases the likelihood to choose casual labour-based coping mechanism to cope with food insecurity challenges in the study area. The main occupation was found to be significant and negatively influence the household to opt for casual labour-based coping mechanism at 5%. This implies that households that engaged majorly in farming would do less casual labour work i.e., a unit decrease in households' main occupation, increases the likelihood to participate in casual labour by 7.4% to cope with food insecurity coping challenges in the area. The extension visit to households' head was not significant at 5%, implying that there was no significant difference in terms of coping mechanisms adopted by households based on their access to extension services.

Table 5. Marginal Effects of Factors Influencing Food Insecurity Coping Mechanisms

Explanatory Variables	Food adjustment-based coping mechanism	Borrowing-based coping mechanism	Assistance-based coping mechanism	Asset-based coping mechanism	Casual based coping mechanism
Age	0.065 (0.025)**	-0.0282 (0.051)	0.0282 (0.001)***	-2.77e-08 (0.988)	-0.2422 (0.001)***
Education	0.0036 (0.842)	0.0144 (0.985)	-0.0020 (0.990)	-3.00e-06 (0.992)	0.0074 (0.789)
Main Occupation	0.01423 (0.218)	0.0966 (0.078)	0.0098 (0.495)	-6.06e-07 (0.997)	-0.0774 (0.001)***
Household size	0.0125 (0.036)**	-0.0154 (0.887)	0.0104 (0.814)	1.05e-06 (0.995)	0.0221 (0.025)**
Land size	-0.0453 (0.016)**	-0.1464 (0.168)	0.0048 (0.946)	-1.45e-06 (0.993)	-0.0955 (0.016)**
Total Annual Income	3.28e-09 (0.967)	7.05e-07 (0.337)	-8.93e-09 (0.040)**	-4.47e-12 (0.999)	1.39e-07 (0.005)***
Membership of	-0.0685	0.5332	0.0466	8.46e-08	-0.3245

Cooperative Society	(0.036)**	(0.004)***	(0.724)	(1.000)	(0.018)**
Extension Visit	0.02304 (0.409)	0.0815 (0.641)	-0.0180 (0.938)	1.63e-06 (0.998)	0.0414 (0.522)

Figures in parenthesis are the P-Value, *** and ** are Significant levels at 1% and 5%.

4. Conclusion and Policy Implications

The study has critically examined the extent of vulnerability of food insecurity and household coping mechanisms among yam producers in Ekiti State, Nigeria using econometric tools. The study was able to conclude that age, household size, household asset, education, membership of cooperative, and dependants are the critical factors of policymaking for the food consumption in the area. This also contributes to the level of vulnerability to food insecurity because the food consumption level goes in a long way in determining the food security and also the living standard of the individuals in a society. It was also concluded that many of the yam producers are far below the average probability of food security threshold. Some of them were undernourished and highly vulnerable which establishes the chronic food insecurity situations in the area. Although many of the sampled farmers were vulnerable to food insecurity, approximately 11.01 per cent of food secure households can become food insecure in the future, if necessary, attention and intervention are not given by both households and the government. On the other hand, 9.4% of households that are currently experiencing food shortage may bounce back in the future. Having established the extent of vulnerability in the area, the farming households have devised several means to cushion and as well cope to avert or reduce the hazardous effect of food insecurity in the area. The study ascertained that the coping mechanisms revolved in four categories, and they are: food adjustment-based; borrowing-based, assistance-based, asset-based, and casual-based coping mechanisms. Therefore, the study established the main factors that contributed to the choice of coping strategies employed by yam farming households and they are the age of household head, main occupation, household size, land size, net household income and membership of the cooperative society. Also, it can be safely asserted that coping strategies (casual labour-based and borrowing based) has significantly enhanced yam farmers' income and food status in the area. Based on the outcome of these findings, it could be recommended that government and non-governmental organisations should encourage yam farmers to invest more in income-generating activities or casual labour works during the off-peak farming periods to enable them to increase their income, and thus, be able to improve their livelihood and food security status. In addition, leveraging the potential role of coping mechanisms already used by households during food shortages to reduce food insecurity should be considered and implemented as policy options. Comprehensive human capital development policy is a key factor that can be used to mitigate the high level of vulnerability to food insecurity among rural yam households. Findings have shown that education of household heads significantly reduces the likelihood of vulnerability to food insecurity. Moreover, family planning policy is considered necessary to allay against the high level of vulnerability to food insecurity among yam farming households due to the increase in the number of dependants in the area. Lastly, more yam farmers should be encouraged to form and join viable cooperative societies to access financial assistance at concessional rates, obtain goods and services at low prices, thereby, improve their standard of living.

Acknowledgements

The authors are thankful to the Ekiti State ADP staff for their assistance during the data collection, and also appreciate the effort of Prof. S.O. Ojo for his expert advice.

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