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Livelihood Activities and Food Security Status of Households in Oyo Town, Oyo State

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Abstract

Previous studies in Nigeria focused on food security and livelihood activities of households using uni-dimensional measures. This paper considered Dietary Diversity Score, Food Consumption Score and food Insecurity Access Scale as measures of the food security status of households. This study aimed at ascertaining the effect of livelihood activities on food security of household's in Atiba Local Government Area. The study used purposive sampling technique to select 6 wards making up Oyo town upon which in the second stage a random sampling of 114 households were selected. Questionnaires were used to source information on food item consumed, livelihood activities and livelihood assessment. Data were analyzed using the descriptive statistics and logit regression. The result showed that 62% of the respondents were male and 38% were female. 80% fall between the age range of 31-64 years, 60% were married and 61% have a household size ranging between 5 and 8 members. The findings also showed that 58.41% are food secure using Household Dietary Diversity Score, 46.90% using Food Consumption Score, while 55.75 are less food secure using Household Dietary Diversity Score and Sustainable Livelihood Framework Condition respectively. Respondents from Ajayi Crowther University Community, Atiba, Oriawo and Tokun Village are food secure using two measures. The logit regression result confirms that food security increases as trading, private paid job, civil service, and casual job as a means of livelihood were significant while food security decreases with increase in household size at five percent for Household Dietary Diversity Score and Food Consumption Score. The logit value (72.74) indicated relationship between the combined effect of livelihood activities and food security. Food security in Atiba Local Government was low, the respondents' livelihood activities should be diversified to be more food secured.

Keywords: *Dietary Diversity Score, Food Consumption score, Food Insecurity Access Scale, Food Security Status, Livelihood Activities*

Introduction

Food, both in quantity and quality is an important factor for a healthy and productive life as well as for a nation to sustain its development (FAO, 2014; Oke, 2015). While the problem of food insecurity was commonly understood from the perspective of availability and supply, it has

progressed to issues of food access, sustainability, and vulnerability (Smith & Boutin, 2016). Statistics from Food and Agriculture Organization reported 795 million people are food insecure, with many more suffering from ‘hidden hunger’ caused by micronutrient or protein deficiencies (FAO, 2015). Despite the huge amount of fund directed to the agricultural sector and different schemes put in place to achieve SDG goal I and II (food poverty and food scarcity), the problem of food insecurity is still high in Nigeria. While previous studies both in Nigeria and elsewhere have mainly focused on food security using secondary data set and uni-dimensional measures, this study used primary data with a focus on multi-dimensional measures of livelihood activities and food security status of households.

It has been well acknowledged that households in rural areas do have multiple sources of income. But how well livelihood strategies connect with food security at the household level remains an empirical issue. Rural people’s livelihood is not tied to just farm income, but to other income earning activities. They cultivate farm lands, work as wage laborer on other farms, operate small shops or work in formal institutions located in rural areas or urban areas not too distant from rural location. The hypothesis tested relates to whether households engaging in more livelihood activities are expected to have lower levels of food insecurity and whether differences exist between male and female-headed households. The objectives of the study are (1) to profile various livelihood activities across household’s food security measure and (2) to determine the effect of livelihood activities on households’ food security.

Literature Review

Food security exists when all people at all times have access to safe nutritious food to maintain a healthy and active life (FAO, 1996; Smith & Boutin, 2016). Livelihoods are capabilities, capitals, and economic activities employed by households in both rural and urban areas to sustain a means of living and ways to obtain food (Adepoju & Olawuyi, 2012). Thus, the concept of Sustainable Livelihood Framework has emerged in the development literature to look at the employability of rural households holistically and how to enhance the ability of rural households to cope and recover from the experience of shock and be able to sustain their capabilities and assets at the present and the future. A characteristic feature of the framework is the interconnectedness of livelihood activities and assets such as social, physical, natural, financial, and human capital which together enable households to pursue a sustainable Livelihood.

Food security has been conceptualized in various ways. Adjimoti & Mensah (2018) conceptualized food security as function of the “quantity, quality and stability” of food. Others have looked at it from the perspective of availability, accessibility, utilization and the stability. Availability connotes physical presence of food in a given country/household. Accessibility reflects the ability to obtain food from own stock/home production, or through market purchases, gifts or borrowing; while the utilization of food, in terms of the ability to derive full biological benefits from food, based on food safety and nutritional/socio-cultural value. Different people in different places at all times have different lifestyles and ways of meeting their needs.

Ganiyu & Omotayo (2016) explored the effects of livelihood activities on the food security using households in Ogbomosho Area of Oyo State. The study used primary data, which was obtained with the aid of structured questionnaires from 75 household heads. Descriptive statistics, food security index and logit regression model were used as estimation techniques. From the result, it was found that food security has positive relationship with total income and year of experience.

This study however neglect Oyo suburb. Connolly-Boutin & Smit (2016) in their study “Climate change, food security, and livelihoods in sub-Saharan Africa” reviewed food security, climate change impacts, adaptation and adaptation, vulnerability, food security, and sustainable livelihoods. The paper developed a conceptualization of the relationships among the three themes and shows how food security’s vulnerabilities are related to multiple stresses and adaptive capacities, reflecting access to assets. Adjimoti & Mensah (2018) examined crop diversification and household food security status using rural Benin household. Primary data from 420 rural households were collected. The use of principal component analysis (PCA) was employed to construct a multidimensional food security index and a Simpson diversity index was used to measure the degree of crop diversification. A linear regression model was used to determine the effect of crop diversification on household food security status. The results showed that crop diversification has a positive effect on household food security status. From their study, diversity of crops grown through dietary diversity can improve household food security. The results also show that some other factors are also affecting the household food security status such as access to extension services and storage facilities.

Obayelu & Oyekola (2018), also assessed Food Insecurity in Urban Slum using Ibadan Metropolis, Southwest Nigeria. Primary data were collected analyzed using descriptive statistics and ordered probit model. Findings showed that food insecurity was found to be prevalent among the slum residents, with about 81% being food insecure. Food insecurity status was explained by educational status of household head, household size, per capita income and duration of stay in the slum. Gani, Olayemi, & Inoni (2019) examined the effects of households’ livelihood diversification strategies on food insecurity in rural Northeastern Nigeria. Primary data were obtained with the aid of structured questionnaire. Descriptive statistics, Tobit regression model, Cost of Calorie Function and ANOVA were used to analyse the data. The findings showed that farmers adopted five livelihood strategies of which Cropping, Poultry and Livestock Keeping (CPL) was predominant. Thus, a significant relationship between households’ food insecurity and livelihood diversification strategies is established.

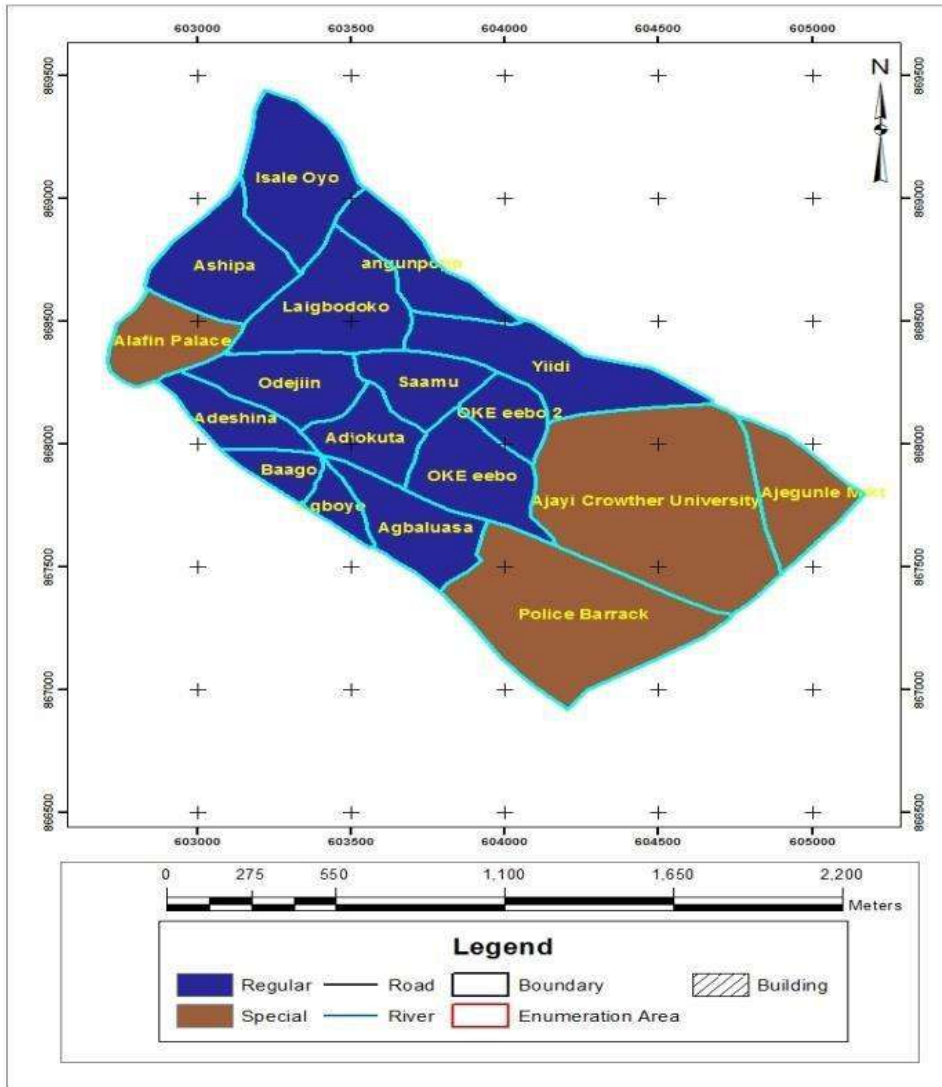
The study of Sani & Kenaw (2019) also analyzed households’ food insecurity and its determinants of food insecurity and shortage in Assosa zone, western Ethiopia. The study used a primary data (records method), focus group discussions and key informants interview were also used. This study employed descriptive statistics, food insecurity index and Tobit model for data estimation. The finding of the study revealed that that family size, age of the household head, and off-farm and non-farm income positively affected extent of households food insecurity; meanwhile access to irrigation, farm income, distance to market and access to credit negatively affected the extent of households’ food insecurity. The study lacks information on the food expenditure of the respondents to ascertain their level of food insecurity. Sidique & Muhammad (2019) also examined determinant of food security among households in Nigeria using food consumption as a proxy for food security to measure impact of some of the determinant of household food security on rural and urban households in Nigeria. OLS analysis and the multinomial logit models was used as data estimation techniques. The study revealed that education has a positive influence on food security while age, household size and gender influence food security negatively. However, land acquisition was insignificant as explanatory variable in the study Owoo (2020) in his study titled “Demographic considerations and food security in Nigeria submitted that close to 14 million people in Nigeria are malnourished while demographic considerations play an important role in

food insecurity within Nigerian households. Data from three waves of the World Bank's Living Standard Measurement Survey for Nigeria was used to illustrate spatial patterns of food security in the country. Fixed effects regressions were also employed for data estimation which revealed that at the household level, larger households have worse food security outcomes and are more likely to report being food insecure.

Methodology

Study area description

The area is Atiba Local Government area of Oyo State Nigeria and selected on purpose because of the the large size of the state and the large number of existing household; limited time and for easy coverage. Atiba Local Government of Oyo State is situated in the southwestern part of Nigeria and northeastern part of Oyo state. It is one of the local governments created from Old Oyo Local Government in 1998. Politically, it is in Oyo State in Southwestern part of Nigeria. It shares border with Oyo East and Ori-Ire local governments in the South-West, and Orelope and Olorunsogo in the North-West, in the North-East, it shares borders with Atisbo and Saki East while in the South-East, it shares border with Oyo West and Itesiwaju local government areas. It occupies total a total land area of 166,413.569 hectares with a population figure of 168,246 (NPC, 2006). In order to obtain an external validity and to make the study of the problems which otherwise could not be undertaken due to the limitations of financial resources time and other academic and social demands. Agriculture is the backbone of the province's economy, and most of the rural people derive their livelihood from agriculture and other related rural economic activities. Although agriculture is a common source of livelihood, the level of agricultural dependency and its importance to overall household income and food security is decreasing. This is because of challenges facing smallholder farmers such as low and erratic rainfall, low and declining soil fertility, low investment, shortages of farm power- labour and draft animals, poor physical and institutional infrastructure. The political and economic instability in the country has exacerbated the condition making farming difficult. This has forced people to engage in non-agricultural livelihoods such as salaried jobs, migration, cross-border trading, migration, and wage labour to ensure food security. Oyo town represents an interesting case for this study on account of the many local government area councils that are driving the urbanization of Oyo Town. These LGAs are Atiba, headquartered at Offa-Meta; Oyo East, headquartered at Kosobo; Oyo West, headquartered at Ojongbodu and Afijio, headquartered at Jobele. There also a number of markets, banks, institutions and private farms driving the economic and commercial activity of the town. With three local government area councils in Oyo town, it is expected that interventions on increasing food security through gainful employment should be promoted. Atiba LGA created from Old Oyo Local Government, is a key local government area council in the area and it shares border with Oyo East and Ori-Ire local governments in the South-West, and Orelope and Olorunsogo in the North-West, and in the North-East, it shares borders with Atisbo and Saki East while in the South-East, it shares border with Oyo West and Itesiwaju local government areas (NPC, 2006).



Research technique and Sampling technique

The research design follows a primary data survey design through household sampling and design of research questionnaires that were administered to randomly selected households. A multistage sampling technique was adopted in selecting the respondents. The first stage involve random selection of six (6) wards from Atiba Local Government, second stage involved random selection of eight (8) compounds from each of the selected wards and lastly, from every compound, twenty (20) household heads were picked, which translated to a total number of one hundred and sixty (160) household heads. The questionnaire is divided into four sections. The first section requires the personal data of the respondents and Section two contains questions on food items consumed, livelihood activities and dietary diversity. Questions were framed on four-point Likert item responses. The questionnaire was trial tested using thirty respondents in Kosobo area of Oyo East

Local Government Area which is entirely outside the geographical scope of the study. This area is considered to have similar characteristics with the study area. The Cronbach Alpha value was estimated at 0.67. Data were collected over a period of four weeks between July and August 2021 by trained enumerators who spoke the local language, Yoruba.

Data analysis

Data were analyzed using descriptive statistics and logistic regression. Frequency, percentage and mean statistics were used to describe the socio-economic characteristics of respondents and the constructed food security index.

Measurement

Food Security

The study used various measures of food security status at the household level since the common definition of food security rests on dimensions of food availability, food access, food stabilization and food utilization (Webb et al. 2006; Ericksen et al. 2011). Measures of food security used in this paper are Household Food Insecurity Access Scale (HFIAS), Household Dietary Diversity Scores, (HDDS), Food Consumption Score (FCS), and Sustainable Livelihood scale. The Household Dietary Diversity Score (HDDS) is a measure of food security that is used to proxy household food access. It is measured by the number of various food groups consumed by a household over a given reference period. The underlying motivation for this measure is that a more diversified household diet is believed to correlate with caloric and protein adequacy as well as the household income (Swindale & Bilinsky, 2006). In our study listed 12 food groups such as cereals, roots/tubers, vegetables, fruits, meat, poultry, eggs, pulses, legumes, nuts, milk and oil/fats. We assigned a score of 1 (if consumed) or 0 (if not consumed). The household score will range from 0 to 12 and is equal to the total number of food groups consumed by the household. The Food Consumption Score (FCS) is a proxy indicator of household caloric availability and aggregates the diversity and frequency of food groups consumed over the previous seven days by a household. It is also weighted according to the relative nutritional value of the consumed food groups. It also weights nutritionally dense foods, such as animal products higher than food groups containing less nutritionally dense foods, such as tubers. The FCS and HDDS are highly correlated and can be used interchangeably as a measure of household-level diet diversity and as a validated proxy for energy sufficiency in most contexts (Maxwell et al., 2013). The Household Food Insecurity Access Scale measures the food insecurity (access) in the household in the past four weeks (30 days) using questions that capture households' behavioral and psychological manifestations of insecure food access, such as having to reduce the number of meals consumed or cut back on the quality of the food due to a lack of resources. The maximum score for a household is 27 (the household response to all nine frequency of occurrence questions on a scale of 0 to 3 with 3 being the maximum score and 0 the minimum score. The higher the score, the more the food insecurity the household experienced and the lower the score, the less food insecurity a household experienced. All four indicators (HFIAS, HDDS, FCS, and SLF) were calculated for each respondent by summing the codes for each frequency-of-occurrence question. The responses were aggregated and classified into categories of Less Food Secure (LFS) and More Food Secure (MFS).

Food Security status probability outcome estimation

Given the random sample of households characterized by a food security status outcome-dependent variable y_i , and explanatory factors x_i . While we can observe y_i , there is an underlying non-observable or latent food security status of the household y^* . This is defined as a linear function of observable and non-observable factors, ($y^* = \beta x_i + \varepsilon_i$) from which y_i , the observed food security status of the household is derived. That is the food security status of a household is observed if $((y^* > 0) \text{ or } ((y^* < 0)$ where 0 is defined as the threshold. In our study, we parametrized the threshold as the average of the food security calibration generated. In this binary model analytical framework, the likelihood or probability of a household food security status is modelled as a function of the independent variables. $\Pr(y = 1) = \Pr(x'\beta + \varepsilon > 0) = \Pr(-\varepsilon < x'\beta) = F(x'\beta)$. Where $\Pr()$ indicates the probability, x , vector of explanatory variables, β , the vector of coefficients to be estimated and ε , the random error term. In empirical analysis various functional forms have been used. In the logistic functional form, the cumulative distribution function of the error term ($F(\cdot)$) is logistically distributed while in probit functional form, it is standard normally distributed. The functional forms allow estimated probabilities to lie between 0 and 1 and the estimation of binary models is by Maximum Likelihood (ML) technique. The Linear probability model also used in empirical studies does not allow probability estimates to lie between 0 and 1 and thus the choice of logistic functional form. We applied the logistic functional form and used the logit syntax in stata expressed as (logit depvar [indepvars][if][in][weight][,options]) It also been argued that in non-linear models, such as the logistic model we are using in this paper, marginal effects are more informative than coefficients (Cameron and Trivedi, 2015). The marginal effects of explanatory variable on the probability of food security status is calculated as:

$$\frac{\delta \Pr(\beta x_i)}{\delta x_{ki}} = \frac{\delta F(\beta x_i)}{\delta x_{ki}} = f(\hat{\beta} x_i) \hat{\beta}_k$$

Theory and empirical evidence from past studies guided the selection of the explanatory variables included in the probit model as depicted in the table below

Table 1. Description of the Explanatory variables used in the food security status model

Variables	Nature	Description
Farming	dummy	1 if yes and 0 if otherwise
Trading	dummy	1 if yes and 0 if otherwise
Artisan	dummy	1 if yes and 0 if otherwise
Salary Job	dummy	1 if yes and 0 if otherwise
Civil servant	dummy	1 if yes and 0 if otherwise
Retiree	dummy	1 if yes and 0 if otherwise
Casual Labour	dummy	1 if yes and 0 if otherwise
Business	dummy	1 if yes and 0 if otherwise
Age	Continuous	Age of household head in years
Gender	dummy	1 if male and 0 if female

Household size	Countinous	Number of persons in a household
Number of boys	Countinous	Number of boys in the household
No of girls	Countinous	Number of girls in the household
Spouse working	dummy	1 if yes and 0 if otherwise
Member of cooperative	dummy	1 if yes and 0 if otherwise
Member of social group	dummy	1 if yes and 0 if otherwise
Acess to Micro Credit	dummy	1 if yes and 0 if otherwise
Residing in Ajayi Crowther Area	dummy	1 if yes and 0 if otherwise
Residing in Ori Awo Area	dummy	1 if yes and 0 if otherwise
Residing in Agunpopo Area	dummy	1 if yes and 0 if otherwise
Residing in Tokun Village	dummy	1 if yes and 0 if otherwise

Results

Socio-Economic Characteristics and Food Security Status Variation across Food Security Measures

TABLE 2: Socio-economic characteristics and food security status variation across food security measures

VARIABLES	FOOD SECURITY MEASURES							
	HDDS		FCS		HFAS		SLC	
	FOOD SECURITY STATUS							
	LFS(%)	MFS(%)	LFS(%)	MFS(%)	LFS(%)	MFS(%)	LFS(%)	MFS(%)
LOCATION								
Ajayi Crowther	45.00	55.00	25.00	75.00	25.00	75.00	20.00	80.00
Oriawo	66.67	33.33	83.33	16.67	38.89	61.11	38.89	61.11
Agunpopo Area	57.89	42.11	57.89	42.11	63.16	36.84	47.37	52.63
OkeAfin Area	55.00	45.00	45.00	55.00	60.00	40.00	70.00	30.00
Atiba Scheme	38.89	61.11	50.00	50.00	66.67	33.33	83.33	16.67
Tokun Village	66.67	33.33	83.33	16.67	22.22	77.78	94.44	5.56
INCOME GROUP								
Poorest	70.00	30.00	70.00	30.00	55.00	45.00	30.00	70.00
Poor	57.69	42.31	69.23	30.77	50.00	50.00	53.85	46.15
Middle	46.67	53.33	53.33	46.67	53.33	46.67	60.00	40.00
Rich	45.45	54.55	45.45	54.55	72.73	27.27	59.09	40.91
Richest	50.00	50.00	7.14	92.86	35.71	64.29	35.71	64.29
GENDER								
Female	46.51	53.49	44.19	55.81	60.47	39.53	60.47	39.53
Male	60.00	40.00	78.57	21.43	51.43	48.57	51.43	48.57

INCOME SOURCES								
1	31.58	68.42	68.42	31.58	78.95	21.05	94.74	5.26
2-3	70.00	30.00	73.33	26.67	53.33	46.67	60	40
4-5	61.29	38.71	64.52	35.48	67.74	32.26	58.06	41.94
6 and above	48.48	51.52	57.58	42.42	30.3	69.7	24.24	75.76

Note: LFS(Less food secure), MFS(More food secure)

Source: Data from field survey, 2021

Table 2 above shows that Ajayi Crowther respondent were more food secure with 55.00 percent using the HDDS approach, 75.00 percent using FCS and HFAIS respectively and 80.00 percent using SLC. This is keenly followed by 61.00 percent, 50.00 percent, and 33.33 of the respondents in the Atiba Scheme who were more food secure using Household Dietary Scores, Food Consumption Score, and Household Food Insecurity Access Scale respectively. The respondents from Tokun Village have 66.67, 83.33, 22.22, and 94.44 percent to be less food secure using HDDS, FCS, HFIAS, and SLFC respectively. This is shown in pictorial form in figures 5, 6 and 7 below.

In figure 1, larger percentage of respondent in Tokun Village were more food secure while the majority of people in Atiba were less food secure. HDDS measure in Figure 2 shows that respondents in Ajayi Crowther and Atiba Scheme were more food secure which implies they consume variety of food items hence their food basket is bulky.

The sources of livelihood using all measures shows that those with 6 and above sources of livelihood activities were more food secure than those with one source of livelihood. This is keenly followed by those with 4-5 sources of livelihood in which 38%, 35%, 32%, 41% were more food secure using HDDS, FCS, HFIAS, and SLFC respectively. This study is in line with Gani, Olayemi, & Inoni (2019), which examined the effects of households' livelihood diversification strategies on food insecurity in rural North-eastern Nigeria and Manlosa, Hanspach, Schultner, Dorresteyjn, & Fischer (2019) who in their study: Livelihood strategies, capital assets, and food security in rural Southwest Ethiopia, established that a significant relationship between households' food security and livelihood diversification activities exist.

On households' income index using quintiles analysis, about 70.00 percent of food-insecure households are located in the poorest quintile, approximately 50.00 percent of food secure households find themselves within the richest quintile. In the second quintile, also classified as poor, food insecurity is still high, about 57 percent. This reveals some level of relationship between households' wealth and food insecurity, in that poorer households tend to be less food secure. In effect, those who are wealthy are more food secure. This explains why food security is very high using HDDS for households within the third quintile (53.44%), fourth quintile (50.00%), and wealthiest. This is in line with the work of Clement Mensah (2014) who submitted that the poor tend to be food insecure and established a link between food insecurity and household wealth.

Table 2 above also shows that females were more food secure than their male counterparts. Using HDDS 53.49 percent of females were more food secure as against 40.00 percent of their male counterparts. Using food consumption score 55.81 of the female were more food secure as against 21.43 percent of the male while using SLFC, 48.57% of male were more food secure as against

39.53% of female. This disparity in food consumption is not in line with the claims articulated by Assenso-Okyere et al. (1997) and clement (2014) that women tend to be more vulnerable to food insecurity. However, the SLFC findings justify the claims by Oni & Fashogbon (2018) whose study makes use of nationwide cross-sectional data of the Nigerian Living Standard Survey (NLSS) and discovered that farming is the predominant livelihood activity and the Female-headed households are more food secure than their male counterpart.

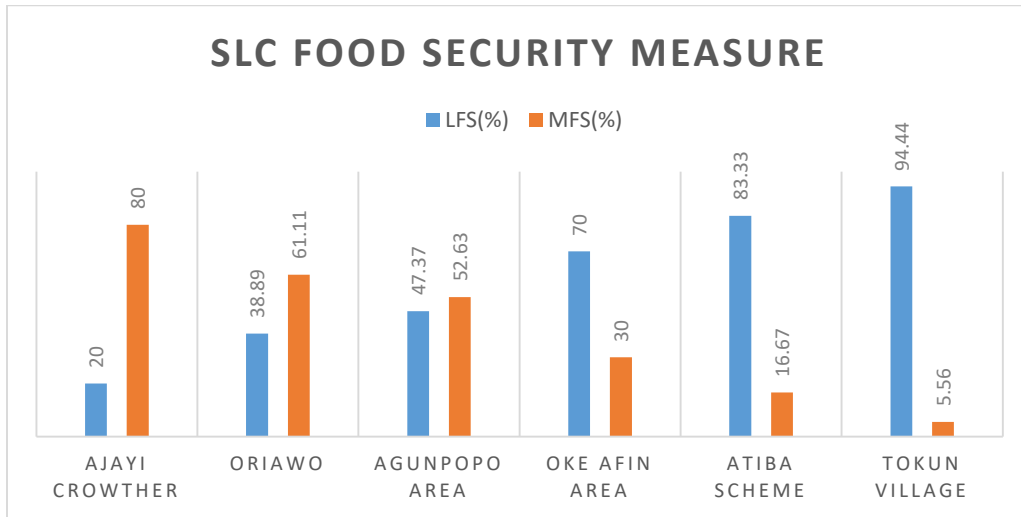


Figure 1: SLFC Food Security Measure

Source: Field Survey 2021

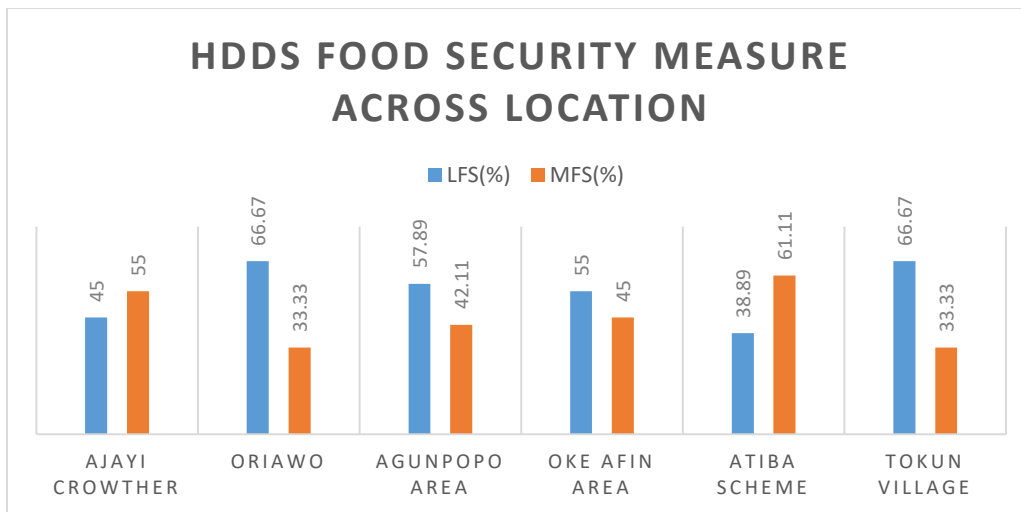


Figure 2: HDDS Food Security Measure

Results

Logit Regression Result of Effect of Livelihood Activities on Households' Food Security in Atiba Local Government Area of Oyo State, Nigeria

Table 2 results show that trading, private salary job, civil servant, and casual job as a means of livelihood were significant at ten percent ($p < 0.1$), five percent ($p < 0.05$), and one percent ($p < 0.01$) respectively. Farming and retiree were found to be insignificant across all measures, trading and artisan, on the other hand, was significant at 95% and 99% respectively using HFIAS and insignificant across all other measures. Salary job as a means of livelihood was significant at 95% using HDDS measure, a civil servant at 99% and 99% for HDDS and HFIAS respectively. Business as a means of livelihood was significant at 95% and 99% using HDDS and FCS measures. Age was significant at 95% using the FCS measure but not significant using HDDS, HFIAS and SLFC measures. Also the marginal effect shows that an increase in age will bring about a chance of 3.1% of being food insecure with respect to HDDS. Also, access to bank credit and spouse jobs were found to be significant at ten percent respectively. This corroborates with previous findings that in Nigeria, determinants of food security are stability of access, household economic status, household income variability, quality of household human capital, degree of producer and consumer price variability, food storage and inventory, household size, and access to social capital (Amaza et al. 2007; Ayantoye et al. 2011; Oni et al. 2011; Olayemi 1998). However, the respondents' age, sex, membership of an association, farming experience, years spent in school, and credits used for housekeeping were not significant. The marginal effect of salary job with value 0.622 shows that with more people entering into civil services, it will lead to 62% in the probability of being food secure in terms of HDDS, with one more increase in civil servant, the likelihood of being food secure increases by 22% in term of HDDS, in term of FCS for casual labour, the likelihood of being food secure is lowered by 45% while the likelihood of being food secure increased by 26% and its likelihood of being food insecure increased by 21% in term of HFIAS. The coefficient of household size (-4.414) is negatively significant at 90% and 1.587 at 95%, for HDDS which implies that there is an inverse relationship between household size and the food security status of the respondents, it indicates that the higher the household size, the more the food insecure they will be, which is in line with apriori expectation. This is in line with Sidique & Muhammad (2019) whose study revealed that education has a positive influence on food security while age, household size, and gender influence food security negatively. However, land acquisition was insignificant as an explanatory variable in the study.

Also, the parameter (-20.336) of spousal job is negative and significant ($p < 0.1$) under HDDS, which indicates that there is a direct relationship between the food security status and spousal job. It implies that the acquisition of a job by a spouse will increase household food security. The location however was not significant across all measures except for Tokun Village that is significant at 90% using FCS. The respondents from Tokun Village were food secure using FCS measure and their likelihood of being food secure was 15.99% while living in this location increases the chance of being food secure by 85% with respect to marginal effect. The LR Chi-square value of 72.74 under HDDS indicates that it is highly significant and the relationship existing between the combined effect of farming, trading, artisan, salary job, civil servant, retiree, casual job, and business and food security status of the respondents. The coefficient of determination shows that 74% of the variation in food security is explained by the control variable. The LR Chi-square value of 51.71 under FCS suggests that it is significant and the relationship existing between the combined effect of farming, trading, artisan, salary job, civil servant, retiree, casual job, and business and food security status of the respondents. The coefficient of determination shows that 58% of the variation in food security is explained by the control variable. Using HFIAS as an approach, the LR Chi-square value of 53.98 under HFIAS indicates that it is

significant and the relationship existing between the combined effect of farming, trading, artisan, salary job, civil servant, retiree, casual job, and business and food security status of the respondents. The coefficient of determination shows that 69% of the variation in food security is explained by the control variable. Using SLFC shows that the means of livelihoods were not significant. These findings affirm the submission of Gani, Olayemi, & Inoni (2019) in which a significant relationship between households' food security and livelihood diversification strategies is established. Similarly, Manlosa, Hanspach, Schultner, Dorresteijn, & Fischer (2019) in their studies on Livelihood strategies, capital assets, and food security in rural Southwest Ethiopia confirmed that livelihood strategies were significantly associated with food security outcome.

Table 2: Regression estimates

Variables	HDDS		FCS		FI		SLFC	
	Coeff	Margi nal Effect	Coeff	Margi nal Effect	Coeff	Margi nal Effect	Coeff	Margi nal Effect
Farming	-3.474	-0.186	0.941	0.7659 78	-0.667	0.064	3.720	0.201
Trading	3.346	0.179	-1.799	-0.147	2.997**	0.290	- 9.606	0.263
Artisan	2.016	0.108	-0.278	-0.023	1.267*	0.122	3.081	-0.520
Salary Job	11.622 **	0.622	-0.272	-0.022	-0.327	0.032	- 8.540	0.167
Civil servant	4.215*	0.226	0.688	0.056	1.916**	0.185	1.545	-0.462
Retiree	-2.068	-0.111	-0.560	-0.046	0.752	0.073	14.69 4	0.084
Casual Labour	- 23.609 *	-1.264	- 5.531* *	-0.450	2.024	0.196	- 20.39 4	0.795
Business	4.837	0.259	3.266* *	0.266	- 2.230**	0.215	22.43 6	-1.103
Age	-0.585	-0.031	- 0.187* *	-0.015	-0.016	0.002	- 0.686	1.214
Gender	- 15.575 *	-0.834	- 7.047* **	-0.574	6.403	0.619	- 22.58 9	-0.037
Household size	4.414*	0.236	1.587* *	0.129	-0.561	0.054	21.30 5	-1.222

Number of boys	-3.241	-0.174	- 3.186* *	-0.259	3.361** *	0.325	- 37.42 0	1.153
No of girls	-0.186	-0.010	0.010	0.001	-0.590	-0.338	- 2.196	-2.024
Spouse working	- 20.336 *	-1.090	-0.301	-0.025	-2.906	-0.281	- 15.32 8	-0.119
Member of cooperative	4.637	0.248	0.247	0.020	2.096	0.203	1.165	-0.829
Member of social group	13.146	0.704	2.169	0.177	1.629	0.157	- 49.71 7	0.063
Access to Micro Credit	9.632	0.516	1.487	0.121	-2.304	-0.223	0.240	-2.690
Ajayi Crowther Area	-4.399	-0.236	-2.969	-0.242	-1.171	-0.113	- 4.984	0.013
Ori Awo Area	-4.256	-0.228	0.983	0.080	1.152	0.111	- 1.302	-0.270
Agunpopo Area	-2.639	-0.141	3.117	0.254	-0.796	-0.077	3.564	-0.070
Tokun Village	15.993	0.857	8.609*	0.701	-3.528	- 0.341	0	0.193
constant	10.092		9.487		- 17.202* **		17.64 0	
r ²	0.749		0.583		0.695		0.697	
LCHI2	72.740		51.710		53.980		46.63 0	

Sig at 10% ** sig at 5% *** at 1%

Source: Field Survey 2021

Conclusion

Based on the findings, it was concluded that majority of the households in Atiba Local Government of Oyo state were food insecure. Multiple source of livelihood has a direct relationship on food security status. Location, household size, income and educational qualification significantly influence food security line. However, household size of the respondents has an inverse relationship on food security status. It should therefore be checked to keep the households on the food security line.

Recommendations

As the country strives to feed a growing population in the face of declining natural resources and ongoing food security crises, commitment by all to a sustainable food future is more important

than ever, hence the study on the basis of the findings of this research work recommends the following;

Households should acquire better education that will help them with their various livelihood activities.

There should be increased investment in rural infrastructure to improve access to market, knowledge, particularly among low income earners.

The households' heads should be encouraged to involve in more income diversified activities in order to improve their livelihood.

The government should focus on food security and sustainable food systems research and development, promoting consumer habit.

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