

Assessment of Households' Socio-Economic Characteristics and Food Security Status in Atiba Local Government Area of Oyo State

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Abstract

Understanding the food security state of households, for whom policies can be enacted to give effective change to the national, regional and international profile of food security issues is needful. Previous studies in Nigeria focused on food security and livelihood strategy without taking into consideration the variation across socio economic characteristics. This study aimed at ascertaining household food security status across socio economic characteristics as well as the effect of multiple livelihood activities on food security status in Atiba local government area of Oyo state. The study used convenient sampling technique to select 114 households from six wards. Questionnaires were used to source information on food item consumed, livelihood activities and livelihood assessment. Data was analyzed using the descriptive statistics and logit regression. The Cronbach alpha reliability value was 0.67. 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 revealed that respondents with 6 and above sources of livelihood activities were more food secured, keenly followed by those with 4-5 sources of livelihood in which 38%, 35%, 32% and 41% were more food secured using HDDS, FCS, HFIAS, and SLFC respectively. Females were more food secured than their male counterparts using HDDS. 53.49 percent of females were more food secured 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. The study concludes that multiple source of livelihood has a direct relationship on food security status while location, income and educational qualification significantly influence food security line. However, household size of the respondents has an inverse relationship on food security status. Household size should therefore be checked to keep the households on the food security line.

Keywords: Food Security, Socioeconomic Characteristics, Food Security Index, Food Consumption Score.

Introduction

Food security exists when all people at all times have access to safe nutritious food to maintain a healthy and active life (FAO, 1996). There exist four major elements in accessing food security, namely: availability, accessibility, utilization, and sustainability. While availability connotes the physical presence of a large quantity of food, accessibility implies that there is the ability to acquire the required quantity; utilization/adequacy means

sufficiency in both quantity and quality of food; and sustainability implies access at all times and not losing such access (Omonona & Agoi, 2007). Young *et al* (2001) asserts that food crisis and food related emergencies have led to malnutrition and mortality.

Different agencies and developmental projects have defined and measured the food security/insecurity status of different countries, groups and social classes. There have been analysis of the food security status of whole regions and countries; however, there is now a shift to understanding the food security state of households, for whom policies can be enacted to give effective change to the national, regional and international profile of food security issues. Whereas food self-sufficiency is a major step towards food security, it is observed that a large percentage of supposed food sufficient developing economies have food insecurity issues. According to Okuneye (2001), despite the increase in production of food in Nigeria, majority of the people in the country, most especially the rural Nigerians, are still not food-secure. In the 40s and early 50s, Nigeria did not have to contend with the problem of food insecurity. The system was able to feed her citizens and at the same time export the surplus food items. Every region of the country specialized in the production of one or two major crops, whether food or cash crops, and together the country was relatively self-sufficient in food production (Emmanuel and Adebayo, 2012). Nigeria had the groundnut pyramids in the North, the cocoa in the west, oil palm and kernel heaps in the East and the rubber plantation in the mid-west, but when oil was discovered in 1956 and exportation of it started in 1958, things started changing gradually, and later furiously around 1970. It was like declaring holiday for hoes and machetes. As oil prices went up, interest in agriculture waned which marked the beginning of decline into the abyss as a polity. The resultant effects of these are problems of malnutrition and restricted access to nutritious and sufficient food. Thus, the need for this study to examine the countrywide food security and livelihood status of Nigeria is important. This is so since national food sufficiency, which is "availability", does not necessarily translate to "access" to food, and thus brings about the issue of food poverty, which is the focus of this study.

The Food and Agricultural Organization (FAO, 2002) succinctly captures the definition of food security concept by stating that food security is a situation that exist when all people at all times have physical, social and economic access to sufficient, safe and nutritious food that meet their dietary needs and food preferences for an active and healthy life. In essence the underlying theme of the food security concept underscores the accessibility of the community's or individual's dietary needs at all times, which behooves as a moral obligation on all human beings to ensure that this topmost priority amongst the basic requisites of man is met for his survival.

Problem Statement

The volume and quality of food that people eat impacts their wellbeing. The world continues to lose ground in its efforts to end hunger, food insecurity, and malnutrition in all its forms by 2030, according to the recently-released 2022 State of Food Security and

Nutrition in the World (SOFI) report. As many as 828 million people were affected by hunger globally in 2021 (around 10.5% of the world population)—an increase of 46 million since the end of 2020 and of 150 million since the COVID-19 pandemic began a year earlier (FAO, IFAD, UNICEF, WFP and WHO (2022).

The findings of the Global Report on Food Crises (GRFC) 2023 suggest that achieving the goal of ending hunger by 2030 is ever more challenging as the population facing high levels of acute food insecurity has increased for the fourth consecutive year. Nearly 258 million people in 58 countries/territories were in Crisis or worse acute food insecurity in 2022 – up from 193 million in 53 countries/territories in 2021.

In particular, the report says, COVID-19 highlighted the fragilities of agrifood systems and inequalities within societies while driving up food insecurity and global hunger. Meanwhile, the ongoing war in Ukraine has further exacerbated food crises by disrupting international supply chains and pushing up the prices of grains, fertilizer, and energy. All of these problems have contributed to an increased average cost of a healthy diets in all regions of the world, and has also undone previous progress in increasing food security and reducing malnutrition among children. Nearly 3.1 billion people globally were unable to afford a healthy diet in 2020, a jump of 112 million from 2019 due to the continuing stresses of pandemic and war.

Pandemic fallout, conflict, and climate-related shocks such as extreme weather continue to impede food supply chains, especially in low income countries and among vulnerable populations in different parts of the world. Africa bears the heaviest regional burden, with one in five people or 20.2% of the population undernourished compared to 9.1% in Asia, 8.6% in Latin America and the Caribbean, 5.8% in Oceania, and 2.5% in Northern America and Europe combined.

In Nigeria, prolonged poor macroeconomic performance, high-level conflicts, and insecurity are among the principal drivers of food insecurity as these were aggravated by the devastating impact of the COVID-19 pandemic in recent times (Ayinde et al. 2020). Nigeria (as of 12 October 2021) has an estimated population of 209,663,744 people with 86,849,507 living in extreme poverty (64% rural and 14% urban), under the poverty threshold of USD 1.90, which is equivalent to 41% of the total population. Poverty, hunger, and food insecurity are of great concern in the rural areas in Nigeria, where a larger percentage of smallholder farming households live and carry out their farming activities. The frightening food insecurity situation in Nigeria calls for urgent humanitarian assistance, especially with the increasing number of undernourished people in the country. With Nigeria's ranking in 2012–2020 GFSI scores with infinitesimal improvement in the score from 40.9/100 in 2012 to 40.1/100 in 2020, Nigeria's 100th global rank among 113 countries and 22nd among 32 African countries captured in 2020 GFSI, Nigeria's 2020 Global Hunger Index (GHI) score of 29.2 (serious category), and percentage of undernourished in the population increasing from 9.1 in 2000 to 12.6 in 2020, Nigeria is far from on track in their lofty pursuit of achieving Sustainable Development (Otekunrin et al., 2021).

An understanding of effect of livelihood on food security is critically important to inform the formulation of policies and strategies to enhance food security and reduce vulnerability to food insecurity among Nigerians. While it has been established that previous studies on food insecurity in many developing countries have mainly focused on current food security using dataset and the econometric approach, this study used primary data collection approach on livelihood activities on multidimensional facet of food security in Atiba Local government. The primary data collection was employed to reach the resident of the selected local government in order to collect sensitive information on their livelihood activities food expenditure and income. In view of the fact that livelihood security and food security are linked in ways that are relevant to development and human well-being.

The main objectives of the study is to explore the food security and livelihood activities while the specific objectives therefore are to analyze food security status of household and the variation across the socio economic characteristics and identify various livelihood activities across household's food security measure

Given the importance of livelihood activities on food security status in Nigeria, questions that one may ask is that what is food security status of household and variation across the socio economic characteristic? What is effect of multiple livelihood activities on food security status in Atiba Local Government? Does farm households' engagement in livelihood activities improve household food security? And if so, to what extent are these effects observable amongst male and female-headed farm households?

Section 2 focuses on the literature review while section 3 focuses on methodology. Section 4 deals with result and discussion while section 5 concludes and recommends.

Literature Review

The Food and Agricultural Organization (FAO, 2014) succinctly captures the definition of food security concept by stating that food security is a situation that exist when all people at all times have physical, social and economic access to sufficient, safe and nutritious food that meet their dietary needs and food preferences for an active and healthy life. In essence the underlying theme of the food security concept underscores the accessibility of the community's or individual's dietary needs at all times, which behooves as a moral obligation on all human beings to ensure that this topmost priority amongst the basic requisites of man is met for his survival.

Food security involves more than the amount of food available. The Food and Agriculture Organization (FAO) defines food security as a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (Smith & Boutin, 2016). While food security is commonly defined as a dichotomy (either it exists or it does not), it can vary by degree, over time, from household to household, or among

communities. According to them, food security was considered largely a function of food production (Anderson & Cook 1999; Maxwell 1996; Baro & Deubel 2006).

Although there is no a single approach to measure the household food security status, accurate measurement indicator is necessary to target resources toward those most in need or at risk of sliding into hunger. Accurate measurement of household food security is also essential for effective research and well-targeted policies and programs. According to Carletto et al. (2013) a wide range of indicators are used for food security analysis and the best way is to define clearly the intended scope. The definition of food security is generally understood as a situation whereby all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (Thompson et al., 2010) There are three important components in this definition: food quantity available in the household, food quality as captured by diet diversity and stability of adequate food supplies.

Most studies try to conceptualize the food security into different way. Two conceptual components have been widely used. According to Adjimoti & Mensah (2018), the first one is to analyze food security through the set “quantity, quality and stability”. The second approach is to follow the conventional components embedded in the definition of food security which are availability, accessibility, utilization and the stability.

Food Availability, Accessibility, Utilization and Stability

Food availability is a combination of domestic food production and food stocks, commercial food imports and food aid. The term ‘availability’ is usually used in reference to food supplies at the regional or national level (Adjimoti & Mensah, 2018) At the household level, the indicators commonly used are household food production and social safety nets (food aid). Some researchers (e.g Demeke & Zeller, 2009) also suggested to use the tropical livestock unit as a determinant of the availability. Food availability refers to the physical supply of food for the household. In this study, the availability was measured by the food crop land size, the cereal landsize, the cereal production and the cereal production per capita. They all helped to estimate how much food was available in the household. Although cereal land size was already included into food crop land size, we separately considered cereal because of their contribution to the household consumption status

Food availability often remains the predominant aspect used in food security analysis and measurement. Indicators used to measure food availability include crop production and/or food production indices, livestock ownership indices, and national food balance sheets (Coates et al. 2006; Barrett 2010; Renzaho & Mellor, 2010). For instance, the FAO derives its “undernourishment” estimates from national food balance sheets (which refer to a country’s food supply) and assumptions of intra-national food distribution (De Haen et al. 2011). (Barrett 2010) to him, ‘Availability’ refers to the production, distribution, and exchange of food and can be understood as the amount, type, and quality of food available

for consumption. "Access" refers to the affordability, allocation, and reference of food and can be understood as the ability to access food of the required type, quality, and quantity. Food accessibility is the ability of the household to get food by having adequate resources, or entitlements, to acquire a sufficient quantity of food, and while consumers' purchasing power in the form of real incomes and food prices is important, entitlements are not necessarily monetary. One of the key determinants of the accessibility is the household income. The income here was measured with the agricultural production income and the non-farm income. Maxwell et al (2008). The food access is related to the household ability to acquire food; it depends on the range of food choice open to household given their income, market price and market accessibility. Two indicators have been retained here to measure the food access: income per capita and distance to market. The income per capita was calculated using the total gross household income divided by the household size.

The stability dimension deals with the fact that people's food security situation may change over the time. Therefore, the number of months without food stock was used to measure the stability

Food Utilization refers to the nutritional value, the social value, and the safety of food. It can be understood as the ability to consume and benefit from food. The availability of food is considered necessary, but not sufficient for its access, and its access is necessary, but is not sufficient for its utilization (Webb et al. 2006; Pinstup-Andersen 2009; Barrett 2010). For example, food may be available in the market, but a person may lack the funds to purchase it (food is available, but the conditions for its access are not met); or the person may have the money to purchase the food, but it may not meet nutritional requirements, as it could be spoiled or unhealthy (food is accessible, but the conditions for utilization are not met) When food is available and accessible to a household, it does not mean that the household is food secure, unless the food is nutritious, safe, and socially acceptable by the members of the household (Webb et al. 2006; Renzaho & Mellor 2010).

Determinants of food utilization include the ability to physically use the available food (e.g., having proper cooking utensils, culturally regulated feeding hierarchies, cuisine patterns, adequate housing) and the ability to biologically use the available food (e.g., absence of diarrhea or other diseases that impede biological food use, infection, etc.) (Renzaho & Mellor 2010; Vink 2012).

Food Security and Livelihoods

Food security is a multidimensional phenomenon that reflects a complex interaction of multiple stresses (e.g., political, institutional, social, biophysical, and economic) (Misselhorn 2005; Altman et al. 2009). Framing food security as an integral part or an outcome of a livelihood strategy recognizes that a host of stresses can interact to affect food security at a household or individual level.

Household-level on food security often draws on livelihood approaches. In fact, some define food security as the success of local livelihoods in guaranteeing access to sufficient food at

the household level (Devereux & Maxwell 2001). The focus of household-level food security research is to study the strategies used by people to achieve food security, whether it be migration (Karamba et al. 2011), income diversification (Babatunde and Qaim 2010), or the use of technology (Burney & Naylor 2012).

Food security can be seen as one dimension of a broader livelihood strategy Maxwell et al, (2008). In short, food security has progressed from an understanding of food security rooted in issues of world and regional food supply, to issues of household and individual food security that focus on access, sustainability, and vulnerability to food insecurity (Smith & Boutin, 2016).

Measures of Food Security

The Household Dietary Diversity Score (HDDS)

The Household Dietary Diversity Score (HDDS) was released in 2006 as part of the FANTA II Project as a population level indicator of household food access. Household dietary diversity can be described as the number of food groups consumed by a household over a given reference period, and is an important indicator of food security for many reasons. A more diversified household diet is correlated with caloric and protein adequacy, percentage of protein from animal sources, and household income (Swindale & Bilinsky, 2006). The HDDS indicator provides a glimpse of a Method of Construction. The following 12 food groups are used to calculate the HDDS indicator: cereals, roots and tubers, vegetables, fruits, meat, poultry, offal, eggs, fish and seafood, pulses, legumes, nuts, milk and milk products, oil/fats, sugar/honey and miscellaneous.

Each food group is 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 HDDS is a population-level indicator that is used as a proxy measure of household food access (Swindale & Bilinsky, 2006).

The Food Consumption Score (FCS)

The Food Consumption Score (FCS) is an index that was developed by the World Food Programme (WFP) in 1996. The FCS aggregates household-level data on the diversity and frequency of food groups consumed over the previous seven days, which is then weighted according to the relative nutritional value of the consumed food groups. For instance, food groups containing nutritionally dense foods, such as animal products, are given greater weight than those containing less nutritionally dense foods, such as tubers. Based on this score, a household's food consumption can be further classified into one of three categories: poor, borderline, or acceptable.

The food consumption score is a proxy indicator of household caloric availability. Validation studies have demonstrated that the FCS and the Household Dietary Diversity Score (HDDS) are both associated with caloric intake, as well as with each other (Coates et al., 2007; Weismann et al., 2009). While the FCS has been validated against quantity of caloric intake,

it has not been validated against adequacy of macronutrients or micronutrients (Leroy et al., 2015).

Food Group Weight are classified under main staples, pulses, vegetables, fruit, meat/fish, milk, sugar, oil. The FCS captures information about usual household diet, since it asks respondents to recall what they consumed over the past seven days. The FCS can be used in a range of ways, including for program monitoring and evaluation, and population-level targeting. 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 (HFIAS)

The Household Food Insecurity Access Scale (HFIAS) is one of the four experience-based food insecurity scales which also contains the Household Hunger Scale (HHS), the Latin American and Caribbean Food Security Scale (ELCSA), and the Food Insecurity Experience Scale (FIES). The HFIAS was developed between 2001 and 2006 by the USAID. The HFIAS has since provided the foundation for the development of the HHS, another household-level experience-based scale, which resulted from cross-country validation of the HFIAS (Ballard et al., 2011).

Like other experience-based indicators, the HFIAS is constructed from a short questionnaire that captures 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. Responses to the questionnaire enable the household to be pinpointed on a spectrum that indicates the degree of severity of insecure food access.

Theoretical Review of Literature

There are various theories used in and developed from the knowledge of the understanding of food insecurity, but according to Scanlan (2003) and Nord (2014), there are seven (7) predominant theories and they are:

- i. The Neo-Malthusian theory which analyses food insecurity from the perspective of food production (Hopfenberg 2007, Maisonet-Guzman, 2011), The Malthusian economics has articulated an arithmetic progression in food production given that the world population growth rate would be in geometric quantum. This view presupposed a dis-equilibrating scenario of shortages in food production to meet up the ever increasing population growth rate. This dis-equilibrating scenario was further articulated by the Marshalian economists who linked supply and demand in the context of time, which explains why some economists have argued that with the advent of technological improvements the gloom story as painted by Malthus would be far from achieving its postulates.

- ii. The techno-ecology theory which sees food insecurity as being caused by the improper, inadequate or nonharnessment of technology and human ingenuity for the aim of solving food production problems (Scanlan, 2003; Peters, 2007; Merlet, 2007),
- iii. The modernization theory which sees food insecurity as being the result of the lack of will of countries to modernise their infrastructure, food production system, institutions, savings, and revamp/restyle their governments as well as their educational system to one that solves problems rather than that those studies problems (Scanlan, 2003),
- iv. The dependency and world system theory which views food insecurity as a product world trade imbalance, food aid politicisation and the extent to which development goals are pursued (Tausch and Heshmati, 2010),
- v. The urbanization theory which proposes that the root cause of food insecurity is the uneven distribution of development between urban and rural areas. It believes that for food insecurity problems to be eliminated from the planet, development in the rural area have to increase at a rate greater than the rate inherent in urban areas (Azizan, Raid and Hussin, 2016; and Drebold, 2017),
- vi. The social stratification theory which posits that food insecurity is as a result of social stratification and the imbalance that comes as a result of that stratification (Safé, 2018), and
- vii. The militarisation theory which sees food insecurity as being the result of food being used as a weapon of war and a provision of help bargaining tool (Scanlan, 2003).

Empirical Review of Literature

Oke (2015) examined the determinants of national food security in Nigeria and found that the various problems encountered by the food sector in the economy include; policy ineffectiveness, high cost of production, high exchange rate, increasing population, among others. The study recommended that food security situation in Nigeria can be greatly improved upon if the cost of production in agriculture is reduced and exchange rate prevailing in the country lowered. The study also suggested that food production should be in line with the rapid population growth in order to save the country from the high rate of poverty

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 results, it was confirmed that food security has positive relationship with total income and year of experience. This study however neglects Oyo suburb.

Connolly-Boutin & Smit (2016) in their study "Climate change, food security, and livelihoods in sub-Saharan Africa" reviewed climate change impacts, vulnerability and adaptation, 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. Food security represents one of several livelihood outcomes.

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 indices 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.

A study by Zubir et al. (2018) was conducted to analyze the food security achievement among coastal fishermen in Northern Peninsular Malaysia (Kedah and Perlis,) through ownership livelihood assets. Based on Sustainable Livelihood Approach, a structured questionnaire was designed which consist livelihood assets (human, physical, finance, natural and social assets), government interventions and livelihood outcome. The smart PLS-SEM was used to evaluate the relationship between the independent and dependent variables. The results showed that physical assets, social assets, natural assets and government intervention were significantly related to food security. The study however ignores household dietary and food consumption scores.

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 et al. (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 & Kemaw (2019) also analyzed households' food insecurity and its determinants and shortage in Assosa zone, western Ethiopia. The study used 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

Sileshi et al. (2019) in their paper analyses vulnerability to food insecurity of farming households using the vulnerability as expected poverty (VEP) approach. The paper explored cross-section data collected from households in East Hararghe, Ethiopia using a multi-stage sampling procedure. The factors that influenced vulnerability to food insecurity were analyzed with feasible General Least Squares regression model. The results of analysis indicate that vulnerability to food insecurity is positively related with the age of household head, and family size and negatively related with access to improved seeds, adoption of soil and water conservation, size of cultivated land, and access to credits. Based on the intensity of their vulnerability, households were grouped as chronic food insecure (24.27%), transient food insecure (11.77%), highly vulnerable- food secure (18.38%), and low vulnerable-food secure (45.59%). Overall, about 54% of households were categorized as vulnerable to food insecurity

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 was 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.

Mohammed (2020) analyzed food insecurity among rural households in Mopamuro local government areas of Kogi State, Nigeria and specifically described the socio-economic characteristics of rural household heads, determined the food insecurity status of the respondents, identified the effect of food insecurity of rural households and identified the coping strategies of the rural household towards food insecurity in the study area. A two-stage sampling technique was used to collect qualitative and quantitative data from 112 household heads using a questionnaire. Data collected were analyzed using descriptive statistics and a food security index (FSI). The findings revealed that 76 % of the household head were male and 93 % were married with a mean household size of 8 persons. The mean per capita food expenditure per month was estimated to be ₦22,388.00 and the 2/3 mean per capita food expenditure for the entire household was ₦14,925.00; sixty-four percent of the households were food insecure. Buying food on credit, no food at home amongst others were the effects of food insecurity among households. Strategies adopted to cope with food insecurity include a reduction in quality of food eaten, buying food on credit, and reduction of adult food intake.

Tuholske et al (2020) used data from a 2017 survey (n = 668) of low- and middle-income residents of Accra, Ghana, to characterize and compare the predictors of household-level

food security using three established metrics: the Household Food Insecurity Access Scale (HFIAS); the Household Food Insecurity Access Prevalence (HFIAP); and the Food Consumption Score (FCS). According to HFIAP, 70% of sampled households are food insecure, but only 2% fall below acceptable thresholds measured by FCS. Only one household reported sourcing food from modern supermarkets and fewer than 3% produce food for consumption through gardening, farming, or fishing. Instead, households rely on purchased food from traditional markets, local stalls and kiosks, and street hawkers. Results from a suite of general linear models show that household assets, education, and demographic characteristics are significantly associated with food security outcomes according to HFIAS and HFIAP. The poor correlation and weak model agreement between dietary recall such as FCS, and experience-based food security metrics, like HFIAS and HFIAP, highlight limitations of employing historically rural-centric food security measurement approaches within the urban context.

Danso-Abbeam et al (2021) examined household food security and its determinants in the rural areas of Southern and Northern provinces of Rwanda. Using cross-sectional data collected from 534 farming households, they estimated household food security status by Food Consumption Score (FCS) and Food Insecurity Experience Scale (FIES) and applied ordered Probit model to identify drivers of household food security. The results indicated that a significant proportion (74.4%) of households had an acceptable FCS, but 36.52% of the farming households experienced moderate and severe food insecurity when assessed with FIES. Ownership of livestock was identified as a key determinant of food security using both metrics, which affirms the importance of combating hunger and food insecurity in Rwanda through their 'one cow per household policy'. They therefore recommended that this policy be strengthened.

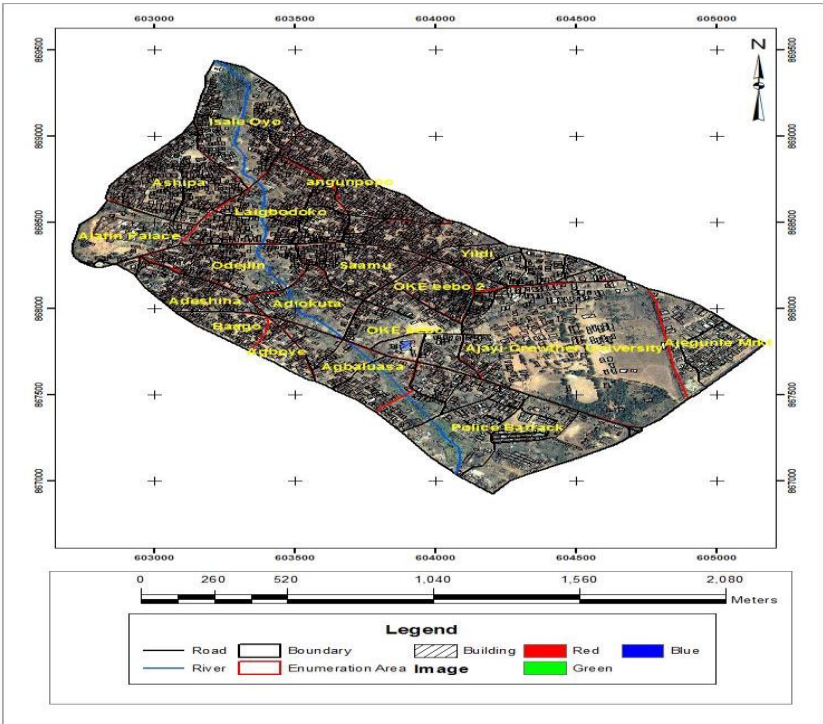
Lelimo et al (2021) investigated the relationship between a household's decision to supply labour for non-farm work and the determinants of food security in rural Lesotho households. They made use of a microdata set from the 2017 Lesotho-Household Budget Survey (HBS) that includes 2825 randomly selected rural households. Heckman's two-stage model, which uses the logit model to estimate participation in the first stage and the Ordinary Least Square (OLS) regression model in the second stage, was used to provide empirical results in the paper. According to the findings, approximately 66 percent of rural households worked in the non-farm sector during the study period. Aside from ecological zones, which have a 5% significance level, gender, education, and age of the household head, household size, non-farm income, and transfers are other factors determining the level of food security in rural non-farm participating households, with a 10% significance level. The higher participation rate in nonfarm work suggests that households are looking for additional income to compensate for the decline in food security. As a result, it is recommended that policies and strategies focus on improving and enhancing non-farming activities by households in order to improve rural development and reduce poverty in rural communities.

Ojoko et al (2021) looked at the factors that influenced the food security status of cabbage farmers in Katsina metropolis, Katsina State. A multi-stage sampling technique was used to randomly select 100 registered cabbage farmers. The analytical tools used include descriptive statistics, coping strategy index and ordered probit model. Results of the socio-economic characteristics indicated that the average age of cabbage farmers was 44 years, 11 years of farming experience, farm size of 1.5 hectares and household size of 9 persons, while 46% had post-primary education. The coping strategy index results showed that 76% of the cabbage farmers were food secure, 18% less food insecure, 5% moderately food insecure and 1% severely food insecure. The ordered probit regression estimates revealed that output of cabbage positively and significantly ($p < 0.01$) affected food security status of the cabbage farmers while involvement in off-farm activities and farm size had negative but significant effect ($p < 0.01$) on food security status of the cabbage farmers. The marginal effect result showed that a 1% increase in cabbage output significantly ($p < 0.01$) increased the probability of cabbage farmers being food secure by 0.002%, while a 1% increase in involvement in off-farm activities and farm size decreased the probability of the cabbage farmers being food secure by 22.70% and 27.23% respectively. It was therefore, recommended that stakeholders in the agricultural sector should provide productive resources for increased productivity, which will subsequently enhance the farmers' income and improved their food security status.

Methodology

This study is a survey-based quantitative case study that is consistent with a deductive approach. It is a case study, concentrating on livelihood activities and food security in Nigeria. This research explores the dietary diversity, food consumption items and livelihood activities in the Atiba Local Government area of Oyo State Nigeria, and is thus also a descriptive study.

As a result of the large size of the state and the large number of existing household; limited time and for easy coverage, the study area was carried out in Atiba Local Government of Oyo State. It is situated in the southwestern part of Nigeria and northeastern part of Oyo state. 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 of 166,413.569 hectares with a population figure of 168,246 (NPC, 2006) areas.



Map 1: Map of Nigeria, Oyo State and Atiba Local Government Area

Source: Urban and Regional Department, Atiba Local Government

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. A population size of 160 respondents was used to help analyze data from the questionnaires. The study population consist of the households in ten wards of Atiba Local Government

A multistage sampling technique was adopted in selecting the respondents. The first stage involves 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 make a total number of one hundred and sixty (160) household heads.

The instrument that was used for this research is a structured questionnaire that follows four point Likert scale to gather necessary information from the participants. The questionnaire is divided into four sections. The first section requires the personal data of the respondents and Section two contains perception on food item consumed, food security index, livelihood activities and livelihood assessment. Four-point Likert item responses was also employed.

Data was analyzed using descriptive statistics and logistic regression. The descriptive statistics such as frequency, percentage and mean was used to describe the socio-economic

characteristics of respondents. Inferential statistics used for the analysis also include food security index and logistic regression model.

The reliability is ability of the instrument to give consistent results after a number of repeated trials. 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.

Results and Discussions

Socio-Economic Characteristics of Households

Table 1 presents the socio-economic characteristics of the sampled households, cutting across gender composition, age structure, and educational attainment, and marital status of household heads. Table 1 shows that 18% of the respondents were less than 30 years, the majority (71%) of household heads were found to be within the ages of 31 and 50 years, 9% were of 51 – 64 age cohort while household head between the ages of above 65 constituted 2%. Additionally, the proportion of the aged, which is 65 years old and beyond constitutes about 9 percent. Mean ages for all household heads was 40 years implying that households are headed by relatively younger adults. 38.05% were females while males constituted larger percentage of the respondent (61.95%). 60 percent of household heads were married, 1 percent were widowed, 12 percent were divorced or separated and 27 percent were single, it implies that most of the respondents were married and have a sense of responsibility. The findings also show that 6.6% had primary school leaving certificates, 3.77% had Grade II certificate, 4.72 were with SSCE, 2.83% were with NCE and OND results respectively, 22.64% were with HND, 27.36% were with BSC, 16.98% were with MSC while less than 1% had PhD qualification.

From the study, 27.93 percent of the respondents had a household size of between 1-3 members, 61.26% percent of the respondents were within the household size of 3-5 members while 10.81% have a household size of 6 and above. This implies that most of the respondents had a household size of 5-8 as the population to feed. It has been established in several studies in developing countries (Mwabu 2002) that small-sized households are less prone to food insecurity and poverty than large-sized households because the income per capita (a measure of wellbeing status) of the former is usually larger than that of the latter. The study of Sani & Kemaw (2019) also revealed that that family size and age of the household head affect the extent of household's food security; meanwhile, access to irrigation, farm income, distance to market, and access to credit negatively affected the extent of households' food insecurity which to large extent justifies the findings of this study. This result also shows that forty percent of the respondents are members of a cooperative association while forty are engaging in traditional savings and seventy percent do not obtain credit and they rely on their income, while 27 percent of respondents obtain credit to be food secured.

Out of the total respondents, 17.70 % were from Ajayi Crowther, 15% from the Ori Awo area, 16.81 from the Agunpopo area, 17.7% from Oke Afin, while 15.93% were from Atiba Local Government Schemes and Tokun village respectively.

Using quintal approach, 20.62% were from the poorest group, 26.8% were poor, 15.46 were from the middle-income group, 22.63 were rich while 14.43 were the richest. Those respondent that has one source of livelihood were 16.81%, those with 2-3 livelihood activities were 26.55% and those 4-5 were 27.43% while those with 6 and above sources of income constituted 33% of the total respondent.

Table 1: Descriptive statistics of socio-economic characteristics of respondents

Socio Economic Characteristics	Frequency	Percentage
Age		
≤ 30	18	18.00
31 – 50	71	71.00
51 – 64	9	9.00
≥ 65	2	2.00
Gender		
Female	43	38.05
Male	70	61.95
Marital Status		
Single	32	27.00
Married	72	60.00
Divorced/Separated	14	12.00
Widow	2	1.00
Educational level		
Primary certificate	7	6.6
Grade 2	4	3.77
SSCE	5	4.72
NCE	3	2.83
OND	3	2.83
HND	24	22.64
BSC	29	27.36
MSC	18	16.98
PHD	1	0.94
Others	12	11.32

Household size		
<3	31	27.93
3 - 5	68	61.26
≥6	12	10.81
Member of Coop		
Yes	49	40.80
No	70	58.30
Member of Savings Group		
Yes	48	40.00
No	64	53.00
Member of social Network		
Yes	50	41.70
No	68	56.70
Access to Bank Credit		
Yes	33	27.00
No	84	70.00
Geographical Location		
Ajayi Crowther	20	17.70
Ori Awo	18	15.93
Agunpopo	19	16.81
OkeAfin	20	17.70
Atiba	18	15.93
Tokun	18	15.93
Income groups		
Poorest	20	20.62
Poor	26	26.80
Middle	15	15.46
Rich	22	22.68
Richest	14	14.43

Income sources		
1	19	16.81
2-3	16.81	26.55
4-5	30	27.43
6 and above	31	33

Source: Field Survey 2021

Discussion of Results and Findings

Analysis of food security status of households and the variation across the socio-economic characteristics of households.

Food security in this study is examined using various measures since food security is a multi-dimensional concept. The measures include (1) Household Dietary Diversity Score (HDDS), (2) Household Food Consumption (FC), (3) Household Food Insecurity Access Score (HFIAS), and (4) Household Livelihood Conditions (HLC). A four-point Likert scale weighted from 1 to 4 points was used to elicit household responses across all the food security measures listed above. Mean responses were estimated and used as a threshold to delineate household food security status into a binary measure of (1) More Food Secure (MFS) and (0) Less Food Secure (LFS)

Distribution of the Dietary Diversity of Households across Four-Point Likert Scale Responses

Table 2 presents the distribution of the dietary diversity of households across four-point Likert scale responses. From Table 2, there are 15 food items in the dietary composition of households. These food items are cereal, tubers, vitamin, leaf vegetable, other leafy vegetables, fruits and vegetables, organ meat, flesh meat, eggs, sea fish, legume, milk, oil fat, sweet, and spices. From Table 2, 67% of households consumed cereal food very often while 5% consumed cereal food very rarely. On average, the mean value of the Likert scale response point for cereal estimated at 3.53 shows that respondents often consume cereal. 35.4% consumed tubers very often while 1.77% consume tubers very rarely, the mean value of the Likert scale responses point for tuber estimated at 3.11 shows that respondents often consume tubers. Also from table 2, 20% consume vitamins very often while 14% consume vitamins very rarely and the average, mean score of 2.57 depicts that respondents rarely consume vitamins.

Very often 14% of the respondent consume flesh meat and 8% consume meat very rarely. On average, the mean value of the Likert scale responses point for meat estimated at 2.6 indicates that respondents rarely consume meat. From table 2 also, 32% of households consumed sea fish very often, while 5% consumed fish very rarely. On average, the mean value of the Likert scale response point for fish estimated at 3.02 shows that households often consumed fish.

Table 2: Mean Distribution of Household dietary diversity across Four points Likert Scale responses in frequencies and Percentage

HDDS measure	Very rarely (freq/%)	Rarely (freq/%)	Often (freq/%)	Very often (freq/%)	Mean
Cereal	6(5.36)	3(2.68)	28 (25.00)	75(66.96)	3.54
Tubers	2(1.77)	23(20.40)	48(42.50)	40(35.40)	3.12
Vitamin	16(14.20)	38(33.63)	37(32.74)	22(19.47)	2.58
Leaf Vegetable	18(15.93)	16(14.16)	31(27.43)	48(42.48)	2.96
Other Leafy Vegetable	3(2.75)	8(7.34)	46(42.20)	52(47.71)	3.35
fruits and vegetables	2(1.77)	40(35.40)	52(46.02)	19(16.81)	2.78
Organ Meat	17(15.89)	37(34.58)	34(31.78)	19(17.76)	2.51
Flesh Meat	9(8.04)	41(36.61)	46(41.07)	16(14.29)	2.62
Eggs	6(5.31)	26(23.01)	54(47.79)	27(23.89)	2.90
Sea Fish	5(4.90)	20(19.61)	44(43.14)	33(32.35)	3.03
Legumes	8(7.08)	42(37.17)	31(27.43)	32(28.32)	2.77
Milk	11(9.73)	41(36.28)	35(30.97)	26(23.01)	2.67
Oil Fat	20(17.70)	15(13.27)	53(46.90)	25(22.12)	2.73
Sweet	23(20.35)	13(11.50)	44(38.94)	33(29.20)	2.77
Spices	14(12.84)	35(32.11)	28(25.69)	32(29.36)	2.72

Source: Field Survey 2021

Food consumption Score

Table 3 shows the mean distribution of food consumption items of households across four points Likert scale responses. From Table 3, 88.50 percent of the respondents consume staple food very often and often. The mean value of 3.53 shows that respondents often consume staple food. 88.39 percent of the respondents consume vegetables, 77.98 percent of the respondents consume vitamin components, the mean value of 3.00 shows that respondents often consume meat or fish, a mean value of 2.73, 2.76, 2.71, 2.61, 2.51, 2.61, 2.57 clearly shows that respondent rarely consumes oil and fat, sweet, spices, fresh meat, milk, organ meat, and vitamin respectively while the mean value of 3.53, 3.11, 3.34, 3.34, shows that most of the respondents often consume cereal, tubers, vegetables, and fish. This implies that most of the respondents consume rice, maize, bread, yam, potatoes, white cassava (other food made from roots), vegetables, and fresh or dried fish more than any other food items listed below in an attempt to be food secure.

Table 3 Mean distribution of Food consumption items across four points Likert scale responses by households

Food Group	Very rarely (freq/%)	Rarely (freq/%)	Often (freq/%)	Very often (freq/%)	Mean
Staple food	9(7.96)	4(3.54)	41(36.28)	59(52.21)	3.33
Vegetable	8(7.14)	5(4.46)	43(38.39)	56(50)	3.31

Fruit	3(2.75)	21(19.27)	50(45.87)	35(32.11)	3.07
Meat fish	6(5.41)	21(18.92)	50(45.05)	34(30.63)	3.01
Milk	10(8.85)	35(30.97)	41(30.97)	27(23.89)	2.75
Oil	12(10.91)	13(11.82)	53(48.18)	32(29.09)	2.95
Sugar	26(23.64)	36(32.73)	24(21.82)	24(21.82)	2.41
Condiment	28(24.78)	45(39.82)	23(20.35)	17(15.04)	2.26

Source: Field Survey 2021

Household Food Insecurity Status by Food Security Measures

Table 4 presents the percentage mean distribution of household food security status by the various food security measures. From Table 4.4., and using household dietary as food security measure 41.51% of the respondents were less food secured while 58.41% are more food secured. Using food consumption score, 53.10% of the respondents were less food secure while 46.90% were more food secure, Household Food Insecurity Access Scale and Sustainable livelihood conditions show that 55.75 of the respondents were less food secure and 44.25 were more food secure respectively.

Table 4. Mean percentage distribution of Household Food Security Status by various Measures.

Food Security Measures	Household Food Security Status	
	Less Food Secure (LFS)	More Food Secure (MFS)
Household Dietary Diversity Score (HDDS)	41.51	58.41
Food Consumption Score (FCS)	53.10	46.90
Household Food Insecurity Access Score (HFIAS)	55.75	44.25
Household Sustainable Livelihood Conditions (SLFC)	55.75	44.25

Source: Field Survey 2021

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

Table 5. Socio-economic characteristics and food security status variation across food security measures

Variables	Food Security Measures							
	HDDS		FCS		HFIAS		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
Education								
SSCE	80.00	20.00	80.00	20.00	80.00	20.00	80.00	20.00
NCE	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00
OND	66.67	33.33	66.67	33.33	100.00	0.00	100.00	0.00
HND	58.33	41.67	79.17	20.83	45.83	54.17	45.83	54.17
BSC	48.28	51.72	41.38	58.62	44.83	55.17	44.83	55.17
MSC	55.56	44.44	77.78	22.22	77.78	22.22	77.78	22.22
PHD	0.00	100.00	100.00	0.00	0.00	100.00	0.00	100.00
Household Size								
1-4	63.27	36.73	79.59	20.41	55.10	44.90	42.86	57.14
5-8	50.00	50.00	56.45	43.55	54.84	45.16	64.52	35.48
Age								
≤30	64.29	35.71	75.00	25.00	71.43	28.57	53.57	46.43
31-50	48.39	51.61	64.52	35.48	51.61	48.39	59.68	40.32
51-64	100.00	0.00	87.50	12.50	37.50	62.50	37.50	62.50
≥ 65	0.00	100.00	0.00	100.00	100.00	0.00	0.00	100.00
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 5 above shows that Ajayi Crowther respondent with 55.00 percent using the HDDS approach, 75.00 percent using FCS and HFAIS respectively and 80.00 percent using SLC this is kneely 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 below. A larger percentage of respondents in Tokun Village were more food secure while the majority of people in Atiba were less food secure. HDDS measure 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. Using FCS, majority of the respondents were less food secure while HFAIS also complement HDDS to prove that respondents in Ajayi Crowther community were more food secure while other locations were food insecure.

Using education level as a parameter, the respondents with Ph.D. were found to be 100 percent more food secure across the food security measures (HDDS, FCS, HFIAS, and SLFC). Using the four measures of food security, eighty (80%) percent of the respondents with SSCE were found to be less food secure. This implies that education level affects food security status. These findings justify the study of Sidique & Muhammad (2019) which revealed that education has a positive influence on food security while age, household size, and gender influence food security negatively. Their work is affirmed in this study with 63.27 percent of the respondents whose household size range 1-3 were found to be less food secure using HDDS while 79.53 percent were less food secure using the Food Consumption Score. 50 percent and 56.45 percent of those with household size range 4- 8 were less food secure using HDDS and FCS respectively. This shows that household size does not determine the food security line of a household.

100 percent of the respondents in the age range of 65 and above were more using all measure indexes food secure. 51.61 percent of those in age range 31- 50 were less food secure using FCS and HFAIS measures. Food consumption score shows that 75.00 and 64.52 of respondents of age less than 30 years and 31- 50 years were also less food secure. This is a pointer to the show that age is not significant in determining food security lines. The result of the findings conforms to the work of Sidique & Muhammad (2019) which revealed that education has a positive influence on food security while age, household size, and gender influence food security negatively.

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 Northeastern Nigeria and Manlosa, Hanspach, Schultner, Dorresteyn, & Fischer (2019) in their study, Livelihood strategies, capital assets, and food security in rural Southwest Ethiopia which 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 5 above 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. HDDS measure reveals that household headed by female were more food secured than male with 53% against 40% male respondents. Using FCS measure, 56% of the female headed household were more food secured as against 49% male. The SLFC measure however reveals that male headed household were more food secure than their male counterparts. This disparity in food consumption is not in line with the claims articulated by Assenso-Okere 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.

Conclusions and Recommendations

This study examines the effects of livelihood activities on household food security status in Atiba Local Government Area of Oyo state. 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.

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:

1. Households should acquire better education that will help them with their various livelihood activities.
2. Retirees should be socially protected to be food secure.
3. There should be increased investment in rural infrastructure to improve access to market, knowledge, particularly among low income earners.
4. Household heads should always control their family size or the dependents they have in their family to ascertain food security. This will be possible through awareness and sensitization programs by both the government and non-governmental organizations to provide family planning knowledge and education for rural households.
5. The households' heads should be encouraged to involve in more income diversified activities in order to improve their livelihood.
6. Also, the findings in this study suggest that channeling investment to the formal educational sector will boost possibility of households to come out of food insecurity, and in the long run have a multiplier effect on helping developing countries meet the Sustainable Development Goals of achieving a well-informed society that is free from hunger, poverty and improved nutrition.

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