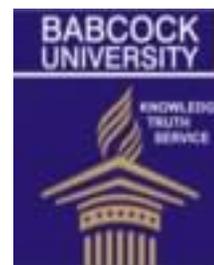




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Evaluation of women contribution to household food security in Oyo State, Nigeria

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Abstract

Women make essential contributions to economic developments, household income and food security. They remain the invisible workforce in global production chains, where they dominate as house workers and temporary labour. This paper examines the contribution of the female spouse to household food security in Oyo State, Nigeria. Data were obtained from 115 respondents in three local government areas of Oyo State, Nigeria. Descriptive statistics were used to profile the socio-economic characteristics of sampled households, the working-Leser specification of the almost ideal demand system (AIDS) model was adapted to determine the share of the female spouse in household's food expenditure, while the logit regression model was used to estimate the determinants of food security among the surveyed households. About 60% of the surveyed households were engaged in farming, and having mean household size and income of 5 members and ₦49,739 respectively. From the logit results, farm size (0.908, $p < 0.1$), monthly income (2.258, $p < 0.1$), and household involvement in farming (3.979, $p < 0.5$) were found to significantly increased households' food security status, while large household size (-1.388, $p < 0.01$) and dependency ratio (-2.900, $p < 0.1$) reduced it. Total food consumption expenditure, age and household size significantly influenced female spouse's contribution to food prepared at home, food eaten away from home and food prepared at home but eaten outside the home. Enacting policies that will improve on households' access to farmland and increased income were recommended to further enable the female spouse impact more on the food security status of the households.

Keywords: Female spouse; food security; households

Introduction

The matrix of food security raises complex questions about how global food sufficiency can adequately and sustainably respond to household food insufficiency in the developing world. Food is a basic necessity of life. Its importance, at the household level, is obvious since it is a basic means of sustenance. In view of the importance of food in man's life, food is rated as the most basic of all human needs. Man needs food for life's sustenance, prevention of sickness and in providing energy for the normal psychological activities of the body including the normal state of mind. Hence, the need for food security becomes pertinent as it eventually affects a nation's productivity and growth (Devereux, 2006). Perhaps, it can be argued that when Mahatma Ghandi affirmed early in the twentieth century that "the world has enough for everyone's need, but not enough for everyone's greed," he had neither the benefit of facts and figure nor was he only concerned with food.

Food security has been defined by Doocy and Burnham (2006) as "access by all people at all times to enough food for an active healthy life, which essential elements are the availability of food and the ability to acquire it." Recasting the two essential elements of food security in simpler terms, it becomes clear that food security entails "ensuring that adequate food supplies are available and households whose members suffer from under-nutrition have the ability to acquire food, either by producing it themselves or by being able to purchase it". At the household level, four dimensions need to be measured to identify food security status. These are: the *quantity of food*, that is, the repleteness of household stores; *the quality of food*, that is, the nutritional value and safety of available foods; the *psychological acceptability* of food, that is, assurance that food is culturally acceptable and obtained without anxiety about supplies; and the *social acceptability* of food, that is, the foods have been obtained from socially acceptable sources and (or) production processes (Johnson, 1992). The relevance of gender as a strong determining factor in the food security matrix is underscored by the proximate impact of socio-economic and demographic variables such as household structure and headship, employment type, wage rates, price ratios, as well as gender role segregation in food production and provision, among others.

In Nigeria, despite projects, programmes and policies targeted at reducing the problem of food insecurity and poverty, the country ranked 156 out of 187 countries and territories on the Human Development Index (HDI) and 18th on the Global Hunger Index (GHI) of 81 countries with a GHI of 15.5 indicating a serious

hunger situation (UNDP, 2011). Escobal (2001) had argued that one of the fundamental causes of poverty, high income inequality, and food insecurity among rural households is insufficient and unequal access to and possession of assets among the teeming competitors for agricultural resource use, especially land. In this respect, improving the asset base of the poor and raising the rate of returns of the assets they possess are key elements of any strategy that aims at improving the livelihoods of the rural poor and earning them unhindered access to food security through own food production (Riggs, 2006).

Nigeria was accessed to be self-sufficient in food production prior to the discovery of crude oil in commercial quantities in the late 1950s. In recent times however, the situation of food insecurity in Nigeria has become a major area of concern to stakeholders at the various levels of governance, as growth in food demand had incessantly kept pace with rapid population explosion without a corresponding domestic food production to take care of this a sporadic demand (Abdullahi, 2010). The fortune from the exploration of crude oil which should have been used to galvanize the agricultural sector was instead diverted to private purse, thereby making the sector to be stagnant while the country largely diverts attention from agriculture as the mainstay of the economy and source of external reserve to a mono-sectoral economy dependent on crude oil. It is rather an irony of fate that though Nigeria is endowed with abundant resources (human and natural), including vast fertile land for farming, that is, about 23% (21 million hectares) arable land, only 0.9 million hectares (1%) is under permanent cultivation (Tiamiyu *et al.*, 2009). As a result of this, the country witnessed a rapid decline in agriculture, both in the share of the Gross Domestic Product (GDP) and absolute terms. Therefore, the Nigerian government had resorted to food importation over the past years as the only antidote to arrest the impending acute food shortage.

Recent evidence clearly shows that rural households are involved in a range of economic activities and that agriculture production, though very key to the economic potentials of the rural populace, may however not be the sole, or in some cases, the main activity of the rural poor (Haggblade *et al.*, 2007). This claim further underscores the important role of the women folk in fostering household income and food security potentials especially through agricultural value addition (Davies, *et al.*, 2007). This livelihoods approach recognizes that households use a range of assets in a variety of activities, both agricultural and non-agricultural, as part of a livelihood strategy and

accepts that there are multiple paths to improving welfare (Ellis, 1998).

Amid the current debates around hunger, food security and nutrition, some international development experts are calling for the 'gender gap' to be closed. For instance, the FAO (2013) report has revealed that farm yields increase by up to 30 per cent if women are given the same access to productive resources, markets and technologies as men. Argued on the basis of its essentials, therefore, women's role in food security takes two broad specific dimensions, namely food production and food procurement. While food availability is directly correlated with food production, the ability to acquire food falls within the purview of food procurement (Keng and Lin, 2005). This study profiled households on the basis of their food security status, as well as examined the share of women in household food expenditure. The socio-economic factors influencing the determinants of food security among the households were also estimated using a regression technique.

Objectives of the study

The broad objective of this study was to evaluate the contribution of women to household food security in Oyo State, Nigeria. Specifically, the study:

- i). examined households' socio-economic and food security status;
- ii). analysed the share of the female spouse in households' food expenditure; and
- iii). estimated the determinants of food security among the surveyed households.

Literature review and conceptual framework

World's Bank interest in poverty and hunger has made significant the issue of food security as a household concept that helps to foster an integrated approach to food and nutrition problems. A World Bank (2000) study defines food security as "access by all people at all times to enough food for an active healthy life". According to this study, the essential elements of food security are the availability of food and the ability to acquire it. Recasting these elements of food security in simpler terms, it becomes clear that food security entails efforts at "ensuring that adequate food supplies are available and households whose members suffer from under-nutrition have the ability to acquire food,

either by producing it themselves or by being able to purchase it" (World Bank, 2000).

Gender-based labour division is also recognized as major cause of food insecurity. A study conducted in Lesotho village found that women and children suffered from lack of food and hygiene because women were too exhausted to cook and engage in other domestic work at the of peak agricultural activities (Degafa, 2002). Whether in the sphere of production or procurement and irrespective of points of overlap, measurable differences in the activities of men and women to ensure household food security have been observed. Argued on the basis of its essentials, therefore, women's role in food security takes two broad specific dimensions, viz. food production and food procurement. While food availability is directly correlated with food production, the ability to acquire food falls within the purview of food procurement. However, a study by Keshav (2006) shows that commonly used indicators of food security at the regional, national level or community level is often poor predictors of household food security status.

Food security is understood as adequacy of food supply at global and national levels until the mid-1970. This view favoured merely food production oriented variables and overlooked the multiple forces which in many ways affect food access. Evidences show that during the last two decades, food production has been increasing in the world. However, large amount of food at global level does not guarantee food security at national level. Moreover, availability of enough food at national level does not necessarily ensure household food security.

Barriers to market, such as poor infrastructure, market standards, limited information, and requirements for large initial capital investments, limited product differentiation, and handicapping policies are major causes of food insecurity in Africa (Idrisa, *et al.* 2008; Keller, 2010). Adequate infrastructure, especially main and feeder roads that improve access to necessary input-fertilizer, seed, pesticide chemicals and other agricultural implements are very indispensable (Osman, 2003). World Bank (2000) reported that due to lack of proper and on time transportation facilities post-harvest total production loss reached up to 30%. Generally, as indicated in many literatures, inadequate infrastructures and social services development such as road, transportation,

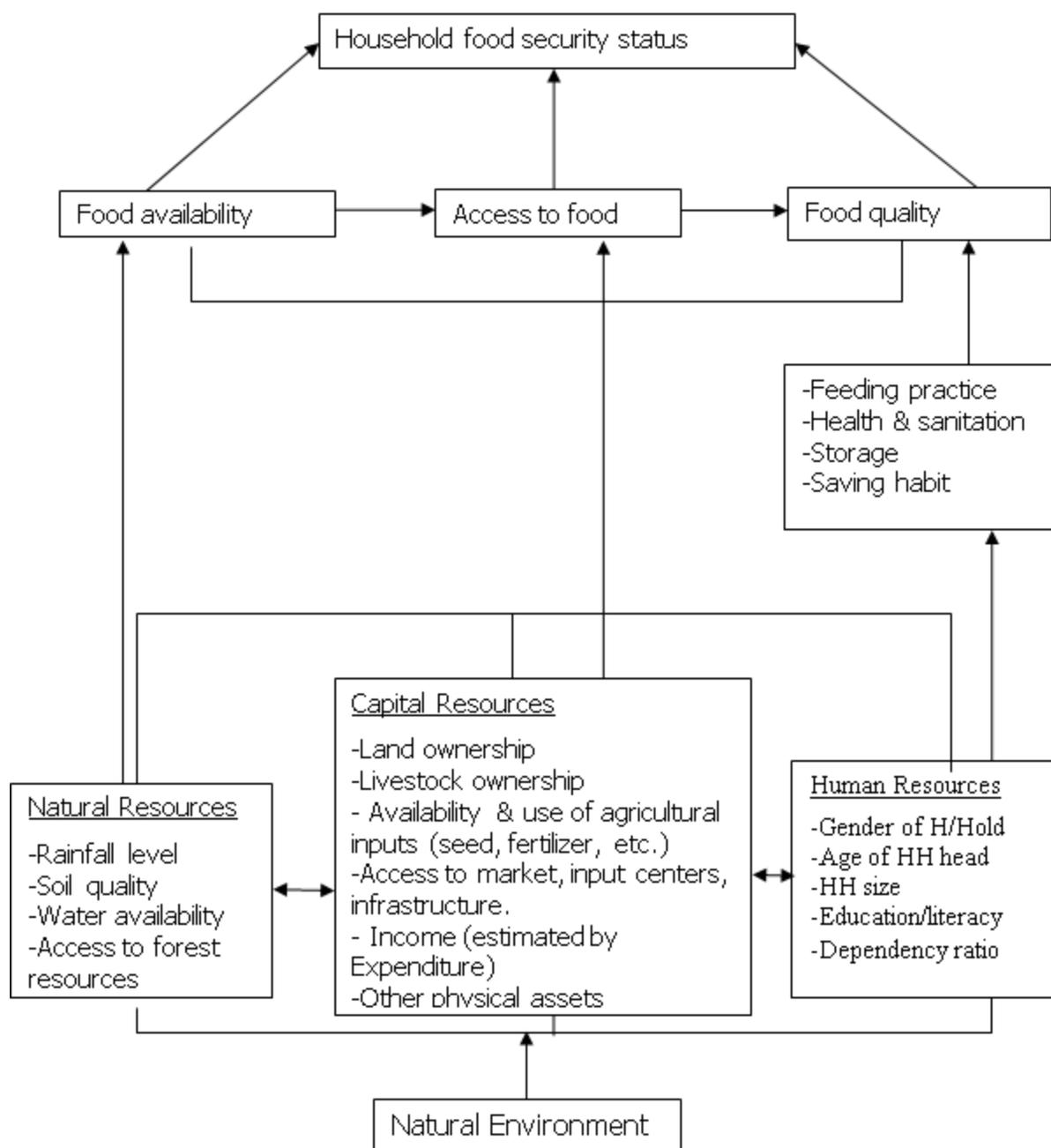


Figure 1. Conceptual framework on households' food security status
 Source: Adapted from Fank *et al.* (1999) and Majda (2000).

communication, electrification, education and health services and agricultural services would be major challenges to sustain the growth of agricultural production and food security.

Climate is one of the important elements of the natural environment that positively or negatively affects the food security status of rural households.

The combined effect of land based resources degradation like deforestation, soil erosion, flooding, and loss of agricultural and pasture land leads to production decline (Lord-Mallam, 2006) while rapid population growth and recurrent drought also cause serious resource degradation (Maduagwu, 2005). Fitsum *et al.* (2002) had argued that the seriousness of

shortage of productive (fertile) land in the highland areas, coupled with population pressure, have forced the cultivation of the steep and moderate slopes which are highly degraded because of soil erosion. For instance, a study by Boussard *et al.* (2005) found that 99% of the food in Sub-Saharan Africa is grown under rain fed agriculture.

Farm equipment's and basic infrastructure are among the physical capitals that influence the day-to-day activities of rural households as producers and consumers. Olumakaiye and Ajayi (2006) observed that ownership of machinery and equipment enables households to raise labour and land productivity and is especially helpful for households with relatively high opportunity costs for labour, such as those pursuing off-farm employments. Also, study by Kidane *et al.* (2005) concluded that the shift from non-fertilizer user to fertilizer user increased the probability of food security from 34% to 44%. Educational attainment by the household head and the female spouse could lead to awareness of the possible advantages of modernizing agriculture by means of technological inputs; enabling them to read instructions on fertilizer packs and diversification of household incomes. Socio-cultural events such as eating habit and food preference, cultural ceremonies and festivals also influence the food security status of the household, and the female spouse plays a major role at influencing household's expenditure in this respect. Also, access of the female spouse to natural, physical and capital resources (e.g, land, agricultural inputs, market and enhanced income base) would enhance overall household's food supply (Kidane *et al.*, 2005) and in turn influence the participation (share) of women in household food security actualisation.

Women's role in food production and household food security

Women's role in the economy is always being underestimated and their contributions to agricultural productions has often remained invisible. While policy makers have often targeted women in their health and nutrition programmes, they have little concern for them as co-performers in the socio-economic transformation of their various households. Substantial food production is the first pillar of food security and in most developing nations, millions of women work as farmers and agro-processors thus contributing to national agricultural outputs and family food security. These contributions they make despite the unequal access to productive assets and market information.

Research evidences abound (e.g, Ruel, 2002; Hoddinott and Yoahannes, 2002; Sarah, 2003) to suggest that if male-female access to inputs are less unequal, substantial growth in agricultural outputs

would occur, benefitting both men and women and their entire households. A Food and Agriculture Organisation (FAO, 1994) report observed that women account for more than half the labour required to produce the food consumed in the developing world, and perhaps three-fourths in Sub-Sahara Africa (Quisumbing, 1994). Aggregate economic data also suggest that African women perform about 90 percent of the work of food crop processing and providing household water and fuelwood; 80 percent of the work of food storage and transport from farm to village; 90 percent of the work of hoeing and weeding; and 60 percent of the work of harvesting and marketing (Hopkins *et al.*, 1994).

Methodology

The area of study, data source and sampling technique

The study was carried out in Oyo State, located in the south-western zone of Nigeria. Oyo state is located in the forest Savannah, with citizens mainly of the Yoruba dialect, who are predominantly farmers growing yam, cassava, maize, and melon in appreciable quantities. Most of the female spouses of the arable crop farmers are mainly involved in crop processing for home consumption and local export to neighbouring states through major markets in the state, prominent among which is Bodija market located at the capital city of Ibadan. Most of the women belong to one form of cooperative organization or the other to enhance their productive capital base.

Multistage, purposive and random sampling techniques were adopted for the study. Stage one was the selection of Oyo State in the south-western zone of Nigeria. In stage two, four (4) Local Government Areas (LGAs) were purposively selected for the prevalence of rural families who are actively engaged in economic/agricultural activities, treating each LGA as a cluster. At the third stage, nine (9) communities were selected proportionate to the size of each of the LGAs, three from Ona-Ara L.G.A (namely Badeku, Akanran, and Olunloyo/Olorunsogo); two from Orile L.G.A (Aba-Oba and Aba-Oyo); two from Saki L.G.A (Ago-Oluwabi and Idi-Apa); and two from Surulere L.G.A (Ajase and Asileke). At the last stage, thirteen (13) households were drawn from each of the nine communities (proportionate to size) making a total sample size of 117, out of which two questionnaires was eventually discarded for incomplete information. Structured questionnaire were administered on the selected female spouses to elicit relevant information bordering on household's socio-economic characteristics, employment status, share of household income and expenditure, among others.

Analytical techniques

Descriptive statistics involving frequency and percentage tables were used to describe respondents/households' socio-economic characteristics (including age, marital status, education, and family size, etc) while food security index (FSI) was used to establish the food security status of the various households.

Share of female spouse in households' food expenditure

The working-Leser specification of the almost ideal demand system (AIDS) model was adapted in this study to determine the share of the female spouse in household's food expenditure, but extended to capture the effect of specific socio-economic factors, as used by Deaton and Muellbauer (1999). The model originates from the Engel curve analysis; and it is the time series counterpart of the Engel function as suggested by Leser (1976). It is specified thus:

$$\omega_i = \alpha_i + \beta_i \log X + \gamma_i HHSIZE_i + \chi_i AGE_i + \sum_j^i \delta_{ij} HD_j + U_i \tag{1}$$

where,

- ω_i = the expenditure share of the female spouse in the *ith* food type (per capita expenditure of that food type as a proportion of per capita total household consumption expenditure)
- $\alpha_i, \beta_i, \gamma_i, \chi, \delta_{ij}$ are coefficients, and $i = 1, \dots, 4$
- 1 = food prepared at home and taken at home
- 2 = food prepared away from home but taken home to consume
- 3 = food prepared away and eaten away from home
- X = total consumption expenditure on food (₦/month)
- $HHSIZE$ = number of household members (person)
- AGE = age of household head (year)

HD_i are household type dummies namely:

HD_1 = Households with only dependents members < 18 years of age

HD_2 = Households with both dependents members < 18 years and > 60 years of age

HD_3 = Households without dependants

U_i = error term

Determinants of household food security

To estimate the determinants of food security among the surveyed households, the binary logistic regression model was used. The cumulative logistic probability model is specified, following Gujarati (1995). The linearised estimable form of it was specified as:

$$L_i = \text{Ln}[P_i/(1 - P_i)] = \alpha_o + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \alpha_6 X_6 + \alpha_7 X_7 + \alpha_8 X_8 + \alpha_9 X_9 + \alpha_{10} X_{10} + \varepsilon_i$$

where:

- L_i = log of the odds ratio, which is not only linear in X_i but also linear in the parameters. It shows how log odd in favour of food security changes as the respective independent variables change by a unit (1 = household is food secured; 0 = otherwise)
- P_i = probability that an individual is food secured, and
- $(1-P_i)$ = probability that a household is not food secured
- α_o = intercept or constant term, that implies the combined impact of these fixed factors on household food security
- X_1 = Household size (number)
- X_2 = Dependency ratio (ratio of non-working members of the household to total household size)
- X_3 = Age of household head (years)
- X_4 = Distance to markets (kilometer)
- X_5 = Size of cultivated land (hectare)
- X_6 = Total household monthly income (Naira)
- X_7 = Household head's main occupation (farming = 1; otherwise = 0)
- X_8 = Value of food aids obtained by the households (Naira)
- X_9 = Gender of the households head (male = 1; female = 0)

X_{10} = Years of formal education of household head

ε_t = error term

Results and discussion

Socio-economic characteristics of surveyed households

The socio-economic characteristics of the surveyed households are presented on Table 1. From the result

on Table 1, about 64% of the respondents are male while 36.5% are females, majority (60%) of whom are active and productive and within age bracket 31-60 years (mean age was 41years) and mostly (68%) with formal years of education ranging between 6 and 12 years. Mean household size and income were 5 members and ₦49,739.00K respectively, implying a monthly mean per capita expenditure of ₦9,948 per household for both food and non-food items.

Table 1: Households' socio-economic characteristics

<i>Characteristic</i>	<i>Category</i>	<i>Frequency</i>	<i>Percent (%)</i>
Gender of household head	Male	73	63.5
	Female	42	36.5
<i>Total</i>		<i>115</i>	<i>100.0</i>
Age of household head	≤ 30 years	35	30.5
	31-60 years	69	60.0
	≥ 60 years	11	9.5
<i>Total</i>		<i>115</i>	<i>100.0</i>
Household head's education	None	30	26.1
	Primary	21	18.3
	Secondary	57	49.5
	Tertiary	7	6.09
<i>Total</i>		<i>115</i>	<i>100.0</i>
Household head's occupation	Farming	38	33
	Food processing	36	31.3
	Formal sector	25	21.7
	Trading	16	14
<i>Total</i>		<i>115</i>	<i>100.0</i>
Household size	1-3	54	47.0
	4-6	58	50.4
	7-10	3	2.6
<i>Total</i>		<i>115</i>	<i>100.0</i>
Household's monthly income	< ₦40,000	68	59.1
	₦40,000-80,000	35	30.4
	> ₦80,000	8	7.5
<i>Total</i>		<i>115</i>	<i>100.0</i>

Source: computed from field data, 2015

Households' food security status

The food security status for the surveyed households is presented on Table 2. The mean per capita household food expenditure was ₦4,047.277, bringing the monthly food security line to ₦2,698.185. From the findings, the food security index was 0.617 and by implication, about 62% of the surveyed households were food secured, possibly emanating from the fact that about 64% of the household heads

engaged in farming and food processing as their primary occupation (as evidenced on Table 1). This result agrees with the finding of Amaza *et al.* (2006).

Share of women in household food expenditure

Result of the almost ideal demand system (AIDS) analysis of the share of women in households' food expenditure is presented on Table 3.

Table 2: Households' food security status

<i>Item</i>	<i>Value</i>
Per capita household <i>food</i> expenditure	1,666.67
Mean per capita household <i>food</i> expenditure	4,047.277
2/3 mean per capita <i>food</i> expenditure (food security line)	2,698.185
Food security index	0.617

Source: computed from field data, 2015

Table 3: Estimated coefficients of the share of female spouse in households' food expenditure

	Food prepared at home (1)		Prepared food taken home (2)		Food-eaten-away-from home (3)	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Intercept	1.308 (1.13)	1.338*** (3.22)	0.261*** (3.21)	0.266 (1.22)	0.142*** (8.09)	0.127*** (3.99)
log (X)	0.131* (1.8)	0.133*** (33.83)	-0.014** (-2.49)	-0.017*** (-5.74)	- 0.004*** (- 4.47)	- 0.005*** (-1.69)
HHSIZE	0.019* (1.64)	0.019*** (2.94)	0.004* (1.73)	0.003* (1.81)	0.013*** (5.37)	0.013*** (7.02)
AGE	0.001** (2.32)	0.001*** (4.69)	-0.001* (-1.67)	-0.003** (-2.72)	-0.002*** (-5.00)	-0.002*** (-19.10)
HD ₁	-0.0707** (-2.2)	-0.078*** (-4.49)	0.022* (1.71)	0.027*** (3.70)	0.009*** (4.05)	0.007*** (7.43)
HD ₂	0.025*** (6.41)	0.022*** (11.15)	-0.006*** (-4.20)	-0.002*** (-6.40)	-0.026* (-1.86)	-0.024*** (-3.49)
HD ₃	0.006*** (3.09)	0.008*** (5.97)	-0.004** (-2.33)	-0.004*** (-5.88)	0.005** (2.41)	0.002*** (9.67)
R ²	0.5152	0.5516	0.0754	0.1081	0.1387	0.1672
χ ²	3703.44	2.06E+07	283.99	2.03E+06	561.08	3.36E+06

Source: computed from field data, 2015

***, **, and * imply p<0.01; p<0.05 and p<0.1 respectively. Figures in parentheses are t-values

The coefficient of determinants, R^2 , for food prepared at home (1), prepared food taken home (2), and food eaten away from home (3) were 0.5511, 0.1081 and 0.1672 respectively for the weighted equations, implying that about 55%, 11% and 17% share of the households' expenditure was explained by the factors hypothesised in the model for each of the food type (1,2 and 3). All the estimated coefficients (weighted equations) for home-prepared food (1) and food-eaten-away-from-home (3) are significant at 99% confidence interval (p<0.01). As for prepared food

taken home for consumption (2), all the coefficient are significant at the 99%, except for household size (p<0.1) and age of household head (p<0.05), in consonance with the report of Sikwela (2008). This is a reflection of the goodness of fit for the coefficients of all the estimated variables (Table 3).

For equations (2) and (3), as household consumption expenditure (logX) increases, the female's share in the expenditure of prepared food taken home and food-eaten-away-from-home tend to decline. Conversely, "HHSIZE", is positive for all types of food, reflecting

an increase in female spouse's share for all types of food as household size increases (Omonona and Agoi, 2007).

Factors influencing food security among surveyed households

Table 4: Result of the logistic regression of the determinants of food security status among households

Variable	Coefficients	Odds ratio	z-values	p-values
Household size	-1.388***	0.24972	-2.84	0.004
Dependency ratio	-2.900*	0.0550	-1.74	0.082
Age	-0.079	0.9236	-1.61	0.107
Distance to market	2.109	8.2445	1.46	0.145
Farm size	0.908*	2.4804	1.86	0.063
Monthly income	2.258 *	9.5671	1.82	0.068
Occupation	3.979**	53.4692	2.58	0.010
Value of food aids	-1.464	0.2314	-0.96	0.339
Gender	-0.149	0.8608	-0.13	0.897
Education	0.569	1.7665	0.95	0.340
Constant	1.872			
R ²	0.675			
Log Likelihood function	-16.715			

Source: computed from field data, 2015

***, **, and * imply $p < 0.01$; $p < 0.05$ and $p < 0.1$ respectively.

As expected, households whose heads are engaged in farming (3.979, $p < 0.5$) as their primary occupation are likely to be food secured than those otherwise engaged despite their relatively low mean income (about ₦49,739/month) and mean per capita expenditure (₦9,948/month) as reported on Table 1. This seeming contradiction is best explained by the fact that a typical rural farm household will normally channel a large percentage of its farm output to satisfy its domestic needs before looking at the possibility of making financial gains from the meagre surplus, if at all. This argument further buttress the earlier position of Sanusi *et al.* (2006).

Conclusion and recommendations

This study examined the contribution of the female spouse to household's food security using selected communities in Oyo State, Nigeria. From the empirical findings, about 60% of the surveyed households were food secured, being largely engaged in farming, and with moderately large family size and relatively low income. Majority of the household heads were active (with mean age of 41years) and mostly (68%) educationally endowed. Consistent with *a priori* expectations, farm size, monthly income and household involvement in farming were found to significantly increase households' food security status, while large household size and dependency ration inhibited it. Total food consumption expenditure,

Large household size (-1.388, $p < 0.01$) and dependency ratio (-2.900, $p < 0.1$) reduced the probability of households being food secured; while large farm size (0.908, $p < 0.1$) and household income (2.258, $p < 0.1$) tend to increase its possibility, confirming the findings of (Onianwa and Wheelock, 2006).

household size and age of household heads had significant influence on increasing the female spouse's contribution on food prepared at home, food eaten away from home and food prepared at home but eaten outside the home. Based on the findings, it was recommended that policies that will improve on households' access to arable farmland and increase income of households should be given more priorities in order to increase the capability of the female spouse to contribute more to the food security status of their households.

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