



Full length research paper

**Gender Analysis of Rural Household's Food Expenditure Pattern and Household Food Security**

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*Received February 11, 2019*

*Accepted May 8, 2019*

*Published June, 2019*

**Abstract**

This study was carried out in selected LGAs of Ogun State, Nigeria to describe the pattern of food consumption-expenditure among male headed and female headed households and identify the determinants of rural households' food security status. It investigated the characteristics of household heads in these farming households and how these characteristics affect household per capita food consumption as well as household food security status. A multistage sampling technique was used to obtain relevant information from the respondent with the aid of a structured questionnaire. A total of 120 households were selected out of which 71 were headed by male respondents and 49 by female respondents. Data gathered was analysed using descriptive statistics such as frequencies and percentages, averages, standard error, inferential statistics such as t-test was used to test for significance of difference in average consumption-expenditure figures of different food groups, while the OLS regression model was fitted to determine the socio-economic characteristics of households determining per capita food consumption-expenditure. In determining the determinants of household food security, the logit regression model was fitted. Findings from the study showed that a substantial proportion of the female headed household were headed by those who are legally underage (28.57%). Access to land was a major issue in the study area, with more than half of both the male and female headed households having less than 1 ha of land for farming (50.70% and 55.10% respectively). Household non-food expenditure ( $p < 0.01$ ), household income ( $p < 0.01$ ) and household size ( $p < 0.01$ ) all positively influenced household per capita food consumption-expenditure. Farm size ( $p < 0.01$ ) was a significant determinant of rural farm households being food secure. The study concludes that underage headship of households and access to land are key determinants of rural households' food security status and suggests that intervention along the line of increasing access to land for households irrespective of gender, as well as sex education among teenagers and pre-teens, would go a long way in reducing the incidence of underage household heads.

**Keywords:** Consumption expenditure, Food security, Gender, Per capita

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## Introduction

The centrality of gender equality, women's empowerment and the realization of women's right in achieving sustainable development has been increasingly recognised in recent decades (Department of Economic and Social Affairs, DESA, 2009). The gender equation in many parts of the world, especially in the rural areas is seriously in disequilibrium with the womenfolk receiving the wrong end of the bargain; the implication in terms of resource access, utilization and distribution seriously spells doom for developmental efforts in the world over. This is premised on the fact that potentials for gains in terms of productivity from the disadvantaged group is seriously hampered and ultimately, lost. The rural areas are of particular interest with respect to food security as it has been proven that about 70% of the world food output is sourced from the rural areas and interestingly, the bulk of these producers (two-thirds of the farmers producing this output) are women.

In rural areas of the world especially, access to non-farm opportunities are restricted or facilitated by socio-economic class, gender, ethnicity, social market, lack of economic assets, be it capital, labour, skills, information etc. Culture and tradition may also dictate who may participate in economic activities especially gender and caste. There is a growing awareness in all domains of existence, especially those of health and nutrition regarding the influence of gender inequities and dynamics as major determinants of health and nutrition outcomes (United Nations Children's Fund, UNICEF, 2011). It is argued and strongly advocated that women's ability to access and control the use of resources for their own health and well being impacts significantly on their children's survival, health and nutrition. The far reaching effect of this assertion cannot be ignored and calls for introspective consideration of equity in resource control among the genders, if not even in favour of the womenfolk. Growing evidence is confirmed to exist from empirical studies that show the existence of synergies between gender equality on the one hand and economic sustainability (among many other indices) on the other (DESA, 2009).

Representing about 25% of the world's population, rural women not only play a crucial role in maintaining rural livelihoods, from where 70% of the world food supply emanates, but they also play important roles of improving rural livelihoods and strengthening rural communities (Committee on the Elimination of Discrimination Against Women,

CEDAW, 2016). Duncan and Brants (2004) quoting a World Bank study, pointed out that women are at the core of the economies of the Sub Saharan Africa (SSA), making up about 60% of the informal sector and providing about 70% of total agricultural labour. Nseabasi (2015) pointed out the role of women in rural development (concentrated in the informal agricultural sector) as constituting the central pillar of rural development as in most developing countries. Irrespective of these crucial roles played by women, still tide of economic means and resources among many other things, continually seem to blow contrary for them. As DESA (2009) points out, women in many parts of the world continue to face discrimination in access to land, housing, property and other productive resources, having limited access to technologies and services that could alleviate their work burdens. Nseabasi (2015) argued that despite women's role in rural development, they still largely invisible in the mainstream rural development policies and programmes.

As Nseabasi (2015) and a couple other authors (DESA, 2009; CEDAW, 2016) have pointed out, the role of women in rural development (concentrated in the informal agricultural sector) as constituting the central pillar of rural development as in most developing countries; it is imperative to understudy the nature of the informal economic sector of the rural areas. Rural non-farm income (RNFI) includes earned and unearned income received by rural people from the urban economy via temporary migration, remittances, welfare, pensions, interest and the rural non-farm economy (RNFE) including activities based in rural towns (Department for International Development, DFID, 2002). The importance of RNFI to rural economy cannot be over-emphasized based off figures furnished by the DFID (2002) where its' contribution stood at 40-45% in Sub Saharan Africa (SSA), Latin America and South-East Asia and at 30-40% in South Asia.

Given the implication of disenfranchisement of women on the nutrition and health outcomes within households (UNICEF, 2011), it is important to understudy how the gender of household head influence their households' food security status, as this may have implications for world food output given the role of rural women in world food production. As Pampi and Meena (2016) rightly argued, in order to help women it is necessary to make them more visible in productive work. This they argued can only be possible, if one fully understood the mechanism of gender roles

prevailing in the society and the extent to which men and women are able to access different livelihood opportunity.

Food security is a desired outcome for all households in the world over; its importance highlighted in its inclusion in the past Millennium Development Goals (MDGs) and more importantly in the present Sustainable Development Goals (SDGs). Understanding the pattern of food expenditure among different households, especially under the headship of the two main genders, how the female headed households would fare compared to their male counterparts, their respective skill sets, resource access and their resultant food security status is important, as a result of the implication their food security status would have on the world at large. Therefore, this paper seeks to understand the dynamics of food security among women headed households in comparison to their male counterparts and identifying the characteristics of these rural households as it affects food security. Also, the food consumption pattern measured through a modification of the household expenditure is captured in order determine rural household behaviour under differing gender of the household head.

### Methodology

A multistage sampling technique was used to obtain a sample of 120 households from rural farming households in Ogun State, Nigeria. The first stage involved obtaining random selection of two LGAs out of the 20 LGAs in Ogun State; Remo North and Odogbolu LGAs were thus selected. The second stage involved obtaining a list of all registered farmers within all the towns and villages of the 2 Local Government Areas selected in the first stage; these lists obtained from the Ogun State Agricultural Development Programme (OGADEP) details farmers with whom the agency has extension contact and as such was adopted as a our sample frame. The third stage involved a random selection of villages from each of the LGAs where the respondents would be picked. Based on the spread of farmers, especially with respect to female owned farms, out of 68 villages in Odogbolu LGA, 12 villages were randomly selected, namely; Idowa, Aiyepe, Emuren, Eriwe, Imaka, Imaweje, Igbile, Idotun, Odo agameji, Odoja, Oke Lamuren and Shibadewa. In Remo North, 5 villages were randomly selected based on spread of women owned farms, namely; Idarika, Iraye, Akaka, Ipara and Ogunmogbo, from a total of about 35 villages.

The fourth stage involved a purposive selection of 30 male farmers and 30 female farmers from each of the LGAs, amounting to 60 farming households per LGA. The assumption was that the female farmers were the heads of their household given their registration with the agency and ownership of such asset as a farm but this assumption was not true in all cases. As a result the male headed farming households were more than the female headed farming households in both LGAs.

A structured questionnaire was used to elicit response from the respondent regarding the household head characteristics, food expenditure pattern, farming household monthly outlay, household food consumption pattern with a view to determining household food security status when headed by different gender as well as their food consumption and expenditure pattern. A compilation of all types of food consumed in the south western part of Nigeria was made; thereafter they were grouped into 8 major groups for ease of analysis. These groups of food are given as Cereals such as grains, rice, wheat and wheat products, maize and maize products etc, animal protein such as meats, eggs, milk etc, plant protein such as cowpea, fruits and vegetables, fats and oils, roots and tubers, swallows such as eba, fufu, amala etc, and finally beverages of all kinds be it alcoholic or non-alcoholic. The student t-test was used to test for any significant difference in the mean per capita food consumption-expenditure between the male headed and the female headed households, for the various food groups consumed by the rural households.

### Determination of food security line

Engel's law regarding household consumption as a function of household income forms the bedrock of the food security line fixed in this research. This is based off the strong argument put forward by the International Food Policy and Research Institute (IFPRI) as quoted by Diego *et al.* (2013). This involves constructing questions in the questionnaire such that not only food expenditure values are captured but also the estimated value of non-purchased food items, be it home production or gifts, for the previous month. This is particularly important for rural households where an appreciable amount of what is consumed may be from own production and as such should form an important part in fixation of food security line based off consumption.

A categorical variable was created which equates ranges of the food expenditure share to levels of food insecurity as developed by Diego *et al.* (2013). In this case, the most food insecure spend greater than 75% of their income on food, while the food secure spend less than 50%. Total expenditure was used as a proxy for income based on the permanent income hypothesis of the income theory. This method is called the Food Expenditure Share

Proxy Indicator (FESPI) developed by a working group at the World Food Programme. The FESPI is simply defined as the share of total immediate expenditure going to food of the total income/expenditure. Thus, based on this categorical variable developed the World Food Programme by Diego *et al.* (2013), the food security lines are fixed as follows;

- |                          |                            |
|--------------------------|----------------------------|
| FESPI < 50%              | = Food Secure              |
| FESPI between 50 and 65% | = Moderately Food Secure   |
| FESPI between 65 and 75% | = Moderately Food Insecure |
| FESPI > 75%              | = extremely food insecure  |

**Determinants of Food Security Status**

Both the male and female headed households were investigated together as to the influence of the gender of household head, among other exogenous

variables, in increasing or decreasing the odds of the farming households being food secure. This was achieved using the Logit regression model, stated as follows;

$$Y = \text{Log} \frac{p(x)}{1-p(x)} = \beta_0 + \sum B_i X_i$$

Y = food security status

FESPI < 50% was set as food secure and assigned a value of 1

FESPI > 50% was set as food insecure and assigned a value of 0

- X1= Age of household head
- X2= gender of respondent being female (female=1, male=0)
- X3= farm household size
- X4= Highest educational qualification of household head
- X5= farm size (ha)
- X6= Farm income in the past month
- X7= Marital status of household head (married=1, otherwise=0)

**Determinants of Food Security Status**

The determinants of rural household food expenditure (for both non-purchased and

purchased items) were predicted using the OLS regression method.

- Y= food expenditure in the last month
- X1= Age of household head
- X2= gender of respondent being female (female=1, male=0)
- X3= farm household size
- X4= Highest educational qualification of household head
- X5= farm size (ha)
- X6= Farm income in the past month
- X7= Marital status of household head (married=1, otherwise=0)
- X8= other non-food expenditure in the past month
- X9= Expenditure on medical treatments in the last month

**Result and Discussion**

**Table 1.** Socio-economic characteristics of rural farming households along the gender line of household heads

Variables	Frequency of Gender of household head		Percentage of gender of household head		Total frequency (percentages)
	Male	Female	Male	Female	
<b>Age</b>					
Less than 18 years	5	14	7.04	28.57	19(15.83)
18 to 30 years					
31 to 40 years	8	5	11.27	10.20	13(10.83)
41 to 50 years	6	3	8.45	6.12	9(7.50)
Above 50 years	33	19	46.48	38.78	52(43.33)
Total	19	8	26.76	16.33	27(22.50)
	71	49	100.00	100.00	120(100.00)
<b>Household size</b>					
Less than 3	13	29	18.31	59.18	42(35.00)
4 to 7	35	18	49.30	36.75	53(44.17)
7 to 10	18	2	25.35	4.07	20(16.67)
Above 10	5	0	7.04	0.00	5(4.17)
Total	71	49	100.00	100.00	120(100.00)
<b>Farm size</b>					
Less than 1 ha	36	27	50.70	55.10	63(52.50)
1 to 5 ha	15	14	21.13	28.60	29(24.17)
6 to 10 ha	9	0	12.68	0.00	9(7.50)
Above 10ha	11	8	15.49	16.30	19(15.83)
Total	71	49	100.00	100.00	120(100.00)
<u>Educational qualification</u>					
Non- formal	2	8	2.82	16.33	10(8.33)
Primary	10	18	14.08	36.73	28(23.33)
Secondary	26	18	36.62	36.73	44(36.67)
Tertiary	33	5	46.48	10.21	38(31.67)
Total	71	49	100.00	100.00	120(100.00)
<u>Marital status</u>					
Married	53	16	74.65	32.65	69(57.5)
Single	18	33	25.35	67.35	51(42.5)
Total	71	49	100.00	100.00	100(100.00)

Table 1 shows that for the female headed households, more than one in every four female headed households (28.57%) interviewed had the household head less than 18 years old, while for the male headed households less than one in every ten households (7.00%) interviewed had the household head less than 18 years old. These are households which perhaps were started by misadventure or unprepared as a result of unsolicited pregnancies since they are less than the age of independence or consent in Nigeria. It appears they are more common among the female headed households than the male headed households. Majority of the female and male headed households had household heads with ages ranging between 41 and 50 years of age (38.78% and 46.48% respectively). With more than a quarter of those interviewed under the age of 18

years (28.57%) for female headed households and a lower incidence (7.00%) for the male headed households, an issue of abuse appears to be prevalent in the rural areas. This finding is in agreement with the work of Odu *et al.* (2015) which asserted that many Sub Saharan African countries has one in every adolescent starting life as an adolescent mother. The implication of this on food security status of such households cannot be ignored, as it is far reaching both on the mothers and the children's' future. As Odu *et al.* (2015) pointed out, adolescent girls who become mothers are likely to suffer financial consequences, drop out of school and may become financially unequipped to provide adequately for their children. These are households which perhaps were started by misadventure or unprepared as a result of unsolicited pregnancies may not depend solely on

own economic activities but also from transfers and other forms of goodwill which may not be reliable sources. It appears they are more common among the female headed households than the male headed households.

None of the female headed households had household size above 10 members; majority of them had household sizes ranging between 1 and 3 (59.18%). On the other hand about 7.04% of the male headed households had household sizes above 10 members; majority of the male headed households had household sizes ranging between 4 and 7 members (49.3%). Both the male and the female headed households had more than half of the interviewed respondents with less than 1 ha of farming land (50.70% and 55.10% respectively). This has implications on the ability of these households to be food secured as most rural farmers are subsistence farmers and the bulk of the food consumed is cultivated or reared by the households. Access to land would not only increase food production among these rural dwellers but also increase income accruable from the sales of marketable surplus of their subsistence farming (Oduşina, 2010; Nosiru, 2010).

Majority of the male headed households (74.65%) were married while majority of the female headed households (67.35%) were single. This high incidence of singlehood was explained by rejected spouses, divorce and widowhood. Apparently, the incidence of households without a male/father figure was missing is quite prevalent among these rural areas, as was also confirmed in the work of Kamilu *et al.* (2017) where 45.2% of the female headed households was made up of single women. With limited access of women to certain assets such as land and other credit facilities, the prospects of food security is seriously jeopardized, especially in these rural areas (Nseabasi, 2015). A third of the female headed households (31.6%) had as low as a primary school education or outright no formal education whatsoever. This confirms the work of Kamilu *et al.* (2017) in which low level of education was observed among female headed households. With low levels of education, the opportunities for economic empowerment and livelihood diversification is seriously hampered. By extension, food security is seriously threatened for such households.

**Table 2.** Gender analyses of rural households' mean per capita expenditure for various food groups

Food group	Gender of household head		Mean per capita food expenditure/month	Level of significance of test of difference in mean food expenditure
	Gender	frequency		
Cereals	Male	71	2887.25 ± 226.93	.146
	Female	49	2364.55 ± 277.44	
Animal protein	Male	71	12481.14 ± 654.10	.412
	Female	49	11592.37 ± 888.12	
Plant protein	Male	71	1224.90 ± 322.86	.386
	Female	49	5768.20 ± 425.31	
Roots and tubers	Male	71	2974.46 ± 251.06	.094
	Female	49	2375.10 ± 223.57	
Fruits and vegetable	Male	71	3290.07 ± 181.59	.937
	Female	49	3314.53 ± 264.46	
Fats and oil	Male	71	2679.94 ± 180.91	.162
	Female	49	2320.02 ± 161.62	
Swallows	Male	71	12002.38 ± 691.58	.405
	Female	49	11082.43 ± 868.01	
Beverages	Male	71	1177.65 ± 113.26	.421
	Female	49	1042.61 ± 115.54	

Table 2 shows the per capita food expenditure of each of the male and female headed households for eight different groups of food. With the exceptions of plant protein and fruits/vegetables groups of food, the male headed households had a mean per capita expenditure on each food group

than the female headed households. The difference in mean per capita expenditure on each of the food groups was however not significant for all the food groups except for the root and tuber groups where the male headed households had a mean per capita expenditure that was significantly higher

( $p < 0.01$ ) than that of the female headed households. This significantly different per capita food expenditure between the male and female headed rural households bears witness to the work of Eke-Okoro *et al.* (2014) who asserted that Nigeria is the largest producer of most root and tuber crops in the world with the bulk of it (95%) being consumed unprocessed. It appears the importance attached to this food group in the rural Nigeria regarding food security, with the male headed households better off. Any attempt in these

areas to improve food security must therefore take cognizance of root and tuber crops. It is a key part of the diets of rural dwellers. A possible solution to the problem of food insecurity in these rural areas, emanating from this study, is the diversion of land and other productive resources to root and tuber crops and an encouragement of the rural farmers to embrace processing of these food groups to augment income given the wealth potentials they have (Eke-Okoro, 2014).

**Table 3.** OLS regression analysis of determinants of rural farming households' food consumption-expenditure

Variable	Coefficient	T ratio	P value
Age of household head(X1)	-1243.0 (1137.0)	-1.093	0.277
Gender of household head(X2)	1380.6 (1681.0)	0.821	0.413
Household size (X3)	3894.9*** (1193.0)	3.264	0.001
Highest educational qualification of household head (X4)	-1375.4 (882.4)	-1.559	0.122
Marital status of household head (X5)	536.57 (1194.0)	0.450	0.654
Farm size (X6)	44.774 (45.62)	0.919	0.329
Farm income (X7)	0.738E-01*** (0.143E-01)	5.178	0.000
Non food expenditure (X8)	0.412*** (0.129)	3.183	0.002
Medical expenditure (X9)	0.793 (0.702)	1.130	0.261
Constant	11358.0 (4778.0)	2.377	0.019

Figures in parenthesis are the standard errors; R-sq = 0.4308, Adj. R-sq = 0.3842, F-value= 126.474\*\*\*, \*significant at 0.10, \*\*significant at 0.05 and \*\*\*significant at 0.01

Table 3 presents the OLS regression analysis of the determinants of households' per capita food consumption-expenditure. The F-statistics was sufficiently high and significant ( $p < 0.01$ ) and the adjusted R-square explained 38.42% of the variation in the average rural household food

expenditure. Increasing rural households' non-food expenditures, farm income and household size all tended to significantly increase the households' food expenditure ( $p < 0.01$ ) i.e. there existed a positive relationship between these variables and rural households' food expenditure.

**Table 4.** Logit regression analysis of the determinants of rural households' food security status  
Convergence achieved after 5 iterations

Variables	Coefficient	T-value	Marginal effects
Age of household head	0.728E-01 (0.375)	0.194	0.809E-02
Gender of household head	-0.450 (0.510)	-0.883	-0.500E-01
Household size	0.208 (0.385)	0.541	0.231E-01
Educational qualification of household head	-0.394E-01 (0.300E-01)	-0.132	-0.440E-02
Marital status of household head	0.370E-02 (0.190E-02)	0.195	0.411E-03
Farm size	0.237E-04*** (0.766E-05)	3.088	0.263E-05
Farm income	0.390 (0.354)	1.101	0.434E-01
constant	-1.385 (1.533)	-0.892	

LOG-LIKELIHOOD FUNCTION = -49.229; LOG-LIKELIHOOD(0) = -62.719; LIKELIHOOD RATIO TEST = 26.9803 WITH 7 D.F. P-VALUE= 0.00034; CRAGG-UHLER R-SQUARE 0.31053

Table 4 presents result of the logit regression analysis. The logit regression model explained 31.05% of the total variation in rural household food security status. There was an inverse relationship between female headed households and household food security, even though the relationship was not significant. It still bears reasoning that increasing the incidence of households being female headed among these rural households tended to reduce the odds in favour of food security. Farm size was a significant determinant ( $p < 0.01$ ) of rural farm households being food secure. Increasing the farm holdings of a rural farm household tended to significantly increase the odds of the households being food secure. This confirms the work of Omotesho *et al.* (2006) who worked among rural farming households in Kwara State, Nigeria and found out that farm size, farm income among other independent variables were significant determinants of rural households' food security status. However, it was discovered from table 1 of this paper that more than half of each of the male and female headed households did not have access to more than 1 ha of land for farming. This has serious implications for food security in these households.

### Conclusion

The study established that a substantial proportion of the female headed households (approximately a third) were headed by those who are legally underage compared to their male headed households (with less than a tenth below the legal

age of independence). This phenomenon was observed to have a possible implication on the financial security and by extension the food security status of such female headed households. Access to land was a major issue in the study area, with more than half of both the male and female headed households having less than 1 ha of land for farming. The resultant effect of this was observed in the logit regression analysis which showed that farm size was a significant determinant of food security among these rural households. Any intervention among the rural households that increases the income of the farm household, whether male headed or female headed, would lead to an increase in per capita food consumption-expenditure and inadvertently increase other non-food expenditures as a result of improved household welfare. Farm size was a significant determinant of rural farm households being food secure. Increasing the farm holdings of a rural farm household tended to significantly increase the odds of the households being food secure. In order to tackle the issue of underage household head in the rural area, the study suggests a sex education campaign to the rural areas, the like of which is already gaining traction in the urban areas; this would serve to educate the teenagers on abstinence from sexual acts at their age when they are not ready to parent or start a household or perhaps give them safer alternatives of sexual activities. Access to land to all who care to have it should be guaranteed; communal land should be



made accessible to all community members who require it for economic purposes without bias to their age or gender.

### **Conflict of Interest**

Authors didn't declare any conflict of interest regarding to this research work.

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