

DETERMINANTS OF FOOD CONSUMPTION EXPENDITURE AMONG AGRO BASED FIRMS WORKERS IN SOUTHERN NIGERIA: SIMULTANEOUS EQUATION APPROACH

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ABSTRACT

The study determines factors that affect food consumption expenditure of agro based firm workers in Cross River State, southern Nigeria. Cross-sectional data were collected from 250 randomly selected workers of five rubber estates in the region. Descriptive statistics and two-stage least squares method of simultaneous equation model was used in the analysis. Analyses of the socio-economic characteristics of respondents reveal that, the rubber sub- sector was dominated by middle age workers who are predominantly males. More than 70% of the workers had some years of formal education while majority of the workers have moderate family size. In addition about 97% of the workers invested more than one year in the various estates sampled. Also, 76.8% of respondents belong to the local cooperative society; while only 6% depended solely on their salaries. Furthermore, the results of the analysis revealed that salary, tax, family size, non-food consumption expenditure and farm income determine the food consumption expenditure of rubber plantation estates workers in cross River State. To improve workers food consumption expenditures, increase in salary in line with changes in the macro-economic variables in the country was advocated. In addition, policies targeted towards reducing household size and tax including provision of amenities and infrastructures in the rural areas were recommended, as these would upsurge the agro-based workers food consumption expenditure and increase productivity in the rubber sub-sector.

Keywords: Food, consumption, workers, rubber, income, expenditure

1. INTRODUCTION

Food consumption plays an important role in the economic development of both developed and developing nations [1]. It has a considerable impact on the circular flows of income in the economy. In the agricultural sector, increase in productivity has a positive linkage with

the size of food consumption expenditure, size of disposal income and proportion of net income saved by farmers [4]. It therefore implies that, agro based industry productivity to a large extent will depend on workers' remuneration and the proportion of it consumed and saved [22].

In Nigeria, salaries and wages paid by most agro-based firms are low; as a consequence there is a general decline in labor welfare in the sub-sector [9]. Natural rubber sub-sector is an example of agro-based firm that has contributed to the economic development of Nigeria. Rubber plantation firms are basically rural based agro-firm, as the result of this, majority of workers are rural dwellers whose income depended considerably on the viability of these firms. To an extent, the sustained productivity of the sub-sector is crucial in combating the scourge of rural poverty and unemployment in the country. Unfortunately, sustained productivity cannot be achieved in the sub-sector without improved workers' welfare. Aggregate saving and consumption expenditure of labor within a specific time frame are proxies of labor welfare [20 and 24].

Food consumption expenditure among workers in the agro-based firms could be described as unsatisfactory in Nigeria; this is evident in the decline in worker's ability to provide for their consumption expenses as well as basic necessities. As advancement in agricultural sector in the country has remained unsatisfactory low, the wiggling productivity among most agricultural firms in the country has been linked to workers' commitment which is directly related to their welfare [1]. The decision of an agro-based firm worker to consume is as a result from the maximization of the utility function subject to a budget constraint. Apart from income and budget limitation other variables may be responsible for undulating decision pattern of agro-based workers to channel part of their remuneration to food consumption. The purchase decisions of agro-based workers are affected by various factors. Income, prices, distribution of income, educational status of the individuals, occupation, age, and socio-cultural factors are the main ones. Besides these factors, the welfare of these workers is enhanced when they maximize the benefit by giving priority to the purchase of goods and services that avails the most and putting off purchasing the least needed goods and services due to income-bound. Thus, differences emerge according to the workers' behavior and effect of the factors determining these behaviors [8].

Undoubtedly, the rubber sub- sector has contributed immensely to the overall development of Nigeria economy. Given the market opportunities for their products in rapidly expanding Nigerian economy, its increasing demand at international market including its socio- economic impact on the lives of Nigerians, there is an overwhelming need to ensure sustained production through good management techniques evolve around improved workers welfare. The study

focused specifically on workers of rubber plantation estates. There are many scatter rubber estates in the rain forest belt of Nigeria. These agro-based firms employed all categories of labour in their production and processing activities. The study is necessary as it will unearth reasons for frequent in and out movement of labour in the estates including rationale for low societal ranking of the estate workers compared to other job areas available in the State. In an attempt to uncover why workers are not steadily attracted to these agro-based outfits despite saturated labor market in other sectors posed a serious question on workers welfare. We assume that, variables that motivate these rural agro-based firm workers to allocate good proportion of their disposable income to food consumption in addition to price variable are the major determinants of their food consumption expenditure. Hence these factors among others may be responsible for the unsteady labor movement in the sub-sector.

Therefore the study aimed at determining factors affecting food consumption expenditure among rubber plantation estate workers in Cross River State southern Nigeria. Being a rural based agro-based firm; the study assumes that the workers depend on job remuneration and farm income. The income is also assumed to be either consume or save. The study assumes that leakages and injection into the circular flow of income in this rural setting is negligible. Simultaneous equation model was used to specify the saving and consumption functions with a definitional equation relating income to consumption and saving. The use of the simultaneous equation model help to reduce the influence of endogeneity or exogenous variable--error term correlation ($\sum X_i U_i = 0$). This problem occurs when multiple regression models is used to study consumption function.

1.1 LITERATURE REVIEW

[14] and [7] showed that non- economic factors (that is education, sex and family size) are important determinants of consumers purchasing decisions. [13] in Niger, found that changes in female annual income while controlling the male income impacted positively on household food expenditure for both earned and non-earned income. [12] in *Cote D' Ivoire* found a positive but small marginal effect of women's income share on household food budget share. According to him, increasing household disposal income may not be effective strategy for food consumption. [11] and [6] in their separate empirically studies discovered that increase income positively influenced food consumption. [2] discovered that expenditure elasticity of per capita calorie intake in South-Western Nigeria is between 0 to 4 percent meaning that calorie intake does not get a substantial share of marginal increase in household income. [3] in Oyo state Nigeria found that household size and level of formal

education affect consumption of Soybean in the study area. While studying factors affecting pork meat consumption in South Africa [19] showed that non-economic factors are becoming increasingly more important when consumers have to make purchasing decision regarding pork meat consumption. [10] determined consumption expenditure and its share to total income in small farm households in Ikwuano, Abia state Nigeria. Results showed that Per-household-member income, and per-household-member wealth was the major determinants of consumption expenditure among respondents. [24] analyzed the determinants of farmers' welfare in Ebonyi State, Nigeria. Standard welfare function was specified and estimated using Ordinary Least Squares Regression. The results showed that microcredit and household size have significant negative effect on welfare. On the other hand, incomes, physical assets, level of education and age of household heads have significant positive effects on welfare. [16] studied determinants of Pork Consumption among rural households in Rivers State, Nigeria. The study found that consumption level of pork was affected by cultural belief, household size, cost and supply. [18] analyses household consumption expenditure of cassava products in Southeast Nigeria. His finding reveals that household size, household income and cost of substitutes were important variables that affect the consumption of cassava products in the area. [17] discovered that household size and expenditure on substitutes affect the consumption of protein among rural households in Oyo state, Nigeria. [21] examined the determinants of household expenditure on Teff in Ethiopia. The double hurdle model for Teff consumption suggested that age of head of the household, household sizes, dependency ratios, education, employment status and gender were significant determinants of Teff consumption. [8] investigated the determinants of household consumption expenditure in Turkey. The findings show that the age, income, marital status, insurance and the size of the household were important variables affecting household consumption expenditure in Turkey. [23], analyses the food expenditure of farm households in Malaysia. Their expenditure function indicated that off-farm income and number of family members are the major determinants of expenditure.

2.0 THEORETICAL FRAMEWORK

Income, saving and consumption are closely related. Several economic studies have shown that income is among the primary determinants of consumption and saving. When the household income increases, the increment is channeled to saving and consumption. Household savings is thus, the complement of consumption. In this study we assumed that agro based worker salary is either save or spent on household consumption and that workers' salary equal income. Economic facts have shown that some variables that affect household savings also affect consumption expenditures [5]. Income is one of such

economic variable that impact on household saving and consumption simultaneously. Implicitly, the relationship between saving and consumption can be express as shown in equations (1), (2) and (3). This relationship usually causes the problem of endogeneity in econometric analysis.

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$$\text{Sav} = \beta_0 + \beta_1 \text{Inc} + \beta_2 X_1 + \beta_3 X_2 + \beta_4 X_3 + \beta_5 X_4 + \beta_6 X_5 + \beta_7 X_6 + \beta_8 X_7 + U_2 \dots\dots\dots (1)$$

$$\text{Con} = \Psi_0 + \Psi_1 \text{Inc} + \Psi_2 X_1 + \Psi_3 X_2 + \Psi_4 X_3 + \Psi_5 X_4 + \Psi_6 M_1 + \Psi_7 M_2 + \Psi_8 M_3 + U_1 \dots\dots\dots (2)$$

$$\text{Inc} = \text{Con} + \text{Sav} \dots\dots\dots (3)$$

Where

Inc = Salary of i_{th} worker in naira

Sav = Monthly savings for i_{th} worker in (₦).

Con = Household consumption expenditure (Con = Inc- Sav) in (₦)

X_1 = is a predicted tax (Tax*) derived from (Tax = t + tInc) and expressed in (₦), where

Tax = Monthly tax on salary of i_{th} worker.

X_2 = Years of formal education of worker.

X_3 = Household size in Number.

X_4 = sex of worker (Dummy 1 for male and 0 for female).

X_5 = Age of the worker.

X_6 = Experience in job measured in years.

X_7 = Membership of local Association (worker's cooperative society) in years.

M_1 = Monthly Income of other family member (₦).

M_2 = Monthly Household non-food consumption expenditure as a proportion of total income (salary + farm income) (₦).

M_3 = Monthly farm income of i_{th} worker (₦).

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2.1 IDENTIFICATION OF THE STRUCTURAL MODEL

Since a unique relationship exist among income, saving and consumption; the OLS estimation of any behavioral equation in the above structural model will yield bias and inconsistent estimates. Therefore, the behavioral equations (i.e. equation 1 and 2) were identified to determine whether unique estimates of the parameters of the specified structural equation can be obtained from the estimated reduced form coefficients. To do this, we employed the order and the rank conditions of identification [15]. The result of the exercise is shown below:

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171 (a) **ORDER CONDITION TEST**

For equation 1			For equation 2		
K - M	$\geq$	G - I	K - M	$\geq$	G - I
13 - 8	>	3 - 1	13 - 9	>	3 - 1
5	>	2	4	>	2

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173 (b) **Rank Condition Test**

0	=	-Sav	+ β_1 Inc	+ β_2 X ₁	+ β_3 X ₂	+ β_4 X ₃	+ β_5 X ₄	+ β_6 X ₅	+ β_7 X ₆	+ β_8 X ₇	+0c	+0M ₁	+0M ₂	+0M ₃
0	=	0Sav	+ ψ_1 Inc	+ ψ_2 X ₁	+ ψ_3 X ₂	+ ψ_4 X ₃	+ ψ_5 X ₄	+0X ₅	+ 0X ₆	+0X ₇	-1c	+ ψ_6 M ₁	+ ψ_7 M ₂	+ ψ_8 M ₃
0	=	Sav	-Inc	+0X ₁	+0X ₂	+ 0X ₃	+0X ₄	+0X ₅	+0X ₆	+0X ₇	+1c	+0M ₁	+0M ₂	+0M ₃

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175 **Matrix of coefficient**

-1	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	0	0	0	0
0	ψ_1	ψ_2	ψ_3	ψ_4	ψ_5	0	0	0	-1	ψ_6	ψ_7	ψ_8
1	-1	0	0	0	0	0	0	0	1	0	0	0

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177 For equation 1

-1	ψ_6	ψ_7	ψ_8	2x2 sub-matrix Determinant = 0 - ψ_6 = - ψ_6				-1	ψ_6
1	0	0	0					1	0

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179 For equation 2

-1	β_6	β_7	β_8	2x2 sub-matrix Determinant = 0 - β_6 = - β_6				-1	β_6
-1	0	0	0					1	0

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181 The result of the identification shows that the structural model is over- identified since $K - M$
 182 $> G - 1$ (order condition) and the rank conditions are fulfilled. (Where K = total number
 183 variables in the model, M = total number of variables in each equation and G = total number
 184 of endogenous variables in the model). This implies that the two-stage least squares
 185 estimation method is appropriate for estimating equations (1) and (2). From equation (1) and
 186 (2) we investigated the relationship between the error terms and established that $\text{Cov}(U_1,$
 187 $U_2) = 0$; meaning that U_1 and U_2 are contemporaneously independent. This further confirms
 188 the relevance of 2- stage least squares method of simultaneous equation model specification
 189 over others. A reduced formed model was specified and the estimated value of endogenous
 190 variables was used to correct for the endogenous variable specify as exogenous variable in
 191 the structural model. That is;

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193 $\text{Inc} = \pi_0 + \pi_1 X_1 + \pi_2 X_2 + \pi_3 X_3 + \pi_4 X_4 + \pi_5 X_5 + \pi_6 X_6 + \pi_7 X_7 + \pi_8 M_1 + \pi_9 M_2 + \pi_{10} M_3 + U_1 \dots (4)$

194 The OLS estimates of equation (4) was used to generate the predicted values of "Inc" (i.e.
 195 Inc*). This was incorporated into the consumption equation (i.e. equation 2) which is the

equation of interest in this research work. It then followed that, the food consumption expenditure function to be estimated given the variables and the transformation is as shown below.

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$$\text{Con} = b_0 + b_1 \text{Inc} + b_2 X_1 + b_3 X_2 + b_4 X_3 + b_5 X_4 + b_6 M_1 + b_7 M_2 + b_8 M_3 + U_2 \dots \dots (5)$$

Where variables are as defined previously.

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203 3.0 METHODOLOGY

204 The study Area, Data Collection and Sampling Technique

The study was conducted in the southern senatorial district of Cross River State in the southern region of Nigeria. The area hosts most of the viable rubber estates in the region. Primary data were collected with the aid of well structured questionnaires and complemented by personal interview schedules. Five rubber estates owned by several private companies in the region were randomly selected and used for data collection. 50 agro-based workers were randomly selected from each of the estate. A grand total of Two hundred and fifty (250) workers in the different estates payrolls were selected from the various operational base of the firm. Baseline information on the socio-economic characteristics, saving, income and consumption expenditures as well as their off-job engagement were collected and analyzed.

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216 3.1 EMPIRICAL MODEL

Simultaneous equation model was used. Explicitly, the structural model is as shown below:-

$$\text{Sav} = a_0 + \sum a_i x_{ij} + e_i \dots \dots \dots (6)$$

$$\text{Con} = b_0 + \sum b_i x_{ij} + e_2 \dots \dots \dots (7)$$

$$\text{Inc} = \text{Sav} + \text{Con} \dots \dots \dots (8)$$

Where e's are white noise error term. X's are vector of explanatory variable including endogenous variable specify as explanatory variables. Details of x's are as given in equation (1), (2) and (3).

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225 4.0 RESULTS AND DISCUSSION

Table 1 presents the socio economic characteristic of respondents in the study area. The results reveal that, the rubber sub- sector in the south-south region of Nigeria is dominated by middle age workers who are predominantly males. More than 70% of the workers had some years of formal education while majority of the workers have moderate family size.

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233 **Table1: Socio-Economic Characteristics of Respondent**

Characteristic	Freq. and %	Characteristic	Freq. and %
Age (Yrs)		Family size (No.)	
< 20	26 (10.40)	<3	38 (15.20)
20 – 30	58 (23.20)	3 – 5	102 (40.80)
> 30	166 (66.40)	> 5	110 (44.00)
Total	250 (100.00)	Total	250 (100.00)
Sex (No)		Experience (Yrs)	
Female	55 (22.00)	<1	6 (2.40)
Male	195 (78.00)	1 – 10	116 (46.40)
Total	250 (100.00)	>10	128 (51.20)
		Total	250 (100.00)
Education (Yrs)		Asso. Membership(Yrs)	
No schooling	58 (23.20)	0	58 (23.20)
Primary School	119 (47.60)	< 1	15 (6.00)
Secondary School	60 (24.00)	1 – 10	107 (42.80)
Tertiary	13 (5.20)	> 10	70 (28.00)
Total	250 (100.00)	Total	250 (100.00)
Av. MONTHLY FARM INCOME (₦)		Av. MONTHLY SALARY (NON FARM INCOME) (₦)	
0	15 (6.00)	< 10000	75 (30.00)
< 5000	120 (48.00)	10001- 20000	130 (52.00)
5001-10000	90 (36.00)	> 20000	45 (18.00)
> 10000	25 (10.00)	Total	250 (100.00)
Total	250		

234 **Source:** Field survey, 2010 and 2011.

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236 In addition about 97% of the workers have invested more than one year in the various
 237 estates sampled. Also, about 76.8% of respondents belong to the local cooperative society
 238 (Osuzu) in the estate which is basically a saving oriented cooperative group. The result
 239 further indicates that only 6% of the workers depended solely on their salaries, while the
 240 remaining 94% depended on farm income in addition to their monthly pay from the estate.
 241 The monthly income distribution shows that about 18% of the workers have above ₦20000
 242 monthly incomes. This cadre of workers are mainly administrative and management staffs.

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244 **4.1 EMPIRICAL RESULT**

245 The estimated food consumption expenditure functions are presented in Table 2. The linear
 246 function was picked as the lead equation (L**) because it has the highest coefficient of
 247 determination ($R^2 = 0.819$) and more significant explanatory variables compared to other
 248 models estimated. The F-statistic (8.830) in the linear model is greater than the other models
 249 and is highly significant at 1% level of probability. This implies that the estimated R^2 is
 250 significant and the model has goodness of fit for the variables specified.

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Table 2: The OLS estimates of the 2 stage-least squares consumption regression

Variable	Exponential	Linear (L ^{**})	Semi-log	Double-log
Salary (Inc*)	0.00709*** (3.553)	17.485*** (3.891)	2812.99 (0.098)	0.585 (0.378)
Tax (X ₁)	-0.0244* (-1.833)	-60.35* (-1.874)	4540.55 (0.071)	0.351 (0.102)
Education (X ₄)	0.005 (-1.294)	85.604** (-2.251)	-729.35** (-2.000)	-0.205 (-1.042)
Family size (X ₆)	0.055* (1.811)	782.03** (2.022)	2005.010* (1.870)	0.157** (2.266)
Income of other Family Members (X ₇)	-0.000049 (-0.3.42)	-0.0.63 (-0.216)	-330.148 (-0.109)	-0.062 (-0.378)
Non-food expenditure (M ₁)	-0.08112* (-1.650)	-800.17** (-2.316)	-135.503 (-0.034)	-0.134 (-0.625)
Gender (M ₂)	0.243 (1.506)	637.55 (0.453)	-966.61** (-2.370)	-0.370* (-1.688)
Farm income (M ₃)	-0.5913*** (-2.895)	-2345.11*** (-4.751)	-1757.14 (-0.773)	-0.093 (-0.761)
Constant	21.707** (2.522)	357.9*** (3.925)	188.20** (2.105)	6.402* (1.665)
R²	0.797	0.819	0.346	0.284
F-stat	6.891***	8.830***	2.185**	1.998*

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Where *, ** and *** represent 10%, 5% and 1% significant levels respectively. Values in parenthesis are t-value while (L^{**}) is the lead equation.

The result revealed that the slope coefficient of the agro-based workers' salary (Inc*) is statistically significant at 1% probability level and positively related to the food consumption expenditure. This implies that as the monthly salary of the agro-based worker increases by one naira, the food consumption expenditure also increase by 17.45 naira. This result however indicates that for every one naira increase in the worker salary, larger increment would occur in food consumption expenditure. In other words; 10% change in salary is less than equivalent 10% change in food consumption expenditure of agro-based workers. This perhaps explains the less positive influence of the agro based workers' salaries to their food consumption expenditures. Since salaries of these workers are relatively constant over a period of time, it is suggested that the farm income is among the major determinants of food consumption expenditure of the workers' households in the short run. This implies that, the more the farm income of the worker the more the tendency to increase food consumption expenditure. Similar result had been obtained from empirical studies conducted by [11], [6]; [24]; [18]; [8] and [23].

Tax on workers' salaries has a significant negative effect (at 5% significance level) on food consumption expenditure of the rubber plantation estate workers in the southern region of Nigeria. This means that the current tax system adopted by the government of the region reduces the purchasing power of workers in the rubber sub- sector. A one naira increase in

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the tax paid by the worker would reduce food consumption expenditure by 60.35 naira. This also gives an insight why workers income cannot adequately take care of their consumption expenditure. A naira tax imposed on workers' salaries would reduce disposable income by ₦60.35. Given the current instability in macro-economic variables in Nigeria's economy, the propensity of tax reduction among these workers is almost negligible. Thus, the workers take home pay may continue to play a less significant positive role in providing for workers food consumption expenses in the rubber sub-sector in the region.

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The estimated coefficient of education (X_4) is negative and statistically significant at 5% probability level. This means that, a unit increase in the year of formal education of workers' decrease the household expenditure by ₦637.55. This result confirms the fact that most of the workers have lower years of formal education and hence will prefer necessary commodities to luxury ones in attempts to curtail consumption expenditures. This result corroborates the empirical findings of [14]; [3]; [7]; [21] and [24].

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The non-food consumption expenditure of the workers had a significant adverse effect (at 5% significance level) on food consumption expenditure. This means that, as workers purchase non- food items, their food consumption expenditure is negatively affected. This result indicates that 10% increase in the expenditure on non-food items would lead to about 800.17 naira reductions in household food expenditure. The result may be attributed to the distance of the rubber estates to the metropolis where most of these purchases are done. The proximity between the estates and the metropolis is the measure of the transportation cost incurred by the workers when they want to purchased household items and other necessary home accessories. This additional cost reduces the worker's disposable income and also increases the food consumption expenditure. It is also striking to note that most of the rubber plantation estate lack standard schools, well equipped clinic and others infrastructures. Hence most workers have to pay heavily to sponsor their wards to attend good schools in the nearby towns and for their health care need. These responsibilities increase their monthly non-food consumption expenditure while drastically reducing the household food consumption expenditure.

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The family size has a significant positive impact (at 5% significance level) on food consumption expenditure of rubber plantation estate workers in the southern region of Nigeria. That is, a number increase in the household size of the worker would result in ₦782.03 increase in household consumption expenditures. This implies that, workers that have large family size would have increase in food consumption expenditure. This means

that, the larger the worker household, the more difficult it will be for the worker to meet the basic food consumption requirement of the family. Since the estates are in rural areas, most of the workers are not exposed to modern method of family planning. In addition, low years of formal education and the rural community influence, perhaps contributed to the mental orientation of most workers having large families. Another possible reason for this result could be the low remuneration to workers which prevent them from accessing modern information and facilities for effective family planning. As a consequence, the family consumption expenditure increase as the family size increase. This result is in consonance with the research reports of [14]; [7]; [3]; [10]; [24]; [16]; [18]; [21]; [8]; [17] and [23].

The coefficient of farm income of workers is statistically significant at 1% probability level and negatively related to food consumption expenditure. The result shows that for every one naira increase in the worker's farm income, about ₦2345.11 worth of household expenditure is saved. This means that, majority of workers are engaged in subsistence farming activities; implying that most of their farm products are consumed by them. This result reveals the importance of farming engagement to the welfare of agro-based workers in the region. The possible reasons for this result could be the low level of formal education among workers and the remoteness of the estates which cut them from accessing luxuries commodities. Given this result, it implies that farm income plays a more significant role in the worker's food consumption expenditure and saving compared to salary earned.

5.0 CONCLUSION

The contribution of the natural rubber sub-sector to the economic development of the southern region of Nigeria cannot be undermined. Improving food-consumption expenditure of workers in the rubber estates will directly increase the productivity of the sub-sector in the region. The study has identified that remuneration in the natural rubber production sub sector in the southern region of Nigeria is generally low and this has a marginal or minimal effect on food consumption expenditure of workers. The study suggests that this hindrance is the major reason why labors are not steadily attracted to this agro based industry in the region despite saturated labor market. In reaction to this situation, most workers complement their salaries with farm income which has a significant effect on the food consumption expenditure. Apart from above reasons, the results suggest that the rural area where the rubber estates are located and the negative impact of non-food consumption expenses on food consumption expenditure of the workers in addition to poor facilities and infrastructures in the production areas are other possible reasons for low societal ranking of workers of these agro based firms; and unsteady labor movement in the sub sector.

5.1 POLICY IMPLICATIONS AND RECOMMENDATIONS

The results of the study identify monthly tax, years of formal education and non-food consumption expenditure to have significant negative impacts on rubber plantation estate workers' food consumption expenditure in the southern region of Nigeria. In addition, the study has revealed that workers salary and workers families size have significant positive relationship with food consumption expenditure. Based on the above findings, the following policies were recommended. The employee or owners of the rubber estate should endeavor to increase the worker's salaries periodically in line with the changes in the country macroeconomic and microeconomic variables. Also policies which reduce agricultural production restraints will increase the workers farm income and subsequently improve their food consumption expenditure through increase in their disposable income. Policies which reduce tax and household size will improve food-consumption expenditure of rubber plantation estate workers in the region. Direct tax cut and appropriate birth control measures for these set of workers are advocated. Non-food consumption expenditure has a negative effect on food consumption of the workers. This suggests that government of the region should adopt policies targeted towards development of rural areas through provision of amenities, re-creational facilities, schools, well equipped hospitals and other necessary infrastructures. These will reduce the non-food expenditure while the unspent income will be channel to food consumption.

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