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Gender Analysis of Rural Households' Involvement in Oil Palm Production, Processing and Marketing in Southeast Nigeria.

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ABSTRACT
The study focused on gender analysis of rural households' involvement in oil palm production, processing and marketing in Southeast Nigeria. Multi-stage sampling procedure was used in the selection of the 540 respondents for the study. Data for the study were collected with the use of structured questionnaire and analyzed with descriptive and inferential statistics. The result showed that the tasks of harvesting (91.6%), farm clearing (81.0%), site selection (75.8%) and transportation (66.1) were majorly carried out by the male farmers, while the tasks of fertilizer/manure application (75.5%), planting (63.4%), nursery establishment (58.7%) and field preparation (57.4%) were majorly carried out by female farmers in the study area. The major tasks performed the male farmers were paying of rents (74.8%) and transportation of products (57.0%) while canvassing for customers (84.2%), selling of products (83.2%), packaging of products (75.2%), grading of products (67.0%), storing of product (60.2%), determining quantity to be sold (58.9%), were performed by female farmers in the study area. Result from Logit regression analysis revealed that coefficients of age (5%), household size (5%), level of education (1%), farm size (1%), and farm income (5%) were the factors influencing involvement in oil palm enterprise among male farmers in the study area. More so, age (5%), marital status (10%), household expenditure (1%), education (5%), farm income (1%), farm size (1%), occupation (1%), labour cost (1%) were the factors influencing involvement in oil palm enterprise among the female farmers in the study area. The study clearly delineates the role of male and female farmers in the production, processing and marketing of oil palm produce and lends itself to the possibility of introducing gender-specific technology for the various activities as paradigm shift. It is therefore recommended that research institutes develop a gender specific technology in oil-palm production, processing and marketing in Southeast Nigeria.
Keywords: gender, oil palm, production, processing, marketing

INTRODUCTION

The global growing demand for palm oil made oil palm cultivation become a means of livelihood for many rural families, and indeed the farming culture of millions of people in Nigeria especially Southeast. The oil palm tree is a useful crop that is relevant in all aspects of live with socioeconomic and socio-cultural values. The reference to oil palm as a crop of multiple value underscores its economic importance. Oil palm is made of essential components, namely; the fronds, the leaves, the bunch, fruit, the trunk and the roots etc (Nwalieji and Ojike 2018).

Oil palm has been a major source of foreign exchange to Nigeria as well as source of revenue to major segment of the rural population of South East Nigeria (Ekenta., Ajala., Akinola, and Oseni, 2017).). The most important product of oil palm is the palm fruit, which is processed to obtain three commercial products namely: palm oil, palm kernel oil and palm kernel cake. Palm oil and palm kernel oil are two distinct oils which are important in World Trade, (Barcelos, Almeida, Cunha, Lopes, Motoike., 2015). Hence, oil palm is often referred to as a crop of multiple values, which underscores its economic importance.

Studies by Udoh and Essien (2018), Nwalieji and Ojike (2018) Ukwuteno, Eboh and Ocheja (2018) revealed that, palm oil production, processing and marketing is a major economic activity of the people of Southern Nigeria and is mostly carried out by rural dwellers particularly women under manual and subsistence methods. Usually, local producers will take their processed oil and kernel to the periodic or daily markets, or display same by the road side or village square where prospective buyers will come for purchase. Essien (2015) found that, palm oil processing and marketing generates revenue for the rural people and therefore boost the economy of the rural dwellers in the area.

Gender issues have taken a global dimension especially in the 20th and 21st century. Gender participation in agricultural production, processing, power and right to agricultural production input has increased significantly recently in Nigeria. Gender refers to social constructed role difference between men and women for the purpose of allocating powers, duties, status, responsibilities and role in any given social milieu or context (United State Agency for International Development, 2015) as distinct from sex which refers to their biological differences. It deals with the social relationship between men and women and how these relationships are negotiated in the production of goods and services (Udoh and Essien, 2018). Women represent on average 70 to 80% of the active farming population, and are highly involved in the entire value chain of staple food items, i.e. in production, processing and marketing (Agomoh and Alocha).

Such gender relations exist in agricultural production where men and women have different roles, priorities, opportunities and constraints. Lack of gender consideration has often led to failure of different Popular projects in the past (Ukwuteno *et al* 2018). Women constitute majority of the farming population in rural areas. They participate actively in agricultural activities but their contributions in relation to men's are not objectively assessed, commensurate, appreciated and documented given rise to stereotype assumption on the contributions of men and women in agricultural production (Mohammed and Abdulquadri 2016). Gender in oil palm production and processing entails the analysis of male and female issues concerning the part both play in production and processing of oil palm produce and if properly conceived, refers to male and female concerns and needs and it stands for value equity and equality (USAID, 2015).

All the world, both men and women play critical role in cash crop production and processing e.g. palm oil production. However, in non-industrialized is very low, women particularly in rural areas produce 60-80% of food consumed which are most especially vegetable cereals and legumes while men participate and concentrate much in cash crop production e.g. oil palm and (Opeke, 2015). According (Conway, 2018), many constraints has limited gender participation in its production and processing techniques adopted. They posited that women have suffered the adverse effect of globalization and liberalization than their male counterparts. They further said that women are faced with problems of inappropriate processing techniques that would suit their physique.

Gender analysis must take into consideration and address differentials in control over and access to land and other resources, inequalities in gender participation and roles in decision making forums as well as inequalities in representation concerning development. There is consensus in agricultural literature that agricultural development activities have been male biased (Conway, 2018). It further stated that to ensure equality in the access and control of resources required for agricultural production, the agricultural sector need to embark on programmes and actions that do not reinforce the dominance of men in the sector. Gender disparities in agriculture is a contributory factor to the poor performance of agriculture, especially in the rural areas looking at the ever increasing roles that rural women play in farming activities (Agomoh and Alocha 2017). In addition to this, socio-cultural perceptions and behaviours towards women limit their access to and control of productive resources.

Until recent past, however, the contribution of women within the farm household remained not fully recognised. Equally unrecognised were women's limited access to productive resources and gender specific constraints they encountered. As a result, the gender implications for agricultural and rural development policies and programmes were frequently overlooked, thus compromising their success and sustainability. According to Mohammed and Abdulquadri (2016), in spite of the contribution of men and women in food production, unlike men, women's role in promoting economic growth and social stability continues to be inadequately recognised and undervalued. With the ever changing economic conditions in Nigeria, the traditional gender tasks ascribed to men and women have been altered.

Research has shown that as a result of economic hardship, women have resorted to combining their traditional gender tasks with men designated tasks (Agomoh and Alaocha 2017). The biggest constraint to the effective recognition of men and women actual roles and responsibilities in oil palm sector is therefore, the scarcity of gender disaggregated data available. In the same vein, with the continuous migration of rural men outside the farming sector in search of paid employment, labour supply for oil palm production becomes a problem and thereby increasing women time and labour supply to oil palm production. Rural-Urban migration especially among rural youths also cuts off rural youth's involvement in agriculture, leaving farming activities on the hands of aged men and women. There is therefore the need for gender analysis to determine the roles and responsibilities men and women play in oil palm production, processing and marketing in Southeast Nigeria. The study specifically examined the roles performed by men and women in oil palm production in production, processing and marketing as well determined factors influencing the involvement of men and women in oil palm enterprise in the study area.

METHODOLOGY

The South-East Agro-ecological Zone of Nigeria was the main focus of the study. The Zone lies between latitude 6° and 9°E and 4° and 7°N longitude, and has a total land mass of 952,400 hectares. The zone has a projected population estimate of 21,955,414 and is made up of five states viz: Abia, Anambra, Ebonyi, Enugu and Imo States (NPC, 2019). The population density is 173 persons per square kilometer (Umeh, 2018). About 60-70% of the inhabitants engage in agriculture, mainly crop farming and animal rearing (Umeh, 2018).

The study population comprised of all rural households who engage in oil palm production in South –East Nigeria. Multi-stage sampling procedure was used in the selection of the 540 respondents for the study. The 1st stage involved the selection of three States from the zone using Simple Random Sampling (SRS) technique. The 2nd stage involved the selection of 6 (six) Local Government Areas from the States selected using Simple Random Sampling (SRS). This gave a total of 18 (eighteen) L.G.A.s. The 3rd stage involved the use of Simple Random Sampling technique (SRS) in selecting 3 Communities each from the selected L.G.A.s bringing the total to 54 Communities. The 4th and final stage involved the selection of ten (10) respondents each from the communities' selected using Simple Random Sampling (SRS) technique. A total of 540 (five hundred and forty) respondents constituted the sample size for the study. The study made use of primary data. Primary data were

collected using structured questionnaire. Data for the study were analyzed using both descriptive and inferential statistics. Specifically, objectives 1, 2 and 3 were analyzed using simple descriptive statistics such frequency and percentage while objective 4 was analyzed using logit regression model.

Model Specification

Factors influencing male and female involvement in oil palm enterprise was determined using the Logistic regression model. This model is suited to models where the dependent variable is dichotomous. If Yi is the random variable (dichotomous), it can then be assumed that Yi takes on the values 0 or 1,

If $X_1 \ldots X_n$ are characteristics to be related to occurrence of this outcome, then the logistic model specifies that the conditional probability of event (i.e., that Y = 1) given the values of X1,……., Xn is as follows:

$$P(Y) = 1/[1 + \exp - (\alpha - \Sigma \beta iXi) \quad (1)$$

In order to linearize the right hand side a logit transformation was applied by taking logarithm of both sides, therefore we have:

$$\text{Logit } P(Y)=\alpha+\Sigma\beta_iX_i1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\beta_6X_6+\beta_7X_7+\beta_8X_8+\beta_9X_9+\beta_{10}X_{10}+1+\beta_{11}X_{11}+\beta_{12}X_{12} \quad (2)$$

Where,
Y_i = 1 if respondents was involved
and Y_i = 0 if respondents was not involved
α = Constant term
X_i = independent variable
β = logistic coefficient for independent variable

The independent variables specified as determinants of involvement in oil palm enterprise are:
X_1 = Age (years)
X_2 = Household size (number of persons)
X_3= Marital status (1= married, 0 = single)
X_4= Household expenditure (Naira)
X_5= Main occupation (1= farming, 0 = non farming activities)
X_6 = Farm size (hectare)
X_7 = Farm income (Naira)
X_8 = Cost of labour (Naira)
X_9 = Capital (Naira)
X_{10} = Years of experience (Years)
X_{11} = access to farm credit (Naira)
X_{12} = Educational level (years)
μ = Error term

RESULTS AND DISCUSSION

Role performed by male and female household's members in oil palm production

The result on Table 1 examined the roles played by rural household members in the production activities of oil palm produce production in the study area. The result showed that the tasks of harvesting (91.6%), farm clearing (81.0%), site selection (75.8%) and transportation (66.1) were majorly carried out by the male farmers while the tasks of fertilizer/manure application (75.5%), planting (63.4%), nursery establishment (58.7%) and field preparation (57.4%) were majorly carried out by female farmers in the study area.

Table 1: Role performed by male and female household's members in production of oil palm produce in the study area

Role Performed by household members	Abia (n = 180)		Anambra (n = 180)		Imo (n = 180)		Southeast (n = 540)	
	M(%)	F(%)	M(%)	F(%)	M(%)	F(%)	M(%)	F(%)
Site selection	81.4	18.6	77.5	22.5	68.4	31.6	75.8	24.2
Clearing	86.7	13.3	82.6	17.4	73.7	26.3	81.0	29.0
Seedling sourcing	56.0	44.0	53.6	46.4	61.5	38.5	57.0	43.0
Nursery establishment	44.1	55.9	45.9	54.1	33.8	66.2	41.3	58.7
Field preparation	30.0	70.0	48.4	51.6	49.5	50.0	42.6	57.4
Planting	41.5	58.5	28.8	71.2	39.2	60.8	36.6	63.4
Fertilizer/manure application	30.0	70.0	26.3	73.7	17.1	82.9	24.5	75.5
Checking of ripped fruits	66.5	33.5	80.3	19.7	77.7	22.3	74.8	25.2
Harvesting	90.8	9.2	89.5	10.5	94.6	5.4	91.6	8.4
Transportation	66.1	33.9	57.8	42.2	74.5	25.5	66.1	33.9

Source: Field Survey, 2020. Multiple responses recorded

The result implied that the society consciously or unconsciously assigned roles to male and female in relations to tasks performed in oil palm production activities. Furthermore, it can be observed that the male farmer performed most of the stressful tasks that require more energy than that of the female farmers in the study area. In agreement with the findings of Mohammed, and Abdulquadri, (2016) asserted that in traditional African agriculture, cultivation of cash crops and other perceived stressful work such as land clearing, ploughing, etc are often ascribed men responsibilities while production of food crops and light works such as sowing seed, weeding etc are often ascribed women responsibilities. Agomoh and Alocha (2017) found that male farmers are involved in oil palm production activities than their female counterparts. It is also important to note that harvesting of ripped oil palm fruit is usually through hiring of climbers especially matured palm trees. The respondents that indicated to be involved in harvesting are mostly those who harvest when the tree is at a younger stage.

Role performed by male and female household's members in oil palm processing

The result on Table 2 examined the roles played by male and female household members in the processing activities of oil palm produce in the study area. The result showed that the tasks of bunch separation (81.2%), softening of fruit flesh (74.8%), pressing out of oil liquid (60.2%), transportation of products (57.3%) were majorly performed by male farmers while the tasks separating of individual fruit from the bunch (81.4%), boiling of palm fruit (75.2%), cracking of nuts (71.7%), separation of nuts (79.1%) and storing of products (66.0%) were performed by female farmers in the study area.

Table 2: Roles performed by male and female in oil palm processing in the study area

Role Performed by household members	Abia (n = 180)		Anambra (n = 180)		Imo (n = 180)		Southeast (n = 540)	
	M(%)	F(%)	M(%)	F(%)	M(%)	F(%)	M(%)	F(%)
Bunch separation	76.5	23.5	80.3	19.7	87.7	12.3	81.2	18.5
Separating of Individual fruits from the bunch	18.5	81.5	23.0	77.0	14.4	85.6	18.6	81.4
Boiling	28.5	71.5	34.6	65.4	11.3	88.7	24.8	75.2
Softening of the fruit flesh	66.5	33.5	80.3	19.7	77.7	22.3	74.8	25.2
Pressing out of oil liquid	68.5	31.5	59.6	40.4	52.5	47.5	60.2	39.8
Cracking of nuts	22.1	77.9	18.2	81.8	44.5	55.5	28.3	71.7
Separation of nuts	11.0	89.0	31.2	68.8	20.5	79.5	20.9	79.1
Transporting of products	52.5	47.5	61.0	39.0	58.4	41.6	57.3	42.7
Storing of products	44.3	55.7	24.0	76.0	33.7	66.3	34.0	66.0

Source: Field Survey, 2020. Multiple responses recorded

The result implied that both male and female farmers were involved in the processing of oil palm products in Southeast Nigeria. Nzeakor (2015) in his study clearly delineated the role of male and female farmers in the processing of oil palm produce in Southeast Nigeria. Agomoh and Alocha (2017) equally found gender specific roles for the various processing activities in Abia State Nigeria which is agreement with the study.

Role performed by male and female household's members in the marketing of oil palm produce

The result on Table 3 examined the roles played by male and female household members in the processing activities of oil palm produce in the study area. The result showed that the major tasks performed the male farmers were paying of rents (74.8%) and transportation of products (57.0%) while canvassing for customers (84.2%), selling of products (83.2%), packaging of products (75.2%), grading of products (67.0%), storing of product (60.2%), determining quantity to be sold (58.9%), acquiring the market shed (58.8%) and buying of produce (57.0%) were performed by female farmers in the study area.

Table 3: Role performed by male and female household's members in the marketing of oil palm Produce in the study area.

Role Performed by household members	Abia (n = 180)		Anambra (n = 180)		Imo (n = 180)		Southeast (n = 540)	
	M(%)	F(%)	M(%)	F(%)	M(%)	F(%)	M(%)	F(%)
Buying	44.0	56.0	46.4	53.6	38.5	61.5	43.0	57.0
Grading of products	35.0	65.0	22.2	77.8	41.8	58.2	33.0	67.0
Transporting the products	56.0	44.0	53.6	46.4	61.5	38.5	57.0	43.0
Storing the product	28.4	71.6	41.4	58.6	49.5	50.5	39.8	60.2
Canvassing for customers	11.0	89.0	9.4	90.6	26.9	73.1	15.8	84.2
Acquiring the market shed	43.0	57.0	32.3	67.7	48.2	51.8	41.2	58.8
Paying rent for the shed	66.5	33.5	80.3	19.7	77.7	22.3	74.8	25.2
Determines the quantity to be sold	41.1	58.9	32.7	67.3	49.5	50.5	41.1	58.9
Packaging of products	28.5	71.5	34.6	65.4	11.3	88.7	24.8	75.2
Selling of products	19.5	80.5	6.3	93.7	24.1	75.9	16.6	83.4

Source: Field Survey, 2020

The result implied that implied the female household members dominated the marketing activities of oil palm produce in Southeast Nigeria. The findings of Nwalieji and Ojike (2018) corroborates the claims of the study that oil palm processing and marketing activities were female farmers located in the rural communities of Nigeria.

Factors Influencing male and female involvement in oil palm enterprise

Table 4 showed the Logit regression estimates of factors influencing male and female involvement in oil palm enterprise in the study area. The result revealed out of the 12 variables estimated, 5 variables were statistically significant for male farmers while 8 variables were significant for female farmers. The Pearson Goodness of fit test values of 323.271(for male) and 425.657 (for female) were statistically significant at 1% alpha level which affirms the logit goodness of fit of the model used. The coefficients of age at 5%, household size at 5%, level of education at 1%, farm size at 1%, and farm income at 5% were the factors influencing involvement in oil palm enterprise among male farmers in the study area. More so, age at 5%, marital status at 10%, household expenditure at 1%, education at 5%, farm income at 1%, farm size at 1%, occupation at 1%, labour cost at 1% were the factors influencing involvement in oil palm enterprise among the female farmers in the study area.

Table 4: Logit regression estimates of factors influencing male and female involvement in oil palm enterprise in the study area

	Male			Female		
Parameter	**Estimate**	**Std. Error**	**Z-value**	**Estimate**	**Std. Error**	**Z-value**
Age	-0.012	0.007	-2.795**	-0.017	0.008	-1.983**
Marital status	-0.146	0.100	-1.463	-0.139	0.081	-1.711*
Household size	0.040	0.023	2.705**	-0.025	0.031	-0.796
Household Expenditure	0.000	0.000	0.710	0.000	0.000	5.853***
Level of education	0.023	0.058	3.389***	0.038	0.017	2.239**
Farm size	0.005	0.016	3.282***	0.024	0.038	5.646***
Years of experience	0.001	0.006	0.221	0.009	0.007	1.265
Farm income	0.000	0.000	2.505**	0.000	0.000	5.027***
Occupation	0.007	0.043	0.172	0.137	0.048	2.952***
Labour cost	0.000	0.000	0.474	0.000	0.000	3.626***
Capital	0.000	0.000	-1.474	0.000	0.000	-0.425
Access to credit	0.000	0.000	0.076	0.000	0.000	-0.841
Intercept	2.546	0.363	7.012***	2.240	0.444	5.043***
Pearson Goodness-of-Fit Test	323.271			425.657		
p-value	P<0.01			P<0.01		

Logit model: LOG(p/(1-p)) = Intercept + BX. *, **, and *** are significant at 10%, 5% and 1% level of probability

The coefficient of age was negatively related and statistically significant at 5% for both male and female farmers in the study area. The inverse relationship implies that any increase in age of male and female farmers will result to decrease the probability of farmer's involvement in oil palm enterprise in the study area. Nzeakor (2015) also found that most of oil palm farmers were still in their active working years and argued that oil palm processing as with other agricultural production or processing activities is very exhausting and maybe too strenuous for an elderly person.

The coefficient of marital status was negatively related and statistically significant at 10% level of probability for the female farmers in the study area. This result implies that as more females get married, the involvement in oil palm enterprise decreases. The decreased in level of involvement among the married female farmers could be attributed to enormous family responsibilities, gender inequality, patriarchal family system, land tenure system and over dependence on their husbands in the study area.

The coefficient of coefficient of house size for male was positively related and statistically significant at 5% level of probability. This result of implies that an increase in household size will result to a corresponding increase in the probability of male farmer's involvement in oil palm enterprise in the study area. The increase of household size suggests that more family labour would be readily available since relatively large household size is an obvious advantage in terms of farm labour supply, where wage rate is relatively costly (Kuye, 2015).

The coefficient of household expenditure was positively related and statistically significant at 1% level of probability for female farmers in the study area. This result implies that a unit increase in household expenditure will result to a corresponding increase in farmer's involvement in oil palm enterprise in the study area.

The coefficient of education was positively related and statistically significant at 1% level of probability for the male and 5% of probability for the female. The result implied that an increase in the level of education of male and female farmers in the study area will lead to a corresponding increase farmer's involvement in oil palm enterprise in the study area. The result conforms to the

researchers *a prior* expectation that education enhances farmers' awareness, access and effective utilization of farm inputs. This is agreement with Kuye (2015) sthat education enhances farmers' ability to make accurate and meaningful management decision.

The coefficients farm size was positively related and statistically significant at 5% level of probability for male and 1% level of probability. This result implies that any increase in farm size will lead to a corresponding increase in the probability of farmers' involvement in oil palm enterprise in the study area. The result is in tandem with the findings of Odoemelam Ifenkwe, and Onu (2020) that large farm size increases agricultural productivity and improves farmer's technical, allocative and resource use efficiency as well as enhances access to credit and other farm inputs.

The occupation was statistically significant at 1% for female farmers and positively related to involvement in oil palm enterprise in the study area. This result implies that implies that the more the female farmers engage in farming, the more their involvement in oil palm enterprise in the study area.

The coefficient for cost of labour, was statistically significant at 1% level of probability for female farmers and positively related to involvement in oil palm enterprise in the study area. This result implies that any unit increase in cost of labour will lead to a corresponding increase in the probability of involvement in oil palm enterprise in the study area. Obviously, female farmers usually perceive agriculture to be labour intensive and are unable to adequately handle the required farm labour alone. The need for hired labour is inevitable among female farmers unlike their male counterparts who usually use household labour for farming (Agomoh and Alocha 2017).

CONCLUSION AND RECOMMENDATIONS

The study provided empirical evidence on the involvement of male and female farmers in oil palm production, processing and marketing in Southeast Nigeria. The society consciously or unconsciously assigned roles to male and female household members in relations to tasks performed in oil palm production, processing and marketing activities. The study clearly delineates the role of male and female farmers in the production, processing and marketing of oil palm produce and lends itself to the possibility of introducing gender specific technology for the various activities as paradigm shift. The study therefore recommended that Researcher Institutes should develop a gender specific technology in oil palm production, processing and marketing in Southeast Nigeria.

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