



GENDER ANALYSIS OF RURAL SMALL-SCALE ARABLE CROP FARMING IN DELTA STATE, NIGERIA

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ABSTRACT

The study was conducted on Gender analysis of rural small- scale arable crop farming in Oshimili South Local Government Area of Delta State, Nigeria. Multi-stage random sampling techniques was used to select 150 respondents for the study. Data was collected through the use of structured questionnaire and analyzed using both descriptive and inferential statistical tools. Results showed that in age distribution of respondents according to gender, about 70% of the male respondents and 60% of the female were less than 35 years of age with only 2.67% and 4.00% respectively being above 55 years. 80% of male and 76% of female were married while 92% of male had formal education as compared to 86.7% for female. Also, 50.66% of male farmers had large families of seven and above while 50.67% of their female counterpart had family size of seven and above. About 16% of the male farmers accessed loan from banks as against 6.7% of the female folks. Male farmers dominated in yam production with over 84% as against the female group that had only 20% of the females involved. Females were into cassava production (60%) as against their male counterpart with 33.3%. The econometric analysis for determinants of gender productivity among small holder farmers showed that coefficients for farm size and age were negative and significant at 5% level for the male and 1% for the female. The coefficients for capital inputs, planting materials, labour and education were positive as expected and significant at 5% level for the male farmers and 1% level for the female farmers. Inadequate credit was the most important constraints to small- scale arable crop farming with 80%. Major constraints also include inadequate extension services (70%). It was recommended that extension agents should sensitize and involve more rural small-scale arable crop female farmers in their contact and training.

Keywords: Analysis, Arable Crop, Constraints, Farming, Small-scale.

INTRODUCTION

Arable farming involves systematic use of land to grow mainly annual crops such as grain crops, pulse crops, oil seed crops, forage crops, fibre crops, root and tuber crops rather than keeping of animals or growing of fruits and vegetables (Collins Dictionary, 2021). In Southern Nigeria the commonly grown annual arable crops include: maize, rice, cowpea soya beans, groundnut, yam, cocoyam, potatoes and cassava. Arable crop farming can be on a large-scale or on a small- scale.

The difference is the degree in the variation in the amount and type of labour utilized, capital invested or amount of land worked. However, land size is the most commonly used criteria. IFAD (2011) stated that FAO adopted a 2- hectare (ha) threshold as a broad measure for a small- scale arable crop production. In this study, small- scale arable crop farming is described as those farmers who utilized not more than 2 hectares of land to grow mostly annual crops relying almost exclusively on family labour. Sabo *et al.* (2017) stated that overall, small-scale farming in Nigeria is cauterized by marginalization in terms of factors of production like



accessibility of resources, information, technology, capital and assets. Despite these problems some small scale arable crop farmers have managed to produce food for their own consumption and market (Sabo *et al.*, 2017). Small-scale farming has the potential to generate employment and income opportunities in rural areas. The challenge in Nigeria is how to remove the structural constraints that inhibit the growth of a vibrant commercial small-scale farming sector. Arable crop farming is not gender bias. Male and female household heads and members are involved in it. Gender is defined as the set of characteristics, roles and behaviour patterns that socially and culturally distinguish women from men in the society (Tchouassi, 2012). Gender characteristics change overtime and differ from one culture to another. As a result of this, socially constructed relationships and power between them also differs. These include their access to and control of resources and the constraints they face relative to each other (WIC, 2005). Emphasis on the link between gender and agriculture has existed as long as the concept of gender itself. However according to Nwandu (2021) rural women in Nigeria are important contributors in small-scale agriculture, rural workforce and daily family subsistence.

Rural women play a pivotal role in ensuring household food security and nutrition, particularly through cultivation of home gardens, and can increase production and food security through improved agro ecological practices and crop diversification. They can also be important agents of rural economic diversification, and key players in vibrant micro-entrepreneurial activities such as artisanal agro processing, which have significant potential to be developed into viable enterprises. Their economic and social empowerment also yields critical inter-generational benefits, helping to make the next generation better fed, healthier and better educated, and thus better equipped to contribute to the economy and society (World Bank, 2014). Despite these important roles, women have greater difficulty than men accessing resources such as land, credit, agricultural inputs, services, labour, market and education that increase their productivity and their possibility to enhance their own and their family's well-being (IFAD, 2009). This is also reinforced by gender segregation in the labour market, which confines women largely to relatively low-income activities and by intra household decision making dynamics that limits their control over household income and their influence on spending priorities. (IFAD, 2009). Consequently, the productivity and economic empowerment of women is a logical priority of programs and policies aimed at promoting agricultural development. The priority is justified, as it considers women's agricultural production as a source of economic growth and as a benefit of rural livelihood and poverty reduction. In order to transform subsistence agriculture into market-oriented farming, gender has become a pivotal issue as the contribution of women in small-scale arable crop farming is significant.

The contribution of women in small-scale agriculture has significant importance to raise production and productivity to achieve food self-sufficiency at household level in particular and at country level in general. Recent analysis suggests that gender issues are explicitly integrated in less than 10% of official development assistance (World Bank, 2014). Moreover, land ownership is often seen as a precondition for increasing the productivity of rural women, as it enhances their access to other resources needed for production (Deere and Leal, 2001). According to CDPA (1996), gender analysis should be integrated into the needs assessments of agricultural productivity and in all sector assessments to ensure that gender-based injustices and inequalities are not exacerbated by human interventions and that where possible greater equality and justice in gender relations are proposed. There is therefore need to analyze gender as it relates to small- scale arable crop production in rural areas. This is with a view to finding out if progress have been made as regards the gender issues often raised in small – scale arable crop production. The broad objective of this study was to analyze the relationship by gender in



arable crop production among small- scale farmers in rural areas of Oshimili South Local Government Area of Delta State. Specific objectives include: determine the socioeconomic characteristics of small-scale arable crop farmers by gender; determine gender base types of arable crop ownership; estimate the determinants of productivity of cassava and maize along gender and determine constraints faced by male and female

MATERIALS AND METHODS

The Study Area

The study was conducted in Oshimili South Local Government Area (LGA), one of the 25 LGAs making up Delta State. Situated in Delta North Agricultural Zone and in the Niger Delta Region/ South- South geo- political zone of Nigeria. The LGA occupies a landmass approximately 603km³ and located within latitudes 6° 43' N and 6° 15' and longitudes 6° 30' E and 6° 15' E. Rainfall of the area is about 1,765.8mm. Minimum and maximum temperature are between 24°C and 33°C, respectively. Relative humidity is between 83.2% and 84.7%. It is seated on the rainforest belt with very large coverage of Fresh Water Swamp and marshy soil occasioned by the river Niger and its tributaries. Vegetation and water bodies account for 58.71% and 8.66% respectively while built -up area account for 32.4%. Population during 170,519. Apart from Asaba which is the administrative headquarters and Capital of Delta State that is growing urban and commercial nerve centre, the rest villages are rural areas and are mainly engaged in farming and fishing. Other communities in Oshimili South LGA include: Okwe, Oko- Anala, Oko- Ogbele, Oko- Amakom, Oko- Obiokpu, Odifulu, Elenchele, Anwai, Aniugo and Amako (Delta State Ministry of Agriculture, 2017).

Sampling Procedure

A multi-stage sampling techniques was used in selecting the respondents. The first stage was purposive sampling of five rural villages/communities from the local government which was based on the presence of large number of small-scale arable crop farmers. They are Oko-Anala, Oko-Ogbele, Aniugo, Okwe, and Elenchele. The second stage was the random selection of 30 small-scale arable crop farmers (15 males and 15 females) from each village selected giving a total of 150 small-scale arable crop farmers used for the study. Primary data was used for the study. Data was collected through the use of structured questionnaire.

Analytical Procedure

Data was analyzed using descriptive statistics involving the use of means, frequencies, distribution and percentage. The null hypothesis which states that socio-economic characteristics of farmers do not affect the productivity of arable crops on gender basis will be tested by Cobb Douglas production function.

The log-linear model derived from Cobb Douglas functional form was the econometric model specified for explaining productivity. The functional form is the most popular in applied research because it is easiest to handle mathematically (Koutsyiannis, 1979). It is only when satisfactory results are not obtained from this model that other forms will be tried out. The model is described thus:

$$\ln Y = a_0 + a_1 \ln Z_1 + a_2 \ln Z_2 + a_3 \ln Z_3 + a_4 \ln Z_4 + a_5 \ln Z_5 + a_6 \ln Z_6 + a_7 \ln Z_7 + a_8 \ln Z_8 + a_9 \ln Z_9 + a_{10} \ln Z_{10} + a_{11} \ln Z_{11} + e$$

where;

Y = Productivity of cassava and maize in kg/ha

Z₁ = farm size in hectares

Z₂ = capital input in naira made up of depreciation, charges on farm tools and equipment, interest on borrowed capital and rent on land



Z_3 = planting materials in kg (cuttings and seeds) (yam, cassava etc.)

Z_4 = fertilizer input in kg

Z_5 = manure input in kg

Z_6 = labour for all activities in man-days (hrs./day)

Z_7 = age in years

Z_8 = household size (number of family members)

Z_9 = farmers level of education in years

Z_{10} = farming experience in years

Z_{11} = number of extension contacts

$b_0 - b_{11}$ = coefficient estimated

e = error term

\ln = represents the natural logarithm

RESULTS AND DISCUSSION

Socio-economic Characteristics of Small-scale Arable Crop Farmers by Gender

Several socio-economic characteristics of small- scale arable crop farmers in the study area were studied along gender lines. These characteristics were age, marital status, level of educational attainment, level of farming experience and source of accessed credit. The data for the studied variables were as presented in Table 1.

The age distribution of respondents according to gender showed that about 70% of the male respondents and 60% of the females were less than 35 years of age with only 2.67% and 4.00% respectively being above 55 years. This may imply that both male and female arable crop farmers in the study area are still young and strong enough to engage in different agricultural enterprises to improve their income. Young aged arable farmers can take risks more than older farmers which will ultimately improve productivity.

Table 1 also showed that 80% of male and 76% of female arable crop farmers were married. This could be because their farm enterprise(s) can generate enough cash flow to sustain their families. Entries in Table 1 further showed that 92% of male respondents had formal education as compared to 86.7% for female. This may imply that literacy level is high among both gender in the study area and also that both genders could readily adopt innovations in order to enhance increased productivity and livelihoods of their various families. As observed by Olagunju *et al.* (2007), educated farmers are more receptive to new innovations.



Table 1: Socio-economic Characteristics of Small-Scale Arable Crop Farmers by Gender

Characteristics	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Age (Years)				
Less than 25 years	7	9.33	15	20.00
26-35	45	60.00	30	40.00
36-45	15	20.00	22	29.33
46-55	6	8.00	5	6.67
56 and above	2	2.67	3	4.00
Total	75	100.00	75	100.00
Marital Status				
Single	15	20	8	10.67
Married	60	80	57	76.00
Divorced	-		3	4.00
Widowed	-		7	9.33
Total	75	100.00	75	100.00
Educational Level				
No formal education	6	8.00	10	13.33
Primary education	20	26.67	33	44.00
Secondary education	37	49.33	27	36.00
Tertiary education	12	18.00	3	4.00
Total	75	100.00	75	100.00
Farming Experience				
1-10 years	25	33.33	30	40.00
11-20 years	31	41.33	28	37.33
21-30 years	14	18.67	11	14.67
31 years and above	5	6.67	6	8.00
Total	75	100.00	75	100.00
Household Size				
1-3	12	16.00	11	14.67
4-6	25	33.33	26	34.67
7-10	28	37.33	30	40.00
11 and above	10	13.33	8	10.67
Total	75	100.00	75	100.00
Access to Credit				
Bank (BOA, Commercial/Microfinance)	12	16.00	5	6.67
Cooperative Society	22	29.33	29	38.67
Esusu (Thrift and Savings groups)	21	28.00	30	4.00
Personal Savings	20	26.67	11	14.67
Total	75	100.00	75	100.00

Further results in Table 1 showed that 74.7% of male respondents had at least 20 years' experience as compared to 77.3% for females. This showed that females were more entrenched in farming business earlier in their lives than males. The distribution of family size of the respondents indicated that 50.66% of male farmers had large families of seven and above while 50.67% of their female counterpart had family size of seven and above. This indicated that the family size of both genders was large in the study area. Family Size had implication on the size of hired labour employed by small- scale arable crop farmers because the higher the size of the family, the lower the hired labour and vice versa.



The distribution of the respondents in line with access and sources of credit indicated that 16% of the male farmers accessed loan from commercial banks comprising Bank of agriculture, as well as microfinance banks as against 6.7% of the female folks. In the same vein 26.6% of male farmers accessed their capital through personal savings as against 14.67% of the females.

Distribution of Respondents by Type of Arable Crop Produced

The type of the arable crop enterprise produced by farmers indicated that the male farmers dominate in yam production with over 84% as against the female group that had only 20% of the females involved (Table 2). Entries in Table 2 also indicated that more female is into cassava production (60%) as against the male with (33%). Vegetable crop production had female dominance with (74.6%) while male only had (34.67%) involvement.

Table 2: Distribution of Respondents by type of Arable Crop produced

Enterprise Ownership	Male		Female	
	*Frequency	Percentage	*Frequency	Percentage
Yam	63	84.00	15	20.00
Cassava	25	33.33	45	60.00
Cocoyam	41	54.67	27	36.00
Maize	45	60.00	42	56.00
Rice	52	69.33	18	24.00
Plantain	60	80.00	24	32.00
Vegetables	26	34.67	56	74.67

*Multiple Responses Recorded

Determinants of Productivity of Rural Small-scale Arable Crop farmers by Gender

The econometric analysis (Table 3) for determinants of gender productivity among small holder farmers in the study area showed that coefficients for farm size and age were negative and significant at 5% level of probability for the male farmers and 1% level of probability for the female farmers. The relationship between farm size and yield became a focal point of agrarian debates after the 1960s when farm management surveys in India first established the empirical basis (Gul Unal, 2008). Since then, the evidence has been so widely observed by many others in different countries (Okoye *et al.*, 2007). It is argued that small land holdings benefited farmers because it reduces the risks of drought, frost, floods, pests and other uncertainties as a result of separated plots. Small land holdings also benefit small farmers in terms of decreasing risk, since “having all one’s land in a single soil type, in a single location and single exposure is considered risky” (Kaldjian, 2001). Old age might pose disadvantages in agriculture because most of the work is physically demanding and also because older household heads might be too conservative to try new, more efficient techniques (Gul Unal, 2008). The coefficient for capital inputs, planting materials, labour and education were positive as expected and significant at 5% level of probability for the male farmers and 1% level of probability for the female farmers in the study area. We expect the education level of the household head to be positively related to productivity since better educated farmers may have improved access to knowledge and tools that enhance productivity (Gul Unal, 2008). Given the fact that agriculture is a labor-intensive production in countries such as Nigeria, more labour input would increase productivity. Hence, we expect a positive relationship between labour and productivity (Okoye *et al.*, 2008).



The coefficient for fertilizer, household size, farming experience and number of extension contacts were positive and significant at 1% level of probability for the female farmers. Large household size might create a positive effect on output per hectare if household labour was devoted mostly to agricultural production. It is also important to note that women were very active participants to agricultural production in Nigeria which would impact labour input and hence productivity positively. The more experienced a farmer is the more efficient his decision-making processes and the more he will be willing to take risks associated with the adoption of innovations. This result agreed with those of Okoye *et al.* (2008). Fertilizer, an improved technology, shifts the production frontier upwards leading to higher productivity. This result was consistent with that of Onyenweaku and Okoye (2007). Increased extension contacts would lead to more knowledge on improved cocoyam technologies which have a strong influence in increased productivity.

Table 3: Determinants of Gender Productivity among Small-scale Arable Crop Farmers

Production Factors	Parameters	Coefficients	
		Male	Female
Constant term	a ₀	6.1326 (0.80)	74.2306 (9.1315)***
Farm size	a ₁	-1.0998 (-2.0583)**	-3.7396 (-11.2226)***
Capital inputs in naira	a ₂	0.6492 (2.5679)**	5.3815 (8.1838)***
Planting materials in kg	a ₃	0.7134 (2.3686)**	2.5394 (7.6502)***
Fertilizer input in kg	a ₄	0.2828 (0.633)	1.0817 (7.9404)***
Manure input in kg	a ₅	0.1124 (0.3028)	-2.8266 (-1.5370)
Labour for all activities in man-days	a ₆	0.0236 (2.5109)**	1.93662 (8.8378)***
Age in years	a ₇	-2.2095 (-3.247)***	-8.5993 (-8.1414)***
Household size	a ₈	-0.0555 (-0.1181)	4.1541 (9.2019)***
Farmers level of education in years	a ₉	0.3668 (2.3596)**	7.4207 (9.1366)***
Farming experience in years	a ₁₀	-0.3806 (-1.3099)	2.6112 (9.104)***
Number of extension contacts	a ₁₁	0.0739 (0.1598)	0.3487 (4.2561)***
	R ²	0.7717	0.9619
	F	3.0728	36.7660

Note: ***and **means significant at 1% and 5%, respectively; Values in parentheses represent t-values.

Constraints Encountered by Male and Female Small-scale Arable Crop Farmers

The result of the major constraints militating against small scale arable crop farmers in the study area indicated that inadequate credit was the most with 80%. This was followed by poor storage and processing problems (79%), lack and high cost of labour in the rural areas (76%0. Poor rural road network (72%) and inadequate extension services (70%) (Table 4.)



Table 4: Constraints to Small Scale Arable Crop Production

Constraint	Fre	Percentage		Rank
Inadequate agricultural credit	120	80		1 st
Storage and Processing Problems	119	79		2 nd
Lack and High Cost of farm labour in rural areas	114	76		3 rd
Poor rural road network	108	72		4 th
Inadequate extension services	105	70		5 th
Lack and high cost of farm inputs	99	66		6 th
Land tenure system	75	50		7 th
Lack of information to smallholder farmers	69	46		8 th
Limited access to modern agricultural technology	63	42		9 th
Poor marketing of products	53	35		10 th

*Multiple Responses recorded

CONCLUSION AND RECOMMENDATIONS

The study concluded that about 70% of the male respondents and 60% of the females were less than 35 years of age with only 2.67% and 4.00%, respectively, being above 55 years. 80% of male and 76% of female were married while 92% of male had formal education as compared to 86.7% for female. Also, 50.66% of male farmers had large families of seven and above while 50.67% of their female counterpart had family size of seven and above. The major constraints that impinge against the performance of small-scale arable crop farming were also identified. The following recommendations were made:

1. Extension agents should endeavor to reach out to more small-scale arable crop farmers especially the female farmers through the use of exhibitions, demonstration of skills and practices in order to improve their efforts in arable crop production.
2. Farm inputs should be made available and affordable to small-scale arable crop farmers at the right time without bias to gender.
3. Findings have shown that allocation of resources especially land favour men arable crop farmers. However, there should be equitable allocation of resources along gender lines since women participate fully as men in small-scale arable crop production.

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