

AKSUJAEERD 7 (3): 84 – 95, 2024 AKSU Journal of Agricultural Economics, Extension and Rural Development.

© Department of Agricultural Economics and Extension, Akwa Ibom State University, AKSU, Nigeria, December.

PRODUCTIVITY DIFFERENTIALS OF MALE AND FEMALE HEADED CASSAVA PRODUCING HOUSEHOLDS IN BENDE L.G.A., ABIA STATE, NIGERIA

¹Onwukwe, F. O and ²*Udokure, U. J

¹Department of Agribusiness and Management

²Department of Agricultural Economics

Michael Okpara University of Agriculture Umudike, Abia State, Nigeria

* Correspondent author: ubongudokure@gmail.com, Tel:+2348067533524

Abstract

The study analyzed the productivity differentials of male and female-headed cassava-producing households in Bende L.G.A, Abia State. Multistage sampling procedures were used in the selection of 120 farm households in the study area. Data were obtained from primary sources through the use of structured questionnaires administered were analyzed with descriptive statistical tools like means, frequencies, percentages, TFP, and multiple regression models. Results showed that the male respondents were younger, married, educated, and experienced, than their female counterparts. Male-headed households had a slightly larger mean farm size (0.9 ha) compared to their female-headed counterparts (0.8 ha). The male respondents were more involved in clearing, stumping, and ridging while their female counterparts were involved in cutting planting materials, marketing, and applying fertilizers. The mean productivity (1.210) of the male farmers was higher than their female counterparts (0.710). Age ($P<0.01$), household size ($P<0.10$), fertilizer ($P<0.01$) and cassava cutting ($P<0.01$) were the significant factors that influenced the productivity of male-headed household farmers while Age ($P<0.01$), education ($P<0.01$), annual income ($P<0.10$), cassava cutting ($P<0.01$) and access to credit ($P<0.01$) were the significant factors that influenced the productivity of female-headed household farmers. The study recommended that governments and non-governmental organizations should provide subsidies, grants, credit, education, policies, and programs to increase their productivity.

Keywords: Total factor productivity, output, quantity, involvement, households, cassava and production

Introduction

One of the world's fastest-growing staple food crops is the root crop known as cassava, which has gained popularity among farming households in Africa while simultaneously meeting steadily rising industrial demand (Ikueomonisan, Mafimisebib, & Adenegan, 2020). According to the Food and Agriculture Organization Corporate Statistical Database (FAOSTAT) (2019), as of 2018, the world's cassava production stood at about 278 million tonnes; Africa's production amounted to 170 million tonnes (about 56% of the world production); and Nigeria produced about 60 million tonnes. More so, a significant portion of farmers produce cassava intensively for both industrial and direct human consumption, depending on the type of farming practice (Ikueomonisan *et al.*, 2020).

Cassava production enterprise is one of the most significant agribusinesses in most African countries, engaging over 4 million

male and female farmers, and providing food for over 100 million persons (Teeken, Olaosebikan & Haleegoah, 2018). It is an economic unit in which decisions on the proper allocation and combination of resources to generate a maximum continuous flow of income are taken by male and female household heads (Oguzor, 2022). Household headship in Nigeria is usually attributed to an adult male (especially in rural settings) in the household who is most often the husband (father). It could also be transferred due to the death of the previous household head, divorce, migration as well as serious illnesses (Ashimolowo, Bolarinwa, Ojebiyi, Adejo, Odediran & Soetan, 2017). In any of these situations, the household head is the primary provider of the economic needs of the household members, gives direction on farm business investment, provides social and basic services such as food, health, education, potable water, protection, psychosocial support, good hygiene and sanitation for members of his or her households (Bamgboye,

Odusote, Olusanmi, Yusuf, Bamgboye, Asaolu, Iwuala, Ayeni & Ladipo, 2020).

The male and female household heads are involved in cassava production in Nigeria (Nwaobiala, Alozie, and Anusiem, 2019). This is evident in the report of Olakojo (2017) that women account for 75% of Nigeria's farming population, in some rural areas in Nigeria and have practically taken over the production and processing of crops; being responsible for as much as 80% of staple food items including cassava. It is reported that men and women perform different functions, and have unequal decision power and differences in access to production resources in agricultural production (Ezeibe, Edafiogho, Okonkwo & Okide, 2015). Given this assertion, Odebode & Adetunji (2015) noted that men and women-headed households perform differently in farm management and productivity (Okpara, 2015).

A cassava farmer's productivity is the measurement of the quantity of cassava output produced for a given quantity of input or set of inputs at a given point in time (Mozumdar, 2018). It reflects the measuring of effects materialized in revenues with the efforts involved materialized in expenditure (Bumbescu, 2015). The increased productivity level of male and female-headed cassava-producing households in Nigeria may be attained if the gender gap between male and female household heads in areas such as access to productive resources, low rates of technology adoption of economic capacities, and incentives are reduced (Evans, Henry & Onabote, 2021).

The differences in the productivity of male and female-headed cassava-producing households have become an issue of discourse in public policy in Abia State and Bende Local Government Area in particular. The reasons for the observed gender gap are differences in access and use of cassava production inputs; tenure security and related investments in land and improved technologies; market and credit access; human and physical capital; and institutional and cultural constraints among others (Ezeibe *et al.*, 2015). Most women-headed cassava-producing households lack access to cassava production input or technical and management expertise owing to cultural barriers. Lack of access to adequate production

resources among women-headed cassava-producing households may result in improper allocation, inadequate utilization of resources, and low productivity.

More so, most female-headed cassava-producing households in Abia State cannot afford the cost of hiring skilled manpower (technical and managerial) to enhance their performance except through the intervention of government and non-governmental organizations which are not readily available and accessible in the study area (Ezeibe *et al.*, 2015). The productivity gap may also be attributed to the personal characteristics of the male and female-headed households as personal characteristics relate to attitudes, motivations, and behavioral patterns. Also, attitudes, motivations, and behavioral patterns influence cassava innovation adoption, sensitivity to risk (investment behavior), and managerial approach.

Many studies have been conducted by researchers to bridge the gender gap among farmers in Nigeria. For example, Nurudeen (2019) studied the assessment of gender differences in productivity among rural households in South West, Nigeria; Nwaobiala *et al.* (2019) studied gender differentials in farmers' involvement in cassava production activities in Abia State, Nigeria. Enete & Amusa (2010) studied the contribution of men and women to farming decisions in cocoa-based agroforestry households of Ekiti State, Nigeria; Folarin, Osabuohien, & Ademola (2021) studied male and female employment in agriculture and agricultural productivity in Nigeria. To the best of the researchers' knowledge, studies on productivity differentials among male and female-headed cassava-producing households in Bende Local Government Area are lacking, which is the gap in the literature that this study intended to fill. Specifically, the study aimed to:

- i. examine the socioeconomic characteristics of the respondents;
- ii. evaluate the level of involvement of male and female headed households in cassava production in the study area;
- iii. estimate the productivity level of male and female headed cassava producing households in the study area; and
- iv. estimate the determinants of productivity of male and female headed

cassava producing households in the study area.

Methodology

The Study Area

The study was carried out in Bende Local Government Area of Abia State, Nigeria. Bende Local Government Area lies on latitude 5.56° N and 5°43' 48' N and longitude 7.63° and 7°37'10' E. The Local Government Area has an estimated population of 280,500. The LGA is bounded in the North by Cross River State, Afikpo and Ohazara L.G. As of Ebonyi State, in the West by Isukwuato, in the East by Ohafia and Arochuku L.G. As, in the South -West Umuahia North and South L.G. As; in the South -South by Ikwuano L.G.A. The area has an average rainfall of 2,238 mm per year that is distributed over seven months rainy season period. It has bimodal peaks, the first occurring in the month of June or July and the second occurring in the month of September. Its minimum and maximum temperatures are 23°C and 32°C respectively and a relative humidity of 60-80% (Uchendu *et al.*, 2020). The LGA is made up of eleven communities, namely; Ozuitem, Ugwueke, Okporoenyi, Itumbuzo, Umujuezechi, Umu-menyi, Igbera, Item, Alaye, Nkpa and Uzuakoli. Agriculture is the major occupation of the people in the local government area. The people produce food crops like rice, maize, cassava, plantain, banana also small ruminant animals are reared. Some of the people engage in craft making, carpentry, trading and others.

Sampling Technique and Sampling size

The study population comprised all cassava farmers in Bende L.G.A, Abia State. The sample size of this study was 120 respondents. Multistage sampling procedures were used in the selection of 120 respondents. In the first stage, three communities namely; Bende District, Ugwueke, and Uzuakoli were purposively selected for high cassava production activities. In the second stage, four (4) villages were randomly selected from the communities as follows: Bende, Agbamazu, Agbomiri, and Okporoenyi from Bende district; Amaba, Amabanta, Camakwu, and Amauta from Ugwueke and Agbozu, Amamba, Amankwo and Eluama from Uzuakoli community. In the final stage, five (5) male headed cassava-producing households and five

(5) female-headed cassava-producing households were randomly selected from the twelve (12) villages with the help of village heads, making it one hundred and twenty (120) respondents (60 male-headed household heads and 60 female-headed household heads).

Sampling Procedure and Sampling Size

Data for the study were obtained from primary sources through the use of structured questionnaires. The data of interest included socio-economic characteristics of households in the study area which include age, level of education, experience, farm size, income, access to credit, household size, extension contact, cooperative membership, capital, income, and level of productivity.

Analytical Technique

Objectives i and ii were analyzed with descriptive statistical tools such as frequency, means and percentages. Objective iii was analysed with Total factor productivity (TFP). Total factor productivity formula is expressed below:

$$TFP = \sum \frac{P_{yi}Y_i}{P_iX_i+K} \dots\dots\dots 1$$

Where:

TFP = Total factor productivity of the male headed cassava producing households

Y_i = quantity of output in kg

P_{yi} = unit price of output in naira

P_iX_i = unit price of input i

X_i = input of the ith farmer

K = fixed cost (rent, depreciation charges, interest on loan)

$$TFP = \sum \frac{P_{yi}Y_i}{P_iX_i+K} \dots\dots\dots 2$$

Where:

TFP = Total factor productivity of the female headed cassava producing households

Y_i = quantity of output in kg

P_{yi} = unit price of output in naira

P_iX_i = unit price of input i

X_i = input of the ith farmer

K = fixed cost (rent, depreciation charges, interest on loan)

Objective iv was achieved using OLS multiple regression model. The model is stated implicitly as follows:

The multiple regression model is specified implicitly thus:

$$Y=f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}) \dots\dots\dots 3$$

Y = Productivity of male headed cassava producing households (as defined in equation 1)
 X_1 = Age (Years)
 X_2 = Farming experience (Number of years spent in cassava production enterprise)
 X_3 = Household size (No of household members)
 X_4 = Level of Education (No of years spent in school)
 X_5 = Farm size (ha)
 X_6 = Capital (Depreciation in naira)
 X_7 = Annual farm Income (₦)
 X_8 = Cooperative membership (Yes=1, no=0)
 X_9 = Credit access (₦)
 X_{10} = Extension contact (Yes=1, no=0)
 β_0 = Intercept
 β_1 - β_{10} = Parameter estimate

The multiple regression model was specified implicitly thus:

$$Y=f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}) \dots 4$$

Y = Productivity of female headed cassava producing households (as defined in equation 2)
 X_1 = Age (Years)
 X_2 = Farming experience (Number of years spent in cassava production enterprise)
 X_3 = Household size (No of household members)
 X_4 = Level of Education (No of years spent in school)
 X_5 = Farm size (ha)
 X_6 = Capital (Rent, depreciation in naira)
 X_7 = Annual farm Income (₦)

X_8 = Farm size (ha)
 X_9 = Credit access (₦)
 X_{10} = Cassava cutting (kg)
 β_0 = Intercept
 β_1 - β_{10} = Parameter estimate

Results and Discussion

The Socio-Economic Characteristics of the Respondents

Results in Table 1 showed that most (36.67%) of the male-headed household farmers were within 50-59 years. The mean age of the male-headed household farmers was 45 years, implying that most male-headed household farmers were still in their active stage in life, a pointer to the fact that middle-aged male-headed household farmers are involved in cassava production in the study area. This finding collaborates with Fasakin & Popoola (2019) who reported that the majority (37.84%) of male farmers in Osun State, Nigeria were in their productive ages of 41-60 years. Concerning female-headed households, the majority (33.33%) were within 30-39 years. The mean age of female-headed household farmers was 46 years, implying that large proportions of middle-aged female farmers are involved in cassava production in the study area. This finding contradicts Ajah (2015) that the mean age of female cassava farmers was 41.19 years in Abuja, Nigeria.

Table 1: Distribution of respondents according to socio economic characteristics (n=120)

Variables	Male headed households		Female headed households	
	Frequency(n=60)	%	Frequency(n=60)	%
Age				
≤29	1	1.67	0	0.00
30-39	19	31.67	20	33.33
40-49	13	21.66	14	23.33
50-59	22	36.67	19	31.67
60-69	5	8.33	7	11.67
Mean	45		46	
Marital status				
Single	7	11.67	10	16.67
Married	41	68.33	36	60.00
Widowed	12	20.00	13	21.67
Divorced	0	0.00	1	1.66
Education				
None	11	18.33	26	43.33
Primary	20	33.33	11	18.33
Secondary	17	28.33	13	21.67
Tertiary	12	20.01	10	16.67

Source: Field survey, 2024

Results in Table 1 also showed that majority (68.33%) of the male-headed household farmers

were married. This connotes that married male-headed household farmers constitute the

majority of cassava farmers in the study area. The preponderance of married male-headed household farmers in cassava production has huge implications on productivity. Married people have children who could assist them in cassava production, enhancing their productivity. This finding collaborates with Fasakin & Popoola (2019) that the majority (67.57%) of male-headed cassava farming households in Osun State, Nigeria are married. Equally, the majority (60.00%) of female headed cassava farming households are married, having children who could help in cassava production is high, serving as a source of additional labor. In addition, Okon *et al.*, (2019) reported that most female headed households preferred using children as their major source of labour.

The majority (33.33%) of the male-headed household farmers had primary education as their highest educational qualification while the least proportion (18.33%) did not attend formal education. This presages that the majority of male-headed household farmers in the study area are literate and could have good attitudes, good understanding, and communication skills needed in cassava production. On the other hand, most (43.33%) of the female-headed household cassava farmers did not have formal education while 21.67%, 18.33%, and 16.67% of female-headed household farmers had secondary, primary, and tertiary education respectively.

Results in Table 2 shows that majority (86.67%) of the male-headed household farmers had a household size of between 1-5 persons while the least proportion (13.33%) had a household size of 6-10 persons. The mean household size of male-headed household farmers in the study area was 4 persons. A household with a mean household size of 4 persons is fairly large, implying that the respondents have more mouths to feed and could likely embark on cassava production to meet the welfare needs of their household members. This finding is in tandem with Ekwere (2016) who reported that male-headed household farmers in Awka North L.G.A of Anambra State, had household sizes of 6-10 persons. Concerning female-headed household farmers, the majority (70.00%) of the respondents had a household size of between 1-5 persons while the least proportion (30.00%) had a household size of 6-10 persons. The

mean household size of female farmers in the study area was 5 persons.

Most (41.67%) of male-headed household farmers had farming as their primary occupation while 6.66% of male-headed household farmers had civil service as their primary occupation. This implies that male-headed household farmers are farmers (either on a full-time or part-time basis). This suggests that male-headed household farmers will be very committed to their cassava production business. However, most (33.33%) of the female-headed household farmers had trading as their primary occupation while 21.67% of the respondents had farming as their primary occupation. This implies that most of the female-headed household farmers in the study area diversified their income sources, reduced income risks in the face of missing insurance markets, and exploited strategic complementarities and positive interactions between different activities. This finding collaborates with Olojede *et al.* (2020) that the primary occupation of the majority of male and female farmers in Oyo State, Nigeria is farming. Most (38.33%) of the male-headed household farmers had farming experience of 20-29 years while the least proportion (5.00%) had between 50-59 years of farming experience. The mean years of farming experience of male-headed household farmers in the study area was 29.00 years. This explains that male-headed household farmers in the study area have been in cassava production for more than two decades and may be considered quite experienced. This development is a plus to the male-headed household farmers as farming experience serves as a guide in innovation adoption, combination and allocation of farming resources, farm management decisions as well as in making forecasts on the likely performance of a farming business especially when considering given to the risky nature of the farming business. This finding contradicts the report of Fasakin & Popoola (2019) that the farming experience of the majority (45.95%) of male farmers in Osun State, Nigeria had the farming experience of 11-15 years. On the other hand, the majority (46.67%) of female-headed household farmers had farming experience of between 20-29 years while the least proportion (1.66%) had between 4-49 years of farming experience.

The mean years of farming experience of female-headed household farmers in the study area was 25.00 years. Relatively, the years of farming experience of male-headed household

farmers is somewhat higher than that of female-headed household farmers and could go a long way to influence their productivity.

Table 2: Distribution of respondents according to socio-economic characteristics (n=120)

Variables	Male headed households		Female headed households	
	Frequency(n=60)	%	Frequency(n=60)	%
Household size				
1-5	52	86.67	42	70.00
6-10	8	13.33	18	30.00
Mean	4		5	
Primary Occupation				
Farming	25	41.67	13	21.67
Trading	21	35.00	20	33.33
Civil servant	4	6.66	19	31.67
Craft/artisan	10	16.67	8	13.33
Farming experience				
1-19	10	16.67	12	20.00
20-29	23	38.33	28	46.67
30-39	11	18.33	19	31.67
40-49	13	21.67	1	1.66
50-59	3	5.00	0	0.00
Mean	29		25	
Farm size				
0.1-0.9	40	66.67	34	56.67
1.0-1.9	19	31.66	21	35.00
2.0-2.9	1	1.67	5	8.33
Mean	0.9		0.8	

Source: Field survey, 2024

The majority (66.67%) of male-headed household farmers had a farm size ranging from 0.1-0.9 ha while the least proportion (1.67%) of the respondents had a farm size of 2.0-2.9ha. The mean farm size of male-headed household farmers in the study area was 0.8 hectares, implying that most male-headed household farmers in the study area are marginal farmers. Fragmentation of farmland is possible among male-headed household farmers because most of them may have inherited their farmland. This finding is in tandem with Ukamaka *et al.*, (2017) that 55.0% of male-headed household-headed household farmers had farm sizes of 0.1-1.0 ha in Anambra State, Nigeria. On the other hand, the majority (56.67%) of the female-headed household farmers had a farm size ranging from 0.1-0.9 hectares while 8.33% of the respondents had a farm size of 2.0-2.9 hectares. The mean farm size of the female-headed household farmers in the study area was 0.9 hectares, suggesting the female-headed household farmers in the study area are also marginal farmers.

The level of involvement of male and female headed cassava producing households in cassava production in the study area

Results in Table 3 shows that majority (85.00%), (83.33%) and (66.67%) of the male-headed household farmers were involved in cassava production activities like bush clearing, ridging, and stumping respectively. On the other hand, the majority (98.33%), (83.33%) and (80.005) of female-headed household farmers were involved in cutting planting materials, marketing, and application of fertilizer respectively. The preponderance of male-headed household farmers in cassava production activities like clearing, ridging, and stumping could be attributed to the fact that these activities are stressful and demanding and might not be effectively done by female-headed household farmers. This finding is in tandem with Ezeibe, Edafiogho, Okonkwo & Okide (2015) who reported that most male-headed household farmers in Abia State, Nigeria were mostly involved in cassava production activities like clearing and ridging.

Table 3: Distribution of respondents according to level of involvement of male and female headed cassava producing households in cassava production

Variables	Male headed households			Female headed households		
	*Frequency (n=60)	%	Rank	*Frequency (n=60)	%	Rank
Clearing	51	85.00	1 st	10	16.67	9 th
Stumping	40	66.67	3 rd	42	70.00	4 th
Ridging	50	83.33	2 nd	14	23.33	8 th
Cutting of planting materials	22	36.67	7 th	59	98.33	1 st
Planting	40	66.67	4 th	37	61.67	6 th
Fertilizer application	19	31.67	9 th	48	80.00	3 rd
Harvesting	30	50.00	6 th	40	66.67	5 th
Transportation	37	61.66	5 th	20	33.33	7 th
Marketing	20	33.33	8 th	50	83.33	2 nd

Source: Field survey, 2024. *Multiple responses

The productivity level of male and female headed cassava producing households in the study area

Result in Table 4 shows that majority (55.00%) of the male-headed household farmers had a productivity level of between 0.01 and 0.99 while a paltry (3.33%) of male-headed household farmers had a productivity level of between 3.01 and 3.99. On the other hand, the majority (53.33%) of the female-headed household farmers recorded a productivity level of between 0.01 and 0.99 while a paltry (1.67%) of non-male-headed household farmers had a productivity level of between 3.01 and 3.99. From the distribution of the productivity level of the respondents, it could

be inferred that there is heterogeneity in the total factor productivity of male-headed household farmers and female-headed household farmers in the study area, with male-headed household farmers having the highest mean total factor productivity (1.210) than female-headed household farmers (0.710). The high productivity of male-headed households could probably imply that they have the physical strength, improved farm input, and technical know-how required in cassava production than their female counterparts. This finding is in tandem with Akpaeti & Frank (2021) that the productivity and efficiency of male farmers were higher than that of female farmers in South-South, Nigeria.

Table 4: Distribution of respondents according to the productivity level of male and female headed cassava producing households

Total Factor Productivity	Male headed household farmers		Female headed household farmers	
	Frequency (n=60)	%	Frequency (n=60)	%
0.01 – 0.99	30	50.00	32	53.33
1.01 – 1.99	13	21.67	24	40.00
2.01 – 2.99	15	25.00	3	5.00
3.01 – 3.99	2	3.33	1	1.67
Mean	1.210		0.710	

Source: Field survey, 2024

The determinants of productivity of male and female headed cassava producing households in the study area

Results of the determinants of productivity of male headed and female headed cassava producing households are presented in Table 5.

For the male headed household farmers, the linear functional form was chosen as the lead equation and it shows that the value of the coefficient of multiple determinations (R^2) was 0.5195. This implies that 51.95% of the variations in the productivity of male headed

household farmers were explained by the regressors included in the model. The F-value of 10.81 was significant at 1% level, presaging the significance of the entire model. Variables such as age, household size, fertilizer and cassava were the significant factors that influenced the productivity of male headed household farmers in the last production season.

The coefficient of age had a significant and negative relationship with the productivity of male-headed households at the 1% level of probability. This suggests that an increase in age leads to a decrease in productivity of the respondents and vice versa. The result is consistent with a priori expectations, of course, innovation adoption, resource allocation, the farmer's mental capacity to cope with the daily challenges and demands of cassava production activities, and his ability to do manual work decrease with age. This finding is in tandem with that of Cordelia & Edwin (2020) who reported that the age of male-headed household farmers has a significant effect on their productivity level in Ebonyi State, Nigeria.

The coefficient of household size was statistically significant at a 10% significant level and positively related to the productivity of male-headed households. This result implies that the productivity of male-headed households increased with household size. Large household size is an incentive for male-headed households since most farmers with large households in Nigeria employ their family members as labor. Ikeke (2017) opined that large household size provides a cheap source of labor for farm work as farmers rely more on members of their households for labor which is more predictable than hired labor.

The coefficient of fertilizer was statistically significant at a 1% significant level and negatively related to the productivity of male-headed households. This result implies increasing fertilizer use will result in a unit decrease in cassava output produced by male-headed farm households. In other words, increasing the use of fertilizer by male-headed households will lead to decreasing output. This is because continued application of fertilizer on the farm will result in soil acidity and binding of certain important micro and

macronutrients that are needed for optimum cassava growth and root development. This finding conforms to a priori expectation because continued application of fertilizer on the farm will result in soil acidity and binding of certain important micro and macronutrients that are needed for optimum cassava growth and root development. However, this finding contradicts with the finding of Mashuubu *et al.*, (2024) who reported that fertilizer had a positive effect on the productivity of cassava farmers in Delta State, Nigeria.

The coefficient of cassava cutting was statistically significant at the 1% significant level and positively related to the productivity of male-headed households. This result implies increasing the use of cassava stems will result in a unit increase in cassava output produced by male-headed households. This finding is in tandem with Oluwafemi *et al.*, (2019) who reported a positive relationship between improved cassava cutting and productivity of cassava-based farmers in Nigeria.

For the female headed farm households, the double log functional form was chosen as the lead equation and it shows that the value of the coefficient of multiple determinations (R^2) was 0.6300. This implies that 63.00% of the variations in the productivity of female headed households were explained by the regressors included in the model. The F-value of 20.87 was significant at 1% level, presaging the significance of the entire model. Age, education, annual income, cassava cutting and access to credit were the significant factors that influenced the productivity of female headed household farmers in the last production season.

The coefficient of age had a significant and negative relationship with the productivity of female-headed households at 1%. This implies that a cassava farm owned by younger female-headed households in the study area is likely to be more productive than that of older female-headed households. The result is consistent with a priori expectation, as advancement in age reduces the ability to carry out strenuous activities involved in cassava production effectively and efficiently by the farmers. This finding is consistent with Chukwuemeka *et al.*, (2019) who reported that age, experience, education, farm size, and household size among

other factors influence the productivity of female-headed household farmers in Ebonyi State, Nigeria.

The coefficient of education had a significant and positive relationship with the productivity of female-headed households at 1%. This suggests that an increase in educational level leads to an increase in productivity of the respondents and vice versa, implying that there is potential for increased cassava productivity since education will enable farmers to have access to improved knowledge and information on new agricultural innovation(s) that will enhance their productivity. Notably, formal education is a catalyst for the adoption of modern production technologies and effective communication systems that encourage an increase in the productivity of any agricultural venture. Of course, female-headed household farmers may have obtained good education on cassava production from extension agents or other agribusiness organizations and were able to properly harness all available resources prudently and efficiently. More so, exposure to a high level of education is an added advantage to the respondents because education guides farm decision-making, efficient combination of resources as well as adoption of Agricultural Development Programme (ADP) innovation. This finding is in tandem with Oluwafemi *et al.* (2019) who reported a positive relationship

between education and the productivity of cassava farmers in Nigeria.

The coefficient of annual income was statistically significant at a 10% significant level and positively related to the productivity of female-headed households. This result implies that the productivity of female-headed households increased with an increase in their income. This is in line with a priori expectation as increased income increases the confidence of female-headed households as well as their financial base. Increased income could enhance their investment in cassava production through the purchase or renting of improved agricultural input which could enhance their productivity.

The coefficient of cassava cutting was statistically significant at a 1% significant level and positively related to the productivity of female-headed household farmers. This result implies increasing the use of cassava stems will result in a unit increase in cassava output produced by female-headed households. Improved cassava cutting is an important and improved technology that shifts the frontier upwards leading to higher productivity. This result is also consistent with Onyema and Henri-Ukoha (2020) who reported a positive relationship between improved cassava cutting and productivity of farmers in Abia State.

Table 4: Determinants of productivity of male and female headed cassava producing households

Variable	Male headed households (LN)	Female headed households (DL)
Constant	0.113 (2.92)***	-0.071 (-0.51)
Age of respondents (X ₁)	-0.138 (4.225)***	-0.155 (3.25)***
Farming experience (X ₂)	0.369 (1.50)	0.197 (1.18)
Household size (X ₃)	0.089 (1.79)*	-0.162 (-1.53)
Educational level (X ₄)	-0.032 (-1.52)	0.024 (3.04)***
Farm size (X ₅)	0.015 (0.11)	3.149 (0.46)
Capital (X ₆)	-0.211 (-0.37)	-0.118 (1.07)
Annual Income (X ₇)	0.159 (0.83)	0.498 (1.95)*
Fertilizer (X ₈)	-0.230 (-5.70)***	-0.017 (-0.09)
Credit (X ₉)	-0.024 (0.91)	0.336 (4.205)***
Cassava cutting (X ₁₀)	0.431 (4.32)***	0.351 (4.86)***
R ²	0.5195	0.6300
Adjusted R ²	0.5102	0.6243
F- statistic	10.81***	20.87***
No. of respondents	60	60

Source: Field survey, 2023, ***, **, and * represents 1%, 5% and 10% levels of significance, SL = semi-log model and DL = double log. Figures in parenthesis are t-ratio.

The coefficient of credit was statistically significant at a 1% significant level and positively related to the productivity of female-headed households. This result implies

that the productivity of male-headed farm households increased with an increase in credit. Credit accessibility is very crucial for the smooth running of farm business for optimum

performance, particularly cassava production that is time-bound. Access to credit makes it possible for farmers to acquire improved farm inputs and labor-saving technologies, leading to increased efficiency. Of course, access to credit could enable female-headed household farmers to finance technological and capital

Conclusion

The male respondents were younger, married, educated, experienced, and had a smaller farm size than their female counterparts. The male respondents were more involved in clearing, stumping, and ridging while their female counterparts were into cutting planting materials, marketing, and application of fertilizers. The mean productivity (1.210) of the male farmers was higher than their female counterparts (0.710). Age ($P<0.01$), household size ($P<0.10$), fertilizer ($P<0.01$) and cassava cutting ($P<0.01$) were the significant factors that influenced the productivity of male-headed household farmers while Age ($P<0.01$), education ($P<0.01$), annual income ($P<0.10$), cassava cutting ($P<0.01$) and access to credit ($P<0.01$) were the significant factors that influenced the productivity of female-headed household farmers.

Recommendations

Based on the findings and conclusion of this study, the following recommendations were proffered;

References

- Ajah, J. J. (2015). Comparative analysis of cooperative and non-male headed household farmers' access to farm inputs in Abuja, Nigeria. *European Journal of Sustainable Development*, 4(1), 39-50.
- Akpaeti, A. J. & Frank, N. N. (2021). Technical efficiency of cassava male headed household farmers in South-South, Nigeria: A comparative analysis. *Nigerian Agricultural Journal*, 52(2), 8-14.
- Ashimolowo, O. R, Bolarinwa, K. K, Ojebiyi, W. G, Adejo, M. K, Odediran, O. F & Soetan, J. O. (2017). Situation analysis of female-headed households in Awo Ekiti, Ekiti State, Nigeria.
- improvements on their farms and thus enhance their productivity. These findings are in line with Cordelia & Edwin (2020) who reported that access to credit influences the productivity of female-headed farm households in Ebonyi State.
1. It is necessary for governments, and non-governmental organizations to provide necessary assistance to female headed household cassava farmers in the form of subsidies, grants, credit, education, policies, and programs in order to increase their productivity.
2. Extension services, especially those provided by the ADP, should educate female headed household on improved cassava production practices, including the use of improved cassava varieties, appropriate planting techniques, integrated pest and disease management, and efficient post-harvest processing methods in order to boost their performance.
3. Cassava cutting was a major determinant of productivity of male and female headed household cassava farmers in the study area. Therefore, effort should be directed towards supplying cassava-based farmers with improved cassava cutting at the right time.

Scholarly Journal of Science Research and Essay, 6(1), 1-9.

- Bamgboye, A. A, Odusote, T. O, Oyindamola, I. Y, Bamgboye E. A, Asaolu, O. S, Iwuala, F. O, Oluwagbemiga, A. G & Ladipo, O. A. (2020). A comparison of male and female headed house holding of orphans and vulnerable children in Nigeria. *Journal of Public Health and Epidemiology*, 12(3), 193-201.
- Bumbescu, S. (2015). Analysis Models of Profitability in Agriculture. *Bulletin of Taras Shevchenko National University of Kyiv Economics*, 9(174), 37-42.
- Chukwuemeka, K. A, Anayo, N. I and Achi, A. A. (2019). Multifactor Productivity of Smallholder Yam Farmers in Ebonyi

- State, Nigeria. *Agriculture*, 16(2), 19-25.
- Cordelia N. O. and Edwin, O. A. (2020). Analysis of the factors influencing productivity of rice farms in Ebonyi State, Nigeria. *SVU-International Journal of Agricultural Science*, 2(2), 316-325.
- Ekwere, G. A. (2016). The effect of agricultural cooperatives on cassava production in Awka North L.G.A. of Anambra State, Nigeria. *Academia Journal of Agricultural Research*, 10(4), 616-624.
- Enete, A. A. & Amusa, T. A. (2010). Contribution of men and women to farming decisions in cocoa based agroforestry Housholds of Ekiti State, Nigeria. *TROPICULTURA*, 28, (2), 77-83.
- Evans, M, L, Margo, L & Maureen, E. F. (2021). A pandemic within a pandemic: Intimate partner violence during Covid-19. *New England journal of medicine*, 383 (24): 2302–2304.
- Ezeibe, A. B, Edafiogho, D. O, Okonkwo, N. A & Okide, C. C. (2015). Gender differences and challenges in cassava production and processing in Abia State, Nigeria. *Afr. J. Agric. Res.*, 10(22), 2259-2266.
- FAOSTAT (2019). Food and agriculture data. <http://www.fao.org/faostat/en/#data/>.
- Fasakin, I. J & Popoola, O. O. (2019). Agriculture co-operative associations, livelihood income and rural households' welfare in Osun State, Nigeria. *Greener Journal of Agricultural Sciences*, 9(2), 180-188.
- Iheke, O. R. (2017). Farm size and determinant of productive efficiency among smallholder rice farmers in Abia State, Nigeria. *American Journal of Agricultural Science*, 4(3), 37-42.
- Ikuemonisan, E. S, Mafimisebi, T. E., & Ajibefun, A. D. (2020). Cassava production in Nigeria: trends, instability and decomposition analysis (1970–2018). *Heliyon*, 6 (2), 19-35.
- Mashuubu, Y. Y, Mourice, S. K, Kudra, A and Baijukya, F. (2024). Effect of fertilizer, planting density and variety on growth and yield of stem cuttings of cassava. *Journal of Current Opinion in Crop Science*, 5(1), 27-40.
- Mozumdar, L. (2018). Agricultural productivity and food security in the developing world. *Bangladesh Journal of Agricultural Economics*, 35(1), 35-69.
- Nwaobiala, C. U, Alozie, E. N & Anusiem, C. N. (2019). Gender differentials in farmers' involvement in cassava production activities in Abia State, Nigeria. *Agrosearch*, 19(1), 72-86.
- Odebode, S. O & Adetunji, T. A. (2015). Gender differentials of cassava processing activities among cassva processors in Ogun State, Nigeria. *Nigerian Journal of Rural Extension and Development*, 9(1), 1-6.
- Oguzor, N. S. (2022). Farm organization, ownership and food productivity in Nigeria. *International Journal of Academic Research in Busines & Social Sciences*. 1(2), 76-83.
- Okon, U. E., Udo, U. J., Nwankwo, J.O. & Udo, N. F., (2019). Child Farm Labour Preference decisions among arable crop Farmers in Ikot Ekpene Agricultural Zone, Akwa Ibom State, Nigeria. *AKSU Journal of Agricultural Economics, Extension and Rural Development*, Vol. 2, No. 1. Pages 43-50
- Okpara, S. A. (2015). Role of gender in cassava processing in Enugu State, Nigeria. *Bangladesh Journal of Agricultural Research*, 35(3), 387-394.
- Olakojo, S. A. (2017). Gender gap in agricultural productivity in Nigeria: a commodity level analysis. *Economics of Agriculture*, 64(2), 415-435.
- Olojede, M.O., Rasaki, W.A., Adeoye, A., Amoo, O & Olayanju, A.I., (2020). Impact of farmers' cooperative society membership on

- rural household livelihood development in Oyo State. *International Journal of Research And Scientific Innovation (Ijrsi)*, 7(5), 2321-2331.
- Oluwafemi, Z. O., Omonona, B. T., Adepoju, A. O. & Sowunmi, F. A. (2019). Cassava productivity growth in Nigeria. *Asian Journal of Research in Agriculture and Forestry*, 4(2), 1-9.
- Onyenma, G. C. & Henri-Ukoha, A. (2020). Technical efficiency of small-holder cassava-based farmers in Abia State, Nigeria. *Applied Tropical Agriculture*, 25(2), 92-100.
- Osabuohien, E. S & Ademola, H. O. (2021). Male and female employment in agriculture and agricultural productivity in Nigeria. *IOP Conference Series: Earth and Environmental Science*. 665(1), 1-11.
- Teeken, O. A, Olaosebikan, A. A & Haleegoah, E. O.(2018). Cassava trait preferences of men and women farmers in Nigeria: Implications for breeding. *Economic Botany*, 72(3), 263–277.
- Uchendu U. I, Kanu C, Kanu K. C & Mpamah C. I. (2020). Spatial pattern of land surface temperature over Umuahia North and Bende LGA, Abia State, Nigeria. *Nigerian Journal of Environmental Sciences and Technology (NIJEST)*, 3(2), 210-217.
- Ukamaka, A. T, Agbasi, O. E. & Okoli, I. M. (2017). Socioeconomic determinants of farmer's membership of cooperative societies in Anambra State, Nigeria. *International Journal for Innovative Research in Multidisciplinary Field*, 12(5), 13-19.