

GENDER ANALYSIS OF ADOPTION LEVEL OF IMPROVED CASSAVA PRODUCTION TECHNOLOGIES IN ABIA STATE, NIGERIA

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Abstract

The study analyzed gender adoption level of improved cassava production technologies in Abia State, Nigeria. Data for the study were collected from a sample size of 120 respondents through the use of questionnaire. Data collected were analyzed using both descriptive and inferential statistics. The result showed that female farmers had mean age of 35 years while the male farmers had mean age of 36.2 years, the mean of education level was 12 years in both genders, the mean of household size was 5 and 7 persons for females and males respectively. The result revealed that adoption level of improved cassava production technologies for females' grand mean was 2.47 while the grand mean for the males showed 2.44. The result revealed that high labour cost (91.67%) in both genders was the major constraint militating against gender adoption of improved cassava production technologies, followed by high cost of fertilizer for females (78.33%) and low financial base for males (70.00%). The result of regression analysis showed that age, education level, participation in activities of association, household size, and farming experience were significant in both genders at 10%, 5% and 1% alpha levels. The study therefore, concluded that both genders had high level of adoption of improved cassava production technologies. It is recommended that younger female and male farmers should adopt improved cassava production technologies for increased productivity of cassava in Abia State.

Key words: *Gender, Adoption, Improved Cassava, Production and Technologies.*

Introduction

Gender refers to the social relationships between men and women and the factors which shape gender-linked behaviours of men and women. A gender analysis considers both men and women and their interaction. It is the socio-cultural differences between males and females as against the biological differences (Sinkaiye, 2005). Gender analysis refers to the systematic

gathering and analysis of information on gender differences and social relations to identify and understand the different roles, divisions of labor, resources, constraints, needs, opportunities, and interests of various groups including men and women, girls and boys, and transgendered persons in a given context (Cristina *et al.*, 2013).

Cassava is one of the most widely grown and consumed staple crop in Nigeria (Okelola *et al.* 2014). It is a perennial root crop that grows in non-ideal conditions (Nwibo, 2011). Cassava is indispensable food security and poverty alleviation crop in Nigeria and entire sub-Saharan Africa due to its special attributes (Ekedo, Ifenkwe and Unanma, 2016). Nigeria produces more than 45 million metric tons (MT) of cassava, thus emerging as the world's largest producer (FAOstat, 2017). About one-third of the total national output comes from the Niger Delta region where many livelihoods depend on cassava as a main source of food and income (Nwibo, 2011). It supplies about 70% of the total calorie intake of more than half the population (Okelola *et al.*, 2014). Dried cassava chips and pellets are also used as livestock feed, cassava can be used in producing alcohol. The low cyanide cassava varieties are being used in confectionary industries for making composite bread and biscuit (Eke-Okoro, 2011). Despite the importance of improved cassava production technologies to enhance yield, income and improve food security of the farmers, there is still dearth of information on the gender level of adoption of the improved cassava production technologies in Abia State. The essence of the study is to assess gender adoption level of improved cassava production technologies in Abia State. Specific objectives of the study are to describe the socio-economic characteristics of the farmers, ascertain gender level of adoption of improved cassava production technologies and identify the constraints to gender adoption of improved cassava production technologies in Abia State. Hypothesis of the study states that there is no significant relationship between gender socio-economic characteristics and adoption of improved cassava production technologies.

Methodology

The study was carried out in Abia State. It occupies a land mass of 5,833.77 square kilometers (Abia State Economic Development Strategy, 2006). The state is bounded by Imo State on the West, Anambra and Enugu State on the North and Cross River and Akwa Ibom States on East while River State on the South. A multi stage random technique was used to elicit data for the study. In the first stage, two Agricultural zones were randomly selected namely Umuahia and Aba agricultural zones. Three blocks from each of the agricultural zones were randomly

selected. They are Umuahia North, Umuahia South and Ikwuano for Umuahia agricultural zone and Aba North, Aba South and Osisioma for Aba zone, giving a total of six blocks. Furthermore, two circles from each of the six blocks were randomly selected making it twelve circles. Finally, ten (10) respondents were randomly selected from each of the selected circles (five females and five males). Data for the study were collected from primary source through structured questionnaire. In all 120 respondents was used as the sample size for the study. Descriptive statistics such as frequency distribution, percentages and mean while inferential statistics used was Ordinary Least Square Regression (OLS) model specifically, semi-log functional form for data analysis. Thus the model is specified in implicit form as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8 + e)$$

Where

Y=Adoption level (mean)

X₁=Age (years)

X₂=Educational level (years of schooling)

X₃= Household size (number)

X₄= Extension agent's visit (number of visitation)

X₅= Annual farm income (naira)

X₆=Farming experience (years)

X₇= Farm size (ha)

X₈= Participation in activities of community based organization (always = 4, often =3, sometimes =2, never = 1)

e = error term

Results and Discussion

Socio-economic characteristics of the respondents

Table 1 shows that female farmers had mean age of 35 years while the male farmers had mean age of 36.2 years. The result indicates that both gender is of middle class of age. This finding is in agreement with FAO (2012) which reported that most farmers are middle age class. This implies that both the male and the female farmers were in their active age. The mean of education level was 12 years in both genders, this result shows that both genders had formal education at secondary level. This conforms to the finding of Kainga (2016) who observed that majority of the farmers now had one form of formal education or the other. The result reveals that the females and males had household size of five (5) and three (7) persons

respectively. This indicates that the farmers had average families size which could serve as source of help in the farm. Both the male and female farmers in the study area had extension visit two(2) times in a year. This shows low level of extension agents visitation in the area. This finding gave credence to Ekwe (2017) who opined that the low level of extension contact was due to the dwindling situation of extension services delivery in Nigeria. The mean annual farm income of female cassava farmers' showed ₦255,450 while the mean annual farm income of the males showed ₦261,750. This result indicates that both female and male farmers were still on small scale cassava farming and were resource poor farmers. The result of table 1 also, reveals that female and male cassava farmers had mean farming experience of 15.6 years and 11.2 years respectively. This result shows that both genders were experienced cassava farmers and such number of experience in farming enable them to adopt new technologies in order to improve production of cassava. Female and male cassava farmers had mean farm size of 1ha and 1.8ha respectively. This indicates that they were small scale farmers. According to Okunmadewa (2003), most of Nigerian farmers are of small farm holdings. The result also shows that both genders participated in the activities of community based organization with average mean of 2, indicating participating always in the activities of the organization where they belonged. According to the report of Odoemelam, *et al.* (2016), non-members of associations are expected to have lower probabilities in acceptance of improved technologies in the society.

Table 1: Gender socio-economic characteristics of adoption level of improved cassava production technologies in Abia State (n= 60 Female, 60 Male)

Options	Female Mean	Male Mean
Age	35 years	36.2 years
Education level	12 years	12 year
Household size	7 persons	5 persons
Extension agent's visit	2 times	2 times
Annual Farm income	? 255,450	? 261,750
Farming experience	15.6 years	11.2 years
Farm size	1hectare	1.8 hectares
Participation in activities of community based organization	2 (Always)	2 (Always)

Source: Field Survey, 2020

Table 2 shows the gender adoption level of improved cassava production technologies in the study area. It was revealed that all the cassava production technologies disseminated were adopted by the female farmers in varying levels while the male farmers had low adoption level in improved yellow root cassava varieties. Adoption of land preparation was (\bar{x} =2.36) for females while (\bar{x} =2.53) for males, improved white root varieties (\bar{x} =2.58) for females, while (\bar{x} =2.47) for males, improved yellow root varieties for female (\bar{x} =2.23) for males (\bar{x} =1.98). The result also revealed that adoption of cassava stem cutting was (\bar{x} =2.35) for females while (\bar{x} =2.12) for males, appropriate spacing for cassava planting (\bar{x} =2.28) for females while (\bar{x} =2.73) for males, cassava planting pattern (\bar{x} =2.42) for females while (\bar{x} =2.18) for males, fertilizer application (\bar{x} =2.75) for females while (\bar{x} =2.63) for males, first and second weeding (\bar{x} =3.00) for females while (\bar{x} =2.93) for males and proper harvest time (\bar{x} =2.28) for females while (\bar{x} =2.47) for males. Grand mean for the females was 2.47 while the grand mean of the males was 2.44. The result showed high adoption level in both genders and it implied that the improved cassava technologies disseminated to the farmers were adopted. It is expected that high adoption would bring about improvement in cassava yield. This finding agrees with Nwosu (2010) who states that acceptance of new technologies by farmers is a necessary precondition for agricultural development.

Gender Analysis of Adoption Level Of Improved Cassava ... Nwokoche, et al

Technologies	Never adopt	Adopt and stopped	Adopt and still using	Total	Mean
					(Female)
Land preparation	18(18)	1(1)	41(123)	142	2.36*
Improved white root varieties	10(10)	5(10)	45(135)	155	2.58*
Improved yellow root varieties	18(18)	10(20)	32(96)	134	2.23*
Cassava stem cutting (6 and 4 nodes)	12(12)	15(30)	33(99)	141	2.35*
Appropriate spacing	15(15)	13(26)	32(96)	137	2.28*
Cassava planting pattern (Slanting)	6(6)	23(46)	31(93)	145	2.42*
Fertilizer application	0(0)	15(30)	45(135)	165	2.75*
Weeding (1 st and 2 nd)	0(0)	0(0)	60(180)	180	3.00*
Proper harvesting time	16(16)	11(22)	33(99)	137	2.28*
Grand mean					2.47*
					(Male)
Land preparation	11(11)	6(12)	43(129)	152	2.53*
White root varieties	15(15)	2(4)	43(129)	148	2.47*
Yellow root varieties	20(20)	21(42)	19(57)	119	1.98
Cassava stem cutting (6 and 4 nodes)	13(13)	27(54)	20(60)	127	2.12*
Appropriate spacing	5(5)	6(12)	49(147)	164	2.73*
Cassava planting pattern (Slanting)	13(13)	23(46)	24(72)	131	2.18*
Fertilizer application	10(10)	2(4)	48(144)	158	2.63*
Weeding (1 st and 2 nd)	0(0)	4(8)	56(168)	176	2.93*
Proper harvesting time	16(16)	0(0)	44(132)	148	2.47*
Grand mean					2.44*

Gender constraints to adoption of improved cassava production technologies

Table 3 reveals that there were many challenges militating against gender adoption of improved cassava production technologies in the study area. Top on the list was high cost of labour (91.67%), followed by high cost of fertilizer (78.33%), low financial base (75.00%), cassava destructions by cattle (70.00 %), lack of land and bad roads (58.33%) among others were challenges faced by female farmers in adoption of improved cassava production technologies while the major challenge faced by male farmers in in adoption of improved cassava production technologies were high cost of labour (91.67%), followed by low finance (70.00%), destruction by cattle (66.67%), high cost of fertilizer (63.33%), high cost of herbicides (58.33%) and bad road (53.33%) among others. This implies that both male and female farmers were faced by many challenges in adoption of improved cassava production technologies.

Table 3: Gender constraints to adoption of improved cassava production technologies in Abia State

Constraints	Female (n=60)		Male (n=60)	
	*Frequency	Percentages	*Frequency	Percentages
Low Finance	45	75.00	42	70.00
Lack of land	35	58.33	11	18.33
Unavailability of planting materials	4	6.67	5	8.33
High cost of labour	55	91.67	55	91.67
High cost of fertilizer	47	78.33	38	63.33
High cost of herbicides	30	50.00	35	58.33
Diseases and pests	5	8.33	3	5.00
Bad road	35	58.33	32	53.33
Destructions by Cattle	42	70.00	40	66.67
Postharvest loses	18	30.00	15	25.00
Climate Change	1	1.67	2	3.33
Unavailability of market	10	16.67	4	6.66
Transportation problem	6	10.00	4	6.66

Source: Field Survey, 2020.

*Multiple Responses Recorded.

Analysis of relationship between gender socio-economic characteristics and adoption of improved cassava production technologies

Table 4 shows relationship between gender socio-economic characteristics and adoption of improved cassava production technologies in the study area. The study employed Ordinary Least Square to determine the relationship between gender socio-economic characteristics and adoption of improved cassava production technologies. Among the four functional forms, the semi-log form was selected as the lead equation because of R^2 (0.5742) value for the female farmers and R^2 (0.4232) value for male farmers, number of significant variables and appropriate *a priori* expectations. The R^2 indicate that 57.42% and 42.32% variability in adoption of improved cassava production technologies was explained by the independent variables in female and male farmers respectively. F ratios were also highly significant at 1% in both genders, indicating goodness of fit.

The results in Table 4 depict that age was significant and negatively related to gender adoption of improved cassava production technologies at 1% and 5% levels for female and male farmers respectively. This result indicated that the younger the farmers, the more active they were in adoption of improved cassava production technologies. This implied that age is capable to influence adoption of cassava farming technologies. The finding is in line with *a priori expectation* and agrees with Anyaegbunam (2019). Education was significant and positively related to adoption of improved cassava production technologies at 1% level for female farmers. This implies that the more educated the female farmers had, the more they adopt the improved cassava production technologies in the study area. This agrees with the observation of Onuekwusi *et al.*,(2014), who observed that increased level of education increases the involvement of people in development programmes. Household size was significant and positive at 10% level for male farmers'. This implies that the higher the number of people living in the same house, the higher the adoption of improved cassava production technologies. The implication is that large households' size will involve more hands in farming activities. It is in agreement with Nwobiala *et al.* (2009), that larger household size is a cheaper means of providing farm labour and reducing labour cost. Extension contact was significant and positively related to adoption of improved cassava production technologies at 1% level for female farmers and at 5% level for male farmers. This result indicates that the higher the extension visitations, the more adoption of improved cassava production technologies in the study area. The result also shows that farming experience was significant

and positively related to adoption of improved cassava production technologies at 1% level in both genders. This indicates that the more experience one had in farm work, the more the person adopt improved cassava production technologies. Finding gave credence to Mazza (2016) who reported that long farming experience builds confidence in the farmers. Farm size was also significant and positively related to adoption of improved cassava production technologies at 1% level for female farmers and also significant and positive at 5% for male farmers. This result shows that increase in farm size increases the adoption of improved cassava production technologies of in the study area .This is in line with the finding of Nwokocha *et al.* (2017).

Participation in activities of association was significant and positively related at 10% level for female farmers. This shows that more female farmers participate in the activities of association as members, the more they adopt cassava production technologies. This is because participation in the activities of an association affords the opportunity to reach relatively more female farmers with technical and advisory services that could lead to adoption of improve cassava production technologies in the study area. This indicates high level of social participation and hence high innovativeness among the respondents due to group dynamic effects (Onu and Madukwe 2002). The result, therefore, shows that there was significant relationship between the socio-economic characteristics of both genders and adoption level of improved cassava production technologies in the study area. Therefore, the null hypothesis was rejected.

Table 4 :Analysis of relationship between gender socio-economic characteristics and adoption of improved cassava production technologies

Gender variables	Female Coefficient	T- value	P>t	Male Coefficient	T- value	P>t
Constant	.4094683	20.89***	0.000	.3812952	20.63***	0.000
X ₁ Age	-.0016302	-2.93***	0.005	-.0009581	-2.16**	0.036
X ₂ Education	.0017201	2.73***	0.009	.0006251	1.16	0.251
X ₃ Household size	.0015057	1.03	0.306	.0018281	1.69*	0.096
X ₄ Extension agent's visitation	.0191800	2.92***	0.005	.0169353	2.14 **	0.037
X ₅ farm income	2.83e-09	0.14	0.888	1.08e-08	0.61	0.544
X ₆ Farming experience	.0031967	4.80***	0.000	.0020632	3.26***	0.002
X ₇ Farm size	.0134463	2.93***	0.005	.0093702	2.15**	0.037
X ₈ Participation i n activities association	.0044977	1.82*	0.075	.0018447	1.18	0.243
R ²	0.5742			0.4232		
Adjusted R	0.3917			0.2171		
F-ratio	29.010***			24.155***		

Source: Field Survey, 2020. Note: t-values significant levels at * 10%, **5% and *** 1%.

Conclusion and Recommendations

The study, therefore, concluded that both genders had high level of adoption of improved cassava production technologies in the study area. The study therefore, recommended that the younger female and male farmers should get more involved in adoption of improved cassava production technologies in the study area since it was found to be significant and negatively related to gender adoption on improved cassava production technologies. Farmers, also, should use the family labour to enable them achieve much in cassava production and government should subsidize the price of fertilizer to enable cassava farmers purchase it for cassava production since high cost of labour and high cost of fertilizer were the major constraints militating both genders in adoption of improved cassava production technologies.

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