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INNOVATIVE AGRICULTURE THROUGH INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTS) FOR OPTIMIZED FOOD PRODUCTION BY WOMEN CASSAVA FARMERS IN IMO STATE, NIGERIA

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ABSTRACT

The need to facilitate access to required information and knowledge through the deployment of information and communication technologies (ICTs) to empower women cassava farmers, especially in the rural areas of Imo state, Nigeria cannot be overemphasized. As a result, a structured questionnaire and focus group discussion (FGD) were used by researchers for data collection from 120 sampled respondents for the study. The data collected were analyzed using descriptive statistics and Ordinary Least Square regression as inferential statistics. From the data collected and analyzed, the result showed that major factors influencing the use of ICTs by women farmers are farming experience, economic status, years of education, and cooperative membership and they have a lot of bearing on the women's involvement in cassava production and ICT usage. The women farmers utilize improved cassava varieties, practice new agronomic techniques, and process cassava into value addition. The result also showed that the use of mobile phones, radio, WhatsApp, Facebook, and fliers top the mean rating of major ICT gadgets commonly used by women and it enhances their overall effectiveness, though the present economic crisis is their major challenge. Therefore, a free adult education policy is highly recommended to enable women farmers to have easy access to ICTs and process innovative information on improved cassava-based technologies to boost participation, and food production and enhance their income and output. More importantly, constant training and retraining of women farmers in the effective use of ICT devices in their farm business to improve efficiency and productivity is highly recommended.

Keywords: *Innovative agriculture, ICT, food production, women cassava farmers, Nigeria*

INTRODUCTION

Presently, the greatest concern facing the whole world today is the provision of adequate and nutritious food for its teaming population. This challenge can be ameliorated with innovative agriculture through information and communication technologies (ICTs) which is the bedrock for national survival and a critical driver for enhancing national economic development (Alocha and Umeh, 2017). In Nigeria, women are very much involved into agricultural practices especially in the area of production and processing. Women make a significant contribution to food production; they provide 60-80% of agricultural labour and are responsible for 80% of food production (Amadi *et al*., 2018). Women play a central role in cassava production, processing and marketing, contributing about 58 percent of the total agriculture labour in the southwest, 67 percent in the southeast and 58 percent in the central zones (Amadi *et al*., 2018). They are almost entirely responsible for virtually all activities like hoeing, weeding, harvesting, transporting, storing, processing, marketing and domestic chores provides them with additional income-earning opportunity percentages to measure the strength of agreement or and enhances their ability to contribute to household food security (Oladejo *et al*, 2011; Nnadozie *et al*., 2015).

Cassava (*Manihot esculenta Crantz*) plays a major role in the livelihood of women in South-Eastern Nigeria. Cassava is a staple food for over 700 million people in western and central Africa with an average consumption of approximately 500 calories per day and it has a big potential to be a profitable cash crop in Africa (Egesi *et al*., 2014; NRCRI, 2014). Cassava is strategically valued for its role in food security, poverty alleviation and as a source of raw materials for agro-allied industries in Nigeria, with huge potential for the export market and for providing a livelihood for over 30 million farmers and countless processors and traders (Amadi *et al*, 2022). Cassava has some inherent characteristics which make it attractive, especially to the smallholder farm in Africa. Some of these are richness in carbohydrates, available all year round and resistant to drought, more tolerant of low soil fertility, and more resistant to pests and diseases (Anyanwu *et al*, 2016). According to Egesi *et al*, (2014), cassava products include garri, fufu, high-quality flour, starch and its derivatives, sweeteners, and ethanol of biofuel grade. The starch of cassava can be used to make 1000 products once well modified chemically into glue and adhesives, cold water starch for clothes, starch for paper, and pharmaceutical inclusion as a bulking agent in tablets, powder of cosmetics, and as a sweetener in many drinks and fruit juices preparations, syrup, and confectioneries also benefit from these secondary products and as a result, information dissemination system is highly needed.

According to Odor *et al*., (2022), ICTs are new technologies that offer new ways of communicating and exchanging information and knowledge, and they include hardware and software media devices for the collection, storage, processing, transmission, and presentation of information in any format (sound, text, image-mail, computers, the internet, CD-ROMs, telephone, radio, television, and video digital cameras). The use of ICTs by farmers, however, particularly in the rural areas has played a great role in climate adaptation, mitigation, and food production. ICTs also bridge the communication gap between extension agents and farmers due to minimized staff strength of extension agents which reduces physical visitation to farmers and their farms. In

addition, the report of Agwu (2012) and Damkor *et al*., (2015) showed that access to and use of ICTs by rural farmers has helped to prevent stagnation in the dissemination, utilization, and application of scientific and environmental information for purposeful development. ICTs also prevent lack of timely information on market prices, weather, environmental challenges, available crop varieties, production techniques, disease control, and other services. Though, access to ICT facilities among the farmers in Nigeria particularly mobile phones has grown but there is still need for improvement considering the importance of ICT s to optimization of food production in the country. This is because, the information needs of Nigerian small-scale farmers resolve mostly around solving problems related challenges. Getting farmers, especially women informed on recent advancements in cassava production and processing technologies and marketing is almost impossible without an information dissemination system that is fast and easy to operate, hence the emphasis on the need for information communication technologies use amongst farmers. This paper therefore calls for improved use of information and communication technologies in accessing information needed to enhance production level of women cassava farmers in Nigeria and their counterparts in advanced countries. The specific objectives of the study include:

i. to describe the socioeconomic characteristics of the respondents;
ii. to assess ICT gadgets commonly use by women cassava farmers in the study area;
iii. to assess the level of women participation in cassava-based technologies in Imo State;
iv. to examine the relevance of ICTs usage for optimized food production;
v. to identify constraints to ICT usage by women cassava farmers in Imo State;
vi. to determine factors influencing use of ICTs by women cassava farmers in Imo State, Nigeria.

METHODOLOGY

The study was conducted in Imo State, which is located in the South-Eastern part of the country, lying between latitudes 4^0 45'N and 7^0 15'N, and longitude 6^0 50'E and 7^0 25'E. Imo state has a population of 3934899, with a total area of 5,530km^2, and has a population density of 710 persons per square kilometer and the population is predominantly rural. Multi-stage random sampling technique was adopted to select 120 women cassava farmers for the study. In the first stage, two (Orlu and Owerri zones) out of the three agricultural zones in Imo state were randomly selected. In the second stage, three extension blocks, Isu, Njaba, Nkwerre were randomly selected from Orlu agricultural zone while Owerri West, Mbaitolu, Ahiazu Mbaise were randomly selected from Owerri agricultural zone to give a total of six extension blocks. In the third stage: two extension circles were randomly selected from each of the extension blocks to give a total of twelve extension circles. In the fourth and final stage, ten women cassava farmers were randomly selected from each of the extension circles, to give one hundred and twenty women cassava farmers. Data were collected with the use of a questionnaire and focus group discussion (FGD) and were analyzed using appropriate statistical tools. In the data analyses, simple descriptive statistics such as tables, means, frequencies, percentages, and bar charts were used to achieve **objectives i, iv, and v**; **objective iii** was analyzed using a mean score drawn from a 3-point Likert type scale graded thus: (3) high, (2) moderate and (1) low, a mean score of 2 was used as the benchmark for deciding on level of utilization of cassava-based technologies by women farmers in the study area while **objective ii** was analyzed using mean score drawn from 5-point Likert scale graded thus: very high (5); high (4); moderate (3); low (2); and very low (1), a mean score of 3 was used as the benchmark

for making decision on ICTs utilization levels of women cassava farmers. Mean score higher than 3 was regarded as high level of ICTs usage while mean score lower than 3 was regarded as low level of ICTs usage, the procedure was used following Amadi *et al* (2020):

$$\bar{x} = \frac{\Sigma f}{n}$$

Where;

$\bar{x}$ = mean

Σ = summation

F = frequency

n = number respondents

$$\bar{x} = \frac{5 + 4 + 3 + 2 + 1}{5} = 3$$

Inferential statistics (multiple regression analysis) was used to analyze **objective vi** on factors influencing usage of ICTs by women cassava farmers in Imo State, Nigeria. The four functional forms (Linear, Semi-log, Cobb-Douglas and Exponential) of the model were tried and the best fit selected. The model is specified implicitly below:

Implicit Form:

$Y = F (X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8)$ .... (3.9)

Where:

Y = Use of ICTs (measured by mean utilization scores of the respondents)
(Utilization level = $\geq$ 3 = 1; < 3 = no utilization = 0)

X_1 = Age of respondent in years

X_2 = Farming experience in years

X_3 = Household size in number

X_4 = Extension contact in mean

X_5 = Economic status (income) in Naira

X_6 = Level of education in years

X_7 = Cooperative membership (dummy)

X_8 = Credit access (dummy)

ei = Error term

b_o = Slope

b = Co-efficient

RESULTS AND DISCUSSION

Socio-economic characteristics of cassava women farmers

Table 1 revealed that 47% of the cassava women farmers were within the age bracket of 41-50 years. The mean age of the women farmers was 46 years indicating that the women were still strong and active and thus capable of withstanding the stress and rigours associated with farming activities and handling ICT gadgets. According to Odor *et al,* (2022) young farmers show higher level of interest in the use of ICTs. The result showed that 81% of the women are married with majority having 4-6 households that eats from the same pot. This implies availability of persons for provision of family labour. The result corroborated with the report of Nwaihu., *et al* (2016) which indicated that most farmers in Imo State had adequate households that readily provided

labour for on and off farm activities. The mean score (12 years) for level of education shows that the women are academically enlightened and educated. The mean farming experience was 17 years, implying that the women farmers had adequate experience in cassava production, processing and marketing. Adequate farming experience enhances participation and adoption of improved farming technologies by farmers (Agbarevo, Amadi and Nwokocha, 2019). Majority 51.7% of the women cassava farmers had annual farm income of between ₦210,000-₦300,000. The mean annual farm income was ₦167,000. With higher income level farm households are more likely to access ICT facilities such as smartphones and television. The result shows that only 51.7% of the women belonged to cooperative societies while 49.2% were of the view that extension agents rarely contact and visit them. About 42.5% had access to credit while the majority of them 57.5% had no access to credit.

Table 1: Socio-economic characteristics of women cassava farmers

Variables	Frequency	Percentage	Mean
Age of the women cassava farmers			**46 Years**
Less than 30 years	2	2	
31 – 40	36	30	
41 – 50	57	47	
51 – 60	16	13	
61 years and above	9	8	
Marital status			
Married	98	81	
Single	13	6	
Divorced	8	7	
Widow	7	6	
Household size			**5 Persons**
1 – 3 persons	34	28	
4 – 6 persons	72	60	
7 persons and above	14	12	
Educational qualification			
No formal education	15	12	
Primary education	16	14	
Secondary education	60	50	
Tertiary education	29	24	
Years of education			**12 Years**
1 – 10	41	34	
11 – 20	56	47	
21 years and above	11	9	
Years of farming experience			**17 Years**
1 – 10	41	34	
11 – 20	56	47	
21 – 30	11	9	
31 – 40	6	5	
41 years and above	6	5	
Economic status (income)			**167,000**
10,000 – 100,000	4	33.0	
110,000 – 200,000	42	35.0	
210,000 – 300,000	62	51.7	
310,000 and above	12	10.0	
Cooperative membership			
Yes	62	51.7	
No	58	48.3	
Access to extension contacts			
Always	51	42.5	
Rarely	59	49.2	
No contacts	10	8.3	
Access to credit facilities			
Yes	51	42.5	
No	69	57.5	
Total	**120**	**100**	

Source: Field survey, 2023

ICT Gadgets Commonly Use by Women Cassava Farmers

The result in Figure 1 showed that although the women cassava farmers had high level of utilization of mobile phones ($\bar{x}$=3.63), radio ($\bar{x}$= 3.49), whatsApp ($\bar{x}$=3.35), facebook ($\bar{x}$=3.22), television ($\bar{x}$=3.21) and fliers/bill boards ($\bar{x}$=3.14), women cassava farmers generally had low grand mean level of utilization of ICT facilities ($\bar{x}$= 2.52). This implies that respondents' utilization of various types of ICTs is not quite encouraging and therefore, there is need for enhancement in ICT usage for optimized cassava food production in the study area. This finding is in agreement with the report of Nyamba and Mlozi (2012).

Table 2: Mean rating of women cassava farmers on level of usage of ICT gadgets

Utilization of ICTS	Very high	High	Moderate	Low	Very low	Total	Mean	Remarks
Radio	25(125)	35(140)	40(120)	14(28)	6(6)	419	3.49	**High**
Television	17(85)	30(120)	41(123)	26(52)	6 (6)	389	3.21	**High**
Laptops/desktops computer	6(30)	11(22)	16(48)	36(72)	51(51)	223	1.85	Very low
Mobile phones	33(165)	41(164)	24(72)	13(26)	9(9)	436	3.63	**Very high**
Internet	16(80)	23(92)	27(81)	32(64)	22(22)	339	2.83	Low
E-mail	4(20)	9(36)	39(117)	41(82)	27(27)	282	2.35	Low
Farmers Helpline	1(5)	4(16)	9(27)	17(34)	89(89)	171	1.43	Very low
Social media:								
Facebook	16(80)	29(116)	47(141)	21(42)	7(7)	386	3.22	**High**
WhatsApp	21(105)	34(136)	41(123)	15(30)	9(9)	403	3.35	**High**
Twitter	7(35)	9(36)	9(27)	54(108)	41(41)	247	2.06	Low
Instagram	3(15)	5(20)	11(33)	62(124)	39(39)	231	1.93	Very low
YouTube	8(40)	11(44)	31(93)	41(82)	29(29)	288	2.40	Low
Telegram	7(35)	16(64)	28(84)	33(66)	36(36)	285	2.38	Low
Print media:								
Newspaper	4(20)	6(12)	14(42)	37(74)	59(59)	207	1.73	Very low
Magazine	4(20)	7(28)	10(30)	48(96)	51(51)	225	1.87	Very low
Research bulletins	7(35)	9(36)	17(51)	32(64)	55(55)	241	2.01	Low
Fliers/Bill boards	19(95)	26(104)	41(123)	21(42)	13(13)	377	3.14	**High**
Grand mean							**2.52**	**Low**

Source: Field survey, 2023

Level of Women Participation in Cassava-based Technologies in Imo State

Findings in Table 3 indicate that women participate actively in the adoption and utilization of improved cassava varieties, practicing new agronomic techniques and cassava processing and value addition of cassava. The level of improved cassava varieties on a 3-point scale was high with a grand mean of ($\bar{\mathbf{x}}$ =2.24) which is greater than the decision mean cut-off of 2.00 while that of improved agronomic practices was also high with a grand mean of ($\bar{\mathbf{x}}$ =2.37) and cassava processing/value addition was of ($\bar{\mathbf{x}}$ =2.19) which are all greater than the mean cut-off of 2.00. The finding implies that women cassava farmers always and actively participate in cassava-based technologies and businesses in the study area. The attendant increase of women in cassava-based

technologies will increase the farm output of the households, improve their standard of living, and boost their communication power.

Table 3: Mean rating on level of women participation in Cassava-based Technologies in Imo State

Variables	High	Moderate	Low	Total	Mean	Remarks
Improved cassava varieties:						
TME 419	99(297)	16(32)	5(5)	334	2.78	High
IBA980581/Dixon	43(129)	59(118)	18(18)	265	2.21	High
IBA961632/Farmer's Pride	56(168)	37(74)	27(27)	269	2.24	High
IBA980505/Fine Face	51(153)	44(88)	25(25)	266	2.22	High
CR36-5/Ayaya	15(45)	66(132)	39(39)	216	1.80	Low
Pro Vitamin A/Yellow Cassava	55(165)	29(58)	36(36)	259	2.16	High
Grand mean					**2.24**	**High**
Improved agronomic practices	**High**	**Moderate**	**Low**	**Total**	**Mean**	**Remarks**
Selection of improved, high-yield and disease/pest-free cassava stems of 10-12 months old.	79(237)	26(52)	15(15)	304	2.53	High
Preparation/treatment of cassava stems & cut into 3 to 4 nodes stakes.	53(159)	33(66)	34(34)	259	2.16	High
Planting @ spacing of 1mx 0.5m, 1mx0.8m,0.5mx0.5m or 0.8mx 0.5m.	37(111)	39(78)	50(50)	239	1.99	Low
Field maintenance with a pre-emergence herbicide or manual weeding using a hoe.	89(267)	18(36)	13(13)	316	2.63	High
Fertilizer application at 8-10 weeks and the rate of 400-600kg/ha using NPK fertilizer or poultry manual	67(201)	31(62)	22(22)	294	2.45	High
Harvesting at 8-12 months after planting	71(213)	29(58)	20(20)	291	2.43	High
Grand mean					**2.37**	**High**
Cassava processing/Value addition	**High**	**Moderate**	**Low**	**Total**	**Mean**	**Remarks**
Improved cassava gari	95(285)	20(40)	5(5)	330	2.75	High
Improved cassava fufu	87(261)	23(46)	10(10)	317	2.64	High
Improved cassava tapioca	51(153)	46(92)	23(23)	268	2.23	High
High quality cassava flour	29(87)	54(108)	37(37)	232	1.93	Low
Chips and pellets	26(78)	38(76)	56(56)	21o	1.75	Low
Value-added products: bread, chin-chin, cake, boons, doughnuts, meat pie, strips, flakes, biscuits, etc.	28(84)	51(102)	41(41)	227	1.89	Low
Grand mean					**2.19**	**High**

Source: Field survey, 2023

Relevance of ICTs Usage for Optimized Food Production

Majority of the women farmers were of the opinion that ICT usage mainly enhances the overall effectiveness of farmers (100%) and helps link farmers with extension agents to boost output (96.7%). This implied that disseminating agricultural inputs and outputs information through ICTs especially mobile phones using various applications like short message service (SMS) and portals could aid in minimizing information asymmetries and enhance the bargaining power of farmers and consequently income. The findings of this study corroborated the submission of Alocha and

Umeh (2017) that ICT tools have the potential to empower and provide greater opportunity for individuals, groups, and communities irrespective of age and sex.

Table 4: Frequency and percentage distribution on the relevance of ICT usage for optimized food production

Relevance of ICT Usage for Optimized Food Production	Freq.	Percent	Ranking
Enhanced women farmers' knowledge of the best and improved cassava production practices	112	93.3	4th
Boost production and farm growth via easy conversation	94	78.3	7th
Helps link women farmers with extension agents to boost output	116	96.7	2nd
Improve access to market information and bargaining power	90	75.0	8th
Link women farmers together in cooperative	103	85.8	5th
Enhanced overall effectiveness of women farmers	120	100	1st
Increase women farmers' access to climate-related information	81	67.5	9th
Make the conversation easier for women farmers in production improvement	101	84.2	6th
Facilitate women farmers and buyers' contacts in marketing cassava produce	113	94.2	3rd
Fast response to farmers' requests on any farming challenges through Farmers Helpline calls	56	46.7	10th

Source: Field Survey, 2023 *Multiple responses

Challenges Experienced by women cassava farmers in ICT use in Imo State

The result presented in Figure 1 shows that women cassava farmers experience serious constraints in the use of ICTs in the study area, and these are the current economic crises in Nigeria (89.0%) followed by a lack of ICT knowledge/ high level of illiteracy among the women especially those of them in the rural areas (86.20%). Others are socio-cultural factors limiting women's participation in the cassava business (86.10%), and lack of constant electricity (81.50%) among others. The implication is that the more the constraints the more difficult the women farmers have to obtain and use ICT facilities which as a result affect the level of cassava production in Imo state.

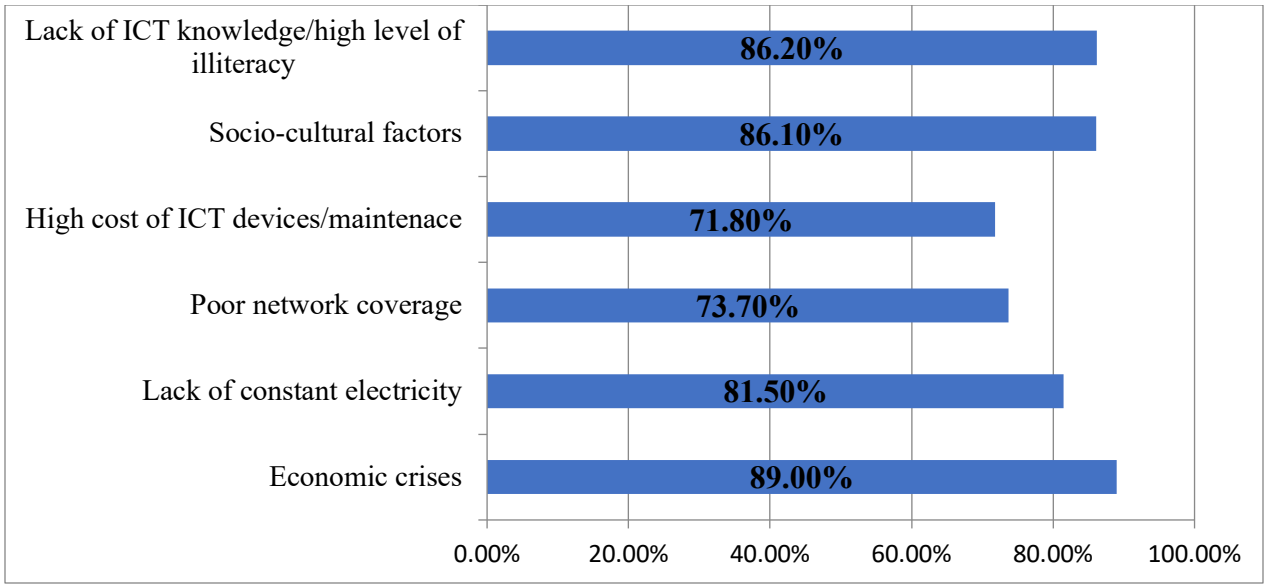


Figure 1: Challenges experience by women cassava farmers in ICTs use in Imo State
Source: Field Survey, 2023

Factors Influencing ICTs Usage by Women Cassava Farmers in Imo State, Nigeria

The Ordinary Least Square (OLS) was used to estimate the factors influencing women cassava farmers on ICTs usage in Imo State, Nigeria. The four functions of the multiple regression model were tried, and the lead equation (semi-log) was selected based on the statistical and econometric criteria such as the high magnitude of the coefficient of multiple determination, the F-ratio, the number of significant variables, and the conformity of the signs borne on the coefficients of the variables to *a priori* expectations. The model coefficient of multiple determinations (R^2) of 0.817 implies that about 82% variation in the factors influencing women cassava farmers was explained by the independent variables included in the model. The F-ratio was significant at 1%, indicating the model's goodness of fit. The result showed that farming experience, years of education of women cassava farmers, economic status (income), and cooperative membership positively influenced the usage of ICTs among women cassava farmers in Imo state, Nigeria (all at 1% level of significance). In comparison, the household size and extension contact were negative at 5 and 1% levels of significance respectively.

The coefficient of farming experience was positive and significant at a 1% alpha level. This implies that an increase in farming experience leads to an increase in the probability of utilizing ICTs among women cassava farmers in the study area. With high experience in farming, farmers are in a better position to enhance farm income with which to access ICTs. Educational status had a positive coefficient that was significant at a 1% alpha level. The positive sign of the variable implies that the more educated cassava farmers are the more they use ICT facilities. High education levels have the effect of enabling households to access and conceptualize information on good farming methods, access better paying rural labour market, and be capable of profitably combining various experiences. Education provides important indicators of household welfare and raising poor households' access to education is likely to have beneficial effects on the adoption process (Odor, *et al*., 2022, Amadi *et al*., 2020). This result agrees with the findings of Osondu and Ijioma

(2015) that the higher the level of education, the higher the level of use of ICTs. The coefficient of economic status (income) was positive and significant at a 1% alpha level. This implies that an increase in income leads to an increase in the probability of accessing and utilizing ICTs among women cassava farmers in the study area. This result compares favourably with findings obtained by Agada and Akpan (2017; Asenso-Okyere and Mekonnen, 2012) among farmers in Nigeria.
Contrarily, the household size coefficient was negatively related to the usage of ICTs among women cassava farmers in the study area. This result implies that farmers with large households are less likely to acquire and utilize ICTs in their cassava-based technologies than those with limited household members. However, a plausible explanation for the negative coefficient of the household size variable could be the presence of dependents who do not contribute to the labour force requirement of farming but solely depend on farm incomes for sustenance. Ajok (2016) and Abu *et al* (2014) opined that most of what is produced is consumed by large family size, leaving little or no marketable surplus that prohibited the marketing of cassava products with little profits. Extension contacts also showed an unexpected negative coefficient, indicating a serious communication gap.

Table 4: Factors Influencing the Use of ICTs by Women Cassava Farmers in Imo State, Nigeria

Variables	Linear	Exponential	Semi-log (+)	Double log
Constant	-2671.823	12.116	-4611826.000	3.665
	(-0.379)	(23.548)***	(-3.516)***	(162.071)***
Age of women	19.290	-0.010	-232708.100	0.006
	(0.124)	(-0.840)	(-0.687)	(1.110)
Farming experience	98.858	-0.022	364690.300	-0.001
	(0.699)	(-2.146)**	(2.959)***	(-0.467)
Household size	-1102.999	0.177	-277755.900	-0.002
	(-1.477)	(3.244)***	(-2.063)**	(-0.738)
Extension contacts	2500.847	0.284	-343397.100	0.003
	(1.644)	(2.560)**	(-2.826)***	(1.291)
Economic status	-1248.319	-0.045	194228.500	-0.002
	(-4.137)***	(-2.029)**	(2.726)***	(-1.302)
Years of education	40.040	0.000	600301.100	1.000
	(947.445)***	(16.375)***	(16.446)***	(1589.206)***
Cooperative	-315.529	-0.905	555367.800	0.001
membership	(-0.124)	(-4.851)***	(4.598)***	(0.353)
Credit access	6115.163	0.108	44631.630	0.002
	(2.390)***	(0.578)	(0.392)	(1.047)
Adjusted R^2	0.999	0.790	0.798	1.000
R^2	0.999	0.809	0.817	1.000
F-ratio	12.635***	41.620***	43.820***	10.251***

Source: Field survey, 2023. * ** and * = 1, 5 and 10% levels of significance**

CONCLUSION AND RECOMMENDATIONS

The need to facilitate access to required information and knowledge through the deployment of information and communication technologies (ICTs) to empower women cassava farmers, especially in rural areas cannot be overemphasized. From the data collected and analyzed, the result showed that major factors influencing the use of ICTs by women farmers are farming experience, household size, extension contact, economic status, years of education, and cooperative membership and they have a lot of bearing on the women involvement in cassava production and ICT usage. The findings also indicated that women farmers utilize improved cassava varieties, practice new agronomic techniques, and process cassava into value addition. The result also showed that the use of mobile phones, radio, television, WhatsApp, Facebook, and fliers top the mean rating of major ICT gadgets commonly used by women farmers. In addition, the major relevance of ICT usage is that it enhances the overall effectiveness of women cassava farmers while the present economic crisis is the most serious constraint to ICT usage in the study location. It is therefore, highly recommended that a free adult education policy is advocated to enable women farmers easy access to ICTs and process innovative information on improved cassava-based technologies to boost participation, boost food production, and enhance their income and output. There is also a need for both government and non-government agencies involved in agricultural development should provide adequate stable power supply, install network facilities, provide adequate ICT facilities and devices, and provide financial support to the rural poor farmers, especially women to enable them to improve communication and boost production of cassava. More importantly, constant training and retraining of women farmers in the effective use of ICT devices in their farm business to improve efficiency and productivity is highly recommended.

REFERENCES

Abu, B. M., Osei-Asare, Y. B., & Wayo, S. (2014). Market participation of smallholder maize farmers in the upper west region of Ghana. *African Journal of Agricultural Research*, *9*(31), 2427–2435. http://doi.org/10.5897/AJAR2014.8545

Agada, M.O and Akpan, C.O. (2017). Access and Use of Information and Communication Technology among Cassava Farmers in Obudu, Cross River State, Nigeria. *International Journal of Innovative Research and Development.* ISSN 2278 – 0211 (Online)/ November, 2017.

Agbarevo, M.N. B, Amadi, P.E and Nwokocha, N. I (2019). Effects of Selected Socioeconomic Characteristics of Farmers on Adoption of Improved Cassava Varieties in Cross River State, Nigeria. *Journal of Agricultural Economics, Extension, and Science.* Vol.5 No 1. April 2019. ISSN 2545-5176. Pp. 67-78.

Agwu, A.E., Uche-Mba, U.C and Akinnagbe, O.M (2012). Use of Information Communication Technologies (ICTs) among Researchers, Extension Workers and Farmers in Abia and Enugu States; Implications for a National Agricultural Extension Policy on ICTs, *Journal of Agricultural Extension.* 12(1), 38-49.

Ajok, W. (2016). Market Participation of Smallholder Cassava Processors in North and North Eastern Uganda. Dissertation paper, submitted to Agri-Enterprises Development of Gulu University.

Alocha, O.C and Umeh, O.C. (2017). Use of Information Communication Technologies among Female Block Extension Agents in South-East Agro-Ecological Zone, Nigeria. *Journal of Agriculture and Veterinary Science, 10(2),* Pp.40-46.

Amadi, P.E. Alleluyanatha, E. and Ibe, M.N. (2018). Factors Influencing Rural Women's Participation in Cassava Production and Processing in Edo State, Nigeria. *Journal of Community &Communication Research (JCCR).Vol.3, No.1 December, 2018. Pp. 47-53. www.jccr.org.ng*

Amadi, P.E, Udoka, I. J and Uchechukwu, N.U (2020) Differentials in Adoption of Pro-vitamin A cassava Varieties among Farmers in Southeast and South-south, Nigeria. *The International Journal of Agriculture, Management and Technology, vol. 4, No. 2. 2020*. ISBN: 978-978-54468-2-7. Pg. 175-181.

Amadi, G, Anyaegbunam, H. and Amadi, C. (2022) Adoption of Improved Varieties of Root and Tuber Crops for Agricultural Development and Food Security in Nigeria *Journal of Community and Communication Research*, Vol. 7, No 1, June 2022. *https;//jccr.sccdr.org.* Pp.100-111.

Asenso-Okyere, K & Mekonnen, D. A. (2012). *The Importance of ICTs in the Provision of Information for Improving Agricultural Productivity and Rural Incomes in Africa.* (Working Paper of the United Nations Development Programme): Regional Bureau for Africa. WP 2012-2015.

Damkor, M., Irinyang, D.J and Hamaa, M (2015). The Role of Information Communication Technology in Nigeria's Educational System. *International Journal of Research in Humanities and Social Studies*, 2(2); 64-68.

Egesi, C.N, Olojede, A.O, Okogbenin, E, Parkes, E and Kulakow, P. (2014). Naming, Registration, and Official Release of three new pro-vitamin A cassava varieties in Nigeria. *NRCRI 2015 Annual Report.*

Harry, A.I. and Ladu, T. (2018) Assessment of Gender Participation in Private Agricultural Extension System in Rivers State, Nigeria. International Journal of Agriculture and Earth Science Vol. 4 No. 6 ISSN 2489-0081 2018 www.iiardpub.org.

Nnadozie, A., Nwaobiala, K.O, Chioma, U and Mkpado, M. (2015) Evaluation of Research – Extension-Farmer-Linkage-System by Agricultural Development Programme in Nigeria.

NRCRI (2014) National Root Crops Research Institute, Umudike. *Annual Report, pp1- 32.*

Nwaihu, E.C, Egbuche, C.T, Onubuogu, G.C, Umeojiakor, A., Osugiri, and Anyanwu, C.N (2016): Evaluation of Awareness, Participation and Perception of Farmers Field School Approach for Food Security in Imo State, Nigeria. *Journal of Community and Communication Research, www.sccdr.org. Vol. 1 No 1, June 2016. Pp 45-50.*

Nyamba, S.Y and Mlozi, M.R (2012). Factors influencing the use of Mobile Phones in Communicating Agricultural Information: A case of Kilolo District, Iringe, Tanzania. *International Journal of Information and Communication Technology Research*, 2(7) 558-565.

Odor, P.C, Amadi, P.E, Mgbeahuru, C and Onuegbu, I. (2022) Socio-economic factors influencing the utilization of Information and Communication Technologies (ICTs) among cassava farmers in Abia State, Nigeria. Journal of Community and Communication Research Vol. 1 No.1, June 2022. Pp.88-93

Okwusi M.C., Nwachukwu I. and Adesope O.M (2009). Assessment of the usefulness of agricultural information obtained from the Internet among farmers in Southeast Nigeria. *Proceedings of the International Conference on the global food crisis. FUTO Owerri, Nigeria, April 19-24, 2009*, Pp. 420-423.

Oladejo, J.A, Olawuuyi, S.O and Anjorin, T.D (2011). Analysis of Women Participation in Agricultural Production in Egbedone, LGA of Osun State, Nigeria, *International Journal of Agricultural Economics and Rural Development -4(1):2011.*

Osondu C. K. and Ijioma J. C. (2015). Access and Use of Information and Communication Technologies (ICTs) by rural Women Farmers in Anambra State, Nigeria. *Journal of Global Economics, Management and Business Research.* 3(4):189-197