

EVALUATION OF ACCESS TO INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTS) AMONG CASSAVA FARMERS IN ABIA STATE, NIGERIA

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ABSTRACT

This study assessed access to information and communication technologies (ICTs) among cassava farmers in Abia state, Nigeria. A random sampling technique was employed to select a total of 120 farmers for the study in 2019 using questionnaire and focus group discussion (FGD). Both descriptive (frequency, percentages and 5 point Likert-scale) and inferential statistics (probit regression model) were used in analysing the data. The result of the analysis of cassava farmers awareness of ICTs in the study area indicated that majority (95.8%) of the farmers were aware of mobile phones, 61.7% were aware of computers, while, 9.2% and 1.7% were aware of internet and e-mail respectively. The result on the level of access to ICTs among the cassava farmers was low with a grand mean level of ($\bar{x} = 2.6$). The result of Probit regression analysis on factors influencing cassava farmer's access to ICTs in Abia State, reveals that coefficients of age, farm size, farm income, farming experience, access to farm credit and member of cooperative societies were positive and significant at various alpha levels respectively, while, gender, household size, distance to city and primary occupation were negative and significant at 10% alpha level. Major constraints faced by farmers to accessing ICTs in the study area were, high cost of ICT facilities (88.3%), inadequate or poor ICT infrastructure/network (84.2%) and lack of electricity supply (70%). The study concluded that cassava farmers in the study area have low access to ICT facilities by. The study therefore, recommended the reduction of high cost of ICTs and accessories especially in the rural areas to enhance farmers' interests and accessibility to ICT facilities. Most of the cassava documentaries and programmes carried out through the electronic media especially radio and television should be done in the evenings and be made more entertaining as well as educative so as to sustain farmers' interest and access to cassava technologies such as, agronomic practices, production, processing, marketing and others.

Keywords: ICTs, Cassava Farmers, Evaluation, Access

INTRODUCTION

Information is vital for increased cassava production, processing and improving market and distribution strategies among farmers in Abia state, Nigeria. Cassava (*Manihot esculenta* Crantz) is a staple food for over 700 million people in western and central Africa with an average consumption of approximately 500 calorie per day (Ogbuokiri *et al.*, 2015). Cassava has a big potential to be a profitable cash crop in Africa (NRCRI, 2014). It 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 livelihood for over 30 million farmers and countless processors and traders (Egesi *et al.*, 2006). In terms of production, almost every farm household grows cassava for purposes of food and as a major source of income. It is widely grown in the 36 states of Nigeria, but only ten states account for the bulk of the crop

output annually (Okonkwo, 2014). Nigeria accounts for 19% of world output of cassava and 34% of Africa's output (FAO, 2005; Apata, 2008).

Getting farmers informed on recent advancements in cassava production and processing technologies will almost be 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 cassava farmers. These farmers need information for linking input and output at reasonable prices. Emphasis has been on the development of information and communication technology (ICT), and its use in boosting agricultural production among farmers (Adejo and Haruna, 2009). The greatest concern facing the whole world today is the provision of adequate and nutritious food for its teeming population, and ICT's are tools for enhancing people's daily lives whether by

increasing access to information relevant to their economic livelihood, better access to other information source, healthcare transport, distance learning or in a strengthening of kinship (Obayelu and Ogunlade, 2006).

Information and communication technologies, (ICTs), generally refer to an expanding assembly of technologies that are used to handle information (Asenso-Okyerere and Mekonnen, 2012). They also include technologies such as hardware and software media for 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). Omotayo (2005) noted that ICTs are technologies that facilitate communication processing and transmission of information by electronic means. According to Omotayo (2005), ICTs include telephone, television, video, telex, voice information system and networks. They are also the new technologies which offer new ways for communicating and exchanging information and knowledge. Many cassava farmers are not adopting cassava technologies that have been developed because they do not have access to information about them (Adedoyin, 2004). This calls for improved use of information and communication technologies in accessing information needed to enhance production level of cassava farmers. However, inadequate access to technical information continues to limit cassava productivity in Nigeria (Mgbada, 2006). Therefore, there is need to bridge the digital divide in information and communication technologies between cassava farmers in South-east Nigeria and their counterparts in advanced countries. The specific objectives of the study include describing socio-economic characteristics of cassava farmers in Abia State; to identify types of ICTs available to cassava farmers in the study area; to assess the level of access to ICTs by cassava farmers and determine factors influencing access to ICTs among cassava farmers in the study area.

METHODOLOGY

The study was conducted in Abia State. The State lies between Longitudes 7°23' and 8°02' E of the Greenwich Meridian, and Latitudes 5°47' and 6°12' N of the Equator. According to the 2006 provisional census figures, it has a population of 3,727,300 people NPC (2006). Multi-stage random sampling technique was adopted to select 120 cassava farmers for the study. In the first stage, two out of the three agricultural zones in Abia state were randomly selected. In the second stage, three extension blocks were randomly selected from each of the two agricultural zones 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. A list of cassava farmers in the selected circles were compiled with the help of extension agents domiciled in those circles. This list served as the sampling frame. In the fourth and final stage; ten cassava farmers were randomly selected from each of the extension circles, to give one hundred and twenty cassava farmers. Data were collected with the use of questionnaire and focus group discussion (FGD). The data obtained were analyzed using appropriate statistical Objectives i, ii and v; were analyzed using descriptive statistics such as frequencies, percentages and mean. Objective iii; was analyzed using mean score drawn from 5-point Likert-type 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 access and utilization levels of cassava farmers. Mean score higher than 3 was regarded as high level of ICTs access while mean score lower than 3 was regarded as low level of ICTs access, the procedure was used following Ezech (2013), and inferential tools such as probit regression model. The model is specified as follows:

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

Thus;

\bar{x} = mean

Σ = summation

F = frequency

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

$I_i = B^T X + e_i$ (1)

$Y_i = 0$ if $I_i < T$ (2)

$Y_i = 1$ if $I_i \geq T$ (3)

Where:

Y represents a limited dependent variable, which simultaneously measures access to or use of ICT facilities.

I^* is an underlying latent variable that indexes access of ICT facilities

T is an observed threshold level

X is the vector of independent variables influencing access/use of ICTs

β_1 is a vector of parameters to be estimated

e_i error term.

The empirical model is presented below;

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6 \dots, X_{13} + e_i)$

Y = access to ICTs (measured by mean access scores of the respondents)

Y = access to ICTs (access level = $\geq 3 = 1$; < 3 = no access = 0)

X_1 = gender (male = 1, otherwise = 0)

x_2 = age (years)

x_3 = education (years spent in school)

x_4	= marital status (married = 1, otherwise = 0)
x_5	= household size (number of persons)
x_6	= farm size (hectares)
x_7	= distance (Km)
x_8	= Occupation (farming = 1, otherwise = 0)
x_9	= farm-income (Naira)
x_{10}	= non-farm income (Naira)
x_{11}	= farming experience (Years)
x_{12}	= access to credit (access = 1, otherwise = 0)
x_{13}	= cooperative membership (member = 1, otherwise = 0)
e_i	= error term

RESULTS AND DISCUSSION

Selected Socio-Economic Characteristics of Cassava Farmers

Table 1 revealed that 40.8% of the cassava farmers were within the age bracket of 41-50 years. The mean age of the cassava farmers was 48 years indicating that the cassava farmers were still strong and active and thus capable of withstanding the stress and rigours

associated with farming activities. According to Osondu and Ijioma (2015) young farmers show higher level of interest in the use of ICTs. The result showed that 45.0% of the cassava farmers had secondary school education, while 28.3% and 21.7% of them had primary and tertiary education respectively. This result indicates that the cassava farmers were educated. The mean farming experience was 14 years, implying that the farmers had adequate experience in cassava production. Adequate farming experience enhances participation and adoption of improved farming technologies by farmers (Agbarevo, Amadi and Nwokocha, 2019). Majority 51.7% of the cassava farmers had annual farm income of between ₦110,000-₦200,000, 35.0% of them had ₦210,000-₦300,000 while 10.0% of them had above ₦310,000. The mean annual farm income of the cassava farmers was ₦167,000. With higher income level farm households are more likely to access ICT facilities such as smart phones and television. The result shows that 80.0% of the cassava farmers had no access to credit while only 20.0% of them had access to credit. The result revealed that majority, 55.0%, of the cassava farmers' belonged to cooperative societies.

Table 1: Distribution of respondents based on selected socio-economic characteristics

Variables	Frequency	Percentage	Mean
Age			48
>30	11	9.2	
31 – 40	35	29.2	
41 – 50	49	40.8	
51 and above	25	20.8	
Level of education			13years
No formal education	6	5.0	
Primary education	34	28.3	
Secondary education	54	45.0	
Tertiary education	26	21.7	
Primary occupation			
Farming	85	70.8	
Trading	8	6.7	
Civil servant	11	9.2	
Artisan	16	13.3	
Farming experience			14 years
1 – 5	10	8.3	
6 – 10	35	29.2	
11 – 15	42	35.0	
16 and above	33	27.5	
Farm income			167,000
10,000-100,000	4	33.0	
110,000-200,000	62	51.7	
210, 000-300,000	42	35.0	
310,000 and above	12	10.0	
Access to credit			
Yes	24	20.0	
No	96	80.0	

Cooperative membership		
Yes	66	55.0
No	54	45.0
Total	120	100.00

Source: Field survey, 2019

Types of ICTs of which Cassava Farmers are Aware of

Table 2 shows that 95.8% of the cassava farmers were aware of use of mobile phones in agricultural information dissemination, 65.8% of them identified radio as a type of ICT. Also, 61.7% of the cassava farmers were aware of existence of computer and its role in information dissemination. Meanwhile, 50.0%, 45.8%, 20.8%, and 9.2% of them were aware that social media network, television, newspaper and internet were ICTs and served as avenue for accessing

information pertaining to cassava production and processing technologies. Information and Communication Technology (ICT) has become a very important feature in the Nigerian agricultural sector in contemporary times but availability of these facilities to the rural farmers still remains a major concern. Therefore, information should be seen as being tangible and concrete to cassava farmers. The result is in line with the findings of Kituyi-Kwake and Adigun (2008), which found high awareness of ICT facilities among farmers in Nigeria.

Table 2: Types of ICTs which the Cassava Farmers are Aware

ICT	Frequency	Percentage
Computer	74	61.7
Mobile phone	115	95.8
Internet	11	9.2
E-mail	2	1.7
Social media network	60	50.0
Radio	79	65.8
Television	55	45.8
NRCRI call centre	1	0.8
News paper	25	20.8
Magazine	9	7.5
Research bulletin	5	4.2

Source: Field survey, 2019.

Level of Access to ICTs by Cassava Farmers in Abia State

Table 3 shows that cassava farmers generally had low level of access to ICTs as indicated by the grand mean (\bar{x} = 2.6) which was lower than the decision mean cut-off of 3.00. Meanwhile the cassava farmers had high level of access to GSM (\bar{x} =4.1), WhatsApp (\bar{x} =4.0), Computer (\bar{x} =3.1), Facebook (\bar{x} =3.1) and Radio (\bar{x} =3.5). This implies that farmers' accessibility to

various types of ICTs and appropriate utilization of such ICTs needs to be enhanced in order to increase the level of adoption of new improved varieties of cassava which will in turn give a boost to cassava production in Abia state. This result is in tandem with Aphunu and Atoma (2011) that there is a high level of access to mobile phones among farmers in rural area. However, Obiora (2014) reported low level of access to ICTs facilities in rural areas.

Table 3: Distribution of Cassava Farmers According to their Level of Access to ICT

ICTs	Very High	High	Moderate	Low	Very low	Total	Mean
Computer	14 (70)	37 (148)	26 (78)	29 (58)	14 (14)	368	3.1
GSM(phones)	37 (185)	62 (248)	21 (63)	0 (0)	0 (0)	496	4.1
Internet	0(0)	8 (32)	29 (87)	54 (108)	29 (29)	256	2.1
E-mail	0(0)	0 (0)	15 (45)	65 (130)	40 (40)	215	1.8
Social network							
Face book	0(0)	13(65)	52 (208)	42 (84)	13 (13)	370	3.1
whatsApp	0(0)	48 (240)	49 (196)	23 (46)	- (0)	482	4.0
Skype	0(0)	0(0)	9 (27)	67 (134)	44 (44)	205	1.7
Twitter	0(0)	0(0)	11 (33)	76 (152)	33 (33)	218	1.8
Instagram	0(0)	0(0)	2 (6)	65 (130)	53 (53)	189	1.6
Radio	43 (215)	23 (92)	20 (60)	16 (32)	18 (18)	417	3.5
Television	02 (10)	27(108)	36 (108)	25 (50)	30 (30)	306	2.5
Fax	0 (0)	17(68)	10(30)	78(156)	15 (15)	269	2.2
Newspaper	15(75)	24(96)	28(84)	48(96)	05(5)	356	2.9
Magazine	09(45)	20(80)	22(66)	54(108)	15(15)	314	2.6
Research bulletin	10(50)	18(72)	24(72)	62(124)	06(6)	324	2.7
Grand mean							2.6

Source: Field survey, 2019

Factors Influencing Cassava Farmers Access to ICTs

The Probit regression estimates of the factors influencing cassava farmers access to ICTs in Abia State, Nigeria is presented in Table 4. The chi-square was significant at 1% level of probability indicating goodness of fit of the probit regression model. The result reveals that there was significant relationship between access to ICTs and some socio-economic characteristics of cassava farmers. The result indicates that gender, household size, distance to city, primary occupation, farm income, farming experience and cooperative membership had negative influence on access to ICTs while age, farm size, and access to credit had positive influence on access to ICTs.

Specifically, the coefficient of gender (-0.523) was negative and significant at 1% probability level. This implies that females have more access to ICTs than the male cassava farmers. Gender is an important indicator of household decision making in traditional setup. Sadaf *et al.*, (2006) found in their study of female internet kiosk users and non-users, that there was no inhibition of women's ability to use public access facilities. Age had a positive coefficient (0.088) that was significant at 1% alpha level. This implies that an increase in age leads to an increase in the probability of accessing ICTs among cassava farmers in study area. Farmers in their middle age are active with an advantage of adopting innovations that can enhance their productivity. This finding disagrees with the report of Omotayo (2011) which posited that young people are more disposed to ICTs especially the modern ICTs (computer/internet and mobile phones). Household size had a negative coefficient (-0.034) that was significant at 10% alpha level. The negative sign

implies that the larger the household size, the lower their access to ICTs. This could be as a result of lack of fund to acquire such ICT facilities, since a larger household size might have many other pressing needs. This finding agrees with Mukoko, (2012) which reported an inverse relationship between household size and access to ICTs. Farm size posted a positive coefficient (0.404) that was significant at 1% alpha level. This implies that an increase in farm size would increase the farmer's probability of accessing ICTs. The result is in agreement with the finding of Diagne and Demont (2007) who found a significant difference in farm size between the technology adopters and non-adopters with the adopters cultivating larger farm size.

In addition, distance to city had a negative coefficient (-0.110) that was significant at 1% alpha level. This implies that the longer the distance to cities, the lower the probability of accessing ICTs by cassava farmers. This result makes sense considering the fact that ICT facilities such as GSM phones, facebook and internet require network signals from service providers such as MTN, GLO and 9Mobile. Farmers residing in remote rural areas may not be able to access network signals with which to access agricultural information. The coefficient of primary occupation (-0.127) was negative and significant at 1% alpha level. This implies that cassava farmers who engaged in farming as a secondary occupation had lower probability of accessing ICTs. Cassava farmers who practiced farming as a primary occupation had higher incentive to access ICTs for their farm production information. The coefficient of farm income (0.184) was positive and significant at 1% alpha level. This implies that an increase in farm income leads to an increase in the

probability of accessing ICTs among cassava farmers in the study area. This result compares favourably with finding obtained by Osondu and Ijioma (2015) among farmers in Anambra State of Nigeria. The coefficient of farming experience (0.050) was positive and significant at 1% alpha level. This implies that an increase in farming experience leads to an increase in the probability of accessing ICTs among cassava farmers in the study area. With high experience in farming, farmers are in better position to enhance farm income with which to access ICTs. Also, experience farmers appreciate better the role of extension service and thus seek means of easier access of agricultural information.

Access to credit posted a positive coefficient (0.168) that was significant at 1% alpha level. This implies that an increase in access to credit leads to an increase in

the probability of accessing ICTs among cassava farmers in the study area. Farmers with increased access to credit facilities are more likely to increase their production. Following the argument that poor households experience difficulties trying to sustain immediate family needs, increased volume of credit helps to better the financial capacity of such households, thus enhancing their probability of accessing available ICTs. This result conforms to Olagunju (2007) that farmers with better access to credit are significantly more likely to be adopters of improved technologies. Cooperative membership was positive (0.665) and significant at 1% alpha level. This implies that any increase in cooperative membership leads to an increase in the probability of accessing ICTs among farmers in the study area.

Table 4: Probit Regression Estimates of Factors that Influenced Farmers Access to ICTs in Abia State, Nigeria

Parameter	Estimate	Std Error	Z –value	Sig
Gender	-0.523	0.077	-6.767***	0.000
Age	0.088	0.006	15.666***	0.000
Education	0.000	0.038	-0.011	0.992
Marital Status	0.048	0.056	0.871	0.384
Household size	-0.034	0.019	-1.767*	0.077
Farm size	0.404	0.072	5.605***	0.000
Distance to city (Km)	-0.110	0.031	-3.505***	0.000
Primary occupation	-0.127	0.038	-3.320***	0.001
Farm Income	0.184	0.065	2.836***	0.005
Non-farm Income	0.024	0.054	0.443	0.658
Farming Experience	0.050	0.006	8.682***	0.000
Access to Credit	0.168	0.097	1.724*	0.085
Cooperative Membership	0.665	0.102	6.546***	0.000
Intercept	-2.739	0.426	-6.434***	0.000
Chi-Square			16128.608***	0.000

Source: Field Survey, 2019

Problems Constraining Cassava Farmers Access to ICTS

Problems constraining cassava farmers' access to ICTs were presented in Table 4.18. The Table shows that cassava farmers experience constraints in their bid to access ICTs in the study area and these constraints are high cost of ICT facilities (88.3%), inadequate or poor ICT infrastructure/network (84.2%), lack of electricity

supply (70%), skill gap and illiteracy (59.2%), weak institutional and poor collaboration (45%), inadequate and weak ICT policies/non implementation (30%) and inappropriate local content (27.5%). According to Lawal- Adebawale (2009) knowledge, level of education and operating procedure of ICTs is a pre-requisite to effective access and successful use of ICTs.

Table 5: Problems Constraining Cassava Farmers Access to ICTs in Abia State, Nigeria

Constraints	*Frequency	Percentage
Inadequate or poor ICT infrastructure/network	101	84.2
High cost of ICT facilities	106	88.3
Inadequate and/or weak ICT policies/non implementation	36	30.0
Weak institutional and poor collaboration	54	45
Inappropriate local content	33	27.5
Skill gap and illiteracy	71	59.2
Lack of electricity supply	84	70

Source: Field Survey, 2019

* Multiple responses recorded

CONCLUSION

The study analysed cassava farmers' access to ICT facilities in Abia State, Nigeria. The result indicated that there was low access to ICT facilities in the study area by cassava farmers. The study also showed that gender, age, household size, primary occupation, distance to city, access to credit, farm size, farm income, farming experience and farm income were significant and influenced both access to ICTs among cassava farmers in Abia state. Therefore, the study recommended that: (1) reduction of high cost of ICTs and accessories should be embarked upon in rural areas to enhance people interest and accessibility to ICT facilities. (2) Most of the cassava documentaries and programmes carried out through the electronic media especially radio and television should be done in the evenings and be made more entertaining as well as educative so as to sustain farmers' interest and access to cassava technologies such as, agronomic practices, production, processing, marketing and others. (3) ICT facilities should be installed in rural areas to decrease the transaction cost of having access to ICTs experienced by cassava farmers. (4) More importantly, regular power supply should be made available in the rural areas for farmers to be able to access ICT facilities in the area.

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