Original Research Article

Utilization of Information and Communication Technologies among Rural Women and Youths in Agriculture in Abia State, Nigeria

ABSTRACT

Aim: The study assessed the utilization of information and communication technologies (ICTs) among rural women and youths in agriculture in Abia State, Nigeria.
Study Design: Data were collected using structured interview schedule by the researcher and other research assistants. Simple descriptive statistics (such as percentage, standard deviation, mean scores) and correlation analysis were used for data analysis and result presentation.
Methodology: Using the multistage sampling technique, the sample size made up of one hundred and twenty respondents was purposively selected.
Results: Findings of the study revealed that GSM, radio and television were the major ICTs used by women and youths to obtain agricultural information among extension and relevant stakeholders in the state. The Pearson correlation coefficient revealed a significant influence of educational level and number of times visited by extension agents with level of ICTs use.
Conclusion: The study found women and youths in agriculture in Abia State used radio, TV, and GSM extensively for obtaining agricultural information. Women were hindered by low literacy, epileptic power supply, and a lack of extension conviction and training, while youths were hindered by a lack of extension awareness in Abia State. Use of chosen ICTs is also positively correlated with years in spent in school and extension agent visits.
Recommendation: The study recommended among others that there is need for effective ICTs training programs for rural women and youths in the state by agricultural extension agencies to increase their knowledge on ICTs use in obtaining timely and credible agricultural information among stakeholders in order to increase productivity, income and improved standard of living.

Keywords: Utilization, information communication technologies, rural, women, youths and agriculture

1.0 INTRODUCTION

Since the advent of information and communication technologies (ICTs), human communication has taken a drastic change. By facilitating prompt information sharing and creativity among stakeholders, the use of ICTs in agriculture can aid in the development of the sector to close the information gap. According to Gomez et al. (2021), information and communication technology use in agriculture refers to the extent to which rural women and youths in Abia State use these technologies to share agricultural information with extension professionals and other stakeholders. In Nigeria, farming is the main source of

employment, income, and food for rural dwellers and women play a significant role in food production, processing and marketing (Asamu, 2020; Osabohien et al., 2021).

Agricultural extension plays a key role in disseminating scientific research-based technologies to farmers that will improve help them develop skills needed in solving their farm problems. But extension to farmer ratio in Nigeria is between 1:5000 and 1:10000, compared to 1:200 in other Sub-Saharan African nations (Norton & Alwang, 2020; Mabaya et al., 2021). This ratio demonstrates that farmers have limited access to extension services, and extension agents, in turn, struggle to reach a large number of farmers who require timely agricultural information supported by scientific research in rural areas (Sennuga et al., 2020). This suggests that farmers lack access to sufficient, reliable, and timely information about improved agricultural inputs, the market, credit sources, weather data, and other technologies. Their productivity, income, food security, and agricultural development in general will all suffer as a result of this information gap especially in the face of changing climate (Misaki, 2021).

However, the use of ICTs in agriculture offers a great opportunity to close the information gap between rural women and youths, who handle most of the state's agricultural activities but still use face-to-face communication, which has become less effective due to technological advancement. ICTs in agriculture can transform Nigerian agriculture and bring it into compliance with international best practices (Balogun, et al., 2021). Rural women and youths must use ICTs' fast information transmission and broad audience coverage to improve productivity, income, food security, agricultural decision-making, and standard of living. Although several scholars have studied ICTs use among extension personnel, there are few empirical studies on rural women and youths use of ICTs in agriculture in Abia State, Nigeria. In light of this, this study examined ICTs use by rural women and youths in agriculture in Abia State, Nigeria. The specific objectives of the study were: to identify the agricultural uses of ICTs by respondents; to ascertain the level of use of ICTs by respondents; to ascertain the perceived importance of ICTs in disseminating agricultural information; to identify the perceived constraints to ICTs use by respondents in the state.

1.1 Hypothesis

The null hypothesis for the study was that the socio- economic characteristics of respondents do not have significant influence on respondents' level of use of ICTs in agriculture

2.0 METHODOLOGY

2.1 Study area

The study was conducted in Nigeria's Abia State. The state is in Nigeria's southeast, between latitudes 4°45' and 6°14' North of the equator and longitudes 7°10'E and 8°09' East of the Greenwich Meridian. East of Imo State, the state borders Anambra, Enugu, and Ebonyi States on the North West, North, and North East (Nwachukwu, 2020). With Umuahia as the state capital, the population of the state is estimated at 3,727,347 in 2016, according to NPC (2017) and 5243.7 square kilometers, with 486 people per square kilometer (Apeh et al., 2017).

The study selected Obi Ngwa and Ossioma LGAs due to their high farming and telecommunication masks. Three agricultural zones—Aba, Ohafia, and Umuahaia—make up the state (Ndem & Osondu, 2018). The state has two main seasons comprising low-lying tropical rainforest with rainy and dry seasons. The southern section receives 2,400 millimeters of yearly rainfall, peaking from April to October, while the rest of the state has moderately high plain and wooden Savanna (Susan et al., 2019). According to Nwankwo, et al. (2019), the people of Abia State are mostly farmers who cultivate small parcels of farm land ranging from 0.1 to 10 hectares. Agriculture accounts for 27% of the state's GDP and employs 70% of the population. The state grows yam, maize, potatoes, rice, cashews, plantains, taro, and cassava due to its excellent fertile terrain. Oil palm and rubber are the state's main cash crops (Yisa et al., 2020).

2.2 Population and sampling techniques

All women and youths involved in agriculture in Abia State comprised the population for the study. A multi-stage sampling technique was used in the selection of the sample size. In the first stage, Osisioma and Obi Ngwa local government areas (LGAs) were purposively selected out of the seventeen LGAs based on the existence of high agricultural activities and telecommunication masks in the area. In the second stage, five (5) autonomous communities were purposively selected from each local government area, giving a total of ten (10) autonomous communities. In the third stage, three (3) villages each were randomly selected from the selected ten communities, giving a total of thirty (30) villages. In the fourth stage, four (4) respondents' comprising of two women and two youths (farmers) were obtained

from each village using a simple random technique. This gave a total of one hundred and twenty (120) respondents' (60 women and 60 youths) for the study.

Data were collected from the respondents in their homes and farms using structured interview schedule. The researcher with the help of other research assistants administered the questionnaire which captured the objectives of the study on the literate farmers while interview schedule was administered on the illiterate farmers. To ascertain the agricultural uses of ICTs provided, the respondents were asked to identify and tick from the list of variables provided across each ICTs.

To determine the level of agricultural uses of ICTs, respondents were asked to rate their level of use of ICTs available to them by ticking from the list of variables provided to them. Some of the variables include: radio, television, GSM and computer. A 4-point Likert of very often = 3; often =2; rarely=1 and never used = 0 was used to collect data. The values were added to get 6 and divided by 4 to get the mean value of 1.5. Variables with a mean score of 1.5 and above were regarded as being used frequently by the respondents in communicating agricultural information while variables with mean scores below 1.5 were regarded as not being used.

To ascertain respondents' perception on the importance of using ICT in agriculture in the study area, the respondents' were asked to identify from the list of variables provided those ICTs perceived as important in obtaining agricultural information. Some ICTs that were on the list include: radio, television, the internet etc. A 3-point Likert of highly important=2, important=1, not important=0 was used to collect the data. The values were added to get 3.0 and divided by 3 to get a mean score of 1.0.Variables with a mean score of 1.0 and above were regarded as being important while variables with mean score of less than 1.0 were regarded as not important.

To identify the perceived constraints to effective use of ICTs, respondents were asked to identify and tick from the list of perceived constraints provided. A 4- point Likert of very serious=4, serious=3, not serious =2, not a problem=1was used to collect data. The values were added to get 10, which was divided by 4 to get a mean score of 2.5, variables with mean scores of 2.5 and above were regarded as constraints while those with mean scores below 2.5 were regarded as no constraints.

2.3 Data analysis

Data were analyzed using simple descriptive statistics such as percentage, frequency counts, standard deviation and mean scores.

The hypothesis of the study was analyzed using Pearson correlation coefficient at 0.05 level of significant.

3.0 RESULTS AND DISCUSSION

3.1 Agricultural uses of ICTs by respondents

Table 1 shows that 55% of women used GSM to get current commodity market prices and 60.0% used it to get subsidized input information straight from governments. 71.7% of women watched TV to learn about agriculture policies and 55.0% to advertise agricultural products. 70.0% of women utilized radio to learn about government-subsidized inputs and finance, while 66.7% advertised agricultural products. However, 80.0% of youths use GSM for market price information and 53.3% for government-subsidized input information. 75.0% utilize television for agricultural policy and program information, 63.3% for advertising agricultural products, and 51.7% for agricultural information. 73.3% utilize radio for government-subsidized inputs and credit facilities, 61.0% for advertising, and 62.7 for agricultural information. This research supports Nwali, et al. (2022), who found that rural Nigerian women use GSM, radio, and TV to get agricultural information. It also suggests that farmers in the research area use GSM, TV, and radio for agricultural information. They can easily access those ICTs. According to Iyere-Freedom & Enwelu (2022), rural women and youth in agriculture can only get agricultural knowledge through GSM, television, and radio.

Radio is also the most used. The finding verifies Sennuga et al. (2020) finding that radio is the most extensively spread electronic communication medium and is traditionally used by smallholder farmers in Nigeria for agricultural information. The result also suggests that teenagers use those ICTs more than women for agricultural purposes, likely because they are more imaginative and open to new ideas due to formal education. Manalo et al. (2019) found that farmers' children (youth) can fulfill infomediary responsibilities well since they are more academically talented.

Table 1: Percentage distribution of ICTs according to agricultural uses

ICTs	Agricultural uses	Overall percentage	Women (n=60)	Youths (n=60)
			Percentage	Percentage
GSM	Obtaining information on			
	Market prices	67.5	55.0	80.0
	Subsidized inputs	56.7	60.0	53.3
	Information exchange	45.0	41.7	48.3
CD-ROM	Information purposes like			
	Back up agric. Information	25.8	18.3	33.3
	Transfer of information	24.2	15.0	33.3
	Storing information	17.5	15.0	20.0
Fax machine	Information transfer in form of			
	Document	16.7	13.3	20.0
	Text and graphics	16.7	8.3	25.0
	Used for communication	27.5	13.3	41.7
Television	Obtain Information on			
	Agric. Programmes and policies	73.3	71.7	75.0
	Advertisement of produce	59.2	55.0	63.3
	Communication	47.5	43.3	51.7
Radio set	Obtaining information on			
	Government subsidized inputs and credits	71.1	70.0	73.3
	Advertisement of produce	64.2	66.7	61.0
	Communication	55.8	48.3	62.7
Computer	Information purposes like			
	Documentation and record keeping	41.7	36.7	47.5
	Statistical/data computation	33.3	40.0	27.1
	Advertisement and marketing	27.5	25.0	30.0
Internet	Information purposes like			
	Sending and receiving email	36.7	35.0	38.3
	Sourcing agric. Information	32.5	35.0	30.0
	Advertisement	26.7	25.0	28.8
Remote sensor	Sourcing information like			
	Predicting crop yield	22.5	10.0	35.6
	Soil suitability to specific crop	20.8	13.3	28.8
	Specific resource allocation of input	20.0	13.3	26.7
Digital camera	Information purposes like			
	Taking shots of farm events	33.3	28.3	38.3
	Storing pictorial information	37.5	31.7	43.3
	Videoing of farm events	32.5	28.3	36.7

Source: Field Survey, 2023

Level of use of ICTs by respondents

Table 2 shows that women and youth in the research area relied on radio, television, and GSM for agricultural information. Because respondents were aware of those ICTs and knew how to use them, they

had access to them. Effiong, et al. (2021) found that farmers were more conscious of radio, TV, and mobile phones.

The finding also shows that radio, television, and GSM had standard deviations smaller than 1.0, indicating that respondents' individual ratings on the amount of use of those ICTs did not vary considerably from the mean, reflecting the actual situation. Rural women and youth using ICTs like radio, television, and GSM to provide agricultural information can improve communication among all stakeholders in agriculture. According to Westermann et al. (2018), ICTs in agriculture enable the effective dissemination of credible information like market prices, early warning information, and others.

Table 2: Mean scores of level of use of ICTs by respondents

ICTs	Women		Youths			
	$\bar{x}$	SD	$\bar{x}$	SD	Overall $\bar{x}$	Overall SD
Radio set	2.47*	0.92	2.66*	0.69	2.57*	0.82
Television	2.33*	1.00	2.55*	0.87	2.44*	0.94
Fixed telephone	0.88	1.08	1.19	1.14	1.03	1.11
GSM	2.17*	1.22	2.37*	0.99	2.27*	1.11
Internet and email	1.23	1.02	1.33	1.16	1.28	1.09
CD-ROM	0.72	0.78	0.92	1.06	0.81	0.93
Video CD Player	1.05	0.99	1.22	1.11	1.13	1.05
Computer system	1.03	0.96	1.32	1.10	1.18	1.03
Digital camera	0.87	0.99	1.05	1.14	0.96	1.02
Fax machine	0.28	0.71	0.67	0.95	0.48	0.83
Multimedia projector	0.40	0.81	0.68	0.95	0.54	0.89
DVD	1.00	1.11	1.05	1.11	1.02	1.10
Online magazine	0.98	1.10	1.10	1.20	1.04	1.14

Source: Field Survey, 2023 variables * = significant Cut off: ≥ 1.5

Correlation between some selected socio-economic characteristics and their level of ICT use

Data entries in Table 3 demonstrates that formal education is positively correlated with the use of internet and email use (r = 0.273), CD-ROM (r =0.219), computer use (r=0.262), and digital camera use (r=0.270). As women and youths acquire more formal education, so does their ICT use increase. This implies knowledge-based ICT use. This supports Khan et al. (2020), finding that farmers are more likely to employ ICTs if they are more educated.

Number of extension agent visits is positively correlated with internet, e-mail, CD-ROM, video CD player, computer, digital camera, fax machine, multimedia, DVD, and online magazine with correlation coefficients of 0.318, 0.377, 0.306, 0.272, 0.340, 0.279, 0.309, 0.330, and 0.216. As extension agents visit more often, women and youth use the internet, e-mail, CD-ROM, Video CD players, computers, digital cameras, fax machines, multimedia, DVD, and online magazines more. Ntshangase, et al. (2018), found that more extension visits increased farmers' adoption of agricultural technology.

Table 3 shows that radio, fixed telephone, and fax machine usage are negatively correlated with age (r = -0.240, -0.192, and -0.209). This implies that as they age, women and youths use less of radio, fixed phone, and fax machines for obtaining agricultural information and tend to rely more on their personal experiences and practices over the years to achieve success in their farm. This is in agreement with the study of Zhu et al. (2020), reported that age variable has a negative and statistically significant coefficient.

Data in Table 3 also reveals that years of farming experience negatively correlates with radio, television, landline telephone, and GSM use, with correlation coefficients of -0.244, -0.193, -0.189, and -0.235. This suggests that as women and youths gain farming expertise, they utilize less radio, television, fixed telephone, and GSM for agriculture information and rely more on their years of farming experience to solve farm problems. This confirms the findings of Zossou et al. (2020), who posited that farmers rely heavily on their personal experiences and fellow farmers to adopt an agricultural technology.

We therefore reject the null hypothesis for educational level, number of extension visits, age and years of farming experience.

Table 3: Pearson correlation between some selected socioeconomic characteristics and the level of ICT use

	Age	Household size	Years spent to acquire formal education	Years of farming experience	Estimated monthly income	Number of times visited by extension agent
Radio	-0.240*	0.124	0.083	-0.244*	0.020	0.091
Television	-0.165	0.154	0.092	-0.193*	0.045	0.044
Fixed telephone	-0.192*	0.009	-0.114	-0.189*	-0.054	0.140
GSM	-0.177	-0.008	0.142	-0.235*	0.077	0.171
Internet and e-mail	-0.080	-0.028	0.273*	-0.111	0.120	0.318*
CD-ROM	-0.101	-0.025	0.219*	-0.073	0.105	0.377*
Video CD Player	-0.129	0.009	0.177	-0.139	0.111	0.306*
Computer	-0.120	0.005	0.262*	-0.152	0.154	0.272*
Digital camera	-0.083	-0.147	0.270*	-0.070	0.165	0.340*
Fax machine	-0.209*	0.052	-0.115	-0.166	-0.095	0.279*
Multimedia	-0.177	0.037	-0.013	-0.159	-0.032	0.309*
DVD	-0.067	0.093	0.149	-0.035	0.065	0.330*
Online magazine	-0.120	0.114	0.092	-0.105	-0.028	0.216*

Source: Field Survey, 2023 * Correlation is significant at the 0.05 level (2-tailed).

Perceived constraints to use of ICTs by respondents

Data entry in Table 4 show that women identified low literacy, epileptic power supply, lack of extension conviction, and lack of effective training as major barriers to ICT use in agriculture, while youth identified lack of awareness as their main barrier. Also, a greater proportion of women's standard deviations were less than 1.0, indicating that almost all respondents' individual scores on the seriousness of the constraints to ICTs in agriculture did not vary much from their mean scores, reflecting the situation on the ground. The lone exception is farmer negative attitude (SD=1.05). Youth had standard deviations greater than one from their mean scores for most variables. The circumstance may be different. Youths may not perceive the study's limits because they depend on their parents for ICTs and education. Thus, rural women and youths in agriculture do not use ICTs due to these state constraints. According to Jiriko et al. (2020), farmers' ICT use is limited by lack of appropriate training, epileptic power supply, and low literacy.

Table 4: Mean score of perceived constraints that militate against the use of ICT by respondents

ICTs	Women		Youths		Overall	Overall SD
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	
Low ICT literacy	2.65*	0.78	2.22	1.01	2.43	0.92
Epileptic power supply	2.58*	0.83	2.10	1.13	2.34	1.02
Complexity in using ICT	2.40	0.89	1.83	1.20	2.12	1.09
Lack of competence	2.33	0.88	2.10	1.12	2.22	1.01
Lack of adequate awareness	2.42	0.92	2.50*	0.83	2.46	0.90
Negative attitude by farmers	2.30	1.05	1.98	1.03	2.14	1.05
Less concentration of ICT in rural areas	2.48	0.95	2.13	1.20	2.31	1.09
Lack of effective training	2.55*	0.811	2.17	1.03	2.36	0.94
Lack of extension conviction	2.60*	0.76	2.22	1.08	2.41	0.95

Source: Field Survey, 2023 Cut off: ≥ 2.5

Conclusion and Recommendation

In conclusion, the study found women and youths in agriculture in Abia State used radio, TV, and GSM extensively for obtaining agricultural information. Women were hindered by low literacy, epileptic power supply, and a lack of extension conviction and training, while youths were hindered by a lack of extension awareness in Abia State. Use of chosen ICTs is also positively correlated with years in spent in school and extension agent visits.

The study recommended that there is need to develop agricultural programs by the government, agricultural extension agencies and relevant stakeholders targeted at the training and education of women and youths to improve their technology literacy skills through the use of existing agricultural extension on the effective use of ICTs in obtaining agricultural information for enhanced productivity, income, standard of living as well as agricultural development.

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