INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) USAGE AMONG YAM PRODUCERS IN KWARA STATE, NIGERIA

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ABSTRACT
The study assessed usage of Information and Communication Technology (ICT) by yam producers in Kwara State. The study used a four-stage sampling technique to select 120 respondents for the study Information was gathered using a structured questionnaire and analysed using percentages, mean score, Pearson Product Moment Correlation (PPM) and Chi square statistics. The findings show that the mean age of the respondents was 45.5 years, 65% of them had formal education with an average of 19 years of farming experience yam production. The most available ICTs to yam farmers were the radio and mobile phones. The benefits they derived from ICT usage include market accessibility and marketing information. The constraints to ICT usage include incessant power outages and network fluctuation. There was a positive significant relationship between income level and ICT usage ($r \leq -0.294^{**}$, $p- \leq -0.001$). Also a significant relationship was established between the constraints and the usage of the ICT. The government should improve power supply in the study area.
Keywords: Information, Communication, Technology Agricultural Development, Digital Device, ICT Usage, Yam producers (farmers) and Yam production information.

INTRODUCTION

Information and Communication Technologies (ICTs) have affected the lives of people and organisations across the globe positively. In Nigeria, the role of ICTs is identified in the Millennium Development Goal Number 8 (MDG8), where the relevance of emerging technologies to combat poverty was emphasized. In Africa, small – scale agriculture provides the majority of people with a living (Adeyemi *et al*., 2023). For a sector to be productive, there must be a fair interaction between the diverse actors thus and information communication flows are very vital to this process (Roberts & Sbihi, 2013). Yam (Dioscorea species) is a root tuber crop with about 600 species which is grown annually for consumption, and for medicine International Institute of Tropical Agriculture (IITA), (2020). A few of the species include Water yam (Dioscorea alata), white yam (Dioscorea rotundata), yellow yam (Dioscorea cayanensis), Chinese yam (Dioscorea sculant) and three – leaf yams. According to the Food and Agriculture Organisation (FAO), (2020), yams are grown on 8.9 million hectares in roughly 47 countries around the world, with Nigeria as the top producer, followed by Ghana, Ivory Coast, and Togo. Yam tubers are usually sold fresh. They are source of income and food consumption as well as a major employer of labour in Nigeria. In West Africa yam is a high – valued crop. In Nigeria, yam has a higher production value than all the other five major food staples (maize, cassava, rice, millet and sorghum) combined. (IITA,2020). In Agricultural extension, ICTs used include radio, television, mobile phones, World Wide Web (WWW), web publishing, feature and smart devices, videos, and computer – aided presentations, e-books, online newspapers, ipod and ipad etc (Fadiji, 2017; Ayeni *et al*.2023). It enhances farmer's productivity and effective communication. As a result of these components, developing countries have embraced the opportunities in ICTs for higher outcomes. According to Nyarko & Kozari (2021), globally, information and communication technology in agriculture has been identified as the driving force in the sector's growth (Ifabiyi & Abdulrahman, 2023a). Yam production in Nigeria is faced with numerous challenges which include the use of old varieties of seed yam, weed pressure, decline in soil fertility, pests and diseases, and high cost of labour. Also, the ratio of extension worker to farmer is 1;2000 instead of 1:500 or at most 1:1000 (FAO 2017). These have affected or reduce the number of farmers reached by extension agents and the availability of information to them. Information technology can be used to disseminate new innovations to rural dwellers. Although, it is not certain now whether yam producers in Kwara State are actually exposed to information's that can improve their production. This is why it is necessary to access the use of ICT by yam producers in Kwara State so that appropriate steps will be taken to bridge the knowledge gap. The general objective of these study is to assess the usage of information and communication technology (ICT) in yam production. The specific objectives of the study were to: (i) ascertain the socio – economic characteristics of the respondents (ii) Identify the type of ICT available for the respondents. (iii) Ascertain the benefits derived from ICT usage (iv) Investigate the constraints **to** ICT usage by the respondent**s**.

$H_0 1$ = There is no significant relationship between the income of the yam producers and the usage of ICT.

$H_0 2$ = There is no significant relationship between ICT constraints and ICT usage level.

METHODOLOGY

The study was carried out in Kwara State Nigeria. The State is located within the North Latitude $11^{0}2$` and $11^{0}45$`. The State is divided into four Agricultural Development zones (A,-B,-C, and D). The target population was the yam producers in Kwara State. A four – stage sampling techniques was adopted in the selection of sample size. In stage one, two local government areas which are Asa and Ifelodun were purposively selected out of the 16 local governments in Kwara State. Secondly, LGAs. Thirdly, five communities were randomly selected from each of the wards making a total of 20 communities. Finally, a proportionate sampling technique was used to select 44 % of the farmers available in each of the communities with large population of yam producers. Thus, a total of 120 farmers were selected and used for the study. A validated structured interview schedule was used to gather primary data. Descriptive statistics such as frequency counts, percentages, mean was used to analyses the data while inferential statistics such as Pearson Moment Correlation and Chi – square statistical tool were employed in testing of hypotheses.

RESULTS AND DISCUSSIONS

Socioeconomic characteristics

Results represented in Table 1 shows that all the respondents are male, this is in line with Ufondu, *et al* (2021) whose study showed majority (71.7%) of yam farmers were males. Majority of the respondents where between the ages of 51-60 (30%), years indicating that young people in the study area are not into yam farming. About 75 % of them were married men with (40 %) having primary school education and (10%) having tertiary education with a farming experience of 21 years this is good because they farmers will understand the farming system better and this will translate to high yield. Ameh & Iheanacho (2017) reported that increase in the years of farming experience enables the farmers to manage and operate a farm better. With their age and experience, some of them may be willing to new technologies in order to improve their production. Also Muhammad *et al.*, (2019) in a study discovered that marital status and educational level of farmers had positive significant relationship on the use of ICT. The study also showed that, about 35% have a farm size of about 4-5.9 ha and 6-7.9ha. About 86% of the farmers do not belong to any cooperative society. Oyegbami *et al* (2020) encouraged the joining of associations for easy access to information.

Table 1: Socioeconomic characteristics of respondents

Variable	Class	Frequency	Percentage (%)	Mean
Gender	Male	120	100	
Age (years)	21 – 30	12	10	45.5
	31- 40	18	15	
	41 – 50	24	20	
	51 – 60	36	30	
	61 and above	30	25	
Marital status	Single	12	10	
	Married	90	75	
	Widower	18	15	
Education	No formal education	30	25	
	Primary education	48	40	
	Secondary education	18	15	
	Tertiary education	24	10	
Household size	4 – 6	30	25	7
	7 – 9	18	15	
	10 -12	60	50	
	13 above	12	10	
Monthly income (N)	20,000-40,000	12	10	62,000
	41,000-60,000	12	10	
	61,000-80,000	42	35	
	81,000 and above	54	45	
Farming experience	Below 5 years	18	15	19
	6 – 10 years	12	10	
	11 – 15 years	18	15	
	16 -20 years	24	20	
	21years above	48	40	

Variable	Class	Frequency	Percentage (%)	Mean
Membership of cooperative societies	Yes	7	14	
	No	42	86	
Farm size (hectare)	< 1	12	10	6.7 ha
	2 - 3.9 ha	24	20	
	4 -5.9 ha	42	35	
	6 - 7.9 ha	42	35	
Yield (t/ha)	< 2	6	5	6.2t/ha
	2 - 3.9 t/ha	30	25	
	4 – 5.9t/ha	30	25	
	6 – 7.9t/ha	36	0	
	8 and above	18	15	

Source: Field survey, 2020

Type and level of Usage of ICT by Yam producers in Kwara State

Table 2 shows that about 100% of the farmers always use the radio while 95% use cell phones. The usage of radio was the most used ICT facilities by the respondent in the study area others include mobile phone (95%). According to Sennuga (2020), smallholder farmers used their mobile phones in a wide range of ways. Achukwu *et al*., (2023) also agreed that the ability of farmers to access markets and conduct business may be greatly enhanced by mobile phone usage. Ifabiyi and Abdulrahman (2023b) stated mobile phones have advantages sure as access to information and improved communications between farmers and extension agents. While television was never used by them (75%), camera (95%), handbill and fliers, computer and internet (100%). A research work carried out by Idu *et al* (2024) also showed very low usage of television, computer, email in the study area. Whereas Dokubo *et al* (2023) says traditional media such as radio, movies, televisions, slides, photos, exhibitions, and field demonstrations have all been employed to speed up information flow in rural areas of developing nations. With this, the hope of using electronic medium (e-extension) for information dissemination which is necessary is still a long way to becoming a substitute for farm and home visit extension approach in Nigeria thereby.

Table 2. Type and level of Usage of ICT by farmers in Kwara State

ICT	Always	Sometimes	Never	Mean	STD	Rank
Radio	100.0	0	0	3.00	0.00	1st
Mobile phones	95.0	0	5	2.90	0.44	2nd
Television	0.0	25	75	1.30	0.44	3rd
Cinema	10.0	0	90	1.10	0.45	4th
DVD	5.0	0	95	1.10	0.44	5th
Camera	5.0	0	95	1.10	0.44	5th
Multimedia	5.0	0	95	1.10	0.44	5th
Newspaper	5.0	0	95	1.10	0.44	5th
Web publishing	5.0	0	95	1.10	0.44	5th
Fax	0.0	5	95	1.10	0.22	6th
Computer	0.0	0	100	1.00	0.00	7th
Internet	0	0	100	1.00	0.00	7th
Handbill and fliers	0	0	100	1.00	0.00	7th

Source: field survey, 2020

Benefits of ICT usage to yam production in Kwara State

In descending order of importance, Table 3 revealed the benefits of ICT usage to yam producers in Kwara State. The usage of radio for accessibility to information on market outlets was (75%) a study carried out by Oke *et al* (2019) also showed (37.5%) of maize farmers using radio for the same purpose, making contact with sales representatives and gathering of information when listening to radio (80%), This is in line with Idu *et al* (2024) whose research survey in 2022 showed farmers agreeing that the use of ICTs helps to increase sales and income. Also Ifabiyi & Abdulrahman (2023a) agrees that ICTs are useful in monitoring crop growth and conditions of the soil, recording yields and accessing market information. Awareness of current yam price through radio (65%), keeping abreast with current government policy on agriculture through radio (60%) and checking the occurrence of disease outbreak on crop with camera and forwarding the documentary to the extension

agent for solution (75%) who disagree to the benefiting from the use of camera, keeping abreast with government policy on agriculture through (55%) disagree same as knowing current prices through the use of television (70%).

Table 3: Benefits of ICT usage to yam production in Kwara State

Benefits	SA	A	D	SD
Through radio, I have accessed information on market outlet.	75	0	25	0
I do contact sales agent on farm inputs.	80	0	5	1
I do listen regularly to agricultural program to gather new innovation on farming through radio.	70	5	25	0
Through radio, I am aware of current price.	65	5	30	0
I am keeping myself abreast of current government policy on agriculture through radio.	60	5	35	0
I am keeping myself abreast of current government policy on agriculture through television.	20	25	55	0
Through television, I am aware of current price.	25	5	70	0
Through newspaper, I do access information on market price.	20	10	60	10
I do get extension information through the use of ICT.	0	30	50	20
Through television, I do access information on market and at market price.	0	15	75	10
I do listen regularly to agricultural programme to gather new innovation on farming through television.	5	5	75	15
I do check disease situation of my crop with camera and forward to the extension agent for solution.	0	10	75	15

Source: Field survey,2020

Table 4 shows that, the major constraints to ICTs usage by the respondents include irregular power outage (70%), fluctuations in network (55%), low level of education (55%). Inadequate training on use of ICT by extension agents and the high cost of acquiring ICT facilities (50%), it is evident that mobile phones, radio, and television need network to function properly. Network fluctuation is a great threat to effective use of ICT. About (40%) assert that ICT technologies are too expensive for them to acquire, this is in line with Idu *et al*., (2023) that cost of ICT services has been noted as one factor that negatively affects the use of ICTs for agricultural input information. while (35%) do not possess adequate skills to operate ICT properly.

Table 4: Constraints to the use of ICT by yam producers in Kwara State

Challenges	HS	MS	NS	Mean	SD	Rank
There is irregular outage of electricity in our domain	70	15	15	2.55	0.74	1st
There is fluctuation of network on usage of ICT in our locality	45	55	0	2.45	0.49	2nd
Due to my level of education, the language of communication is not understood by me	55	30	15	2.40	0.74	3rd
Inadequate training on use of ICT by extension agents	50	25	25	2.25	0.83	4th
The cost of acquiring ICT facilities is high	50	25	25	2.25	0.83	4th
There is difficulty in getting feedback for solution of farm problem from extension agencies.	40	35	25	2.15	0.79	6th
I do not have access to the area where I can repair ICT equipment	30	55	15	2.15	0.66	6th
I do not possess adequate skill to operate ICT properly	35	40	25	2.10	0.77	8th
The ICT technologies are too expensive for me to acquire	40	30	30	2.1	0.83	8th

Challenges	HS	MS	NS	Mean	SD	Rank
The use of ICT is not readily available for me in my area	20	45	35	1.85	0.73	10th
The cost of maintenance of ICT facility is extremely high	15	40	45	1.70	0.72	11th
The ICT are not easy to come by in our locality	15	35	50	1.65	0.73	12th

Field survey, 2020.

Hypothesis of the study

Pearson's ranked ordered correlation between the income level and usage of ICT

The result in Table 5 indicated a positive significant relationship exists between the yam farmers' income and the usage of ICT (multimedia) in yam production so the increase in income level significantly raises ICT usage level. This is contrary to the findings of Idu *et al* (2023) which showed low annual income of farmers leading to a more engagement in the usage of ICT I believe so they can have better yield next season leading to increase in their income level.

Table 5: Pearson's ranked ordered correlation analysis between level of income and usage of ICT

Factors	Level of income
Multimedia	0.294**

Sources: Field Survey, 2020 ** **Correlation is significant at the 0.001 level (2-tailed)**

Chi–square between ICT constraints and level of ICT usage

Table 6 shows a significant interaction between the ICT usage level and constraints associated with it, indicating the level of usage depends on the associated constraints. According to Ifabiyi & Abdulrahman (2023a), the high cost of buying airtime and data was a most severe factor limiting the use of ICTs (mobile) which hinder farmers from using them. Idu (2023) also agrees that there many obstacles to farmers using ICT in developing countries.

Table 6: Chi – square analysis between constraints faced while using and level of ICT usage.

Chi-Square Value	df
1.202*	1

Sources: Field Survey, 2020

CONCLUSIONS AND RECOMMENDATIONS

The study concluded that all the yam producers in the study area were male, married, had primary education and in their active age. The yam producers had significant years of experience but do not belong to any cooperative society. Radio and mobile phones were the most available and most used ICTs by the respondents while television, newspaper and computer/internet were never used by the respondents. Accessibility to market information and contact with sales agent were the most glaring benefits of radio as ICTs. The major challenges to the use of ICT by the respondents was power outrage, network fluctuation, education level of farmers, high cost of ICTs facilities and inadequate training of extension agents on the use of ICTs.

The following were recommended based on the findings:

Need for Government to pay attention to power supply and all other infrastructural services to increase the usage of ICTs.

Farmers should be trained and encouraged to use ICT facilities for accessing information. Extension agents should also be empowered on e–extension services to farmers in Nigeria. Telecommunication companies should increase/improve network services for effectiveness and accessibility.

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