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DETERMINANTS OF YAM FARMERS' ACCESS TO INFORMATION AND COMMUNICATION TECHNOLOGIES IN AGRICULTURAL SERVICES DELIVERY AND PRODUCTION IN DELTA STATE, NIGERIA

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ABSTRACT
This study examined the determinants of yam farmers' access to ICT tools in agricultural services delivery and production in Delta State, Nigeria. It identifies the agricultural services and the ICT tools available to yam farmers, determined the roles of ICT tools in improving yam farmers' access to agricultural services and examined the determinants of yam farmers' access to ICT tools, among others. The sample size was 176 respondents made up of 88 farmer adopters and 88 non-adopters of ICT tools in yam production. Data was analyzed with the use of descriptive and inferential statistics. Results showed that services on: transportation/distribution of farm products (93.18%), marketing (92.05%), crop production (87.50%), advisory (80.68%), farm management (71.59%) and finance (70.46%) were services offered to the farmers by the extension agents. Common available ICT tools to the farmers are mobile phones (95.45%), television (85.23%) and radio (80.68%). Farm size (mean = 3.42), level of farm income (mean = 3.41), farmers educational level (mean = 3.12) and area where farmers stay (mean = 2.98), were found to be major determinants of farmers access to ICT tools. Farmers' high level of access to ICT tools have played significant roles in improving their access to agricultural services, production and farm income. There was significant difference in farm income (₦105,113.63) in favour of adopters over non-adopters of ICT tools in yam production. The study thus recommended that government should make the ICT tools more available to the farmers so that their income can be boosted.

Keywords: Access, Agricultural services, Determinants, Farmers, Farm income, ICT tools.

INTRODUCTION
One of the top-most agenda of the country, Nigeria and Delta State in particular is her production of sufficient food for the ever-increasing population (DMANR, 2012). The report of DMANR (2012) assured that this agenda can be met by improving or developing on the crops that can comparatively be produced by the State, and such crops include yam, cassava, and plantain, amongst others. Over the years, successive governments of Delta State have encouraged the production of yam through the supply of seed yams, fertilizer, insecticides and herbicides.

Okoedo-Okojie and Okwuokenye (2016) stated that Nigeria accounts for about 25 million tonnes out of the 30 million tonnes of the total quantity of yam produced world-wide, thus ranking number one in where world production is concerned. Pius-Chinwba and Odjuvwuederhie (2006) posited that yam crop exists in several species running into hundreds but out of which only few of them have been domesticated and cultivated. These include *Dioscorea rotundata* (white yam), *D. cayenensis* (yellow yam), *D. alata* (Water yam), *D. dumetorium* (trifoliate yam). Yam crop is grown for its nutritional food value and preference over other tuberous crops (Pius-Chinwba and Odjuvwuederhie, 2006). The authors identified

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the crop to be a major source of carbohydrate, some little quantity of protein, vitamin C and dioscorine (which is a heart stimulant). Above all, Pius-Chinwba and Odjuvwuederhie (2006) acknowledged that yam production is very and ever viable and stands as a staple food to many people especially in the rural areas.

In spite of the economic importance of yam as above mentioned, there seem to be differentials between production and demand. This scenario or lag according to Okoedo-Okojie and Okwuokenye (2016) has not only been attributed to explosion in population but has also been linked to the neglect of rural communities (where majority of the farmers leave) and the community's deprivation of substantial access to Information and Communication Technologies (Sobalaje and Adigun, 2013). It therefore follows that depriving farmer of information and access to ICTs would adversely affect farmers productivity and market survey for their yields. Information and Communication Technologies was defined by Sharma and Maheshwari (2015) as a diverse set of technological tools and resources used to create, disseminate, store, bring value addition and manage information. Sharma and Maheshwari (2015) advanced that ICTs do play an important role in disseminating a wide range of information and advice leading to knowledge and attitude change among rural communities. Nkwocha *et al.* (2009) admitted that ICTs play essential roles in poverty alleviation and that it is a powerful tool in overcoming food crisis across the world. Nkwocha *et al.* (2009) further stated that ICTs provide useful strategies that help to transmit agricultural information to the rural areas where majority of the farmers are domicile and that such information would help to enhance agricultural production.

In spite of the lofty advantages offered by the use of ICTs to farm production, not all the farmers have been able to access it adequately. In precise terms, Sobalaje and Adigun (2013) stated that yam farmers have been described as people who have always faced challenges in respect to information dissemination and accessibility to ICTs that would have enhanced their agricultural information and knowledge. Going further, such challenges according to Akinola *et al.* (2010) may be linked to lack of infrastructure, cost of purchasing a radio and television sets, cost of purchasing printed media such as newspapers, magazines, bulletins, and lack of infrastructural facilities especially electricity, wrong timing of agricultural programs and low levels of literacy among the farmers.

The challenges have joined to determine farmers preference of ICT tools to use and adopt in their farm production. It is against this background that that study sought to examine farmers preference of ICTs tools in agricultural services delivery and production in Delta State, Nigeria. More specifically, the objectives of the study were to: i. identify the agricultural services and the Information and Communication Technology tools available to yam farmers in Delta State; ii. determine the roles of Information and Communication Technologies in improving yam farmers' access to agricultural services in the State; iii. examine the determinants of yam farmers' access to Information Communication Technology tools; iv. examine the level of yam farmers' access and use of Information and Communication Technology tools in agricultural production in Delta State; and v. determine the effect of farmers access to Information and Communication Technology tools on yam farmers farm income in the area.

Hypotheses of the study were: Ho_i: Level of yam farmers access to Information and Communication Technology tools have no significant effect on their farm income; and Ho_{ii}: There is no significant difference between yam farmers that are satisfied and those that are not satisfied with the use of Information and Communication Technology tools on income realized from yam production.

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MATERIALS AND METHODS

The Study Area

The study was carried out in Delta North agricultural zone of Delta State. Delta State Wikipedia stated that Delta State is a state that is comprised of mainly of Igbo (Anioma people), Urhobo, Isoko, Ijaw and Itsekiri ethnic groups. The Delta State Wikipedia also stressed that all the ethnic groups are administratively grouped into three (3) Senatorial/Agricultural Districts namely Delta North, Delta South and Delta Central for easy administrative purposes. The State has an estimated area of 17,698 Km^2, thus ranking 23rd in terms of area out of the 36 states of the country, Nigeria. (Delta State, Wikipedia). The State's capital is Asaba while the economic nerve centre and most populated town is Warri (Nigeria Atlas of Electoral Constituencies [NAEC], 2008).

The estimated population by sex of Delta State according to National Population Commission (NPC, 2016) is 2,754, 993 males and 2,720,147 females making a total of 5,475,139 with a population density of 333.4 Km^2. Agriculture stands the mainstay of the of the state's economy and crops grown include yam, cassava, plantain, oil palm produce, rice, and corn (Delta State, Nigeria Britannica) Delta State, Nigeria Britannica stated that Delta North agricultural zone covers nine (9) local government areas namely Aniocha North, Aniocha South, Ika North East, Ika South, Nndokwa East, Nndokwa West, Oshimili South, Oshimili North and Ukwani. The estimated population of the agricultural zone is 1,511,265 (NPC, 2016) and the people are predominately farmers involved in growing crops such as cassava, yams

Sampling Procedure

As presented in Table 1, a four-stage multi-random sampling technique was used to select the respondents of the study. It began with the purposive selection of Delta North agricultural zone which was the area used for the study (stage one). The area was purposively selected because the zone is majorly known for yam production. Stage two involved the random selection of five (5) local government areas (LGAs) in the zone.

This stage was followed by the random selection of three (3) towns from each of the LGAs (stage three) and this in fact made the number of towns used for the study to be 15. The LGAs and the towns are as shown in Table 1. The last stage (stage four) involved the random selection of six farmers per community who are adopters of ICT in yam production. From this selection, the number of farmers become 90 in number and constituted the respondents of the study who were administered with the question instrument. Eighty-eight (88), i.e., 97.78% out of ninety of the instruments returned which are suitable for analysis were used for the study. An equivalent number of non-adopters of ICT were also randomly sampled per community for comparative purposes.

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Table 1: Showing the random selection of respondents

Zone	LGA	Selected Towns	Membership size of ICT Adopters	Membership size of Non-ICT Adopters
Delta North	Aniocha North	Onicha-Ugbo	6	6
		Issele Uku	6	6
		Issele-Azagba	6	6
	Ika North East	Mbiri	6	6
		Umunede	6	6
		Ute-Ogbeje	6	6
	Ika South	Abavo	6	6
		Ekuku-Agbor	6	6
		Ihuozomor (Ozanogogo Alisimie)	6	6
	Ndokwa West	Abbi	6	6
		Ogume	6	6
		Utagba-Uno	6	6
	Oshimili North	Okpanam	6	6
		Ibusa	6	6
		Illah	6	6
Total	**5**	**15**	**90**	**90**

Source: Field survey, 2021

Analytical Techniques

Data were analyzed with the use of descriptive and inferential statistics. The descriptive statistics include the use of frequency distribution, percentage and means. This was used to analyze agricultural services being rendered to farmers, ICT tools available to the farmers, level of farmers access to ICT tools in agricultural production and the effects of ICT tools on yam farmers income. likert scale was used to determine roles of ICT in improving farmers access to agricultural services and determinants of yam farmers access to ICT tools. The scale ranges from, Strongly Agree: (coded 4), Agree: (coded 3), Disagree: (coded 2) and Strongly Disagree: (coded 1). The weighted mean score of 2.50 and above was agreed as roles of ICT tools in improving farmers access to agricultural services. Weighted mean score of 2.50 and above was also agreed as determinants of yam farmers access to ICT tools. values less than 2.50 were considered otherwise. The weighted mean score (2.50) was obtained as follows: (4 + 3 + 2 + 1) / 4 = 2.50.

Inferential statistics such as t – test and binomial test were used to analyze hypotheses one and two respectively. T-test was used to determine if level of yam farmers access and use of ICT tools have any significant effect on their farm income. Madukwe (2005) concluded that t-test is used to compare the means between two groups. The formula for t- test is shown below:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$ (Madukwe, 2005)

where;

$\bar{x}_1$ = the mean of group 1;

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$\bar{x}_2$ = the mean of group 2
S_1 = standard deviation for group 1; S_2 = standard deviation for group 2
S_1^2 = variance of the first group; S_2^2 = variance of the second group
n_1 = size of the first group; n_2 = size of the second group
√ = square root
Decision rule for t-statistics, i.e., if $t_{cal} > t_{tab}$ = reject null and accept alternative hypothesis $t_{tab} > t_{cal}$ = accept null and reject alternative hypothesis. Binomial test on the other hand was used to test if any significant difference exists between yam farmers that are satisfied and those that are not satisfied with the use of Information and Communication Technology tools on income realized from yam production.

Binomial test is an exact test of the statistical significance of deviation from a theoretically expected distributions into two categories (Wikipedia, 2015). In this analysis, the two-tailed binomial test was used to determine the significance of difference in proportion of respondents that are satisfied as well as those not satisfied with use of ICT tools in yam production. The binomial distribution formula is given below:

$b(x;n,p) = {}_nC_x * p^x * (1-p)^{n-x}$

where; b = binomial probability; x = total number of successes (satisfied or not satisfied)

p = probability of success on an individual trial; n = number of trials.

RESULTS AND DISCUSSION

Agricultural Services carried out by Extension Agents on Yam Farmers

Table 2 shows the various agricultural services rendered to yam farmers adopters of Information Communication Technology tools. Amongst the services, transportation / distribution of farm products services (93.18%) was the highest-ranking service rendered by the extension agents to the farmers. Marketing services (92.05%) was the second ranking service rendered to the farmers. Crop production services (87.50%) was the third service rendered to the farmers. Other services rendered include advisory services (80.68%), farm management services (71.59%), financial services (70.46%) and land preparation (21.59%) as the fourth, fifth, sixth and seventh ranking services offered to the farmers by the extension agents.

Transportation / distribution of farm products include sorting, grading, packing, loading and off-loading of the products. Marketing services involve how the goods are exchanged for money at agreeable prices, ensure the avoidance of product glut and see to how the crops can attract value addition for better prices. Crop production services include provision of good planting materials, crop planting, protection of crops against weeds, pests and diseases as well as irrigation and staking of crops. Advisory services involve the provision of information on planting, sourcing of planting materials, solving of problems when they occur and training of farmers on innovations. Farm management services include how to plan and organize for the factors of production (land, labour and capital) for the purpose of ensuring for the success of the farm. Financial services been rendered were provision of credit, savings and payments for services rendered. All of these are carried out for the purpose of ensuring continuity of production and making of profit in yam farming activity. The above findings regarding services rendered to yam farmers are in line with that of Anyoha *et al*. (2018) which identified services associated with transportation, marketing, crop production, advisory, farm management, financial and land preparation as major areas where agricultural services are disseminated to the farmers.

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Table 2: Agricultural services rendered to yam farmers adopters of ICT tools. n = 88

Agricultural services	*Frequency	Percentage	Ranking
Transportation / distribution of farm products services	82	93.18	1st
Marketing services	81	92.05	2nd
Crop production services	77	87.50	3rd
Advisory services	71	80.68	4th
Farm management services	63	71.59	5th
Financial services	62	70.46	6th
Land preparation services	19	21.59	7th

*Multiple response
Source: Field survey, 2021

Information Communication Technology Tools Available

The Information Communication Technology (ICT) tools available to the yam farmers is shown in Table 3. The most common available ICT tools to the farmers are mobile phones (95.45%), television (85.23%) and radio (80.68%). They respectively ranked 1st, 2nd and 3rd major or common sources of technological information dissemination of innovation to the farmers in the area. Newspapers / magazines, audio cassette player and internet with percentage of 72.73%, 71.79% and 62.50% respectively also indicate that the farmers sources information through them. The sources ranked the 4th, 5th and 6th most available sources of technological information to the yam farmers. In addition, e-mail and video respectively had a percentage of 57.95% and 48.86% and also respectively ranked the 7th and 8th most available sources from where the farmers get technological information from.

On the other hand, flash drive / rewriteable CD, DVD/VCD and computer respectively had a percentage of 13.64%, 12.50% and 7.96%. The last three ICT tools ranked the 9th, 10th and 11th sources of technological information to the farmers. They are interconnected and are not readily available to many yam farmers. This ill-scenario may not be unconnected to the high cost associated with acquiring the tools and or the low-level rate of the farmers. The result is in consonance with findings of Munyua (2009) which identified radio, television, cellular phones, computers, tablets and networking, hardware and software and satellite systems as ICT devices that help to facilitate farming information and activities.

Table 3: Information Communication Technology tools available to yam farmers

ICT tools available	*Frequency	Percentage	Ranking
Mobile phones	84	95.45	1st
Radio	71	80.68	3rd
Television	75	85.23	2nd
Audio cassette players	63	71.59	5th
DVD / VCD	11	12.50	10th
Video	43	48.86	8th
Computer	7	7.96	11th
Flash drive / Rewriteable CD	12	13.64	9th
Internet services	55	62.50	6th
Newspapers / Magazines	64	72.73	4th
E-mail	51	57.95	7th

*Multiple response
Source: Field survey, 2021

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Roles of ICT Tools in Improving Farmers' Access to Agricultural Services

Information and communication technology tools play significant roles in providing access of agricultural services to farmers. Table 4 shows that a weighted mean index of 2.50 was used as a minimum bench score and with this the following are the roles of ICT tools to farmers' access on agricultural services. Access to information on training of farmers (mean = 3.69) was the highest role ICT tools play to farmers access on agricultural services. This is simply achieved through making calls and making negotiations on fixing of time and place where such training is to be carried out. The next is access to information on weather change (mean = 3.65), followed by information on handling and protecting crops (mean = 3.41).

Other roles of ICT tools to farmers access on agricultural services include accessibility to farm labour (mean = 3.09) which is achieved by making voice calls to the persons needed for the job, improvement of access to market prices (mean = 3.08), improving farm productivity (mean = 2.92) and access to financial services (mean = 2.64) which has to do with providing information on credit, loans and necessary levis. Going further, ICT tools roles on how to regulate / adjust supplies to the market, information on ideal place to transport and sell crops and information on price negotiation of yam had means of 2.61, 2.58 and 2.55, respectively. From the foregoing, ICT tools have really played significant roles in rendering yam farmers access to agricultural services. The results are in line with findings of Anyola *et al.* (2018). The authors noted that ICT tools help to provide relevant agricultural information (via training) such as agricultural and farming techniques, commodity prices and weather forecast to farmers. Anyola *et al.* (2018) further supported this result as they noted in their findings that ICT tools help agricultural producers with timely and relevant information in determining when, where or for how much to sell their produce. Also reiterated by the authors was the fact that ICT help to facilitate agricultural growth by increasing the efficiency of market interactions achieved through internet and mobile applications.

Table 4: Roles of ICT tools in improving farmers' access to agricultural services

Roles of ICT tools in improving farmers access to agricultural services	**Mean**	**Std. Dev.**	**Ranking**
Access to information on training of farmers	3.69	0.46	1st
Access to information on weather change	3.69	0.55	2nd
Information on handling and protecting crops	3.41	0.64	3rd
Accessibility to farm labour	3.09	0.65	4th
Access to improved market prices	3.08	0.68	5th
Improvement of farm productivity	2.92	0.71	6th
Access to financial services	2.64	0.83	7th
Information on how to regulate / adjust supplies to the market	2.61	0.85	8th
Information on ideal place to transport and sell yam tubers	2.58	0.86	9th
Information on price negotiation of yam	2.55	0.87	10th
Access to farm input	2.11	0.88	11th
Information on how to avoid farm losses	1.94	0.88	12th
Information on diversity of farm crops	1.72	0.90	13th

Agreed ≥2.50
Source: Field survey, 2021

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Determinants of Yam Farmers' Access to ICT Tools in Farm Production

Table 5 shows the determinants of yam farmers' access to Information and Communication Technology tools. With a discriminating mean index of 2.50, the determinants of access to ICT tools are: farm size (mean = 3.42) which is usually in hectares, level of farm income (mean = 3.41) measured in naira and got from sales of farm products and farmers educational level (mean = 3.12). Other determinants of yam farmers access to ICT tools include area where farmers stay, farmers social interaction with others in the area, family size (which has to do with the number of people living and feeding together) and social class of farmers which respectively have means of 2.98, 2.93, 2.61 and 2.58. Rajni *et al.* (2012), in agreement with this finding noted that farm size, farm income per acre, farmers educational level, caste (social class) and family size were observed to be positively correlated or regarded as determinants with farmers access to ICT tools in farm production.

Table 5: Determinants of yam farmers' access to ICT tools in farm production

Determinants to ICT tools	Mean	Std. Dev.	Ranking
Farm size	3.42	0.53	1st
Level of farm income	3.41	0.61	2nd
Farmers educational level	3.12	0.64	3rd
Areas where farmers stay	2.98	0.66	4th
Farmers social interaction with others in their area	2.93	0.71	5th
Family size	2.61	0.75	6th
Social class of farmers	2.58	0.79	7th
Number of households	2.11	0.80	8th
Family type (nuclear / extended)	1.96	0.82	9th
Off-farm income	1.81	0.83	10th

Source: Field survey, 2021

Level of Farmers' Access to ICT Tools on Yam Production

Table 6 shows the level of access to Information and Communication Technologies on yam production. It revealed that majority (34.09%) of the farmers' access and use of ICT tools in yam production was to a high extent. Above this level was few (7.95%) of them who had a very high level of access and use of ICT tools in the production of yam. Further description shows that 25%, 20.46% and 12.5% of the farmers respectively had low, average and poor access and use of ICT tools in yam production.

Table 6: Level of use of ICT tools by the farmers in yam production

Level of extent of use of ICT tools	Frequency	Percentage
Very High Extent	7	7.95
Just High Extent	30	34.09
Average Extent	18	20.46
Low Extent	22	25
Poor Extent	11	12.50

Source: Field Survey, 2021

Table 7 shows a dichotomous level of farmers' access to ICT tools in yam production. The result shows that most (62.50%) of them had high access level to ICT tools in yam

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production. While few (37.50%) of them had low access to ICT tools in yam production. From the foregoing, the result implies that patronage of ICT tools by yam farmers is still low. It therefore suggests that further exploration of use of ICT tools by more farmers would result to higher productivity and farm income. This assertion is in line with the findings of Nkwocha *et al.* (2009) that farmers need information that can be disseminated through ICT and that such information will help to enhance agricultural production of the farmers.

Table 7: Dichotomous level of farmers' access and use of ICT tools in yam production

Level of extent of use of ICT tools	Frequency	Percentage
High level	55	62.50
Low level	33	37.50
Total	88	100.00

Source: Field Survey, 2021

Effects of yam farmers' accessibility to ICT tools on farm income

The income realized from yam production was used to determine the effects of accessibility of yam farmers to ICT tools. This was achieved by simply assessing the annual farm income of those yam farmers that have access to ICT tools (the adopters' category) along line with an equivalent number of those who don't have access to ICT tools in their yam production (non-adopters). Table 8 shows that the annual farm income of most (42.05%) of yam farmers with access to ICT tools was ₦200,001 – ₦300,000 while most (38.64%) of those farmers without access to ICT tools in their farm production was ₦100,001 – ₦200,000.

Going further, the average farm income of the farmers with access to ICT tools was ₦306,818.18 while that of the farmers without access to ICT tools was ₦201,704.55. The difference in average farm income was ₦105,113.63 and this was in favour of those farmers with access to ICT tools. This implies that farmers accessibility to ICT tools have positive effects on the production of yam crop. the result is in line with findings of Sobalaje and Adigun (2013) who reported that farmers access to ICT tools has some way of impacting positively on production activity, farm income and marketing of yam crop in Osun State, Nigeria.

Table 8: Effects of yam farmers' accessibility to ICT tools on farm income

Farm Income (₦)	Farmers with access to ICT			Farmers without access to ICT		
	Freq.	%	Mean	Freq.	%	Mean
≤ 100,000	3	3.41		23	26.14	
100,001 – 200,000	10	11.36		28	38.64	
200,001 – 300,000	37	42.05		17	14.77	
300,001 – 400,000	18	20.45		12	11.36	
400,001 – 500,000	12	13.64		8	9.09	
> 500,000	8	9.09	306,818.18	-	-	201,704.55

Difference = 306,818.18 – 201,704.55 = 105,113.63
Source: Field Survey, 2021

Effect of yam farmers access to Information and Communication Technologies on farm income (t-test)

Hypothesis one was analyzed with t – test technique and the results on effect of yam farmers' access to ICTs on farm income revealed that the average income of yam farmers adopters of ICT was ₦306,818.18 while that of non-adopters and use of ICT was ₦201,704.55

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(Table 9). The results of the adopters' category were higher than that of the non-adopters' category. The difference in average farm income was ₦105,113.63 in favour of the adopters of ICT in farm production category. In addition, the difference was significant at the 5% level since the calculated t-value, 27.324 was greater than the tabulated t-value of 1.645. based on the result, the alternative hypothesis was accepted leaving out the null. It however, states that: level of yam farmers' access to Information and Communication Technology tools have significant effect on their farm income. this result is supported by that of Sobalaje and Adigun (2013) whose findings revealed some level of appreciable benefits that are associated with increase in farm production and consequently income derived from the use of ICT tools in farm production.

Table 9: Effect of yam farmers' access and use of ICTs on yam production (t-test)

Yam farmers status	N	Mean income (₦)	Difference in income (₦)	t-value
Yam farmers with access and use of ICT on farm production	88	306,818.18		
Yam farmers with access and use of ICT on farm production	99	201,704.55	105,113.63	27.324

Source: Field Survey, 2021

Test of difference in Farmers' Satisfaction with the use of ICT in Yam Production

Hypothesis two (there is no significant difference between yam farmers that are satisfied and those that are not satisfied with the use of Information and Communication Technology tools on income realized from yam production) was analyzed with the use of binomial test and the results are shown in Table 10. It revealed that a larger fraction (86%) of the yam farmers was satisfied with the use of ICT tools on yam production. The other fraction, a lower one which is 14% was found o be less satisfied with the use of ICT tools in the production of yam. On a statistical consideration, the result was significant at the 5% level of probability. For this reason, the alternative hypothesis was accepted while the null was rejected. The result therefore implies that there is a significant difference between yam farmers that are satisfied and those that are not satisfied with the use of ICT tools on income realized from yam production. Farmers' level of satisfaction with the use of ICT tools on income realized from yam production is an indication that ICT tools have helped to boost farmers' production and their farm income. This result is in line with the findings of Rajni *et al.* (2012) which expressed that ICT plays significant role in improving the economic status of farm women and also increasing their economic welfare.

Table 10: Difference in farmers' satisfaction with the use of ICT tools in yam production (Binomial test)

Satisfaction status	Frequency	Percentage	Prob. level
Satisfied	76	0.864	0.005
Less satisfied	12	0.136	
Total	88	1.000	

Source: Field survey, 2021

CONCLUSION AND RECOMMENDATIONS

The study found that several agricultural services like transportation/distribution of farm products, marketing services, crop production services, advisory services, farm management and financial services were rendered to farmers adopters of ICT tools and this was possible due to the several ICT tools (mobile phones, television, radio, newspapers/magazines, audio cassette player, internet services, e-mail and video) at the disposal of most of the farmers. Farmers' high level of access and use of ICT tools have played significant roles in improving their access to agricultural services, production and farm income. This was evident in the significant difference in farm income (₦105,113.63) between adopters and non-adopters of ICT tools and this was in favour of those farmers who are adopters of ICT tools in yam production. Based on findings, the study recommends that: though some of the farmers have various ICT tools available to the farmers, it was also found that many others didn't have access to these tools. To this end in view, government should through her agricultural agencies fill this gap by making the ICT tools available to many more farmers. Doing this will help to increase the agricultural services rendered to them and consequently have their farm income increased.

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