

# ICT-Based Market Information and Adoption of Agricultural Seed Technologies Insight from Gwagwalada Area Council, Abuja

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## ABSTRACT

The purpose of this investigation was to determine the ICT-Based Market Information and Adoption of Agricultural Seed Technologies Insight from Gwagwalada Area Council, Abuja. The objectives of the study were to; Describe the socio-economic characteristics of farmers in the study area, Assess the current level of adoption of ICT-based market information among farmers, Identify the factors that influence the adoption of ICT-based market information among farmers, Examine the challenges faced by farmers, in accessing and using ICT-based market information for their agricultural activities. Data was collected from 120 respondents in the study area using questionnaire, the data were subjected to descriptive data analysis. The results of the analysis showed that majority (60.00%) of the farmers were male while 40.00% were female. 52.5% were between the age of 21-30, while 21.7% were between 31 – 40 years old and 15.0% were at least 20 years old, 6.7% were above 60 years old and 3.3% were between 51 – 60 years old with a mean age 51.18. Majority (53.30%) of the farmers have house hold size of 1-4 persons while 35.8% had house hold size of 5-8 persons. Majority (79.2%) of the farmers earn ₦ 0- ₦100,000 while another 10.8% earns ₦ 100,001 – ₦ 200,000. Majority (80.0%) of the farmers have a 0 – 10 years farming experience while 18.3% have 11 – 20 years of farming experience. The study therefore concludes that access to and use of ICT based information marketing is affected by some factors in the study area. The study also concludes that farmer use ICT based information for activities such as communicating with customers, learning of new ways of production and marketing, getting information about business, and to make production and marketing faster and it was recommended that Governments at the national level must collaborate with groups like farmers. Designed to allow the exchange of agriculturally related knowledge, information, and experiences regarding various ICT initiatives and projects in Africa. And Strategies for training and building up people's, groups', and communities' capacity to be knowledgeable about using ICT to gain market information and links to new clients must be developed also doing so speeds up the adoption of new technology, the organization.

**Keywords:** Information, technologies, agriculture, market, seed

## INTRODUCTION

Agriculture is the backbone of Nigeria's economy, employing over half of the country's workforce and contributing significantly to the nation's GDP. Yet, acquiring vital market information on crops, pricing, and demand is difficult for smallholder farmers in Nigeria, especially those who live in remote areas (Sennuga, 2019). ICT-based market information systems (MIS) are designed to provide farmers with real-time information on market prices, weather forecasts, and pest management. These systems are meant to empower farmers with the knowledge they need to decide on their agricultural operations in an educated manner. The use of ICT-based MIS has been shown to increase the efficiency of agricultural markets and mitigate the risk of farmers making losses due to poor market information. In addition, in order to improve market prospects, these technologies aid in bridging the knowledge gaps that occurs between farmers and

purchasers (Sennuag et al., 2020a).

This is where ICT-based market information services come in – leveraging the power of technology to provide smallholder farmers with real-time, relevant information on market conditions, prices, and demand. These operations, which can consist of mobile apps, SMS-based platforms, and online portals, are capable to assist farmers in selecting the appropriate decision and improve their agricultural productivity and profitability. Agricultural seed technologies refer to the utilization of enhanced seed varieties that are designed to increase yields, improve disease resistance, and enhance the quality of crops. It has been demonstrated that using these technologies has a favorable effect on farmers' production as well as the agricultural industry as a whole (Adeyongo et al., 2022). Farmers often rely on traditional sources of information, such as fellow farmers, extension workers, and seed vendors, which might not offer up-to-date, reliable information on market demand and prices for agricultural products and inputs. This article will explore the role of agricultural seed technologies in improving agricultural productivity in Nigeria and how access to reliable market information can promote the adoption of these technologies. It will also examine the barriers facing the agricultural sector in Nigeria and suggest possible solutions to increase productivity and promote economic growth (Alfa et al. 2022).

Agricultural extension specialists, policymakers, researchers of information and communication, development organisations, and other pertinent stakeholders have confirmed the use of information and communication technologies (ICTs) for disseminating information to farmers (Nwafor, 2020). Knowledge is crucial and enables farmers to become more self-reliant in an effort to raise their level of living and agricultural output. Information on new agricultural innovations and technology, high-quality agricultural seed varieties, production technologies, livestock breeds, and animal vaccines, smallholder farmers always need ways to control weeds and pests, as well as pertinent market data that will best increase agricultural productivity (Nwafor, 2020). It is crucial to involve farmers and local residents in the development of new technologies and the research process at all levels. The ideation of engagement directs the establishment of a relationship between farmers, extension agents, business leaders, and policymakers in practise (Sennuga and Oyewole, 2020). Information and communication technology (ICT) has currently attracted quality attention on a global scale, particularly in the agriculture industry. It has been ascertained that utilizing ICT to disseminate market information and implement agricultural seed technology will increase agricultural productivity and enhance farmers' quality of life Okeke et al. (2020).

One of the systems is the Market Information System (MIS), the Market Information System (MIS), which gives farmers access to real-time market data on prices, demand, and supply for agricultural commodities. The MIS is a web-based platform that farmers may access from computers and mobile devices to get information about market trends and decide when and where to sell their produce. The MIS also offers details on the best seed management and selection techniques, enabling farmers to use new seed technology that can increase yields., this study intends to analyze the consequence of ICT-based market information on the adoption of agricultural seed technology (Ebisike et al., 2021a)

## LITERATURE REVIEW

The adoption of agricultural seed technologies by farmers is critical to improving crop yields and enhancing food security in Nigeria. However, many smallholder farmers in Nigeria lack access to accurate and timely information on available seed technologies and market prices, preventing people from making well-informed choices regarding what crops to sow and when. The use of information and communication technology (ICT)-based market information systems has the potential to address this information gap, improving both agricultural productivity and market outcomes for farmers.

A study conducted by Lokeswari(2016) found that the use of ICT-based market information led to

increased adoption of enhanced seed technologies among farmers. The study involved a randomized controlled trial where a treatment group of farmers had access to market information through mobile phones, while a control group did not. The findings indicated that farmers were more inclined to embrace new seed technologies and increased their dependence on hybrid seeds for planting when they got market information. In a similar study conducted Maningas (2006) found that ICT-based market information systems not only aided farmers in making appropriate choices about their seed choices, but also assisted them in negotiating higher market prices for their produce. The authors noted that access to timely and accurate market information was an important driver of improved efficiency in agricultural supply chains, as it allowed farmers to make better decisions and engage in more profitable transactions (Fadiji & Sennuga, 2020).

Another study conducted by Ebisike, et al.,(2022) examined the role of ICT-based market information in increasing the adoption of drought-tolerant maize varieties among farmers in Nigeria. According to the study, farmers were more inclined to adopt drought-tolerant maize varieties when they obtained knowledge about the market via their mobile phones, and this increased adoption resulted in improved crop yields and increased farmer revenue. In the context of Gwagwalada Area Council, an agricultural hub located in the Federal Capital Territory of Abuja, the adoption of ICT-based market information services has the ability to improve smallholder farmers' quality of life while revolutionizing the industry (Sennuga et al., 2020b). Additionally, by adopting agricultural seed technologies, farmers can improve crop gains as well as to reduce post-harvest losses, further increasing their income and food security. However, the adoption of ICT-based market information services, inclusive of agricultural seed technologies, faces wide array of obstacles in Gwagwalada Area Council. For instance, inadequate or poor internet connectivity, limited financial resources, and a lack of awareness about the advantages of these services are few of the challenges facing farmers in adopting ICT-based market information services and agricultural seed technologies (Nwali et al., 2022).

Therefore, it is imperative to identify and evaluate potential solutions to these challenges, including partnerships with government agencies and private sector actors, training programs for farmers, and innovative financing models, among others. Overall, the adoption of ICT-based market information services and agricultural seed technologies in Gwagwalada Area Council has the capacity to enhance agricultural productivity and improve the livelihoods of smallholder farmers, contributing to Nigeria's economic development and food security priorities. The adoption of improved agricultural seed technologies is key to establishing increment in agricultural productivity and achieving food security in the area Council although a number of issues, such as a lack of awareness and incomplete knowledge of the advantages of these technologies, have contributed to the sluggish adoption of better agricultural seed technology. However, the use of ICTs has been instrumental in promoting the adoption of these technologies. For instance, the National Agricultural Seeds Council (NASC) introduced the Seed Tracker System (STS) in 2019, which enables farmers to track the provenance and quality of their seed purchases (Wole-Alo and Oluwagbemi, 2020). Similarly, the Agricultural Transformation Agenda Support Programme (ATASP) launched the e-Wallet System in 2014, this gives farmers discounted access to premium supplies, such as enhanced seeds and fertilizers (Jideani and Lawal, 2017). The use of these ICT-based platforms has improved the adoption of improved agricultural seed technologies among farmers in Gwagwalada Area Council.

Information and communication technologies (ICTs) have the potential to transform the agriculture industry in Nigeria, helping farmers overcome key barriers to success such as poor market access, lack of information, and limited access to inputs and technologies. In particular, the use of ICTs can play a critical role in improving agricultural productivity, increasing farmers' income and standard of living, and promoting sustainable agricultural practices (Manfre and Nordehn, 2013). One key way in which ICTs can support agriculture is by providing farmers with access to critical market information. Through mobile apps,

SMS-based platforms, and online portals, farmers can receive real-time information on market prices, demand, and supply chain management. This empowers them to decide more effectively which crops to cultivate, how much to produce, and when to sell, which increases their profits and decreases their risks.

Another key role that ICTs play in agriculture is in facilitating the adoption of new technologies, such as improved seed varieties and pest management practices (Ebisike et al., 2021b). By providing farmers with information on the latest technologies and how they can be used effectively, ICTs can help farmers increase their crop yields and productivity, which in turn improves their income and economic well-being.

ICTs can also support sustainable agricultural practices, such as conservation farming and agroforestry, by providing farmers with information on sustainable land management practices and effective use of agricultural inputs. By adopting sustainable practices, farmers can improve their soil health, conserve resources, and reduce their overall environmental impact. Despite the promise of ICTs in agriculture, notwithstanding, there relatively lies constraints to implementation and adoption. These include limited infrastructure and connectivity in rural areas, lack of awareness and education on the use of ICTs, and affordability of technology and related services. Addressing these barriers is critical to realizing the full potential of ICTs in agriculture and ensuring that smallholder farmers are able to derive satisfaction from the innovations (Fadiji et al. 2022).

Overall, the role of ICT in agriculture in Nigeria is rapidly expanding, and for some of these technologies, there is enormous promise. to transform the agriculture sector, improve farmer livelihoods, and promote sustainable agricultural practices.

1. ICTs play an important role in improving agricultural productivity and promoting sustainable agriculture practices. According to a study by Okeke et al. (2020) the use of ICTs is capable of significantly increasing crop yields, particularly in developing countries. The study found that electronic delivery of agricultural information reduced information asymmetry, improved input use efficiency, and increased yields by 5-20%.
2. In addition, through encouraging sustainable farming methods such conservation farming, agroforestry, and precision agriculture, ICTs can improve soil health, conserve resources, and reduce environmental impact.
3. By giving farmers details on pricing trends, input markets, and other economic activities, market information services made possible by ICTs can be beneficial to farmers, Oladele (2011). This information can alert farmers to market changes, allowing them to exploit bigger prices and avoid price volatility which has the potential to increase market efficiency and, in turn, food security. A study conducted in Rwanda by Mutamuliza et al.(2021)found that farmers receiving SMS-based market price information increased their income by more than 12 percent, showing the significant role of ICTs in enhancing smallholder farmers' ability to reach markets.
4. Information and communication technology (ICT) has unquestionably become a beneficial and more dependable tool for exchanging agricultural information, enhancing the agricultural development process (Sobalaje and Adigun, 2013). This can include micro-credit facilities, savings accounts, and insurance products, which can improve farmers' resilience to economic and environmental shocks. By facilitating access to financial services, ICTs can support agricultural productivity, increase farmer incomes, and help farmers move out of poverty.

This study aims to evaluate the effect of ICT-based market information on the adoption of agricultural seed technology.

### **Specific objective of the study**

1. describe the socio-economic characteristics of farmers in the study area

2. assess the current level of adoption of ICT-based market information among farmers in Gwagwalada Area Council, Abuja,
3. identify the factors that influence the adoption of ICT-based market information among farmers in Gwagwalada Area Council, Abuja
4. examine the challenges faced by farmers in Gwagwalada Area Council, Abuja, in accessing and using ICT-based market information for their agricultural activities.

## **MATERIALS AND METHODS**

### **Study Area**

The study area is Gwagwalada town, the town is located between latitude 8.25 and 9.25 North of the equator and longitudes 6° 45', and 7° 45' and 7° 45', east of Greenside. The town is among of the many oldest towns of the federal capital territory. The FCT covers some 8000km<sup>2</sup> lying close to the geographical heartbeat of the country. Its location is fully within the region generally referred to as the “middle belt” (Oyebade, 2010) and North-Central geo-political zone. It is bounded by Kaduna state in the North, by Nasarawa State to the South-East and by Kogi and Niger States to the South and south-west respectively.

### **Population of the Study**

The population for this study is all the small scale farmers in Gwagwalada area council FCT, Abuja.

### **Sample and Sampling Techniques**

Purposive sampling technique was employed in this research to select a sample size 120 respondents for this research.

### **Procedure for Data Collection**

The study employed good use of primary data was collected through the self-administered questionnaires distributed to respondents by the researcher. The questionnaire was thereafter coded to obtain the data for statistical analysis which was utilized to provide answer to the research question raised in this present research.

### **Data Analysis**

Both descriptive and inferential statistics was used to analysis the data. Based on the questionnaires, data was analyzed using a statistical software for social sciences (SPSS). Specifically, mean scores, standard deviations, percentages and frequency distribution was employed to compile the responses and demonstrate the degree of similarity and difference.

### **Ethical Considerations:**

The study adhered to ethical principles, including voluntary participation, confidentiality, anonymity, and informed consent. Participants' confidentiality was maintained by enforcing an order that no personal information is revealed, and data was kept secure

## **RESULTS AND DISCUSSION**

### **Socioeconomics characteristics of respondents**

Results in Table 2 presents the socio economic characteristic of the respondents in this research. The results

elucidated that the majority (60.00%) of the famers were male while 40.00% were female. 52.5% of farmers in Gwagwalada Area council, Abuja were between the age of 21-30, while 21.7% were between 31 – 40 years old and 15.0% were at least 20 years old, 6.7% were above 60 years old and 3.3% were between 51 – 60 years old with a mean age 51.18. Farmer households typically consist of 1-4 people, making up the majority of them (53.30%). while 35.8% had house hold size of 5-8 persons. Majority (79.2%) of the farmers earn ₦ 0- ₦100,000 while another 10.8% earns ₦100,001 – ₦ 200,000. Majority (80.0%) of the farmers have a 0 – 10 years farming experience while 18.3% have 11 – 20 years of farming experience. The years of experience in this study were consistent with what Olaniyi indicated (2013). If the farmer uses these years of expertise, they will often be able to improve farm productivity. According to Nwaru (2004), the more experience a farmer has, the more information and technical advances he or she would have access to for use in overcoming agricultural obstacles and boosting productivity and profitability. The level of formal literacy revealed that 44.2% has secondary education while 35.8% had tertiary education and 20.0% had primary education. The large degree of literacy among this farmers could be translated to better understanding and implementation of agriculture information and innovation. This result is in accordance with Chavula’s (2014) assessment, which said that a skilled workforce is a necessity for the adoption of ICTs and their ability to increase agricultural output.

The results further reviewed that majority (97.50%) do not have access to loans or extension services (71.67%). The lack of access to credit facilities will restrict farmers from affording most of the technologies required to access agricultural information as most of the faculties are expensive. The absence of contact with extension officers by most of this respondents can lead to lack of training on how to effectively apply information or how to even access information using ICT.

**Table 1: Socioeconomics characteristics of respondents**

Sex	Frequency	Percentage (%)	Mean
Male	72	60.00	
Female	48	40.00	
<b>Age</b>			
At least 20 years	1	0.8	
21 – 30 years	63	52.5	
31 – 40 years	18	15.0	51.18
41 – 50 years	4	3.3	
51 – 60 years	4	3.3	
Above 60 years	8	6.7	
<b>Farm experience</b>			
1 – 10	96	80.0	
11 – 20	22	18.3	7.93
21 – 30	2	1.7	
<b>Educational status</b>			
Primary education	24	20.0	
Secondary education	53	44.2	
Tertiary education	43	35.8	
<b>Farm size</b>			
0.1-0.5	12	10.00	
0.6-1.0	29	24.17	
1.6-2.0	28	23.33	

>2.1	51	42.50	
<b>Access to loan</b>			
Yes	39	32.50	
No	117	97.50	
<b>Contact with Extension Workers</b>			
Yes	34	28.33	
No	86	71.67	
<b>Household size</b>			
1-4 persons	64	53.3	
5-8 persons	43	35.8	
9-12 persons	12	10.0	6
Above 12	1	.8	
<b>Annual income</b>			
1-200,000	95	79.2	
210,000-400,000	13	10.8	
401,600000	7	5.8	
601-800000	3	2.5	
>801,000	2	1.7	

**Field survey, 2023**

**Major source of Agriculturally based information**

The information sources for agriculture that farmers in the study region have access to are displayed in the findings of the table. It was shown that the most available source of information was Agricultural events (74.19%) followed by corporative societies (68.33%), family member (67.50%), Extension workers (62.50%) and others. This finding asserts that a larger category of farmers gets their information from agricultural events where ideas are shared among farmers. This result corroborates with that of Ajayi (2003) that, apart from the use of radio as a source of information the sharing of direct information among farmers was one of the most popular among farmers in Nigeria. Farmers exchange experiences on their years of farming. Also as the social network theory depicts farmers observe the activities and practices of other farmers and implement the same when beneficial to them such information are shared at agricultural events where farmers gather. This result is similar to the findings of Sharma *et al.*, (2008) that personal sources like, progressive farmers, neighbors, friends and opinion leaders as important sources in the transfer of rapeseed-mustard technologies. Likewise Rehman et al. (2013) reported fellow farmers as the basic source of information to farmers.

**Table 2 Major source of agricultural based information**

Source of agricultural based information	Frequency	Percentage %
Extension workers	75	62.50
Agricultural events	89	74.19
ICT	38	31.67
Internet	49	40.83
Corporative	82	68.33
Agricultural journals /magazines	55	45.83
Family member	81	67.50

**Field survey, 2023**

### Usage of ICT-based market information

The results in table 3 showed the uses of ICT based information by farmers in the study area. Not all the farmers in this research work have used ICT in accessing or sharing information about agriculture, however for those farmers who have utilized ICT, they agreed to all the items raised in this investigation study as uses of ICT. They specifically indicated that they; ICT-based market information during my production process (mean = 3.16), ICT tools to communicate with my customers (mean = 3.08), their customers expect them to use ICT tools during marketing process (mean = 3.07), ICT tools for learning is very important (mean = 3.05), ICT tools for marketing my goods/services because I'm very interested in IT (mean = 3.03), save time when they use ICT tools for obtaining information about business (mean = 2.98), and that ICT tools make production (mean = 2.93) and marketing faster and Information is much more easily available by using ICT tools than by visiting the library (mean = 2.70). This results implies that farmers used information available to them to improve their farm output and marketing through proper adoption of ICT faculties available to them. The finding of this research agrees with Asiabaka (2002) who reported that the major information needed by farmers to improved farm output and marketing by the farmers are information that border effective application of farm machineries and input, new practices and agricultural innovations and products marketing. This implies that farmers in this research area if they effectively utilize this information available to them are expected to have improved output in their farms.

This finding also suggests that farmers would be able to utilize ICTs in the most effective and original ways the more extension workers teach them. The benefits indicated by this farmers also agree with the report of Asiabaka (2002) who asserted that ICTs helps farmers to boost their efficiency and output.

**Table 3 Usage of ICT-based market information**

How often do you engage in the following activities	Mean	SD
I use ICT-based market information during my production process	3.16	0.917
I use ICT tools to communicate with my customers	3.08	0.681
My customers expect me to use ICT tools during marketing process.	3.07	0.827
Using ICT tools for learning is very important to me.	3.05	0.839
I use ICT tools for marketing my goods/services because I'm very interested in IT.	3.03	0.859
I save time if I use ICT tools for acquiring information about my business	2.98	0.860
I can understand the material much more easily, if I use ICT tools.	2.97	0.829
ICT tools make production and marketing faster for me.	2.93	1.019
Information is much more easily available by using ICT tools than by visiting the library.	2.70	0.931

Field survey, 2023

### Challenges faced by farmers in accessing and using ICT-based market information for their agricultural activities

Table 4 shows the Challenges faced by farmers in Gwagwalada Area Council, Abuja, in accessing and using ICT-based market information for their cropping activities. The major challenges were Inability to enjoy the use of ICT (73.33%), Cost of technology (72.50%), Lack of technological infrastructure (67.50%), Do not understand the value of ICT (64.17%), too hard to use/ unfriendly (61.67%), Lack of training (60.83%), Lack of suitable ICT programs (60.00%), Personal impediments (Illiteracy) (59.17%), among other



challenges. This result means that access to information and usage is affected by the factors listed above. Poor infrastructures remain an important problems to the accessibility and use of ICT based information by farmers, especially farmers in the rural area. These results agreed with the research study of Adomi (2007) who stated that power outages are problem militating against information/internet provision and use in African countries. Similarly, Ossai-Ugbah (2013) claims that this “power outages increase the general overhead and running cost thus having a negative impact on the use of social media for marketing and advertisement of agricultural products and how to optimally utilize social media for promotion in a cost-effective manner”.

**Table 4 Challenges faced by farmers in Gwagwalada Area Council, Abuja, in accessing and using ICT-based market information for their agricultural activities**

ICT-Based Market Information	Frequency	Percentage %
Inability to use ICT	88	73.33
No perceived economic or other benefits	62	51.67
Too hard to use/ unfriendly	74	61.67
Lack of technological infrastructure	81	67.50
Cost of technology	87	72.50
Not useful information/ relevant problems	34	28.33
Fear of technology	44	36.67
Not enough time to spend on using ICT	67	55.83
Do not understand the value of ICT	77	64.17
Lack of training	73	60.83
Better alternatives	32	26.67
Personal impediments (Illiteracy)	71	59.17
Lack of integration with other farm/other systems,	61	50.83
Lack of suitable ICT programs	72	60.00

Field survey, 2023

### Effect of Socio-economic characteristics on access to ICT based marketing information

Table 5 shows the logistic regression of analysis of the effect of social economic characteristics of farmers on their access to and use of ICT based marketing information. The table shows that some socio economic characteristics affects of the farmers accessibility and utilization of agricultural information in the study area ( $P < 0.05$ ), these characteristics includes sex, contact with extension, annual income, farming experience, degree of education and farm size. The regression analysis therefore implies that the ability of the farmers to have access to different origins of information is dependent on the socio-economic characteristics of the farmers such as sex, membership of farers cooperation, income level, farming experience, level of education and farm size. This result agrees with the findings of Matata *et al.* (2010) who reported the bias against women in the delivery of the extension message. In most cases the information are generally provided by male extension agents to men with the implicit assumption that it would “trickle down” to women. Furthermore, it noted that extension messages tend to focus on activities of male farmers while ignoring the wide range of agricultural activities, responsibilities and constraints facing women farmers. This is the case since most extension officers are males and tend to favor men in their extension efforts in the majority of developing countries (Barry 2005).

The hypothesis also elucidated that contact with extension services or membership of cooperate organization also affect farmers access to information, this is so because most times extension agents and other

information sources are focused toward groups and cooperative societies where information can be passed to a vast amount of farmers at same time. Other factors that affects farmers access to and use of agricultural information are income level, farm experience, level of education, and farm size. The outcomes also highlight how crucial education is to farmers’ access to and use of agricultural information. According to the findings, farmers are more likely to understand and apply information offered to them, particularly through ICT, the more education they have, and the more informational resources they can purchase the more income they have. In addition, education broadens access to important knowledge. This conclusion is in line with Fagbohunge and Longe’s (2009) assertion that humans are capable of making sense of their surroundings by combining and incorporating a variety of new pieces of information in the context of what they already know.

**Table 5. Logistic regression of analysis of the effect of social economic characteristics of farmers on their access to ICT based marketing information**

Characteristics	Coef.	Std. Err	z	P-value	95% Conf. Interval]
Sex	.124685	.0658456	1.40	0.000*	-.002151 .6552122
Age	.1063279	.024668	4.31	0.078	.0522665 .3522133
House hold size	.1097286	.0891101	1.23	0.418	-.036445 .2843812
Extension contact	.1063279	.024668	4.31	0.007*	.2654455 .3251552
Income	-6.13e-07	1.98e-06	-0.31	0.000*	-.5486212 .0365888
Farm Experience	.1097286	.0891101	1.23	0.001*	-.0254662 .5525886
Level of Education	.1063279	.024668	4.31	0.000*	.0665455 .5661122
Farm size	.6928957	.3941596	1.76	0.004*	-1.664888 .0455662
Constant	6043869	1.637978	0.37	0.712	-1.365564 1.548836

\* = Significant at 5% significant levels

### Field survey, 2023

## CONCLUSION

The study concludes that farmers use ICT based information for activities such as communicating with customers, learning of new ways of cultivation and harvesting and marketing, getting information about business, and to make production and marketing faster. Thus, it is advised that change agents increase their efforts to raise awareness of the value of ICT-based marketing and offer assistance to make these facilities easier to use..

## RECOMMENDATION

1. Governments at the national level must collaborate with groups like farmers. Designed to allow the exchange of agriculturally related knowledge, information, and experiences regarding various ICT initiatives and projects in Africa.
2. Strategies for training and building up people’s, groups’, and communities’ capacity to be knowledgeable about using ICT to gain market information and links to new clients must be developed.
3. Because doing so speeds up the adoption of new technology, the organisation and other agriculturally focused organisations should encourage small-scale farmers to work in community groupings

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