



## THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES AMONG AGRICULTURAL EXTENSION PERSONNEL IN LAGOS STATE, NIGERIA

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### ABSTRACT

To enhance agricultural production in developing countries, the use of information and communication technologies (ICTs) in extension delivery services is of great importance. This study examined personal characteristics of respondents, type of ICTs available, benefits of use of ICTs and constraints to use of ICTs among extension officers in Lagos State. Simple random sampling technique was used to select one hundred (100) Agricultural Extension Personnel from among the Extension agents employed in the State's ministry of agriculture and cooperative. Structured questionnaire was used to obtain data from the respondents. Descriptive statistics such as frequency distribution, percentage and mean were used to present and summarize the data. Inferential statistics (chi-square and Pearson Product Moment Correlation) were used to describe the type of relationship that exists between the variables in the stated hypotheses. The mean age of the respondents was 39years. Fifty five (55%) were females, and 57% of respondents were B. Sc. holders. Majority (70.0%) were married and 64% were Christians. The mean job experience of the respondents was 16years. Availability of radio set rated high by majority (72%) while 91.0% of respondents had access to radio set. In provision of current information; television was rated high by majority (93%) while in contacting farmers, extension service delivery and improved production; mobile phone was rated high mostly (80%), (84%) and (78%), respectively. High access charge of internet was identified as constraint among majority (81%) of the respondents. Inferential statistics revealed a significant relationship between personal characteristics of respondents and use of ICTs such as age ( $X^2 = 5.2003$ ,  $P < 0.05$ ), religion ( $X^2 = 3.822$ ,  $P < 0.05$ ) are related, further result of correlation test of relationship between personal characteristics. Age ( $r = 0.183$ ,  $P < 0.05$ ) and Educational level ( $r = 0.218$ ,  $P < 0.05$ ) and use of ICTs were significantly related. Moreover, test of analysis showed significant relationship between type of ICTs available ( $r = 0.605$ ,  $P < 0.05$ ) and use of ICTs. In conclusion, higher education level of respondents affected their use of ICTs and influenced by their age. Therefore, the development agencies/institutions involved in Agricultural extension programmes should be sincere and improve upon their efforts.

**Keywords:** Communication, Extension, Information, Personnel, Technology.

### INTRODUCTION

The concept of information in general and of agricultural information in particular, as a resource for development is very important in the contemporary world and cannot be overemphasized (Swanson and Rajalahti, 2010). The ability to easily use and share information and stimulate the creation of new ideas is viewed as essential to maintaining a nation's economy and enhancing the quality of life of every citizen in all nations of the world.



Communication device enable people around the world to contact one another to use information instantly, and to communicate from remote areas. There are lots of difficulties facing rural farmers which can be solved by providing them with adequate access to quality information which many researchers have generated.

Information and Communication Technologies (ICTs) play important roles in addressing these challenges and enhancing the standard of living of rural farmers. Improved agricultural production is the major weapon in the fight against world hunger, improving rural livelihood and increasing economic growth. The world development report of the World Bank (2008), argued that the growth in the agricultural sector contributes proportionally more to poverty reduction than growth in any other economic sectors.

This argument is supported by the levels of commitment of various economies to agriculture world over. Any effort towards a meaningful improvement of agriculture in Nigeria must be targeted by rural farmers who constitute the bulk of agricultural production in Nigeria. Information is a vital resource and has its application in rural, agricultural, social and industrial development (Nwachukwu, *et al.*, 2009). A prime challenge of typical Nigerian rural farmer is the dearth of timely, up to date agricultural information in spite of several research findings lying in shelves in various research organizations. For instance, inadequate information may be responsible for the low level of yields among farmers in spite of availability of improved seed variety (Idachaba, 2000). Agricultural extension officers are the direct link bridging the communication gap between the agricultural researchers and the farmers. In order to perform this role effectively and efficiently, agricultural extension personnel must have steady access to up-to-date agricultural information. This brings to the need for a comprehensive and well-articulated agricultural extension programme which ensures adequate and timely delivery of services to farmers if meaningful growth is to be achieved in the agricultural sector.

Information and communication technologies (ICTs) are all technologies used for the widespread transfer and sharing of information. ICTs are rapidly consolidating global communication networks and international trade with implication for people in developing countries. ICTs can be used to enable, strengthen or replace existing information system and network. ICTs in agriculture promote and distribute new and existing farming information and knowledge which is communicated within the agricultural sector since information is essential for facilitating agricultural and rural development as well as bringing about social and economic changes (Swanson and Rajalahti, 2010). Agricultural extension which depends to a large extent on information exchange between and among farmers on one hand and a broad range of other actors on the other has been identified as one area in which ICTs can have a particularly significant impact. There is growing recognition that farmers and members of rural communities have needs for information and appropriate learning methods that are not being met (Greenidge, 2003), and these have been lacking in the growth of Africa.

ICTs are set of technologies that facilitate information, processing, storage, retrieval and transmission (Torero and Von-Brown, 2005). ICTs are veritable tools with which a network of interaction can be stimulated among individuals such that they overcome the physical barrier of distance and social standing to become integrated in the global knowledge system. ICTs can enhance the integration and efficiency of agricultural system by operating new communication pathway and reducing transaction cost by enhancing accessibility of information on price, transportation and production technologies (CTA, 2003).

ICTs when available to rural farmers will improve the availability and quality of information either indirectly through producers, associations, extension workers and the like or directly through broadcast radio information and mobile phone messaging. In spite of



abundant agricultural information hosted on the internet, farmers' productivity has continued to be hindered by poor access to timely information.

Mainly, agricultural extension agents are ineffective in reaching farmers and farming communities with information and technologies needed to ensure food security and sustainable development. Thus, they cannot give what they do not have. Consequently, a substantial number of rural farmers have no access to some ICTs including e-mail, or computer, facebook or a twitter contacts or other forms of information communication channels provided by internet. There is, therefore, the need to examine the use of ICTs among extension personnel in Lagos State.

The study determined the use of Information and Communication technologies (ICTs) among extension personnel in Lagos State. Among the specific objectives examined are; personal characteristics of respondents in the study area, type of ICTs available for use by extension personnel in Lagos State, benefits of use of ICTs among extension personnel in the study area and the major constraints to use of ICTs among extension personnel. The study tested the relationship between personal characteristics of respondents, types of ICTs available to respondents, constraints facing respondents and their use of ICTs in the study area.

## **MATERIALS AND METHODS**

The study area was Lagos State, which is geographically located in the South west region of Nigeria, on the narrow plain of the Bight of Benin Republic and occupies 3,577 square kilometers. Lying approximately on longitude 20°42'E and 3°21'E and between latitude 6°22'N and 6°02'N. Lagos State is bonded in the North and East by Ogun State of Nigeria in the West by the republic of Benin and stretches over 180 kilometers along the Guinea coast of the Bight of Benin on the Atlantic Ocean. The State is officially made up of 20 local government areas (LGAs). The population of the study comprises of all the extension personnel in Lagos state Ministry of Agriculture and Co-operatives. Simple random sampling technique was used to select 100 Agricultural Extension Personnel from among the Extension agents employed in the State's ministry of agriculture and cooperatives. Data for the study were gathered through administration of structured questionnaire. Data were analyzed using frequencies, percentages, chi-square and Pearson Product Moment Correlation (PPMC).

## **RESULTS AND DISCUSSION**

### **Personal Characteristics of Respondents**

The age distribution of respondents as shown in the Table 1 below shows that majority of the respondents are 36 years and above which means that majority (77%) of respondents are within their economic active age. This implies that extension service delivery is in the hands of people within active, innovative, motivated and adaptable age category. This quality is expected to influence their quest for innovative source of information and wisdom to cope with constraints facing agricultural extension service delivery. Sex is an inevitable and important factor to be considered in Agricultural extension service because of the mode of communication service and attractive relationship among people in the society. The result revealed that above half (55.0%) of the respondents were female while 45% of respondents are male. This shows that the agricultural extension service has moderate extension service delivery by female and fair involvement of male. Ekong (2003) pointed out that marriage in our society is highly cherished. This was further confirmed by the report of Fakoya (2000) and Oladoja *et al.* (2008) who asserted that marriage confer some level of responsibility and commitment on individual who are married. In this study, majority 70.0% of the respondents



were married while 22% were single. This implies that majority of the respondents were married, responsible; contribute either directly or indirectly positively to the society.

**Table 1:** Personal Characteristics of the Respondents

<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age (years)</b>		
21-25	10	10
26-30	13	13
31-35	35	35
36 and above	42	42
<b>Sex</b>		
Male	45	45
Female	55	55
<b>Marital status</b>		
Single	22	22
Married	70	70
Divorce	4	4
Widow	4	4
<b>Educational level</b>		
Primary	1	1
OND	12	12
HND	14	14
B.Sc.	57	57
Post Graduate	16	16
<b>Job Experience</b>		
1-10	27	27
11-20	37	37
21-30	20	20
31 and above	16	16
<b>Religion</b>		
Christian	64	64
Muslim	33	33
Traditional	3	3

Source: Field Survey data, 2019

It was obvious that respondents acquired one form of formal education or the other. According to the result of analysis in Table 1, 57.0% of the respondents are B. Sc. holders. Below half (43%) of the respondents had other forms of formal education. The result indicated that Education plays a significant role in extension service delivery through ICTs in creating awareness, interest in innovation, communication skills and understanding of the ICTs usage. It also revealed that the more educated the respondents were, the better the use of ICTs in extension service delivery.

Table 1 revealed that 37.0% of the respondents had been on the job between 11-20years. 27.0% between 1-10 years of experience, 20% of the respondents had between 21-30 years of experience while 16% of the respondents had 31 and above years of experience. The result indicated that a reasonable number of respondents were neither new staff with minimal experience nor old staff with high experience that can effectively use available ICTs for extension service delivery. The religious affiliation of the respondents is also presented in



Table 1. The results revealed that majority (64.0%) of the respondents were Christians, 33% were Muslims and 3percent were traditional worshippers. The percentage distribution of religious affiliations of extension personnel in the study area indicated that there is no religious bias and discrimination in extension service delivery in the study area.

### **Type of ICTs Available for Use**

Considering availability of ICTs, results in Table 2 revealed that majority (72%) of the respondents agreed that radio was always available. This implies that the radio is affordable and it is always available for the respondents as type of ICTs. This is in line with the findings of Arokoyo (2003) who reported that the major ICTs used in Agricultural extension delivery in Nigeria have been on radio and television. Above half, fifty-eight percent (58%) of respondents confirmed that mobile phone is always available. Almost half forty-eight percent (48%) of respondents agreed that computer is sometimes available. The cost, maintenance, installation and the operation of computer might have prompted this level of agreement among respondents. The Table 2 also revealed the result of respondents that the internet is the least available type of ICTs. The implication of its result is that, the internet has sporadic network, unstable server and climatic condition usually affects its service.

**Table 2:** Distribution of Respondents based on Types of ICTs Available

Types of ICT	Frequency (%)	Frequency (%)	Frequency (%)
	Always	Sometime	Never
Radio Set	72 (72)	22 (22)	6 (6)
Television	49 (49)	45 (45)	6 (6)
Mobile Phone	58 (58)	41 (41)	1 (1)
Computer	48 (48)	48 (48)	4 (4)
Internet	49 (49)	44 (44)	7 (7)

Note: The values in parentheses are percentages

Source: Field Survey data, 2019

### **Benefits of ICTs**

Determining the benefits of use of ICTs, Table 3 revealed that most of respondents 93.0% agreed that television provided current information. This however implies that the visual demonstration and clear observation of an object and equipment of television makes it provide current information needed in extension services. In terms of contacting farmers, mobile phone was leading ICT used among majority (87%) of the respondents. Internet, television and radio as ICTs were also appreciably explored in contacting farmers. The benefit of mobile phone in enhancing extension service delivery cannot be over emphasized as it led other ICTs in aiding access to farmers (80%), ease the extension effort in service delivery (84%) and equally improved farmers' production (78%). The benefit derived from other ICTs used in the study area was also not negligible as some were also agreed to be beneficial among majority of the respondents. This implies that the respondents in the study area were technology compliant in the discharge of extension duties. This in turn bears on the production activities of the farmers.





**Table 3:** Distribution of Respondents based on Benefit of use of ICTs

Type of ICT	Frequency (%) current information	Frequency (%) contact to research Work	Frequency (%) access to farmers	Frequency (%) ease of service delivery	Frequency (%) improved production
Radio Set	92 (92)	55 (55)	71 (71)	67 (67)	72 (72)
Television	93 (93)	65 (65)	62 (62)	72 (72)	76 (76)
Mobile Phone	86 (86)	87 (87)	80 (80)	84 (84)	78 (78)
Computer	67 (67)	69 (69)	36 (36)	54 (54)	69 (69)
Internet	68 (68)	79 (79)	39 (39)	43 (43)	74 (74)

Note: The values in parentheses are percentages

Source: Field Survey data, 2019

### Constraints in the Use of ICTs

Table 4 showed the data on constraints facing respondents in their use of ICTs. Result indicated majority 81.0% of the respondents agreed that high access charge is major constraint facing the use of ICTs. This result revealed that the internet is costly. The respondents have no time to search for its network, server and service because of the remoteness of stations. Low level of knowledge of operation of internet was demonstrated among majority 69.0% of the respondents. According to Omotayo (2005), most Nigerian farmers are illiterate, live in rural areas, hence have little or no knowledge on the use of ICT facilities like computer/internet. Available statistics show that there is very little knowledge on the use of ICTs among extension officers across Nigeria. For instance 57.1% and 55.7% of extension officers in the north central and south west Nigeria respectively, do not have requisite knowledge on computer usage (Nda *et al.*, 2008).

According to the result, the following is the rate at which the respondents faced the constraints of high access charge on different ICTs; internet 81.0%, computer 78.0% and mobile phone 78.0%. The high cost of internet service, costly computer facilities and high cost of purchasing mobile phone data and recharge card were also found to be the cause of the constraints.

**Table 4:** Constraints in the Use of ICTs

Type of ICT	Frequency (%) lack of time	Frequency (%) remoteness of station	Frequency (%) high access charges	Frequency (%) low knowledge of use
Radio Set	56 (56)	51 (51)	35 (35)	41 (41)
Television	60 (60)	58 (58)	45 (45)	45 (45)
Mobile Phone	50 (50)	51 (51)	78 (78)	58 (58)
Computer	70 (70)	57 (57)	78 (78)	66 (66)
Internet	72 (72)	70 (70)	81 (81)	69 (69)

Note: The values in parentheses are percentages

Source: Field Survey data, 2019

### Testing of Stated Hypotheses

Hypothesis 1: There is no significant relationship between personal characteristics of respondents and use of ICTs. Pearson Product Moment Correlation (PPMC) was used to test relationship between respondents' age and educational level while chi-square ( $\chi^2$ ) was used to test the relationship between sex, marital status and religion, and use of ICTs. Table 5 revealed that significant relationship exists between age of respondents and their use ICTs ( $r = 0.183$ ,  $P < 0.05$ ). The relationship is, however, positive implying that increase in age may lead to



effective in use of ICTs. Likewise, in educational status there is also significant relationship between educational level of respondents and use of ICTs ( $r = 0.218$ ,  $P < 0.05$ ). Therefore, it can be concluded that the use of ICTs is affected by age as well as educational attainment of respondents in extension service delivery.

**Table 5:** PPMC Analysis of Respondents' Personal Characteristics (Age and Educational Level) and Use of ICTs

Variables	r-value	p-value	Decision
Age and use of ICT	0.183	0.001	S
Educational Level and use of ICT	0.218	0.000	S

Note: S = Significant

Source: Field Survey data, 2019

Table 6 below presents chi-square analysis of relationship between respondents' sex, marital status and religion in their use of ICTs. Result revealed that there is significant relationship between sex and use of ICT ( $\chi^2 = 5.203$ ,  $P < 0.05$ ). This observation may be due to good communication skills of female for interpersonal relationship with the people for extension service delivery. Hence, from descriptive data of this study, there were more female respondents (55.0%) in the study area than male (45.0%). The finding of this study indicated that sex influences use of ICTs in agricultural extension service. It was also revealed in Table 6 below that there is no significant relationship between marital status and use of ICTs ( $\chi^2 = 6.101$ ,  $P < 0.05$ ). This implies that both the married and single respondents use ICTs in extension service delivery adequately. Also, significant relationship was recorded between religion of respondents and use of ICTs ( $\chi^2 = 3.822$ ,  $P < 0.05$ ). It implies that in this study, a particular religion was dominated (Christianity) which influence the use of ICTs among respondents, while existence of other religions in the study area indicated there is no religious bias and discrimination in extension service delivery.

**Table 6:** Chi-square Analysis of Respondents' Personal Characteristics (Sex, Marital Status and Religion) and Use of ICTs

Variables	$\chi^2$	Df	CC	P-value	Decision
Sex and use of ICTs	5.203	1	0.411	0.000	S
Marital Status and use of ICTs	6.101	1	0.003	0.122	NS
Religion and use of ICTs	3.822	1	0.800	0.001	S

Note: CC = Contingency Coefficient; NS = Not Significant Df = Degree of freedom

Source: Field Survey data, 2019

Hypothesis 2: There is no significant relationship between type of ICTs available to respondents and use of ICTs. Results in Table 7 showed that there is significant relationship between type of ICT available ( $r = 0.605$ ,  $P < 0.05$ ) and the use of ICTs. The relationship was positive and significant. This implies that availability of any type of ICT would determine the extent of its usage in extension service delivery. High access charge of internet has been identified as one of the problems facing Agricultural extension service delivery. It can be inferred from this study that the more ICTs available, the higher the level of their use in extension service delivery.



**Table 7:** Chi-square analysis of Type of ICTs Available to Respondents and Usage

Variables	r-value	P-value	Decision
Types of ICTs and Usage	0.605	0.002	S

Note: S = Significant

Source: Field Survey data, 2019

Hypothesis 3: There is no significant relationship between constraints facing respondents and the use of ICTs. Using chi-square analysis as presented in Table 8, there is significant relationship between constraint facing respondents and use of ICTs ( $r=0.206$ ,  $P<0.05$ ). This implies that high access charge is a major constraint facing the use of ICTs. However, lack of time, remoteness of station and low knowledge of use of ICTs are typical constraints facing use of ICTs.

**Table 8:** Chi-square Analysis of Constraints in the Use of ICTs

Variables	r-value	P-value	Decision
Constraints vs use of ICTs	0.206	0.005	S

Note: S = Significant

Source: Field Survey data, 2019

## CONCLUSION AND RECOMMENDATIONS

The main objective of the study has been to determine the use of ICTs among extension personnel in Lagos State. The result of the study revealed that most of the extension personnel were within the economic active age (36 years and above). Hence, age was found to be an important feature that significantly assist in determining new innovation, motivation and particularly change in extension service delivery. Evidence in the study showed that education played a prominent role in use of ICTs for extension service among respondents. That is, extension personnel with higher level of education were able to use ICTs more compared to their colleagues with lower education. Consequently, the study recommended that there should be training and retraining for extension personnel in the study area. Access charge on internet during utilization of the ICTs should be subsidized.

## REFERENCES

- Arokoyo, T. (2003). *ICTs in the transformation of agricultural extension; the case of Nigeria*. Paper presented at the 6<sup>th</sup> consultative expert meeting of CTA's observatory on ICTs, Wageningen; September 23<sup>rd</sup>-25<sup>th</sup>.
- CTA (2003). CTS – Transforming agricultural extension. CTA Observatory, WICC/CTA, Wageningen, the Netherlands.
- Ekong, E. E. (2003). *An Introduction To Rural Sociology* (2<sup>nd</sup> Ed). Dove Educational Publishers, Uyo, Nigeria. Pp 167.
- Fakoya, E. O. (2000). *Farmers Use Of Sustainable Land Management Practices In Ondo State, Nigeria*. Unpublished Ph.D Thesis, Department Of Agricututural Extension And Rural Development, University Of Ibadan. Pp 160.
- Greenidge, C. B. (2003). *ICTs and the rural sector in ACP State: Mirage or Marriage?* Address delivered at the CTA's ICT observatory USA.
- Idachaba, F. (2000). "A Framework for Agricultural Policy networking: The Way Forward", Proceedings of a CTA Workshop, Uganda, November 6-10, P-15.





- Nda, I., Sanusi, R. A. and Aigbekaen, E. O. (2008). “*Comparative Analysis of Information and Communication Technology (ICT) use by Agricultural Extension Workers in South-West and North-Central Nigeria*”. Proceeding of the 19<sup>th</sup> Annual International Information Management Association. Pp. 35-40.
- Nwachukwu Kenneth, C.N., Olojede, A. O. and Onyenobi, V. O. (2009). “*Agricultural Marketing Network (AGMARKET) For Enhanced Research, Information Dissemination and Agricultural Development*”. Proceedings of 43<sup>rd</sup> Annual Conference of the Agricultural Society of Nigeria, Abuja. Pp. 700-703.
- Oladoja, M. A., Adedotin, S. E. and Adedokun, O. A. (2008). Training Needs Of Fisherfolks On Fishing Technologies. *Journal Of Food, Agriculture, Environment, Science And Technology*. 16(1), WFL Publisher, Helsinki, Finland. Available At [Www.World-Food.Net](http://www.World-Food.Net)
- Omotayo, O. M. (2005). *ICT and Agricultural Extension: Emerging issues in Transferring Agricultural technology in Developing Countries*”. In: Adedoyin, S.F. (Ed) *Agricultural Extension in Nigeria*, AESON. Pp. 145-158.
- Swanson, B. E. and Rajalahti, R. (2010). *Strengthening Agricultural Extension and Advisory Systems: Procedures for Assessing, Transforming and Evaluating Extension Systems*. The International bank for Reconstruction and Development/the World Bank, Washington. Pp. 98-127.
- Torero, M. and Von Braun, J. C. (2005). *ICTs (Information and Communication Technologies) for the Poor*. Washington, D.C. P.6. UNDP (2001) *Information Communication technology for Development. Essentials ICTD 31. Synthesis of Lessons Learned*. New York: Evaluation Office. <http://www.uhndp.org/eo>.
- Warren, M. F. (2001). “Adoption of ICT in Agricultural Intrinsic and Instrumental Roles in Technology Transfer 3<sup>rd</sup> Conference of the European Federation of Information technology in Agriculture. Food and the Environment, Montpellier Agromontpellier. Pp. 675-79
- World Bank (2008). *World Development Report: Agriculture for Development* World Bank, Washington.