ANALYSIS OF THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES BY EXTENSION WORKERS IN FEDERAL CAPITAL TERRITORY (FCT) AND NASARAWA STATE, NIGERIA.

BY

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ABSTRACT

This research work assessed the use of information and communication technologies (ICTs) by extension workers in FCT and Nasarawa State Nigeria. A multi-stage sampling technique was used to purposively select one hundred and thirty-five (135) agricultural extension workers using a convenient sampling method in the study area. Primary data were collected using a well- structured questionnaire containing both open and closed-ended questions.The data collected was analyzed using Statistical Package for Social Sciences (SPSS version 27). Descriptive statistics was used for the study. The result revealed that a good number (59.3%) of the respondents were within the age range of 50-59 years. Majority (85.2%) of the respondents were male with HND or B.Sc. as their highest educational qualifications with 21 and above years of extension service experience. However, all respondents were aware of the ICTs with majority (92.6%) of them having a total awareness in the study area. Also, all the respondents had access to ICTs in the study area with majority (67.4%) of them having full access to ICTs tools. A considerable number (44.4%) of the respondents had mobile Apps, Radio and social media as the most accessible ICT tools to them. Also, majority (66.7%) of the respondents had a full used of ICTs in the study area with a good number (59.3%) of them having availability, simplicity, economical and large area coverage as the most important factors that influence their used of ICTs. Based on the finding of this research work, concluded that agricultural extension workers in the study area employed the used of ICTs (such as radio, social media and television in the dissemination of extension services). At the conclusion of the study, the research work recommends that 100% of all levels should formulate an agricultural extension policy on the use of ICTs by extension workers which emphasis on availability and accessibility as well as capacity building workshops on ICTs usage among agricultural extension personnel.

Keywords: Analysis, The use, Information, Communication, Technologies, Extension Workers.

INTRODUCTION

Background to the Study

The role of public agricultural extension service has originally been known to provide an important link between farming communities and farming innovations particularly technology transfer and value addition in support of agricultural and rural development (Philips, 2019). However, in recent times, strong critism of public agricultural extension service delivery has been in circulation due to its top-down approach which has been supply driven, technically week, catering only for large scale famers and providing insufficient coverage of the small-scale farmers. This implies that proven agricultural technologies, which are needed to ensure higher productivity and food security, are not able to reach millions of small- scale farmers operating in the rural

areas (Felix, 2020).

Recent research indicated that many small-scale farmers in Sub-Saharan Africa (SSA) resorted to be obtaining agricultural information from other sources such as other farmers, inputs dealers, produce buyers and Non-Governmental Organizations (NGOs). Given the urgent need for current and reliable agricultural knowledge and information system by farmers, the use of conventional communication channels such as farm/home visit, personal letters and use of contact farmers for disseminating agricultural information is counterproductive and therefore, calls for adoption of information and communication Technologies (ICTs) by extension workers to disseminate relevant agricultural information to farmers in most efficient manner (Frank, 2021).

Agricultural extension services which depend heavily on information exchange between and among farmers and a broad range of other actors is an area in which information and communication Technologies (ICT) can have a significant impact. Research scientists can relate directly with farmers through ICTs. Front line extension workers who are the direct link between farmers and others actors in agricultural knowledge and information system are well posited to make use of ICTs to access expert knowledge or other types of information that could be beneficial to the farmers (Arokoyo, 2020). Agricultural extension is an educational service which brings information and new technologies to farming communities to enable them improve their production, incomes and living standards. With problem that an extension workface in facilitating direct contact with farmer clients and with researchers due to the physical distances involved and lack of transportation needed for their mobility, the application of ICTs offers excellent possibilities for strengthening extension systems and beyond urban level (Felix,2020).

The use of information and communication technologies (ICTs) in agricultural extension began since the introduction and development of telecommunication which was the gateway to the outside world. Subsequently mobile devices, internet, social networking, big data and computing clouds have revolutionized work practices in offices, business and healthcare centers. The development of the ICTs has evolved from primary devices meant for simple tasks to sophisticated instruments capable of handling both simple and complicated tasks (Grange, 2019). The first stage of ICTs applications was marked by the emergence of telecommunications which began in the early19centuryin Europe and then later in other parts of the world. Information and communication Technologies have undergone tremendous changes its inception. The evolution of ICTs application in agricultural extension has been driven by technological advancements, changing user needs and desire by technological advancements, changing user needs and desire for greater efficiency and productivity in communication and information management in agricultural extension (Eddy, 2020).

Information and communication technology (ICTs) is very useful in agricultural extension and advisory services and in facilitating and reaching out to family farmers. Extensions advisory services play a crucial role in promoting agricultural productivity, increasing food security, improving rural livelihoods (Smith 2020). Majority of the family farmers in the developing divorced from modern technology and vital agricultural support services need to carry out farming activities. Extension and advisory services are relevant to small holder farmers, who remain the bedrock of the agricultural and food supply chains in the developing countries (Francis, Nyon and James, 2021).

Information and communication technologies also help in providing farmers with timely relevant information, access to credit facilities and better market prices, which could go a long way in addressing global poverty and improving productivity. The aspect of timely and relevant information especially with the role of information and communication technologies to connect farmers with information has received much attention in the last decade (Felix, 2020).Through the assistance of ICTs, farmers are able to stay update with all recent

information, this is inclusive of data about weather, agriculture and newer and more advanced ways of enhancing crop quality production information and communication technologies have largely revolutionized the way people, government and business, both small, function in the modern world. Closed to 60

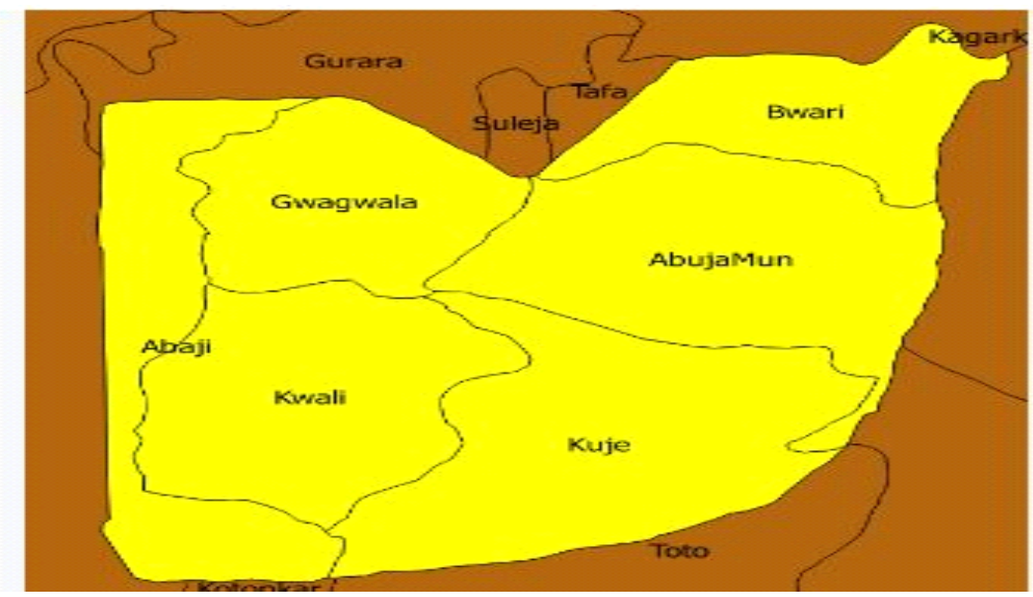

Fig. 3.1: Map of FCT

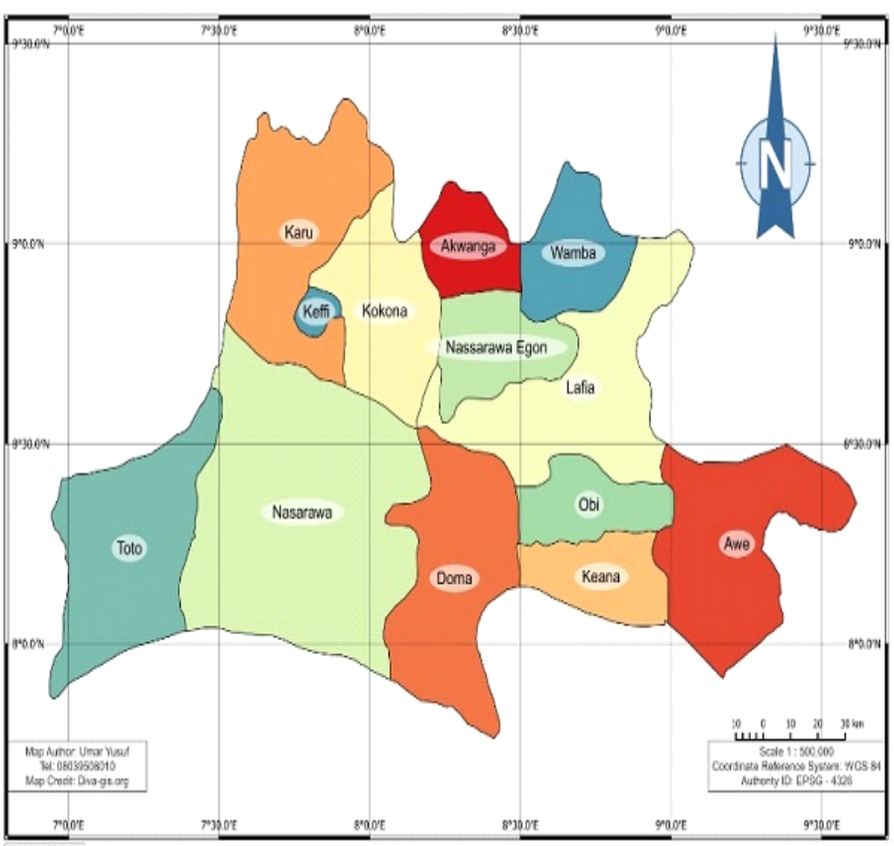

Figure 3.2: Map of Nasarawa State

Sampling Procedure and Simple Size

A multi-stage sampling technique was used for this research work, Involving three (3) stages. The first stage involved the division of the study area in to nine (9) agricultural zones (ADPs) situated in the FCT and Nassarawa State. The second stage involved a convenient selection of Agricultural Zones (APDs) in the FCT and Nasarawa State. The third stage involved a purposive selection of respondents in the nine agricultural zones in the study area. Respondents were selected connveniently using purposive sampling technique. A sample of one hundred and thirty five (135) extension workers constitutes the sample size of the study and were selected from a sample frame of 240 extension workers in the study area. Below is the table for sapling procedure and sample size of the study.

Table3.1: Sampling Procedure and Sample of the Study

Study Area	Selected Agric Zones Frame (ADPs)		Number of Respondents
FCT	Abaji	27	15.0
	AMAC	24	13.0
	Kuje	22	16.0
	Gwagwalada	30	14.0
	Bwari	25	16.0
	Kwali	25	14.0
Nassarawa	Western Zone	35	13.0
	Easter Zone	28	17.0
	Southern Zone	24	15.0
Total	**Nine (9)**	**240**	**135.0**

Source: Field Survey, 2024

Data Collection

The procedure used for data collection of this research work was questionnaire schedule and focus group discussions. Structural questionnaire containing open and close ended questions was used and was administered to the extension workers in the selected ADPs in the study area. The questionnaire contains the information on socio-economic characteristics of the respondents, level of awareness and access to ICTs, level of usage of the ICTs by respondents in the discharge of their responsibilities, most useful ICTs tools by respondents and the major constraints encountered by respondents in the use of ICTs in the study area. However, textbooks, Journals and internet will be use as reference materials.

Validity of the Instrument and Reliability Test

The questionnaire for the collection of data was subjected to face content validation. The research instrument was given to the supervisors who are equally experts in the department. The observations and corrections made were adhered and address strictly.

The reliability test for the instrument to used for data collection was carried outside the study area 10% of the total sample size was used for the test. The consistency and reliability of the questionnaire was tested using Cronbachis Alpha test of reliability and was conducted for

the scale variables.

Procedure for Data Analysis and Analytical Tools

The data collected from administered questionnaire were analyzed using Statistical Package for Social Sciences (SPSS) version 24). Descriptive Statistics was used.

RESULTS AND DISCUSSION

This chapter present the outcome of the field work and proceeds to give the statistical analysis of the competed variables.

Socio- Economic Characteristics of the Respondents

This present information on age, sex, educational level, marital status, family size, income level per month, income sources and year of experience in service of the respondents.

Age Range of Respondents

Table 4.1 revealed that a good number (59.3%) of the respondents were within the age range of 50 - 59 years. 22.2% of the respondents were within the age range of 40 - 49 years. 9.6% of the respondents were within the age range of 30 - 39years. 7.40% of the respondents were within the age range of 60 and above years and only 1.50% of the respondents were within the age range of 20 - 29 years. This implies that majority of the extension workers in the study area were within the age range of 40 - 59 years, indicating their active and productive stage.

This finding substantiate that of Arokoyo (2020) who reported that majority of the extension workers in Sub-Saharan Africa were within the age of 40-60 years

Sex of the Respondents

The same result equally revealed that majority (85.2%) of the respondents were males and only 14.8% of them were females (Table 4.1). This implies that majority of the extension workers in the study area were males, indicating poor participation of women in agricultural extension service delivery in the study area.

This finding coincides that of the FAO (2022) who reported lack of women participation in Agricultural extension services delivery in all Sub- Saharan African Nations.

Educational Qualification of Respondents

Table 4.1 also revealed that majority of the respondents had HND or B.S.C and this constitutes 63.0% of the respondents 29. 6% of the respondents had OND or NCE, and only 7.4% of them had post graduate qualification. This implies that majority of the extension workers in the study area were either HND or B.Sc. graduates, indicating their ability to deliver effective services to the farmers.

This finding is in line with that of Francis *et al.,* (2021) who posited that majority of extension workers in North Central Nigeria, were either HND or B.Sc. graduates. They can therefore, deliver effective and efficient services to the farmers.

Table 4.1: Socio- Economic Characteristics of Respondents

Characteristics	Frequency	Percentage	Mean
Age Range (years)			
20 – 29	2	1.5	44.5
30 – 39	13	9.6	
40 – 49	30	22.2	
50 – 59	80	59.3	
60 years and above	10	7.4	
Sex of Respondents			
Male	115	85.2	
Female	20	14.8	
Educational Qualifications			
ND/NCE	40	29.6	
HND/B.Sc.	85	63.0	
Post Graduate	10	7.4	
Marital Status			
Single	2	1.5	
Married	108	80.0	
Divorced	20	14.8	
Widow	5	3.7	
Family Size			
1-5	23	17.0	5.5
6-10	50	37.0	
11 and above	62	46.0	
Income level (₦)Month			
51,000- 100,000	31	23.0	₦125,500
101,000- 150,000	60	44.0	
151,000-200,000	40	30.0	
201,000 and above	14	3.0	
Other sources of incomes			
Farming	80	59.3	
Trading	20	14.8	
Farming and trading	35	25.9	
experience in service (Years)			
1-10	2	1.5	15.5
11-20	50	37.0	
21 and above	83	61.5	
Total	135	100.0	

Source: Field Survey, 2024

Marital Status of Respondents

Table 4.1 indicates that majority (80.0%) of the respondents were married 14.8% of the respondents were divorced 3.7% of the respondents were widows and 1.5% of them were single. This implies that majority of the extension workers in the study area were married, indicating that; they have one family responsibility or the other.

This result agreed with that of Eddy (2020) who revealed that extension workers in Sub-Saharan, Africa majority of them were married with one family responsibility or the other.

Family Size of Respondents

Table 4.1 revealed that a considerable number (46.0%) of the respondents had family size of 11 and above members. 37.0% of them had family size between 6-10 members, and only 17.0% of them had family size of 1-5 members. This implies that, majority of the extension workers had family size of more than 5 members, indicating that they have high family responsibilities.

This result was in the line with that of Felix (2020) who reported that extension workers in Sub-Saharan Africa had many family members with high family responsibilities affecting their services efficiency.

Income Level of Respondents

The same results, shows that, a considerable number (44.0%) of the respondents had income level of N 101,000-N 150, 000 per month 30.0% of the respondents had an income level of N 151,000- N 200,000 per month 23.0% of the respondents had an income level of N 51,000- N 100,000 per month and only 3.0% of them had an income level above N 201, 000 per month (Table 4.1), this implies that majority of the respondents had an income level below N 200,000 per month, indicating their low income earning.

This research finding coincides with that of Bello (2023) who reported that majority of the extension workers in Nigeria had a low income earning which affect their service delivering ability.

Other Income Source of Respondents

Table 4.1 shows that a good number of (59.3%) of the respondents had farming as their other sources of incomes besides extension service. 25.9% of the respondents had farming and trading as their other sources of incomes beside farming and only 14.8% of the respondents had trading as their other source of incomes besides extension service. This implies that all the extension workers in the study area had other sources of incomes besides farming; indicating their lack of full commitment to agricultural extension service delivery.

This result agreed with that of Fadiji (2010) who revealed that, agricultural extension service encounters with a lot of challenges Nigeria due to lack of commitment to service among extension workers.

Years of Experience in Service

Table 4.1 also shows that majority (61.5%) of the respondents were within the age range of 21 years and above in extension service and only 1.5% of the respondents had 1-10 years of service. This implies that majority of the extension workers in the study area had more than 10 years in service, indicating their wealth of experience in agricultural extension service.

This finding coincides with Eddy (2020) who reported that agricultural extension workers in West Africa had more than 10 years in service particularly Nigeria.

4.2: Level of Awareness and Access to ICTs by Respondents

This present information on whether respondents were aware of the ICTs and have access to ICTs.

Table 4.2: Level of Awareness and Access to ICTs

Awareness of ICTs	Frequency	Percentage
Yes	135	100
No	0	0.0
Level of Awareness		
Not Aware	0	0.0
Partially Aware	10	7.4
Totally Aware	125	92.6
Access to ICTs		
Yes	135	100
No	0	0.0
Level		
Full Access	91	67.4
Partial Access	44	32.6
Access to ICTs Tools		
Mobile Apps	4	3.0
Radio	0	0.0
Television	0	0.0
Social media	5	3.7
Web platforms	0	0.0
Data base management	0	0.0
SMS and IVR	6	4.4
Mobile Apps and Radio	20	14.8
Mobile Apps, Radio& TV	40	29.6
Mobile Apps, Radio, TV and Social media	60	44.4
Total	**135**	**100.0**

Source: Field Survey, 2024 (Multiple Response)

Level of Usage of ICTs by Extension Workers in the Study Area.

This present information on whether extension workers in the study are use ICTs or not and to what extent ICTs are been use by them.

Awareness of the ICTs

Table 4.2 revealed that all respondents were aware of the information and communication technologies (ICTs) in the study area. This implies that agricultural extension workers in the study area were up to dates, indicating their awareness of modern means of communication. This finding agreed with Arokoyo (2020) who revealed that majority of agricultural extension workers in Sub-Saharan Africa are aware of the use of information and communication technologies in the discharge of agricultural

innovations. However, the finding was in contradiction with that of Eddy (2020) who posited that agricultural extension workers in Sub-Saharan regions of Africa do not have an up to date practical use of information and communication technologies in the disperse of modern farming techniques.

Respondents Level of Awareness of ICTs

The same result equally shows that majority (92.6%) of the respondents were totally aware of the information and communication technologies (ICTs) and their use in agricultural extension service and only 7.4%) of the respondents were partially aware of the ICTs. This implies that extension workers in the study area were totally aware of the ICTs. Indicating their awareness on Modern means of Communication (Table 4.2).

This result agreed with that of Arokoyo (2020) who revealed that, agricultural extension workers in Nigeria are totally aware of the information and communication technologies in their day to day extension activities. So also, the finding Substantiate that of Fadiji (2010) who indicated that agricultural extension workers in Nigeria were fully aware of the ICTs and its practical application in the disperse of modern improved technologies.

Respondents Access to ICTs

Table 4.2 also shows that all the respondents had direct access to ICTS and its usage. This implies that all the extension workers in the study area had full access to information and communication technologies, indicating their utilization in agricultural extension. This research finding is in line with that of Bello (2023) who reported that agricultural extension workers in the Sub-Saharan West Africa had total access to the use of ICTs in agricultural extension service delivery. The same finding equally coincides with Fadiji *et al.,* (2010) who posited that agricultural extension workers in some parts of West Africa had access to modern ICTs and its usage in their services delivery.

Respondents Access Level to ICTs

Table 4.2 also shows that majority (67.4%) of the respondents had full access to information and communication technologies (ICTs) and only 32.6% of them had a partial access to ICTs. This implies that respondents in the study area had a total access to information and communication technologies, indicating their ability to transmit modern agricultural technologies to farmers. This result substantiate that of James (2019) who reported that modern of information and communication technologies are accessible in all the developing countries by all categories of change agents. This result also is in agreement with that of Francis *et al.,* (2021) who revealed ICTs use in many African Nations is real. Many change agents today use ICTs for their legal activities.

Types of ICTs Tools Accessible to Respondents

The same findings equally indicates that, a proportionate number (44.4%) of the respondents had access to mobile apps, radio, and television and social media 29.6% of the respondents had access to mobile apps, radio and television, 14.8% of the respondents had access to mobile apps and radio. 4.4% of the respondents had access to SMS and IVR 3.7% of the respondents had access to social media only and 3.0% of the respondents has access to mobile apps only (Table 4.2). this implies that all the extension workers in the study area had access to ICTs; indicating their access to modern information and communication technologies.

This result is in conformity with that of Felix (2020) and Arokoyo (2020) who revealed that the use of modern ICTs tools varies between change agents depending on the type and classes of individuals. The finding equally was in concord with that of FAO (2022) who reported that different ICTs tools are used by different individual change agents in West Africa.

Level of ICT Usage by Respondents

Level of ICT Usage by Respondents

Table 4.3 revealed that majority (66.7%) of the respondents had full used of information and communication technologies (ICTs) in the study area, 29.6% of the respondents had average used of ICTs in the study area and only 3.7% of them had a partial used of ICTs in the study area. This implies that all extension workers in the study area employed the used of information and communication technologies (ICTs) in the discharge of their legal services; indicating their up-to-date knowledge.

This finding substantiates that of Fadiji *et al.,* (2010) who reported that ICTs is been used by agricultural extension workers in the developing countries in order to disseminate farming information to the farmers. The finding also agreed with that of Arokpoyo (2020) who posited that agricultural extension service in West Africa is been delivered using information and communication technologies (ICTs).

Factors Influencing the Use of ICTs by Respondents

Table 4.3 equally shows that, the most dominant factors influencing the use of information and communication technologies (ICTs) by respondents are availability, simplicity, economical and large are a coverage and this constitutes a large number (59.3%) of the respondents 13.3% of the respondents revealed availability and simplicity,11% of them said economical, 7.4% of them said large area coverage, 5.2% said availability only and 3.7% of them revealed simplicity. This implies that, the major factors influencing the extension workers used of ICTs for their activities are availability of ICTs simplicity of usage, economical and large area coverage.

This finding therefore coincides that of Food and Agricultural Organization (FAO) who shows that the availability of ICTs, simplicity of usage and operation, economical and large area coverage in time are the major factors influencing the use of ICTs by agricultural extension workers in Sub-Saharan Africa. The result also is in line with that of James (2019) who reported that ICTs use in West is influenced by some factors, including availability and ease of use, economical in terms of time and area coverage.

Table 4.3: Level of ICTs Usage by Respondents

Level of usage	Frequency	Percentage
Not using	0	0.0
Partially using	5	3.7
Averagely using	40	29.6
Fully using	90	66.7
Factor Influencing Usage		
Availability	7	5.2
Simplicity	5	3.7
Economical	15	11.11
Large Area coverage	10	7.4
Availability and simplicity	18	13.3
Availability, Simplicity, Economical and large area Coverage	80	59.3
Total	**135**	**100.0**

Source: Field Work, 2024 (Multiple Response)

Conclusion

From the finding of this study, the research work concluded that agricultural extension workers in the study area directly employed the use of information and communication technologies (ICTs) in the discharge of agricultural extension service to all categories of farmers for improvement of agricultural productivity in the study area, with Radio, television and social media were the most useful ICT tools to them.

Recommendations

Base on the conclusion of the study, the following suggestions were recommended by the researcher:

i. Government should formulate and agricultural extension policy on the use of ICTs with much emphasis on availability and access at all level.
ii. Government and NGOs should provide adequate training to agricultural extension workers particularly on computer literacy and other complex ICTs tools to enable them have access to internet services.
iii. Provision of Sufficient modern ICTs facilities and stable electricity supply by the government and NGOs.

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