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# UTILIZATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) BY AGRICULTURAL EXTENSION WORKERS IN NIGER STATE, NIGERIA

S. I. Umar and S. Jibrin

Department of Agricultural Economics and Extension Technology,

Federal University of Technology Minna, Nigeria

Corresponding author's email address: umarsheshi@gmail.com

Corresponding author's cell phone number: +234(0)8039192721

## ABSTRACT

*The study examined the utilization of information and communication technologies by agricultural extension workers in Niger State, Nigeria. To achieve the study objective, 206 respondents were proportionately and randomly selected from the three agricultural zones in the State through multi-stage sampling technique. A validated questionnaire with reliability coefficient of 0.81 was used to collect data, and data collected were analyzed using both descriptive and inferential statistics. Result of the study revealed that the respondents acquired one form of formal education or the other, ranging from National Diploma to Master's Degree. Radio was the most frequently utilized ICT by the respondents with 76.7% response rate, while internet facility was the major source of extension information for the respondents. The result of regression analysis further indicated that educational level, place of residence and ICT training had significant influence on the use of ICTs by the respondents. Major challenges to ICTs' utilization by the respondents were poor electricity supply and non-availability of ICT facilities in the rural areas as reported by 62.6% and 44.2% of the respondents, respectively. Therefore, it was suggested that young graduates with ICT training should be recruited as extension workers, while capacity building training on use of ICTs should be organized for existing extension staff. It was also recommended that internet centres should be established at the village levels to bring internet services closer to rural agricultural extension workers.*

**KEYWORDS:** Utilization, ICT, radio, internet facilities, Extension Workers

## INTRODUCTION

The agricultural sector is faced with the problem of improving output to cater for the ever growing population in the present time of decreasing natural resources. While lending credence to this assertion, United Nation (2009) pointed out that in the coming 50 years, world agriculture will undergo far-reaching economic and physical changes of which population increase, urbanization and income growth will drive the demand for food, while stress on natural resources and climate change may act as constraints to supply. In order to feed the world's increasing population projected to exceed nine billion in 2050, it will be necessary to increase food production and doing so will require using information and

communication technologies (ICTs) that can deliver current and appropriate technical knowledge to agricultural extension workers who are saddled with the responsibility of disseminating useful, relevant and current information to farmers.

Information and Communication Technologies (ICTs) is an umbrella word that includes any communication device or application, encompassing: radio, television, internet, cellular phones, computers, satellite systems, network hardware and software as well as various services, appliance and applications associated with them, which are used for collecting, processing, storing, retrieving, disseminating and implementing data and information (FAO, 1993).

The role of ICTs in enhancing the work of Agricultural Extension Agents is gaining recognition (Tologbonse *et al.*, 2011). ICT is essential for agricultural extension workers because it enable them to access current information and expert knowledge that facilitate the discharge of their daily responsibilities as front liners in agricultural extension service delivery. (Tologbonse *et al.*, 2011). The need for integration of ICT into agricultural extension sub-sector is further justified by the fact that agricultural profession is highly dynamic, and progress in the sector is almost a daily affair. If modern ICT facilities are not well build into the mainstream of the agricultural extension system, there is the likelihood of delay in the dissemination and utilization of scientific information for increased agricultural production (Adebayo and Adesope, 2007).

In order for the agricultural extension sub-sector to be able to discharge her responsibilities, it is necessary that the front line extension workers have adequate access to ICTs for current and up to date farm knowledge and information for onward dissemination to farming families. It is against this background that this study was carried out to examine the utilization of ICTs by Agricultural Extension Agents in Niger State, Nigeria to generate empirical research information for policy makers and instructs policy to promote the utilization of ICTs for extension activities for purposeful economic development. The specific objectives of the study are to:

1. describe the socio-economic characteristics of the respondents;
2. determine the utilization of ICTs by the respondents;
3. identify ICT facilities used by the respondents for sourcing extension information;
4. determine the factors that influence the usage of ICTs by the respondents; and
5. ascertain the challenges to the utilization of ICTs by the respondents.

## METHODOLOGY

### Study area

The study was conducted in Niger State, Nigeria. The State is located in the Southern Guinea Savannah ecological zone of Nigeria. The State falls within latitude 8°-10°N and longitudes 3° - 8° East. The State Covers a land area of 92,800 square kilometers with a projected population of 4,634,105 (National Population Commission, 2013). The State is divided into three agricultural zones, namely Zones I, II and III.

### **Population and sample**

Niger State has 342 agricultural extension workers as target population for the study. Multi-stage sampling technique was used to select proportional sample size randomly from the three agricultural zones, 40 extension blocks and 342 extension cells. In all, a total of 206 Agricultural Extension Workers were selected as respondents for the study. The sample size selected from each agricultural zone was 60% of the sampling frame established from the zones.

### **Instrumentation, measurement of variable and statistical analysis**

The questionnaire was the instrument used to collect data. The dependent variable for the study was ICT usage and the variable was measured based on the frequency and number of ICTs used by the extension workers. The independent variables were the socio-economic characteristics such as age, educational level and working experience were measured in years while sex, place of residence and ICT training were measured as reported by the respondents. ICT facilities used for sourcing specific extension information and challenges faced were determined by asking the respondents to indicate ICT sources of information and challenges faced. Descriptive statistics were used to achieve objectives one, two, three and five while multinomial logit regression analysis was used to achieve objective four of the study.

## **RESULTS AND DISCUSSION**

### **Socio-economic characteristics of respondents**

Results in Table 1 indicate that 76.2% of the respondents were between 31-50 years. This suggests that most of the extension workers in the study area were in their productive and active ages which can motivate them to effectively utilize ICTs for accomplishment of their routine activities. The finding further revealed that 82.5% of the respondents were male, which implies that agricultural extension activities at the field level, is dominated by male folk in the study area. This result supported the finding of Yakubu *et al.* (2013) who stressed that male dominated agricultural extension work in Nigeria.

Table 1 also shows that the respondents acquired different forms of formal education ranging from National Diploma to Master's Degree. This result is an indication that the extension workers in the study area possessed the basic knowledge for the utilization of ICTs. More than half (51.0%) of the respondents had 15-24 years of working experience as Agricultural Extension Workers. These long years of working experience of the respondents is expected to place them in a position to use ICTs to source for information to up-date their knowledge. Similarly, Table 1 reveals that 51.9% of the respondents resided in towns, majority (55.8%) of them had ICT training.

**Table 1: Distribution of respondents according to their socio-economic characteristics.**

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age</b>		
21-30	35	17.0
31-40	86	41.7
41-50	71	34.5
51-60	14	6.8
<b>Sex</b>		
Male	170	82.5
Female	36	17.5
<b>Educational level</b>		
National Diploma	76	36.9
Higher National Diploma	89	43.2
First Degree (B.Sc)	27	13.1
Master's Degree (M.Sc)	14	6.8
<b>Working experience</b>		
5-14	71	34.5
15-24	105	51.0
25-34	30	14.5
<b>Place of residence</b>		
Town/Cities	107	51.9
Village	99	48.1
<b>ICT training</b>		
Had ICT training	115	55.8
No ICT training	91	44.2

Source: Field survey, 2014

### **Utilization of ICTs**

Findings in Table 2 show that radio was the most frequently utilized ICT facility by the respondents in the study area with 76.7% response rate. This is attributed to the popularity of radio as a source of information owing to its affordability, portability and accessibility of its signal even in the rural areas. Arokoya (2003) reported that access to radio was higher compared to any other ICT for people living in rural areas. Other ICTs that were occasionally utilized by the respondents were television (45.1%), telephone (35.4%) and internet (25.2%). The reliance of these ICTs on electricity minimized their utilization as sources of information for agricultural extension workers particularly those who reside in the rural areas.

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First Degree (B.Sc)	27	13.1
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5-14	71	34.5
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**Table 2: Distribution of respondents based on ICTs utilized**

ICTs*	Always	Sometimes	Percentage
	F(%)	F(%)	F(%)
Radio	158(76.7)	37 (18.0)	11(5.3)
Television	86 (41.7)	93 (45.1)	27 (13.2)
Telephone	71 (34.5)	73 (35.4)	62 (30.1)
Internet	61 (33.5)	52 (25.2)	85 (41.3)

\* Multiple responses

F Frequency

% Percentage

Source: Field survey, 2014

### **ICT facilities used for sourcing extension information**

Table 3 reveals that internet facility was the major source of information for the respondents on improved crop varieties, livestock production techniques, crop production techniques, market and farm product price, home economics and nutrition, soil conservation techniques climate change and government policies, while radio was the major source of information on sources of farm inputs and diseases outbreak to the respondents in the study area. On the whole, internet was the major ICT facility providing information in diverse areas of extension information to agricultural extension workers in the study area. This was followed by radio, television and telephone. The first ranking of internet as an important source of extension information points to the fact that internet provides access to different websites of agricultural research institutes and extension organizations, which supply specific information that addresses problems peculiar to need, time, season or farm operation.

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**Table3: Distribution of respondents based on ICTs used for sourcing extension information**

Types on information*	Radio F(%)	Television F (%)	Internet F(%)	Telephone F(%)
Improved crop variety	74 (35.9)	67(32.5)	85(41.3)	52(25.2)
Source of farm inputs	92(44.7)	82(39.8)	56(27.2)	68 (33.0)
Livestock production technique	70(34.0)	58(28.2)	83(40.3)	69(33.5)
Crop production technique	68 (33.0)	59(28.6)	77(37.4)	46(22.3)
Market and commodity price	65(31.6)	32(15.5)	81(39.3)	51(24.8)
Home economic and nutrition	37(18.0)	43(20.9)	60(29.1)	28(13.6)
Soil conservation technique	67(30.1)	49(23.8)	69(33.5)	34(16.5)
Climate change	39(18.9)	25(12.1)	53(25.7)	19(9.2)
Government policies	36(17.5)	24(11.7)	41(19.9)	09(4.4)
Disease out break	61(29.6)	40(19.4)	43(20.9)	21.(10.2)

\* Multiple responses

F Frequency

% Percentage

Source: Field survey, 2014

### Factors influencing usage of ICTs

The result of the regression analysis in Table 4 indicate that the educational level of the respondents had significant influence on the usage of ICTs ( $Z=3.74$ ). This points to the usefulness of education in the utilization of ICT facilities by the respondents. Thus, the higher the level of education, the higher the usage of ICTs by the extension workers would be. This result agrees with the finding of Idirisa *et al.* (2013) who indicated that educational status of the Extension Agents had significant effect on the use of ICTs. Also, place of residence significantly influenced the use of ICTs by the respondents ( $Z=3.28$ ), indicating that the agricultural extension workers who reside in the towns and cities used ICT facilities more than those that live in the rural areas. In a related study, Omotayo (2005) reported that many rural areas of developing countries including Nigeria, lack access to basic telecommunication services that support key ICT facilities. Similarly, ICT training significantly influenced the use of ICTs by the respondents for extension purposes ( $Z=1.99$ ). Training in the use of ICTs is therefore necessary for Extension Agents to function effectively in using ICTs to facilitate enhanced job performance.

**Table: 4 Multinomial logit regression analysis of factors influencing usage of ICTs**

<b>Factors</b>	<b>Coefficients</b>	<b>Z-Value</b>
Age	0.00371	0.05 <sup>ns</sup>
Educational level	0.13452	3.7 <sup>5**</sup>
Sex	0.03730	0.98 <sup>ns</sup>
Place of residence	0.03913	3.28 <sup>**</sup>
Working experience	0.15744	1.82 <sup>ns</sup>
ICT training	0.02356	1.99 <sup>*</sup>

\*\* Significant at 1%

\* Significant at 5%

ns Not significant

Source: Computed from field survey data, 2014

### Challenges of ICT utilization

Entries in Table 5 show that the major challenge to the effective use of ICT facilities in the study area was poor electricity supply as indicated by 62.6% of the respondents. This result is not surprising considering the erratic and unstable electricity power supply that is common in most Nigerian urban and rural areas. Similarly, 44.2% of the respondents reported that there are no ICT facilities in the rural areas where they are posted to and reside, they stressed that most of the facilities such as internet cafe are located only in towns and cities. This result may not be unconnected to the fact that 48.1% of the respondents reside in the rural areas as shown in Table 1. Other challenges of concern to the respondents were lack of ICT training and poor internet connectivity with 41.7% and 30.1% response rate, respectively. A major inference to be drawn from this finding is that the main challenges to effective utilization of ICTs by the extension workers in the study area were poor infrastructure and capacity building.

**Table 5: Challenges to ICT usage by respondents.**

<b>Challenges*</b>	<b>Frequency</b>	<b>Percentage</b>
Lack of ICT training	86	41.7
Poor electricity	129	62.6
Poor internet connectivity	62	30.1
ICT facilities not available	91	44.2

\* Multiple responses.

Source: Field survey, 2014

## CONCLUSIONS

From the findings of the study, it was concluded that the educational qualification of the respondents ranged from Diploma to Master's Degree. Radio was the most frequently utilized ICT by the extension workers in the study area, while internet facility was the most important source of information for the extension workers. Educational level, place of residence and ICT training had significant influence on the use of ICT by the extension workers. Major challenges to the use of ICT facilities by extension workers in the study area were poor electricity supply and non-availability of ICT facilities.

## RECOMMENDATIONS

In view of the leading role played by internet as a source of information, it was recommended that more internet centres should be established at the village levels under the supervision of block extension supervisors to bring internet services closer to extension workers who reside in the rural areas.

In order to revitalize the extension system, young graduate with ICT training should be recruited as extension workers while capacity building on ICT use should be organized for the existing extension workers.

To facilitate effective utilization of ICTs, provision and improvement of rural infrastructure such as electricity and telecommunication should be undertaken by government in collaboration with other social investors.

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