



Utilization of Information and Communication Technologies (ICTs) by Agricultural Extension Workers in Niger State, Nigeria

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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. 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 ICT 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, Extension workers

1. 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.

This is probably why the role of ICTs in enhancing the work of agricultural extension agents is gaining recognition. 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 ICTs 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, and if modern ICT facilities are not well build into the mainstream of agricultural extension system,

there is likelihood of delay in the dissemination and utilization of scientific information for increased agricultural production (Adebayo and Adesope, 2007).

Therefore, for the agricultural extension sub-sector to be alive in 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:

- i. describe the socio-economic characteristics of the respondents;
- ii. determine the utilization of ICTs by the respondents;
- iii. examine ICT facilities used by the respondents for sourcing extension information;
- iv. determine the factors that influence the usage of ICTs by the respondents; and
- iv. ascertain the challenges to the utilization of ICTs by the respondents.

2. Materials and methods

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. Covering 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 with 342 agricultural extension workers as target population for the study. Multi-stage sampling technique was used to select proportional sample size randomly from agricultural zones, extension blocks and 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.

Questionnaire was used to collect data. The dependent variable for the study is ICT usage and the variable was measured based on the frequency and number of ICTs used by the extension workers. Independent variables i.e. 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 dummy variables. 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.

3. Results and discussion

3.1 Socio-economic characteristics of respondents

Result in Table 1 indicated 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 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 showed 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 revealed that 51.9% of the respondents reside in towns, majority (55.8%) of who had ICT training.

3.2 Utilization of ICTs

Finding in Table 2 showed 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 source of information due to its affordability, portability and accessibility of its signal even in the rural areas. Arokoya (2003) reported that access to radio is 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 these who resides in the rural areas.

3.3 ICT facilities used for sourcing extension information

Table 3 revealed 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 provide access to different websites of agricultural research institutes and extension organizations, which provides specific information that address problem peculiar to need, time, season or farm operation.

3.4 Factors influencing usage of ICTs

The result of the regression analysis in Table 4 indicated that the educational level of the respondents had significant influence on the usage of ICTs ($Z=3.74$). This point 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 resides in the towns and cities

used ICT facilities more than these that lives 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 ($Z=1.99$). This can roughly be used to explain the value of training to staff for them to function properly.

3.5 Challenges of ICTs utilization

Entries in Table 5 showed 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 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 infrastructures and capacity building.

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

Variables	Frequency	Percentage
Age		
21-30	35	17.0
31-40	86	41.0
41-50	71	34.5
51-60	14	6.8
Gender		
Male	170	82.5
Female	36	17.5
Educational level		
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
Working experience		
5-14	71	34.5
15-24	105	51.0
25-34	30	14.5
Place of residence		
Town/Cities	107	51.9
Village	99	48.1
ICT training		
Had ICT training	115	55.8
No ICT training	91	44.2

Table 2. Distribution of respondents based on ICTs utilized

ICTs*	Always	Sometimes	Percentage
	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)
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

Table 3. Distribution of respondents based on ICTs used for sourcing extension information

Types on information*	Radio	Television	Internet	Telephone
	F(%)	F (%)	F(%)	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

Table 4. Multinomial logit regression analysis of factors influencing usage of ICTs

Factors	Coefficients	Z-Value
Age	0.00371	0.05 ^{ns}
Educational level	0.13452	3.7 ^{5**}
Gender	0.03730	0.98 ^{ns}
Place of residence	0.03913	3.28 ^{**}
Working experience	0.15744	1.82 ^{ns}
ICT training	0.02356	1.99 [*]

** Significant at 1% , * Significant at 5% , ns Not significant

Table 5: Challenges to ICT usage by respondents.

Challenges *	Frequency	Percentage
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.

4. Conclusion and recommendations

From the findings of the study, it was concluded that 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.

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 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 training on ICT should be organized for the existing extension workers.

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

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کاربرد فناوری اطلاعات و ارتباطات (ICTs) توسط کارکنان ترویج کشاورزی

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این مطالعه به بررسی وضعیت کاربرد فناوری‌های اطلاعات و ارتباطات توسط کارکنان ترویج کشاورزی ایالت نیجر در کشور نیجریه می‌پردازد. برای دستیابی به اهداف تحقیق، به طور تصادفی و متناسب با حجم جامعه از سه منطقه کشاورزی در ایالت مذکور از طریق روش نمونه‌گیری چند مرحله‌ای، ۲۰۶ نفر انتخاب شد. پایایی پرسشنامه از طریق ضریب کرونباخ آلفا محاسبه شد (۰/۸۱). داده‌های جمع‌آوری شده از طریق آمار توصیفی و تحلیلی ارزیابی شد. نتایج تحقیق نشان داد سطح تحصیلات پاسخ‌دهندگان بین دیپلم تا فوق لیسانس بوده است. رادیو بیشترین کاربرد را در بین فناوری‌های اطلاعات و ارتباطات داشته است (۰/۷۶/۷). همچنین اینترنت نیز به عنوان مهمترین منبع اطلاعات ترویج برای پاسخ‌دهندگان بوده است. نتایج رگرسیون نشان داد که سطح تحصیلات، محل سکونت و آموزش در زمینه ICTs نقش معنی‌داری بر کاربرد ICTs داشته است. مهمترین چالش‌ها برای کاربرد ICTs به ترتیب شامل تأمین ضعیف انرژی برق (۰/۶۲/۶) و عدم دسترسی به تسهیلات اینترنت (۰/۴۴/۲) می‌باشد. بنابراین پیشنهاد گردید که دانش‌آموختگان جوان که در زمینه ICTs آموزش دیده‌اند به عنوان کارکنان ترویج به استخدام درآیند و همچنین ظرفیت‌سازی لازم از طریق آموزش در زمینه ICTs برای کارکنان موجود نیز سازماندهی شود. پیشنهاد گردید که مراکز اینترنتی در سطح روستاها برای ارائه خدمات اینترنتی به کارکنان ترویج کشاورزی و روستایی تأسیس شود.

شکل

کلمات کلیدی:
کاربرد، فناوری
اطلاعات و ارتباطات،
کارکنان ترویج