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Access and Utilization of Information and Communication Technology (ICT) Devices among Small Scale Farmers in Kabba/Bunu Local Government Area, Kogi State - Nigeria

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Abstract

The study evaluated access and utilization of ICT among small scale farmers in Kabba/Bunu LGA of Kogi State. A three stage sampling technique was used to select 150 farmers. A well structured questionnaire was used to generate primary data. Obtained data were analyzed with descriptive statistics and Logit regressions analysis. The farmers had a mean age of 41 years while most (83%) attended formal education with a mean household size of 4 persons. About 61% of the respondents had no contact with extension agents while majority (79%) belonged to cooperatives. Further, 97.21% of the famers most often had access to radio as source of information while findings also showed that the farmers (63.36%) never used ICT devices to access agricultural information. The Logit regressions result revealed that age, level of education, level of income and extension contact had positive and significant relationship with utilization of ICT devices at 1% level of probability. The major problems the farmers encountered in the utilization of ICT devices were cost of the devices, level of illiteracy and lack of interest. It was concluded that farmers most often accessed and utilized the conventional information methods (radio and television) in accessing agricultural information.

Key Words: Farmers, Evaluation, Information, Utilization, Devices,

Introduction

The use of information and communication technologies (ICT) in agriculture is an emerging trend expected to help improve the extent of farmers' access to agricultural information. According to Singh *et al.* (2015), Agriculture Information System (AIS) is a computer based information system which contains all the interrelated information that helps farmers in the management information and policy decision making. Munyua and Adera (2009) and Pande and Deshmukh (2015) reported that radio, television, cellular phones, computers, tablets and networking, hardware and software, satellite systems are some of the ICT devices that help farmers in facilitating their farming activities. Akude (2010) defined as the application of new electronic and other technologies (computers, communication satellites, fibre optics, video recording etc) to the creation, storage, selection, transformation and distribution of information of all kinds. Farmers are short of adequate information that would help to assist them in productivity and market survey for their yields and products. Farmers experience many challenges with respect to information dissemination and accessibility to ICTs to increase their agricultural information and knowledge. Lack of infrastructure is found as the biggest challenge in deploying ICTs to solve agricultural information dissemination problems in Nigeria. Without such resources as ICTs, there are few business that can thrive today all over the world. Although most urban communities in Nigeria have adopted

ICTs, this is not the case with our rural communities (UNDP, 2002). ICTs application in agriculture most especially to Nigerian rural farmers is highly limited because of insignificant level of attention on the part of the government on one hand, as well as the huge capital required for setting it up on the other hand. For these reasons, it has affected the free flow of information on production capacity of farmers in terms of land cultivation, pest and disease control, marketing of farm's produce and farm activities in developing countries such as Nigeria. This study therefore was carried out to evaluate the access and utilization of Information and Communication Technology (ICT) devices among small scale farmers in Kabba/Bunu Local Government Area of Kogi State, Nigeria with the objectives to describe the socio-economic characteristics of farmers, evaluate farmers extent of access of various ICT devices, ascertain farmers' frequency of utilization of the various ICT devices and determine the relationship between farmers socio-economic characteristics and the utilization of the various ICT devices and identify the problems farmers encounter in the utilization of various ICT devices in the study area.

Research Methodology

The study was carried out in Kabba/Bunu Local Government Area of Kogi State. It is an agrarian community located within the Southern Guinea Savannah Ecological Zone of Nigeria. The study area is located in the western part of the state and lies between 7^0N and $8^0$31'N of the equator and longitude $5^0$41'E and $6^0$15'E of the Greenwich meridian. The study area is known to have a tropical savannah climate with wet and dry seasons. The wet season ranges between the months of April-October and the dry season between the months of November-March. The mean annual temperature varies between 27^0C and 37^0C. The relative humidity is similarly variable with an average of 70-80 percent in July and August. The soil in the study area is predominantly sandy and loam, pure loam and clay loamy in texture. Majority of the inhabitants are farmers who plant yam, maize, sorghum, sweet potato, cassava, etc and reared animals such as cow, poultry, pig, sheep, goat, etc while minority are engaged in business and civil servants. The administrative headquarter is located in Kabba town. The Local Government Area has a population of 119,929 with 55,382 as females while 64,547 are males (National Population Census, 2006). The language spoken by the inhabitants is Yoruba while the dialect is Okun.

Three stages sampling technique was adopted to select towns and villages that are majorly known for agricultural production in larger quantities. In the first stage, 5 towns in the LGA were randomly selected. In the second stage, six villages were randomly selected from each town. In the third stage, 10% of the farmers were selected from the sampling frame in each village. This brings the number of respondents for each town to thirty (30). This gave a total of one hundred and fifty (150) respondents for the study, though 98 questionnaires were found valid to be used for analysis.

The primary data for the study was obtained through the administration of structured questionnaires while secondary information was obtained via journals and net. Data collected were analyzed using descriptive statistics to achieve objectives i, ii, iii and v. Objective 4 was achieved with the use of Logit Regressions Analysis at 1% significant level employing SPSS package version 20.

The Logit Regression model is state below:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + U}$$

Y = Utilization of ICT devices (Yes =1, N0. = 0)

X_1 = Age of farmers (Years)

X_2 = Sex (Male = 1; Female = 0)

X_3 = Marital status (Married = 1; Single =0)

X_4 = Household size (No. of people in the household)
X_5 = Level of Education (Years)
X_6 = Level of income (₦/K)
X_7 = Farming Experience (Years)
X_8 = Membership of a co-operative or farm association (Membership = 1; or otherwise = 0)
X_9 = Total farm size (Hectares)
X_{10} = Contact with Extension (Frequency of contact)
U = Error term

Results and Discussion

Result on socioeconomic characteristics of the respondent shows that the modal age is between 40-49 years with a mean of 41 years in the study area. This implies that the farmers are still in their productive stage though are aging, which indicates that younger farmers are less interested in agriculture in the study area. This finding agrees with the findings of Mohammed (2011) that younger people were less interested in agricultural activities. Majority (69.39%) of the respondent were male. This is probably because the female engaged themselves in domestic work and marketing activities in the study area. This result corroborates the results of Ironkwe (2013) who reported that agricultural technology development and transfer processes were being dominated by male gender group. Most of the respondent attended one form of education of the other with a mean of 13 years spent in a formal education level. This level of educational attainment could affect productivity and adoption of innovation. Egun (2009) observed that years of formal education has a positive influence on adoption of innovation. About (69.39%) of the respondent were married. Most (54.08%) of the respondent had 1- 5 persons with a mean of 4 persons in each household. This will make the farmers to rely more on hired labour which could affect their income. About 54.08% of the respondent had between 0-1 ha of farm size with a mean of 1.4 ha of farm land to cultivate on. This means that the farmers are small scale farmers in the study area. About 56.13% of the respondent had between 1 - 10 years farming experience with a mean of 15 years of farming experience in the study area.

More than half (67.35%) of the respondent had between ₦50, 000 - ₦99, 000 level of income with a mean of ₦98, 000 recorded in the study area. Most (61.22%) of the respondent had no access to extension agents. This means that farmers still rely on traditional way of farming and this could affect their output while majority (79.59%) of the respondent do no not belong to any cooperative society in the study area.

Table 2 reveals that on the average, about 27% of the farmers never had access to any of the ICT devices. Also, about 11% often had access; about 11% very often had access while about 51% most often had access to the various ICT devices for utilization in the study area. The result further shows that radio (97.21%), television (78.12%) and telephone (71.79%) ranked first, second and third respectively in their access in the study area. The farmers had very low access to print media and internet. This means that the farmers do not have adequate access to newspapers, magazines, bulletins and hand bills and as such cannot access agricultural information from them. The very low access to internet could be associated with the level of awareness of internet and the educational attainment levels of the farmers in the study area. The result collaborate the findings of Chapman and Blench (2003) and Nakabugu (2001) who reported that Radio is a powerful communication tool that has proved to be the most effective media in promoting agriculture and

development in rural area. Also, Kuponiyi (2000) asserted that Radio has been identified as the only medium of mass communication the rural population is very familiar with

Table 1: Socioeconomic Characteristics of Farmers in the Study Area

Characteristics	Frequency	Percentage (%)	Mean
Sex			
Male	68	69.39	
Female	30	30.61	
Age			
20 – 29	10	10.20	
30 – 39	12	12.24	
40 – 49	40	40.82	41
50 – 59	30	30.61	
> 59	06	06.12	
Marital Status			
Married	68	69.39	
Single	30	30.61	
Level of Education			
Non Formal Education	15	15.31	
Primary Education	53	54.08	13
Secondary Education	20	20.41	
Tertiary Education	10	10.20	
Household Size			
1 – 5	53	54.08	
6 – 10	40	40.82	4
11 – 15	05	5.10	
> 15	0		
Farm Size			
0 – 1.0	53	54.08	
1.1 – 2.0	30	30.61	1.4
2.1 – 3.0	15	15.31	
Farming Experience			
1 - 10	55	56.13	
11 - 20	23	23.47	15
21 - 30	12	12.24	
> 30	08	8.16	
Level of Income			
50, 000 – 99, 000	66	67.35	
100, 000 – 149, 000	16	16.33	98, 000
150, 000 – 199, 000	10	10.20	
> 199, 000	06	6.12	
Extension Contact			
None	60	61.22	
1 – 2 times/month	30	30.61	0.9
Thrice a month	08	8.17	
Membership of Cooperatives			
Yes	78	79.59	
No	20	20.41	

Table 2: Famers Responses on the Frequency of Access to Various ICT Devices in the Study Area

ICT Devices	Extent of Access					
	Never	**Often**	**Very often**	**Most often**	**Total**	**Rank**
Radio	0%	0%	2.79%	97.21%	100	1st
Television	0%	7.00%	14.88%	78.12%	100	2nd
Telephone	0%	10.20%	18.09%	71.79%	100	3rd
Print Media	61.21%	20.29%	12.50%	6.0%	100	4th
Internet	73.09%	17.30%	6.20%	3. 41%	100	5th
Average	**26.86%**	**10.95**	**10.89**	**51.30**	**100**	

Table 3 shows that 21.33% of the farmers regularly used the devices, 13.31% rarely used the devices while 65.63% never used any of the devices in accessing agricultural information in the stud area. The result further showed that the use of radio (40.20%) ranked first followed by the use of television (33.10%) and the use of telephone (20.41%). The result explains that farmers do not rely on the use of ICT devices in obtaining agricultural information. This finding confirms the report of Nazari, and Hassan (2011) who reported that television and radio play very major roles in the transfer of modern agricultural technology to educated and uneducated farmers within a short time for farming communities. Further, Mahmood and Sheikh (2005) opined that Television plays significant roles in creating awareness and knowledge about latest agriculture technologies information among farmers.

Table 3: Farmers Responses on the Frequency of Utilization of Various Information and Communication Technology Devices to Access Agricultural Information in the Study Area

ICT Devices	Never	Rarely	Regularly	Total %	Rank
Radio	41.43%	18..37%	40.20%	100	1st
Television	53.63%	13.27%	33.10%	100	2nd
Telephone	61.02	18.57%	20.41%	100	3rd
Internet	89.10%	2.74%	8.16%	100	4th
Print Media	81.63%	13.58%	4.79%	100	5th
Average	**65.36**	**13.31**	**21.33**	**100**	

The regressions result showed that 10 variables were fitted into the model, out of which 4 (age, level of education, level of income and extension contact) had significant and positive relationship at 1% probability level with the use of ICT devices in the study area. On the other hand, sex, marital status, household size, farm size, farming experience and membership of cooperatives did not have significant relationship with the utilization of ICT devices. The positive significance of the variables implies that a unit increase in any of the variable will result to a proportionate increase in the utilization of ICT devices to access agricultural information in the study area. The result further revealed that the adjusted R^2 is 0.59. This implies that 59% of the independent variables accounted for the variations in the dependent variable.

Table 4: Tobit Regressions Result of the Relationship between Socioeconomic Characteristi cs and Utilization of various ICT Devices in the Study Area

Characteristics	Regressions Coefficient	Standard Error	t-values	Results
(Constant)	0.390	0.292	1.336	
Sex	0.469	0.248	1.891	NS
Age	0.037	0.008	4.625***	S
Marital Status	0.780	0.655	1.190	NS
Level of Education	0.031	0.003	10.333***	S
Household Size	0.913	0.656	1.391	NS
Farm Size	0.908	0.667	1.361	NS
Farming Experience	0.858	0.773	1.109	NS
Level of Income	0.018	0.002	9.000**	S
Extension Contact	0.037	0.009	4.111***	S
Membership of Cooperatives	0.049	0.112	0.437	NS
R^2	0.65			
Adjusted R^2	0.59			

*** = 1% Significant NS = Not Significant; S = Significant

Table 5: Multiple Responses of Problems Farmers Encountered in the Utilization of Various ICT Devices in the Study Area

Factors	Radio	Television	Telephone	Print Media	Internet	Average	Rank
Cost of the devices	43%	64%	86%	25%	97%	63%	1st
Level of Illiteracy	8%	16%	44%	87%	98%	50.6%	2nd
Difficulty in understanding the technicalities of the device	10%	31%	57%	33%	89%	44%	3rd
Lack of Interest	4%	12%	41%	75%	88%	44%	3rd
Unawareness of the usefulness of the devices in accessing information	8%	11%	61%	27%	90%	39.4%	5th
Inadequate knowledge of how to operate the devices	5%	10%	35%	20%	91%	32.2%	6th
Inadequate supply of power	39%	45%	25%	08%	10%	25.4%	7th

Table 5 shows that the cost of the devices averaging 63% ranked as the first problem farmers encounter in the utilization of various ICT devices. This followed by level of illiteracy (50.6%), difficulty in understanding the technicalities of the devices (44%) and lack of interest (44%) as the major problems farmer encounter in the utilization of ICT devices in the stud area. Further, the use of the conventional devices; radio and television were mostly affected by inadequate supply of power, and cost of the devices. Similarly, the use of telephone was mostly affected by cost of the

device, unawareness of the usefulness of the device in accessing information and difficulty in understanding the technicalities of the device. The use of print media was affected by level of illiteracy and lack of interest.

Conclusion and Recommendation

The farmers are most often access and utilized the conventional information methods, age, level of education, level of income and extension contact significantly relationship influenced the utilization ICT devices and the major factor constraining the use of ICT devices in the area is the cost of the devices.

The Agricultural Development Project (ADP) should expose the farmers to other sources of accessing information their The Local government authority should as part of their community project establish internet centres in designated areas to facilitate farmers access information through this source.

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