

Assesment of the Utilization of Information and Communication Technologies by Crop Farmers in Gombi Local Government Area, Adamawa State, Nigeria

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Abstract

The study examined the application and use of information and communication technologies among crop farmers in Gombi Local Government Area of Adamawa State, Nigeria. Multistage sampling technique was used in selecting 120 respondents for the study. Data were collected through the use of structured questionnaire. Descriptive and inferential statistical tools were used to analyse the data. The findings revealed that most (73.7%) of the respondents were male and marginally above half (52.5%) were between the age of 31-40. Majority (90%) of the respondents attained one form of education or the other. Also, 56.4% of the respondents preferred the use of mobile phone to acquire agricultural related information. The result of regression analysis shows that out of seven variables tested, five were significant at 1% and 5% level respectively. The major constraints faced by the respondents were high cost of ICTs, lack of time for training and lack of awareness on ICTs. It is recommended that various and sustainable ICT related programmes should be organized for capacity building to the farmers to update their knowledge on the application of ICT facilities and stakeholders should subsidize the cost of their services to facilitate easy access to information on available innovations. The stakeholders should also help at improving the quality of the services and improve network coverage.

Key words: Assessment, Crop, farmers, ICTs, Utilization

1. Introduction

Information and Communication Technologies (ICTs) is the scientific, technological and engineering discipline for management of technologies used in the handling of information, processing and application related to computers. ICT is also concerned with interactions between man and machines; and associated socio-economic and cultural matters [1] Information technology could be regarded as the coming up and putting together of telecommunication for the purpose of handling information. The bottom-line is that, information technology is an application that is computer-based for the purpose of sharing ideas, data and other relevant information and the improvement of the status quo for development. However, in the recent past, there has been revolution with regards to information and

communication technologies. The world is going through an information technology revolution that has drastically changed many facets of human life, from politics, education, and entertainment to industry [2]. Agriculture and its associated natural resources management are not likely to be exception. [3] observed that agricultural extension depends largely on information exchange between and among farmers and a broad range of other actors. However, [4] pointed out that Nigeria's economy is rural-based, with over 70% of the population deriving their means of livelihood from agriculture either directly or indirectly. They further stated that these rural areas are still starved for most modern technological facilities. Information and Communication Technologies have unique features that provide opportunities to harness farmers in ways that are different from how the traditional media have

been used for development. According to [5], in comparison with traditional media, ICTs can offer opportunities for two-way and horizontal communication for opening up new communication channels for rural communities, intermediaries and development organizations that support them. Once mastered the potential of communication, it allows every user to be a sender, receiver, newscaster and broadcaster; support bottom-up articulation of development needs and perceptions, facilitate the merging of global and local knowledge of information, create and strengthen interactive and collaborative networks that enable information to flow from rural communities, facilitate dialogue between communities and development organizations, foster coordination of national and local development efforts and overcoming physical barriers to knowledge and information sharing.

Information and communication technology, according to [6] is an omnibus term that encompasses computer and telecommunications technology. It is any technology that is used in producing, organizing and distributing information. [7] see it as a broad based term that encompasses the gathering (acquisition), organization (packaging), storage and retrieval (dissemination) of information that can be in textual or numeric (books and documents), pictorial and vocal forms (audio-visual). In using the combination of all the above (multimedia) including computers and telecommunications (telephones) there is fact saying that information and communication technologies are the nervous systems of any contemporary society. ICT has led to a lot of achievements and innovations in different sectors of the Nigerian economy including agriculture. An effective agricultural extension depends on extension messages (information) in reaching many farmers and farmers problems reaching extension staff quickly and regularly. The extension agent is the only agent who teaches the production and recommendations directly to farmers. Through him, therefore, it is expected that the farmer benefits from agricultural research with the ultimate target of raising his agricultural production efficiency and effectiveness which may eventually lead to improved social and economic well-being of the farmer's household. Unfortunately, in Nigeria today, extension agents still depend heavily on traditional extension methods of communication which is no longer effective for the time bound research discoveries and there is a high farmer's ratio in the new millennium. Effective communication reflects a situation in which a skilful communicator duly sends a useful message through the proper channel to the appropriate audience who responds as desired [8].

Statement of the problem

In Nigeria information change from time to time due to changes in agricultural technologies, environmental changes, absence of appropriate agricultural policies, and the emergence of agricultural innovations that affect farmers in the use of ICTs facilities. Thus, better understanding of farmers' agricultural information and communication technologies is required and these information sources could help to guide farmers and other agricultural programmes to better development.

Some attempts have been made to study the ICTs. However, there has not been any empirical study into the use of information communication and technologies by crop farmers in the study area. The study was carried out to address the following research questions.

- i. what are the socio-economic characteristics of farmers in the study area;
- ii. what are the types of information and communication technology facilities in the study area;
- iii. what were the factors influencing the use of information and communication technology in the study area;
- iv. What was the constraints experience in use of information and communication technologies by respondents in the study area.

2. Methodology

Area of study

The study was carried out in Gombi Local Government Area (LGA) of Adamawa State. Gombi LGA is located between latitudes 10° and 11° and longitude 12° and 15° of the Greenwich meridian and covers approximately $17,101\text{km}^2$ [9]. The area has an estimated population of 147,787 [6]. The vegetation is made up of sparsely populated grasses and trees (*Tamarintus indica* and *Azadgirachta indica*). The rainfall last for about 4-5 months in a year with an average of 550mm and 770mm per annum [10]. The dry season begins in November and terminates in early June of the following year. Farming is the principal economy of the people in the area. The soil is high loam and good for cultivation of crops such as; sorghum, millet, maize, rice and cassava. It also favors the production of local cash crops such as cowpea, groundnuts, sesame and sugar cane on a large scale basis. Livestock production is also very important in the study area and is one of the largest concentrations of cattle in Adamawa state.

Source of data

Primary data were collected through the use of structured questionnaire administered to respondents. The data were collected based on their socio-economic characteristics, types and sources of information and communication technology facilities use by farmers, factors influencing the use of ICTs, farmers' attitude towards its utilization and constraints in its application and usage.

Sampling procedure and techniques of data analysis

A multi-stage random sampling technique was employed. In the first stage, eight wards out of ten were randomly selected. In the second stage fourteen villages were randomly selected from the sampled wards. Finally 120 farmers were selected from the fourteen sampled villages proportionate to size. The data were analysed using descriptive (frequency distribution and percentage), 4-point likert rating and inferential (Multiple regression) statistics. The frequency distribution and percentage were used to achieve specific objective (i), (ii) and (iv), while Objective (iii) was analysed using multiple regression analysis.

Descriptive statistics

$$X = \frac{\sum fx}{n} \dots \dots \dots (1)$$

Where X = mean, $\sum fx$ = Sum of individual observation and
 n = Sample size

Multiple regression analysis

Multiple regression analysis was used to determine the factors influencing the use of information and communication technology in the study area. Various functional forms (linear; semi-log, exponential and double log) were used. Linear function gave the best fit and is explicitly expressed as:

$$Y = f(b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 \dots) + \mu \dots (2)$$

Where:

- Y= Number of ICTs used (in percentage)
- X₁= Gender (dummy male1, female 0)
- X₂= Age (number of years)
- X₃= Educational qualification (years of schooling)
- X₄= Farm size (in hectare)
- X₅= Household size (number of persons)
- X₆= Annual income (in naira)
- X₇= Farming experience (in years)
- b₀= Constant
- μ= error term

3. Results And Discussion

Socio-economics characteristics of respondents

The distribution of respondents by socio-economic characteristics is presented in Table 1. The socio-economic variables studied include: sex, age, educational level, farm size, household size, annual income and experience in ICTs use by the respondents. The table shows that majority (73.3%) of the respondents were male while female constitutes only 26.7% in the study area. This implies that male led the agricultural labour force in the study area. It further implies that technology development, innovations and transmissions were gender bias. In addition, (52.5%) of the respondents were within the age range of 31-40 years. This implies most of the respondents are active in the use of ICTs facilities.

On the level of education, the result in the table further shows that majority (90.0%) of the respondents have attained one form of education or the other. This implies that level of education greatly affects information accessibility, comprehension and adoption of new agricultural innovation and practices. The result also shows that 62.5% of the

respondents have a farm size in the range 0.5-2. The finding is in agreement with that of [11] who opined that majority of Nigerian farmers are small scale farmers who cultivate less than five hectare. The study also indicates that most of the respondents (30.0%) have a household size of 6-8 members. This implies that household size could have both positive and negative influence on the activities of the family. The larger the family size the lesser food availability to each member of the household and also nutritional status may be possibly affected [12]. The study further reveals that most of the respondents (43.3%) earn between 100,000 – 200,000 income per annum. This means, the income level of the respondents in the study area is not satisfactory as the income per capita is low. This implies that limited access to agricultural information services by the respondents partly accounted to this problem. The study also indicated that 44.2% of the respondents had 1-5 years' experience based on their use of ICTs with a mean experience of about 2.73 years. This further implies that the respondents were not using ICTs facilities for long time in the study area.

Table 1: Socio-economic Characteristics of the Respondents (N = 120)

Variable	Frequency	Percentage
Gender		
Male	88	73.3
Female	32	26.7
Total	120	100.0
Age		
20-30	32	26.7
31-40	63	52.5
41-50	17	14.1
Above 50	8	6.7
Total	114	100
Educational Attainment		
No formal Education	12	10.0
Primary School	21	17.5
Secondary School	45	37.5
Tertiary education	42	35.5
Total	120	100
Farm Size (Ha)		
< 1	29	24.2
1.5-2	45	37.5
2.5-3	30	25.0
3.5 and above	16	13.3
Total	120	100
Household size		
≤5	34	28.3
6-8	36	30.0

9-11	22	18.3
12 and above	28	23.4
Total	120	100.0
Annual income		
>90,000	29	24.2
100,000-200,000	52	43.3
2010,000-300,000	23	19.2
3010,000 and above	16	12.3
Total	120	100
Experience in ICTs use		
None	10	8.3
≤5	53	44.2
6-10	40	33.3
111 and above	17	14.2
Total	120	100

Source Field survey 2016

Types of ICT facilities used by the respondents

Table 2 shows the types of ICT facilities used by the respondents in the study area. The study revealed that most (56.4%) of the respondents used GSM as the major ICT used. This was closely followed by radio (29.1%). While, the Table 2: Distribution of Respondents by types of ICTs Used

least is television (5.6%) and 8.6% of the respondents does not use any ICT facility to obtain information on agricultural production. This finding is in consonance with that of [13] who opined that radio has becomes the most important medium for farmers to obtain agricultural information.

Type ICT Used	Frequency	Percentage
Radio	52	29.1
Television	10	5.6
GSM	101	56.4
None	16	8.9
Total	179*	100

Source Field survey 2016

Factors influencing the use of information and communication technology in the study area

The results in Table 3 show the factors influencing the use of ICTs. The regression analysis revealed a coefficient of multiple determinations of (R^2) of 0.792838. This indicates that 79% of the variation in use of ICTs is accounted for by the explanatory variables included in the model. Also, most variables involved in the model jointly influenced the use of ICT facilities significantly as shown by the F- value (13.05). The results further revealed that gender (X_1), age (X_2), education (X_3), farm size (X_4), and annual income level (X_6) were positively related to use of ICTs by the respondents. Table 3: Relationship between socio-economic characteristics and factors influencing the use of ICTs among crop farmers

The results also indicated that gender, age, education, farm size and annual income level were found to be statistically significant at 1% and 5% level of probability, while household size (X_5) and experience in use of ICTs (X_7) were not significant. Education (X_3) were found to be significant at 1% and 5% level indicating that majority of the respondents have secondary and tertiary school certificate, and they appreciate the role of ICTs in the agricultural information.

Variables	Coefficient	Std. Error	t-Statistic
Gender (X_1)	0.871884	0.175950	4.956142***
Age (X_2)	0.175597	0.048661	3.608607***
Education level (X_3)	0.002296	0.000514	4.468609***
Farm size (X_4)	0.289065	0.070115	3.837458***

Household size(X_5)	0.003234	0.003566	0.907018 ^{ns}
Income level (X_6)	0.268341	0.120242	2.231677**
Experience in ICTs (X_7)	0.003234	0.003566	0.907018 ^{ns}
C	4.093146	0.767944	5.330006
R-squared	0.792		
Adjusted R-squared	0.755		
F-statistic	13.049		

Source: output from Eviews software *** 1%, ** 5% and NS not significant

Constraints experience in use of information and communication technologies by respondents in the study area

Table 4 shows that most (49.7) of the respondents reported high cost of ICT facilities, 8.2% lack physical access, 12.6% lack adequate time for training, while 7.5% indicated poor benefit on use of ICTs. The results further shows that 11.9% lack awareness on used of ICTs and 10.1% expressed lack of literacy level to operate ICT facilities. The study concluded that; high cost of purchase of ICT facilities

Table 4: Distribution of respondents based on Constraints

Constraints	Frequency	percentage
High cost of ICTs	79	49.7
Lack of physical access	13	8.2
Lack of time for training	20	12.6
Poor benefit in use of ICTs	12	7.5
Lack of awareness on ICTs	19	11.9
Lack of literacy	16	10.1
Total	159*	100

Source: Field survey, 2016

*multiple response

Stakeholders should organize capacity building for the farmers to update their knowledge on the application of ICT facilities and to subsidize the cost of ICT facilities to enable

remained the most serious constraint faced by farmers regarding the application of ICT facilities in obtaining their agricultural related information. This result is in line with findings of [14] that high cost of purchasing radio and television set, cost of purchasing print media such as: newspaper, magazine bulletin, and lack of infrastructural facilities, especially electricity, wrong timing of agricultural programs and low level of literacy among farmers were some of the factors militating against the effectiveness of mass media in communication channels.

farmers have easy access to agricultural related information as it will serve as a booster for decision making.

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