



Determinants of Access and Farmers' use of Information and Communication Technologies (ICTs) in Edo State, Nigeria

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ABSTRACT: This study assessed determinants of farmers access and use of new ICTS in the study area. Data obtained from 270 respondents through multi-stage sampling technique were subjected to descriptive and logit regression analysis. The results show that GSM is the only new ICT farmers have access to (mean= 2.66) and use regularly (mean =3.44) while they have little or no access to and use either computer, E- mail or internet. This poor farmers access to and use of new ICTs can limit the extent of agricultural information they can receive. The probability of respondents having high access to new ICTS was significantly related to education (b = 0.784) and farming income, (b = 0.754). The study recommends organizing farmers into associations for training in the use of and collective acquisition of new ICTs. @JASEM

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Information and communication technologies (ICTs) are basically technologies that enhance the creation, storage, processing, communication, and dissemination and implementation of data as well as information using microelectronics, optics, telecommunication and Computers . Revolution in the information and communication technologies has provided opportunities for globalization of agricultural practices in rural communities (Richardson, 1996). Arokoyo (2003) outlined five main areas of information technology (IT) applications in support of agricultural and rural development as follows: (1) economic development of agricultural producers, (2) community development,(3) research and education, (4) small and medium enterprises development and (5) media networks. Yekini and Hussein (2007) said that rural communities require information on supply of inputs, new technologies, early warning systems (on drought, pests and diseases), credit , market prices and their competitors. Given the fact that knowledge and information are basic ingredients of food security, ICTs if properly harnessed, offer the potential to store and transmit needed information for agricultural and rural development. The old ICTs of radio, television and wireless technology as well as the internet are important tools for meeting the information needs of small scale farmers. The information needs of farmers cut across extension education, agricultural technology, agricultural credit and marketing..Traditional media have been used very successfully by farmers in Edo State. For example the agricultural extension agents have used the radio to deliver agricultural messages to farmers. Print, video, television, films, slides, pictures drama, dance, folklore, group discussions, meetings, exhibitions and demonstrations (Munya, 2000) have also been used to speed up the flow of information.

New ICTs however, have the potential of getting huge amount of information to farmers in a more timely, comprehensive and cost effective manner, and could be used along with traditional media (Fagbola and Adebisi-Adelani, 2007). Yekini and Hussein (2007) pointed out that there has not been optional deployment of the new ICTs by research and development organizations for development oriented activities in Nigeria. They further observed that effective information dissemination for agricultural research and development in the developing countries is not optimal between the national and international research institutions. There equally exists a great problem in the transfer of information from the research institutions to the National extension systems, and a greater one in disseminating to the information users especially farmers. This means that there is a divide in knowledge between delivery institutions and rural farmers. This gap in knowledge is further heightened by the fact that farmers' access to the new ICTs is very scarce in the rural areas. There is need therefore to examine factors which enhance or hinder farmers access to and use of new ICTs in Edo State.

The main objective of this study was to examine the new ICTs farmers have access to and use in Edo State. The specific objectives focused on the following: to examine the personal characteristics of farmers in the study area; assess farmers access to and use of modern ICTs in the study area; to ascertain the areas of agricultural production in which farmers use new ICTs; and identify the determinants of farmers' access to and use of modern ICTs. The hypothesis of the study which is stated in the null form include: There is no significant relationship

between farmers' socio-economic characteristics and their access to new ICTs.

METHODOLOGY

The study was carried out in Edo State of Nigeria. The major telecommunication and internet services providers in the state are MTN, Celtel, Gol, Starcom, Multi-Links, Zoom and Visafone communications. The Edo State ADP contact and non-contact farmers constituted the study samples. A multi-stage sampling procedure was used to select 9 blocks communities from 135 contact and 135 non contact farmers were randomly selected. This gave a total of 270 respondents. The primary data for the study were obtained from the 270 respondents by means of interview schedule.

The reliability of the data instrument was tested using cronbach Alpha for items relating to farmers' access to ICTs (0.700), frequency of use of ICTs (0.598) and purpose of using ICTs (0.843). The dependent variable for the study was frequency of use of new ICTs. Respondents were asked to indicate how frequently they use new ICTs for agricultural information sourcing and their response measured on a 4-point scale of every week (4), every –two weeks to once a month (3), once in two months to once in three months (2) and not at all (1). Farmers access to modern ICTs facilities such GSM, e-mail, computer and internet were measured on a 3-point Likert_type scale as follows: High access (can get to use anytime (3), average access (can get to use sometimes (2), none (cannot get to use at all (1).

RESULTS AND DISCUSSION

TABLE 1: Distribution of Respondents By Socio-Economic Characteristics

Characteristics	Mean	Mode	Frequency	%
Gender (Male)	Male			
Male	-	-	183	73.9
Age (40-49) Years	46 Years	-	105	41.5
Marital Status (Married)	-	-	212	83.8
Household Size	-	<6	133	52.6
Farm Size (1.1-1.5ha)	1.67 ha	1.3 ha	105	41.5
Educational Level (Pry. Sch.)	-	-	110	43.5
Farming Status (Full-Time)	-	-	151	59.7
Farming Income	-	<₦100,000	177	70.0

Source: Field survey data, 201

Table 2 reveals that GSM is the only modern ICT the respondents have access to (mean = 2.66), while they have little or no access to computer (0.94). E-mail (0.88) and internet (mean = 0.70). This is indicated by the mean scores of less than 2.00. The fact that farmers have major access to GSM suggest that

Respondents' personal characteristics are as presented in Table 1. Among the respondents, males were in the majority representing 73.9. This is expected because farming occupation is male dominated the mean age of the respondents was 46 years. Most (41.5%) of the farmers were between 40 and 49 years. This suggests that respondents are relatively young and active farmers. The finding corroborates Oguoma (1995) who in his study of effective rural farm labour mobilization found that 75% of the farmers were in the age bracket of 45-50 years. Majority of the respondents (83.8%) were married. Married farmers are likely to have access to family labour such as using their wives and children on the farm. The modal household size of the farmers was 52.6% (<6 members of household).

Ojo and Ajibefuin (2000) observed that the availability of family labour depend largely on household size and its age structure. The average farm holding of the respondents was 1.67 hectares while the modal farm size of the farmers (41.5%) was 1.1-1.5 hectares. This finding shows that farmers in the study area are small-scale farmers. The educational level of the respondents was primary education (43.5%). Taking the base line for literacy to be primary school level, the Implication of the finding is that majority of the farmers in the study area should be able to appreciate the use of modern ICTs in meeting their agricultural information needs. The respondents were full time farmers, revealing that farming was their primary occupation. Majority (70%) of the respondents earned less them N100, 000 per annum from farming activities. This income level may probably assist them to meet modern ICTs needs for agricultural information.

farmers will use GSM more than other modern ICT regularly used by farmers (mean = 3.44), whereas the mean score for E-mail (mean =1.30) computer (mean = 1.23)and internet (mean = 1.09) indicates that these are not regularly used by the farmers since the mean scores are less than 2.50. This means that farmers are

yet to embrace modern ICTs, apart from GSM. This can limit the extent of agricultural information they can receive.

TABLE 2: Distribution of Respondents by Access to and Use of Modern ICTS

<u>Access to ICTs</u>	<u>mean</u>	<u>SD.</u>
GSM	2.66*	0.66
Computer	0.94	0.87
E-mail	0.88	0.85
Internet	0.70	0.65
<u>Use of ICTs</u>		
GSM	3.44**	0.87
E-mail	1.30	0.59
Computer	1.23	0.58
Internet	1.09	0.34

Source: Field survey data 2010.

*Have access (mean \geq 2.00) ** regular usage (mean \geq 2.50). SD = standard Deviation.

Table 3 indicates that to communicate with extension agents (mean = 2.33) had the highest use of ICTs followed by to obtain information on improved farm practices (mean= 2.16) and to communicate with customers/buyers (mean= 2.09). All other uses had mean below 2.00 which suggests that farmers do not

use modern ICTs regularly for such purposes. Thus, farmers use modern ICTs mainly for communicating with extension agents and obtaining information relating to improved farm practices as well as communicating with customers.

TABLE 3: Distribution of Respondents by Application of ICTS for Agricultural Tasks

<u>Agricultural uses</u>	<u>Mean</u>	<u>SD</u>
Communicate with extension agents	2.33*	1.324
Obtain information relating to improved farm practices	2.16*	1.232
Communicate with customers/buyers	2.09*	1.224
Obtain information on land preparation	1.95	1.108
Obtain marketing information on farm prices	1.90	1.217
Obtain information relating to farm storage	1.89	1.116
Obtain information on crop production	1.89	1.158
Source for agricultural input/resources	1.83	1.81
Obtain information on processing of farm produce	1.82	1.123
Obtain information on animal production	1.66	0.986
Obtain information on pest/ disease control	1.79	1.144
Source for agricultural credit	1.52	0.970

Source: field survey data, 2010.

*Regular (mean \geq 2.0;) S.D = standard Deviaa.

Results of logit analysis (Table 4) reveals that educational status (b= 0.784) and income (b = 0.754) are important determinants of respondents access to new ICTs, in the study area. These were significant at the 5% probability in favour of formal education, implying that being educated increases the probability of high access to new ICTs. This is so because education enhances the ability of respondents to use new ICTs. An increase in respondents farming income is also a determinant of respondents access

status (have access or no access) suggesting that farmers earning higher income probably appreciate the need for applying new ICTs in agricultural production as high income afford them the opportunity to acquire new ICTs.

Gender, age, farm size and household size were not important determinants of respondents likelihood of having access to new ICTs. The model Chi-Square (49.09), which is significant at 1% (Critical $R^2 =$

0.8646) is an indication of the strong influence of the significant explanatory variables on respondents likelihood of high access to new ICTs in the study

area. About 29% variation in farmers' access to new ICTs is accounted for by the explanatory variables.

TABLE 4: Parameter Estimates of Determinants of Respondents Access to New ICTS.

Independent Variables	Coefficient	t
Sex	-0.359	0.674
Age	-0.323	1.385
Education	0.784	3.302*
Farm Size	0.212	0.566
Household Size	-0.0576	1.766
Income	0.754	4.253*

Computers from field data, 2010.

Model chi-square (δ^2) = 49.07, Pseudo R^2 = 0.289

*Significant at 5% (t = 1.943) ($P \leq 0.05$) Critical R^2 = 0.8646

Conclusion: New ICTs have the potential of getting huge amount of information to farmers in a more timely, comprehensive and cost effective manner. Unfortunately, farmers in the study area have access to and use only GSM and have little or access to computer, E-mail or internet. These three new ICTs have higher potential of conveying considerable amount of information on agriculture and other agriculture-related issues than GSM. It is necessary therefore that urgent step be taken to enhance farmers' access to new ICTs, hence the following recommendation:

1. farmers can be organized into association for training in the use of new ICTs acquisition cost are beyond the reach of individual farmers;
2. the importance/relevance of new ICTs in meeting the agricultural information needs of farmers must be clearly brought to the understanding of farmers to encourage positive attitude towards the use of new ICTs for agricultural production; and
3. Extension activities should be intensified among the farmers there should be emphasis on providing adult literacy programmes for them as education enhance their ability to use new ICTs.

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