International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

http://ijpsat.ijsht-journals.org
Vol. 28 No. 2 September 2021, pp.139-146

Perceived Roles of Selected Information and Communication Technologies in Agricultural Extension/Farmers Training in Oyo and Ekiti Southwestern States of Nigeria

[1]Akintonde J.O., [1]Akintaro O.S., [1]Oladipo S.O., [2]Bamidele B.S., [1]Oladosu I.O. and [1]Ogunwale A.B.

[1]Department of Agricultural Extension and Rural Development, PMB 4000, Ladoke Akintola University of Technology, Ogbomoso, Oyo State, Nigeria.

[2]Department of Agricultural Extension and Management, Federal College of Agriculture, P.M.B. 5029, Moore Plantation, Ibadan, Oyo State, Nigeria.

Abstract – Perception plays a serious role in individual's disposition and making rightful judgement of any event. Farmers' interest, knowledge and experience over time in crop production may influence their attitude and participation in extension training activities. This study therefore determined perceived role of ICTs in agricultural extension/farmers training in Oyo and Ekiti States of Southwester Nigeria. Multistage sampling technique was used to select Two-Hundred and Thirty-Five (235) crop farmers. Data for the study was collected through structured interview schedule and analyzed with frequency counts, percentage, mean and ranking as main descriptive statistical tools, while Ordered probit inferential tool was employed to make inference between the variables. The mean age of the crop farmers was 49years, both male (61.3%) and female (38.7%) constituted the sampled population, majority (82.5%) of the crop farmers are literate with different educational background with 26years of farming experience. GSM-Phone (100.0%), Digital Camera/Video (100.0%each), Posters and Extension Bulletins (100.0%) are part of ICTs that are available and used for agricultural extension/farmers training. The crop farmers had different perception towards agricultural extension/farmers training. Some of the selected socio-economic variables (age- 3.41*, $p< 0.01$; sex- 1.72*, $p< 0.1$; marital status- 5.17***, $p< 0.01$; years spent in school- 1.77*, $p< 0.1$ and years of farming experience- 2.12, $p< 0.5$) exhited significant relationship with farmers perception on roles of ICTs in agricultural extension/farmers training.**

Keywords – Perception, Roles, ICTs, Extension/Farmers, Training.

I. INTRODUCTION

Under developing countries especially Africa including Nigeria are still striving to meet up with their food demand, while country like Nigeria still rely on importation for virtually all forms of food and other non-consumable commodities that could be locally produce by its local industries via the raw materials production through agriculture. Agricultural advisory systems have changed over the past decades, especially in regard to public extension, as farmers receive information from a wide range of ICT sources. These changes in ICT during the past two decades have been rapid and far-reaching, from the costly, colossal, energy-consuming equipment once available to the very few towards the booming and continuously changing mobile, wireless, and Internet industries for the many. In the last two decades, public and private actors operating in rural contexts in developing countries have widened their array of methods for disseminating knowledge through radio programmes, videos and other ICT-based methods[1]. The challenge of food shortage can be ameliorated through quality extension service with the help of Information and

Corresponding Author: Akintonde J.O.

Communication Technology (ICT) as a tool of revamping extension network of the country. ICT is a relatively new means of disseminating information among people worldwide. ICTs have been defined as and it comprises of processing and transmission of information by electronic means such as radio, television, telephones (fixed and mobile), computers, Pocket PCs and the internet[3]. Generally, the various available ICT components/devices include the following: Radio, Television, Multi-media systems (VCDs, DVDs, VHS, over-head projectors), Telephones (Land-lines and Mobile phones), Internet (E-mailing, Web-browsing, telephoning), Computers and Personal Digital Assistants (PDAs). Others include: Media Players (MP2, 3 & 4), Geographic Information System (GIS), Geographic Position System (GPS), Cable Satellite, online Newspapers, e-Books, journals, tablet systems and smart phones, ipods and ipads[4]. ICT can act as a catalyst in the productivity of Nigeria agriculture as it would accelerate the information, knowledge and technology sharing among different stakeholders (researchers, extension personnel and rural farmers) in agricultural production. Hence, hope for agricultural development lies so much on accessibility of crop farmers to appropriate production technologies via the appropriate ICTs. Agricultural extension communication, in the context of development, is specifically targeted toward improving the livelihoods of the participants (the farmers and extension staff) through the process of exchanging agricultural information between themselves and others[4]. ICT includes all technical means that are used for handling information and facilitating communication, including computers, network hardware, communication lines and all the necessary software. In other words, ICT is comprised of information technology, telephony, electronic media, and all types of process and transfer of audio and video signals and all control and managing functions based on network technologies[2]. National policy and role of ICT on agricultural extension services delivery: Extensive use of modern information technology will be promoted for communication between researchers, extension workers and their farmer clients to transfer of technologies and information more cost effectively[6]. It is found that ICT allows efficient and transparent storage, processing and communication of information and that entrepreneurial innovation in this field may affect economic and social change[5]. ICT would enable extension workers to gather, store, retrieve and disseminate a broad range of information needed by small producers such as information on best practices, new technology, better prices of inputs and outputs, better storage facilities, improved transportation links, collective negotiations with buyers, information on weather[6]. The extension agents are champion with responsibility of transferring and disseminating to farmers appropriate agricultural technologies and good farm practice via extension training with the use of different ICTs these days unlike analog used in the primitive era. It is on the above premise; this study was embarked upon to determine the perceived role of ICTs in agricultural extension/farmers training in Oyo and Ekiti State of Southwestern Nigeria. Specifically, the study described the socio-economic characteristics of crop farmers, identified the ICT tools available and use for extension training and examined the crop farmers perception of role of ICTs in agricultural extension/farmers training in the study area.

II. METHODOLOGY

The study was carried out in Oyo and Ekiti States of Southwester Nigeria. The two States are from South-West zone of Nigeria and this zone lies between latitude 6.00°N and 9.00°N and between longitude 2.00°E and 7.00°E. The climate in the two States favours the cultivation of crops like maize, yam, cassava, millet, rice, plantains, cocoa, palm produce, cashew, etc. Multistage sampling method was adopted for the study. During the first stage, 12% of the Local Government Areas (LGAs) were randomly selected from the two States, therefore, 3 LGAs (Oyo State) and 2 LGAs (Ekiti State) were involved in the study. Thereafter, 15% crop farmers were randomly selected from Oyo (154) and Ekiti (81) States which amounted to a total of 235 crop farmers that constituted the sample size of the study. Data were collected through structured interview schedule. Collected data were analyzed with frequency distribution, percentages, mean and ranking as the main descriptive statistical tools. Socio-economic variables influencing crop farmers' perception on the role of ICTs in agricultural extension/farmers training were determined with Ordered probit regression inferential tool.

The farmers perceptions were measured on Likert scale measurement of Strongly Agree (5), Agree (4), Undecided (3), Disagree (2) and Strongly Disagree (1). Thereafter composite score of each identified role was used to recatigorized farmers' level of agreement into 3 level of High (3), Moderate (2) and Low (1) with mean (x) ±SD and this correspond to censoring values 3, 2, and 1 respectively used for the Ordered probit analysis. This is implicitly stated as:

Y = Level of agreement (3 = High, 2 = Moderate, 1 = Low).

x_1 = Age (Years)

x_2 = Sex (Dummy, Male=0, Female=1)

x_3 = Marital status (Dummy, 1= Married; 0= Unmarried)

x_4 = Religion (Dummy,1= Christian; 0= Islam)

x_5 = Years spent in school (Years)

x_6 = Years of farming experience (Years)

e= error term

The Likert type measurement instrument is presented as by the formula:

x= (□f x) /n, when:

x = mean score

□ = summation sign

f = frequency

n = No of responses

5 different scaling statements were used namely, Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. The mean of the scaling statement was found as:

(5+4+3+2+1)/5=15/5=3. Therefore, 3 is the weighted mean of the scaling statement.

Decision Rule: Any mean value greater or equal to 3 is high; any mean value less than 3 is low.

III. Results And Discussion

3.1 Socio-economic characteristics of farmers

Table 1 revealed that most (42.1%) of the were above 50 years of age with only 8.1% indicated less and equal to 30 years of age. The mean age of the crop farmers is 49years. This result implies that the sampled crop farmers are of different age groups. More than half (61.3%) of the crop farmers were male and 38.7% were female. Majority (89.8%) were married and only 10.2% that were single. The result suggests that the farmers sampled are adults and this is expected to influence their perception and having a right disposition on the role of ICTs in the extension/farmers training. Again, 71.9% and 28.1% of the farmers were Christians and Muslim. It implies that both major religion in Nigeria constituted the population of this study. The famers sampled indicated different educational background such as primary (39.1%), secondary (33.6%) and only 9.8% had tertiary education, while 17.5% do no not have formal education. This result implies that majority of the farmers are literate though with different educational background. The farmers educational level is expected to have influence on their judgement on the role of ICTs in agricultural extension/farmers training. Almost all (92c.3%) of the farmers indicated farming as primary occupation, while only 7.7% indicated other forms of occupation as their primary occupation and this include: artisans, trading, and civil service. All the farmers have different years of farming experience with mean of 26years. This implies that all the farmers sampled are not novice in crop production and this must have influence in their judgement on the role of ICTs in agricultural extension/farmers training.

Table1: Distribution of respondents by socio-economic characteristics n=235

Socio-economic variable	Frequency (Percentage)	Mean
Age (years)		
≤30	19(8.1)	
31-40	41(17.5)	49
41-50	76(32.3)	
>50	99(42.1)	

Sex		
Male	144(61.3)	
Female	91(38.7)	
Marital status		
Married	211(89.8)	
Unmarried	24(10.2)	
Religion		
Christianity	169(71.9)	
Islam	66(28.1)	
Level of education		
No formal	41(17.5)	
Primary	92(39.1)	
Secondary	79(833.6)	
Tertiary	23(9.8)	
Primary occupation		
Farming	217(92.3)	
Others	18(7.7)	
Years of farming experience (years)		
≤ 10	24(10.2)	
11-20	45(19.1)	
21-30	65(27.7)	26
30-40	77(32.8)	
>50	24(10.2)	

Source: Field survey, 2018:

3.2 ICTs available and use for agricultural extension/farmers training

Table 2 revealed the multiple responses of the respondents on the basis of ICT gadgets that are available and used by village extension agents for agricultural extension/farmers training and all (100.0%) of the farmers indicated digital camera and video, Global System of Mobile Communication (GSM-Phone) as well as extension bulletins. In the same vein, majority (99.6%) of the farmers indicated Projector/Transparencies, majority (95.3% each) of respondents indicated radio and Compact Disc/Digital Video Disk (CD/DVD). Other ICT gadgets indicated include Television (74.0%), internet (45.1), Flash Drive (35.7%) respectively. The result implies that crop farmers are aware of different ICT gadgets through which they received extension/farmers training. The variation in the percentages may be due to differences in their interests and preferred ICTs for extension training among the sampled crop farmers.

Table2: Distribution of respondents by ICTs that are available/use for extension training

ICTs	*Frequency (Percentage)
Radio	224(95.3)
Television	174(74.0)
Digital Camera	235(100.0)
Digital Video	235(100.0)
Projector/Transparencies	234(99.6)
CD/DVD	224(95.3)
Flash Drive	84(35.7)
Internet	106(45.1)
GSM-Phone	235(100.0)
Extension Bulletins	235(100.0)
Posters	235(100.0)

Source: Field Survey, 2018; *: Multiple Responses

3.3 Perception of roles of ICTs in agricultural extension/farmers training

For this objective, Likert scale measurement of Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. Thereafter statistical mean was computed and different perceptional statements on the role of ICTs in agricultural extension/farmers training were ranked accordingly. Table3 revealed that, the statement that "with ICT, information on crop production flows freely which ensures the usage of different extension recommendations via its training" had the highest weighted mean Score (WMS) of 4.91 and was ranked first (1st), followed by the statement that "Crop production technologies/information are timely shared through ICTs compared to primitive era (WMS=4.90; 2nd)", "The ICT plays serious role especially in the information sharing among different stakeholders in extension/farmers training ditto for agricultural inputs dealers (WMS=4.89; 3rd)", "ICT ensures clarity in addressing issues and challenges associated with crop production by VEAs (WMS=4.69; 4th), "There is improvement in the literacy level of farmers with ICTs in extension/farmers training (WMS=4.66; 5th)" respectively. The statements that "ICTs foster cordial relationship that encourages farmers' participation in extension training" and "With ICT, farmers and training/information providers (VEAs) are in constant touch, hence challenges and other related crop production issues are addressed as they surface were ranked least (WMS=2.72; 10th and WMS=2.89; 9th) in that order were ranked least and these two later statements were also rated low on the decision on the scaling of the statements in relation to the crop farmers perception of roles of ICTs in agricultural extension/farmers training. The variation in the ranking order of different statements on the roles of ICTs in agricultural extension/farmers training may be due to differences in the crop farmers' perception of different ICTs, preferred ICTs by the farmers for the extension training, the VEAs' skill and knowledge in the application/usage of these ICT gadgets for the farmers' training. The above finding implies that, the crop farmers sampled have different perceptions (i.e. high and low) on the role of ICTs in agricultural extension/farmers training.

Table3: Distribution of respondents by their perception of role of ICTs in agricultural extension/farmers training

Perceptional Statements	Frequency (Percentage)						
	Level of Agreement						
	Strongly Agree	**Agree**	**Undecided**	**Disagree**	**Strongly Disagree**	**WMS**	**Rank Decision**
ICTs foster cordial relationship that encourages farmers' participation in extension training	48(20.4)	49(20.9)	33(14.0)	47(20.0)	50(21.3)	2.89	9th Low
ICTs bridges the distance barrier between the farmers and village extension agents (VEAs), hence, information on crop production are readily available to farmers	155(66.0)	48(20.4)	-	-	-	4.11	8th High
With ICT, farmers and training/information providers (VEAs) are in constant touch, hence challenges and other related crop production issues are addressed as they surface	54(23.0)	27(11.5)	84(35.7)	3(1.3)	37(1.6)	2.72	10th Low
With ICT, extension teaching via training are encouraging, as well as the utilization of its recommendations	178(75.7)	40(17.2)	14(6.0)	-	-	4.65	6th High
ICT ensures clarity in addressing issues and challenges associated with crop production by VEAs	187(79.6)	26(11.1)	20(8.5)	2(0.9)	-	4.69	4th High
ICT encourages timely delivery of information/messages that are required in addressing issues that calls for urgency especially with GSM-Phone	121(51.5)	72(30.6)	42(17.9)	-	-	4.34	7th High
Crop production technologies/information are timely shared through ICTs compared to primitive era	214(91.1)	19(8.1)	2(0.9)	-	-	4.90	2nd High
There is improvement in the literacy level of farmers with ICTs in extension/farmers training	165(70.2)	60(25.5)	10(4.3)		-	4.66	5th High
The ICT plays serious role especially in the information	208(88.5)	27(11.5)	-	-	-	4.89	3rd High

sharing among different stakeholders in extension/farmers training ditto for agricultural inputs dealers							
With ICT, information on crop production flows freely which ensures the usage of different extension recommendations via its training	215(91.5)	20(8.5)		-	-	4.91	1st High

Source: Field survey, 2018

WMS: Weighted Mean Score

Figures in parentheses are percentages

3.4 Ordered probit analysis

Ordered probit and marginal effect regression estimate from the fitted model (which follows a standard normal distribution) in which the response variable is the level of level of agreement of different perceptional statement, while the explanatory variables are the selected socio-economic characteristics of the crop farmers. The estimate revealed from the result in Table 4, an LR chi^2 of 51.28, pro > chi^2 of 0.0000 and pseudo R^2 of 0.1165. The coefficient of age is positive and statistically significant at 1% ($p<0.01$), which suggests that increase in the age of farmers, would lead to the likelihood of changes in the perception of crop farmers on the role of ICTs in agricultural extension/farmers training by 2.64%. Also, the coefficient of sex and marital status are positive and both were statistically significant at 10% and 1% ($p<0.1$ and $p<0.01$), which implies that sex and marital status crop farmers have significant influence on the likelihood changes of their perception on the role of ICTs in agricultural extension/farmers training by 4.50% and 3.26%. The result further revealed that coefficient of years spent in school is also positive and statistically significant at 10% ($p<0.1$), suggests that the more the years spent in school, the decrease in the likelihood of crop farmers' perception on the role of ICTs in agricultural extension/farmers training by 3.67%.

Table 4: Test of significant relationship between selected socio-economic characteristics of respondents and their perception on roles of ICT of ICTs in agricultural extension/farmers training Ordered probit regression analysis – Marginal effect

Socio-economic variables	Coefficient	Std. Error	z-value
Age	-0.0900	0.0264	3.41***
Sex	0.0775	0.0450	1.72*
Marital status	0.1686	0.0326	5.17***
Religion	-0.0008	0.0026	-0.31
Year spent in school	0.0649	0.0367	-1.77*
Year of farming experience	0.0053	0.0025	2.12**

Source: Data Analysis, 2018; *: Significant at 1%; **: Significant at 5% *: Significant at 5%**

In the same vein, the coefficient of farming experience is positive and statistically significant at 5% ($p<0.05$), which implies that increase in the years of farming experience would lead to increase in the likelihood of change in the crop farmers perception on the role of ICTs in agricultural extension/farmers training by 0.25%. This result suggests that all the afore-mentioned socio-economic variables (age, sex, marital status, years spent in school, and years of farming experience) have decisive influence on crop farmers' perception on the role of ICTs in agricultural extension/farmers training.

IV. Conclusion And Recommendations

This study the perception of crop farmers towards the roles of ICTs in agricultural extension/farmers training. Multistage sampling procedure was used to select crop farmers from the LGAs in selected States. Information was collected through interview schedule from the sampled male and female crop farmers of different age groups and educational background. The farmers indicated radio/television, digital camera and video, projectors, GSM-Phone, extension bulletins among others ICTs available and used by extension agents for extension training in the areas. The crop farmers have both high and low perception towards the roles of ICTs in agricultural extension/farmers training. The variation in the perception of the crop farmers was attributed to differences in the types ICT gadgets, their preferred ICTs for extension training, the VEAs' skills and knowledge in the application/usage of these ICT gadgets for the extension/farmers' training. The study therefore concludes that, the socio-economic factors such as age, sex, educational status of the farmers should be given adequate consideration in the selection of ICTs for any extension training; the use of ICTs should be encouraged among farmers in the area and Nigeria at large as it remains the major sources of information through which new production technologies can be easily accessed.

References

[1] Barber, J. Mangnus, E. and Bitzer, V. (2016). Harnessing ICT for agricultural extension. Sustainable Economic Development and Gender. KIT working paper-4., pp.1

[2] Celebic, G. and Rendulic, D. I. (2011). ITdesk.info – project of computer e-education with open access. Open Society for Idea Exchange (ODRAZI), Zagreb.

[3] CTA (2003). ICTs-Transforming Agricultural Extension? An e-discussion, 20th August – September, pp.27

[4] Fadiji, T.O. and Sennuge, S.O. (2020). Influence of characteristics and perception on change of ICT by selected Extension Agents in Northern Nigeria. *Global Journal of Agricultural Research, Vol.8, No.2, pp. 45-57*

[5] Kaushik, P. D. and Singh, N. (2004). Information Technology and Broad-Based Development: Preliminary Lessons from North India. World Development, 32:591-607

[6] Rohila, A,K., Yadav, K. and Ghangha, B.S, (2017). Role of ICT in Agriculture and Extension. *Journal of Applied and Natural Research, 9(2):1097-1100*