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The use of Information and Communication Technologies among Farmers in Ekiti State, Nigeria

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Summary- This study evaluated the use of information and communication technologies (ICTs) among arable farmers in Ekiti State, Nigeria. A multi-stage sampling procedure was employed for the selection of 240 respondents in the study area. Collection of primary data from the respondents was through a well-structure interview schedule. Descriptive and inferential statistics were used to analyse data. The result of the findings revealed that more than one-third of the respondents(66.7%) were male. The mean age of the respondents was 47years and had a mean household size of 5 persons. Mostly (95.8%) had formal of education and a mean farming experience of 23 years. Farmers were aware of mobile phone (3.75), radio (3.59), television (3.41), internet (2.59) and video recorder (2.57).The mostly used ICTs tools by the respondents were mobile telephone (3.77), radio (3.57) and television (3.33).Farming experience, household size and level of awareness on ICTs had significant influence on level of usage of ICTs among arable farmers. Limited finance, high cost of ICTs facilities, unstable power supply, limited technical know-how, language illiteracy, inadequate infrastructure and inadequate access to agricultural information were major constraints to the use of ICTs by the farmers. Government should therefore create more awareness to sensitize, provide adequate training on the use of ICTs and incentives to enhance ICTs usage by these farmers for better productivity.

Keywords: *information, communication, technologies, farmers.*

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I. Introduction

Agricultural information is crucial to the development of rural populace who are mainly farmers. Information and communication technology (ICT) is crucial in the dissemination of agricultural information to farmers in improving their livelihoods.ICT is an effective solution to problems that militate against the development of agricultural industry, such as weak marketing linkages, poor information management, low productivity, low income and lack of diversity (Ramli et al., 2015).

The ICT devices which are of potential dissemination of agricultural information in farming activities include like radio, television, cellular phones, computers, and networks among others (Pande and Deshmukh, 2015). According to Ramli et al. (2015) stated that the Internet and web-based applications are extensively utilized in spreading of agricultural knowledge, marketing of goods and services. Researchers observed that mass media are utilized to disseminate agricultural technologies to the farmers at rapid rate (Leeuwis and Van den Ban as cited in Hasanet al., 2019)).

Crop production as an important sub-sector in Nigeria agriculture has contributed largely to the development of Nigeria's agricultural sector (Odefadehan et al., 2019). Arable farming as a type of crop production involves the production a wide range of annual crops. Dissemination of useful agricultural information to the farmers will enhance arable crop production. ICT provide recent knowledge and information on agricultural technologies, best practices, markets, price trends, and weather conditions (Yimer, 2015). New approach for improving access to relevant agricultural information could be achieved through the use of information and communication technologies (Olaniyi and Ismaila, 2016). Farmers need information on improved farm inputs, modern farming technologies, and climate changeto enhance food production for ever-increasing population. Important agricultural information such as sowing, improving soils, profit maximization and control pests and diseases will empower the farmer and their decision making capabilities (Lokeswari, 2016).

In recent times, ICTs have gained more recognition in Nigeria as a whole and particularly, Ekiti State. The use of ICTs can be very time-effective in disseminating relevant information to farmers to aid agricultural extension services in Nigeria (Anyoha et al., 2018). However, the potential of these ICT tools is under-utilized especially among the farming households (Olaniyi and Ismaila, 2016). Poorly disseminated information and knowledge as a result of certain constraints may hinder agricultural development of any community (Li, 2013). In Ekiti State, farmers are faced with some constraints which are limiting them in the use of ICTs in order to gain access to relevant information on improved technologies for enhanced productivity and improved income. Therefore, it is of empirical importance to carry out this study on the use of Information and Communication Technologies among arable farmers in Ekiti State. The broad objective of the study was to investigate the use of ICTs among farmers

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in Ekiti State, Nigeria. The specific objectives of the study were to; describe the socio-economic characteristics of arable crop farmers in the study area; determine the farmers' awareness of various ICTs among the respondents in the study area; determine the level of use of ICTs among the respondents in the study area, determine factors influencing the use of ICTs among farmers in the study area; and identify the constraints to the use of ICTs among farmers.

II. Materials and Method

The study area was Ekiti State. The state is located in the Southwest Nigeria within the tropics. It is predominantly an agrarian state with food crops grown such as cassava, yam, cocoyam, vegetables, and grains such as maize, rice etc. The state has two main seasons i.e. the rainy season and dry season. A multi-stage sampling procedure was employed in the selection of the respondents in the study area. Firstly, four Local Government Areas (LGAs)were randomly selected. The second stage involved selecting three farming communities from each LGAs randomly. Lastly, there was a random selection of ten (10) arable farmers from each of the communities, making a sample size of one hundred and twenty (120) arable farmers. A well-structured interview schedule was employed in the collection of primary data. Descriptive statistics such as mean, frequency counts and percentages were used to analyse objective 1. Likert-type scale was employed to measure objective 2as Very Much Aware (4), Much Aware (3), Aware (2), and Not Aware (1). The mean score of the scaling statement is 2.5. Therefore, any mean score value greater or equal to 2.5 was regarded as Aware while any mean score value less than 2.5 was regarded as Not Aware. Objective 3 was also measured using Likert-type scale as Regularly used (4), Occasionally used (3), Rarely used (2), and Not used (1) with any mean score value greater or equal to 2.5 was regarded as used while any mean score value less than 2.5 was regarded as Not Used. Objective 5 was also measured using Likert-type scale as Very Severe (4), Severe (3), Less Severe (2), and Not Severe (1). The mean score point of the scaling statement was 2.5 and ranked in descending order.

Inferential statistics such as Multiple Regression analysis was used to analyse objective 4.
The model was specified in its explicit form thus;

$$Y = f(b_o + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + e)$$

Y = Use of ICTS by the respondents
b_o = Constant $b_1 - b_6$ = Coefficients of multiple regression
X_1 = Age of the respondents (years)
X_2 = Farming experience (years)
X_3 = Gender (male=1, female= 0)
X_4 = Educational level (formal education = 1, no formal education =0)
X_5 = Household size (persons)
X_6 = Level of awareness of ICTs
e = Error term

III. Results and Discussion

a) Socio-economic characteristics of the respondents

The mean age was 47years. This implies that most of the respondents were in their active age. The result revealed that most of the respondents were males (66.7%), married (73.3%), and had a mean household size of 5 persons. It was also that the respondents mostly (95.8%) had formal education. This could enhance the utilization of ICTs among the farmers. The mean years of experience for the respondents was 23 years and mostly (55.8%) had contact with extension agents.

Table 1: Socio-economic characteristics of the respondents

Socio-economic Variables	Frequency	Percentages	Mean
Age (years)			
≤ 30	10	4.2	47
31 – 40	32	13.3	
41 – 50	64	26.7	
51 – 60	60	25.0	
≥ 61	74	30.8	
Gender			
Male	160	66.7	
Female	80	33.3	
Marital Status			
Single	12	5.0	
Married	176	73.3	
Divorced	30	12.5	
Widowed	22	9.2	
Household size (persons)			
≤ 3	40	16.7	5
4-6	142	59.2	
7-9	54	22.5	
>9	4	1.7	
Educational level			
No Formal Education	30	12.5	
Primary Education	56	23.3	
Secondary Education	70	29.2	
Tertiary Education	84	35.0	
Farming Experience (years)			
≤ 10	18	7.5	23
11-20	86	35.8	
21-30	54	22.5	
31-40	52	21.7	
≥ 41	30	12.5	
Contact with extension agents			
Contact	67	55.8	
No contact	53	44.2	

Source: Field Survey, 2021

b) Level of respondents' awareness of ICTs

The result revealed that mobile phone has the highest mean score of 3.75 indicating that the arable farmers are aware of mobile phone. Radio had a mean score of 3.59, followed by Television (3.41), Internet (2.59) and Video recorder (2.57) which implies that the respondents were aware of the radio, television, internet and video recorder as an ICT tools respectively with a grand mean of 2.75. This finding agrees with the findings of Nnenna (2013) that the farmers were aware of phone, radio and television.

Table 2: Level of respondents' awareness of ICTs

ICTs	Very much aware	Much aware	Aware	Not aware	Mean
Mobile Telephone	206(85.8)	20(8.3)	4(1.7)	10(4.2)	3.75
Radio	168(70.0)	52(21.7)	14(5.8)	6(2.5)	3.59
Television	130(54.2)	84(25.0)	20(8.3)	6(2.5)	3.41
Video recorder	22(9.2)	110(45.8)	92(38.3)	16(6.7)	2.57
Projector	18(7.5)	82(34.2)	78(32.5)	62(25.8)	2.23
Telegram	12(5.0)	52(21.7)	80(33.3)	96(40.0)	1.91
Computer	40(16.7)	58(24.2)	78(32.5)	64(26.7)	2.31
Internet	42(17.5)	90(37.5)	76(31.7)	32(13.3)	2.59
Print media	38(15.8)	66(27.5)	86(35.8)	50(20.8)	2.36

Percentages are in parenthesis
Grand mean = 2.75
Source: Field Survey, 2021

c) *Level of usage of ICTs by the respondents*

The result presented in Table 3.3 indicated that the farmers had level of usage of mobile phone (3.77), radio (3.57), television(3.33) implying that mobile phone, radio and television are highly used by arable farmers in the study area. This finding corroborates the finding Olaniyi and Ismaila, 2016 who reported that the most available ICT tools for accessing information by farmers were cell phone, radio and television. The result further agrees with Nnenna (2013) who found that the most readily available ICT facilities owned, accessed and utilised by most farmers were radio, television and phones were. In addition, this finding is in line with Anyoha *et al.,* (2018) who reported that mobile phone is the most readily available (ICT) device and this is followed by radio.

Table 3: Level of usage of ICTs by the respondents

ICTs	Regularly used	Occasionally used	Rarely used	Not used	Mean
Mobile Telephone	202(84.2)	22(9.2)	14(5.8)	2(0.8)	3.77
Radio	160(66.7)	58(24.2)	20(8.3)	2(0.8)	3.57
Television	124(51.7)	80(33.3)	28(11.7)	8(3.3)	3.33
Video recorder	22(9.2)	76(31.7)	108(45.0)	34(14.2)	2.35
Projector	10(4.2)	50(20.8)	68(28.3)	112(46.7)	1.82
Telegram	14(5.8)	40(16.7)	66(27.5)	120(50.0)	1.78
Computer	36(15.0)	52(21.7)	82(34.2)	70(29.2)	2.25
Internet	36(15.0)	74(30.8)	90(37.5)	40(16.7)	2.44
Print media	34(14.2)	26(10.8)	88(36.7)	92(38.3)	2.01

Percentages are in parenthesis
Grand mean = 2.59
Source: Field Survey, 2021

d) *Factors influencing the use of ICTs among arable farmers*

Multiple regression analysis result in showed that R^2 was 0.645. This means that about 64.5 percent variation in the dependent variable was caused by changes in independent variables included in the regression model. The low value of Durbin-Watson constant (1.745) indicates absence of autocorrelation meaning that since important variables were included in the regression model. Statistically reliable and dependable result was shown by the low value of standard errors of the estimates (0.3069). The results indicated that farming experience was significantly influencing the use of ICTs among arable farmers at 1% level of significance and had a positive coefficient of 0.012. This implies that a unit increase in farming experience would increase the use of ICTs by 0.012 unit. This might be due to the fact that experienced farmers would have sought for and acquired the knowledge and skill on ICTs over time to utilize ICTs as a source of agricultural information. This finding is in consonance with findings of Williams and Agbo (2013) that years of farming experience significantly influencing the use of ICTs among farmers.

It was also revealed that the coefficient of household size (0.076) was significant at 10% level of significance and had positive relationship with use of ICTs among farmers. This implies that a unit increase in household size would cause an increase in the use of ICTs by 0.076 unit. This is because farmer with high household size might engage in more agricultural activities than farmers with low household members which might result to more reasons to use ICTs. This finding concords with Adegbidi et al. (2012) who reported that household size is a determinant factor in the use of ICTs among farmers. Furthermore, level of awareness had a significant influence on use of ICTs among farmers at 1% level of significance and had a positive coefficient of 0.677 implying that a unit increase in the level of awareness of ICTs would cause an increase in the use of ICTs by 0.677 unit. This finding supports with the findings of Hasan et al. *(*2019) that there is a positive and significant influence between awareness of ICTs and the use of ICTs.

Table 4: Factors influencing the use of ICTs among arable farmers

Variables	Coefficients	Standard error	T-value	Significance
(Constant)	0.508	0.242	2.102	0.007
Age	-0.003	0.004	-0.730	0.467
Level of education	-0.111	0.142	-0.778	0.438
Marital status	-0.111	0.066	-0.166	0.869
Household size	0.076*	0.043	0.102	0.081
Farming experience	0.012***	0.004	2.777	0.006
Extension contact	0.023	0.051	0.450	0.653
Level of awareness	0.677***	0.053	12.791	0.000

$R = 0.803$, $R^2 = 0.645$, standard error of the estimates = 0.3069, Durbin-Watson constant (1.745)
****Significant at 1%; * Significant at 10%*
Source: Field Survey, 2021.

e) Constraints to the Use of ICTs by the respondents

Table 13 shows that limited finance (3.23), high cost of ICTs facilities (2.90), unstable power supply(2.88), limited technical know-how (2.69), language illiteracy(2.68), inadequate infrastructure(2.61) and inadequate access to information (2.52) were indicated as major constraints to the use of ICTs by the arable crop farmers and ranked as 1st, 2nd, 3rd, 4th, 5th and 6th respectively. The study agrees with Anyoha et al. (2018) that high cost of ICT devices, widespread illiteracy, insufficient income and language illiteracy are constraints to the use of ICTs among farmers.

Table 5: Constraints to the use of ICTs by the respondents

Constraints	Very severe	Severe	Less severe	Not severe	Mean	Rank
Limited Finance	122(50.8)	66(27.5)	36(15.0)	16(6.7)	3.23	1st
High cost of ICTs facilities	72(30.0)	90(37.5)	60(25.0)	18(7.5)	2.90	2nd
Unstable power supply	70(29.2)	84(35.0)	74(30.8)	12(5.0)	2.88	3rd
Limited technical know-how	28(11.7)	122(50.8)	78(32.5)	12(5.0)	2.69	4th
Language illiteracy	36(15.0)	108(45.0)	80(33.3)	16(6.7)	2.68	5th
Inadequate infrastructure	30(12.5)	104(43.3)	88(36.7)	18(7.5)	2.61	6th
Inadequate access to information	18(7.5)	100(41.7)	110(45.8)	12(5.0)	2.52	7th
Accessibility of ICT tools	28(11.7)	72(30.0)	100(41.7)	40(16.7)	2.36	8th
Availability of ICTs	20(8.3)	64(26.7)	130(54.2)	26(10.8)	2.33	9th
Our culture and tradition are not in support of ICT usage	22(9.2)	36(15.0)	80(33.3)	102(42.5)	1.91	10th

Percentages are in parenthesis
Source: Field Survey, 2021

IV. Conclusions

The mean age of the respondents was 47years, mostly males (66.7%) and had a mean household size of 5 persons. Mostly (95.8%) had formal of education and a mean farming experience of 23years. Farmers were aware of mobile phone (3.75), radio (3.59), television (3.41), internet (2.59) and video recorder (2.57). The mostly used ICTs tools by the respondents were mobile telephone (3.77), radio (3.57) and television (3.33). Farming experience, household size and level of awareness on ICTs had significant influence on level of usage of ICTs among arable farmers. Limited finance, high cost of ICTs facilities, unstable power supply, limited technical know-how, language illiteracy, inadequate infrastructure and inadequate access to agricultural information were major constraints to the use of ICTs by the farmers. Government should therefore increase awareness to sensitize, provide adequate training and incentives such as credit facilities, subsidies etc. on ICTs tools to enhance the use of ICTs by these farmers for better productivity.

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