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Socio Economic Effect on the Use of Information and Communication Technology among Rural Farming Households in Afijio Local Government Area, Oyo State, Nigeria

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Abstract
This study was conducted in Afijio Local Government Area of Oyo State, Nigeria. It investigated the types of information and communication technologies used by farmers, the most frequently used, the level of utilization of the existing information and communication technology, farmers accessibility to ICTs and constraints faced in using ICT facilities in the study area. Analytical techniques used include descriptive statistics such as percentages, table and frequency; and Logit model analysis. A multistage sampling technique was used to select the Local Government, four (4) villages and thirty (30) farmers per village. One hundred and twenty (120) questionnaires were administered while one hundred and sixteen (116) were retrieved and used for analysis. The socio-economic characteristics of the farmers in the study area shows that the mean age of the farmers was 45 years while majority (92%) were male and 8% were female. The use of ICTs (Radio) and accessibility to ICT constituted 76% and 85% respectively. Majority (91%) argued that lack of power supply was a menace to ICT in the study area. The results of Logit model revealed that age ($p<0.05$), marital status ($p<0.05$), and major occupation (farming) ($p<0.01$) significantly affect the use of ICT. The study therefore recommended that government should provide electricity on a sustainable basis to all rural and urban communities for effective communication.
Keywords: Information technology, Farming household, Communication, Utilization

Introduction

Information and communication technologies is an umbrella term that include computer hardware and software digital, broadcast and telecommunication technologies as well as digital information repositories online and offline. It could also be interpreted as technologies that facilitate communication, the processing and translation of information by electronic means (Alampay *et al*., 2003). Information and Communication Technology (ICT) is the scientific, technological and engineering discipline of managing 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 (Osuagwu, 2001; Selwyn, 2002). It plays an important role in any country's development especially as pertain to agricultural development of underdeveloped nation right from the grass root to the centre and among the population. It also serves as a resource for agricultural development mechanism for accessing new technology and essentially aimed at empowering farmers to improve their farming system, thus enhancing growth trade and agricultural investments.

Information is a source that activates/links various sectors of agriculture making it possible for researchers, extension agents and farmers to have a good linkage system, allows for the public and rural dwellers to participate meaningfully in the adoption of new technologies through engaging in public discussion and contribution to decision making process, thereby providing food and fiber for man as well as raw materials for the agro allied management research and development. The information supply to farmers must be concise, dynamic, and complete and should be cost effective to the dearest minimum.

Despite the rapid improvement and awareness in information and communication technologies brought recently by science and technology, most of the extension workers in Nigeria still rely on the training and visit system (T & V System) which is the traditional way of reaching out to farmers. A majority of the population in the underdeveloped world lives in rural areas and has little or no access to agricultural information (Hosseini *et al*, 2009). The use of conventional/traditional means of communication such as home visit, personal letter and use of contact farmer for disseminating agricultural information has been counter-productive (Salau, 2008). Adedoyin *et al.* (1999) showed that the role of public agricultural extension service has provide the important link between agricultural research and farming communities, especially for technology transfer in support of agricultural and rural development. Agricultural development in Nigeria in particular has been hampered with low level of agricultural information exchange among the rural farmers. Arokoyo (2003; 2005) reported that in Nigeria the national extension service is based on the training and visit system supported by mobile phone, video, radio and television being the only information and communication technology used by majority of extension

workers. Munyua (2000), also shows that print video, television, film, slide drama, folklore, group discussion, meetings, among others are other ways of disseminating information among rural farmers. The world has witnessed an unprecedented growth in the area of information and communication technology. As a result of emerging new paradigm shift in agricultural development, old ways of delivering important service to citizens are being challenged and that traditional society are also being transformed into knowledgeable society. However, modern agricultural extension systems encourage the development of positive attitude among scientist to appreciate the knowledge, experience and capacity of the local people in the research development process. ICT as an extension tool will enhance flow of information in application of agricultural extension service (Meera *et al.*, 2004).

Furthermore, information communication is very crucial in agricultural and rural development. Communication is a basic process which permits all human activities and interaction. Extension communication is a complex form of social action principally because it goes beyond information delivery system. It is through communication that human being share knowledge, ideas, experiences and thus understands, persuades, converts and controlled their fellow beings (Ogunmokun, 2007) thereby providing solution(s) to the problem(s) of the farmers. Moreover, effective information technology also encourage agricultural researchers and extension agents who join a network to benefit either from formal and informal contacts with distant colleagues, opportunities to find solution to a common problem where the information needs of various interest groups can be identified and fulfilled. In this modern way of information technology tele-centres provides the rural farmers with prompt and reliable information about what is happening in agriculture in terms of improved seedling, better method of cultivation, fertilizer application, post and weed control/eradication, livestock production as well as disease control among others. Aina (2007) enacted the following as constraints with agricultural information and communication as inadequate financial agricultural information, illiterate, lack of basic infrastructure such as telephone electricity, good road network, pipe borne water, poor radio and television reception signals among others.

Despite the fact that 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 (Ajayi, 2002). However, Oluwadare and Okunlola (2006) 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 and further stated that these rural areas are still starved of most modern facilities such as potable water, electricity, good roads, educational facilities, modern health facilities, storage facilities and communication facilities.

Agricultural information is an essential ingredient that would lead to better productivity in any country therefore, there is need for scientific research on improved access to information and information technology so as to help farmers to access the right agricultural information needed in order to provide optimal farm product at minimum cost of production. This paper therefore, examines the utilization of information and communication technology among rural farmers; identify various types and most frequently used ICTs; level of utilization of the existing ICTs; farmers' accessibility to ICTs; constraints to effective use of ICTs by farmers in the study areas.

Methodology

The Study Area

The study was conducted in Afijio Local Government Area of Oyo State. It has an area of 722km and its headquarters in Jobele town with an estimated population of 134,173 (NPC, 2006). The vegetation of the area is derived savannah agro-ecology. Afijio local government are sub divided into wards which are Ilora I, Ilora II, Ilora III, Fiditi I, Fiditi II, Awe, Akinmorin, Jobele, Iware, Imini. Afijio is an agrarian area and most farmers cultivate crops such as maize, guinea corn, yam, cassava, soya bean, tomatoes, and cash crops like groundnut, cocoa, oil palm, kola nut, coffee and citrus.

Sampling Procedures and Sample Size

Primary and secondary data were used in this study. The primary data was collected through personal interview with the use of well structured questionnaires from the respondents. The secondary data include the use of literatures, journals, monographs, news paper among others. Multistage sampling technique was used by first selecting four villages from the Local government areas randomly which include Fiditi, Ilora, Iware and Akin morin; thirty farmers were randomly selected each from these villages making the sample size to be one hundred and twenty (120) farmers in the study area.

Method of Data Analysis

Data were analyzed using descriptive statistics which include frequencies, percentages, means and tables. The variables considered under the socio economics characteristics of the farmers were: age, gender, household size, farming experience, farm size, educational status, and marital status, availability of information communication techniques (ICT), ICT accessibility, ICT usage, ICT awareness and constraints. A four point likert scale was

developed and used to measure sources of information and the level of utilization of information communication technology among farmers (Usman *et. al.*, 2012). The response options and values attached to them were as follows: always = 4, occasionally = 3, rarely = 2 and none = 1. Also, Logit model was used to determine the effects of the independent on the dependent variable.

The model stated more explicitly as:

$$L_i n = \ln\left[\frac{P_n}{1-P_n}\right] = z = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + ... + \beta_n x_n + e_i \quad .....(1)$$

$$\Pr(Y_n) = \frac{\exp \beta_0 + \beta_{11} x_1 + = \beta_{21} x_2 + ... + \beta_{k1} x_k}{\sum \exp(\beta_0 + \beta_{11} x_1 + = \beta_{21} x_2 + ... + \beta_{k1} x_k)} \quad .....(2)$$

Where:

Yn = use of ICT by famers in the study area

The independent variables are as listed below

X_1 = Age (yrs)

X_2 = Gender (1 for female, 2 for male, otherwise 0.)

X_3 = Household size

X_4 = Farming experience (yrs)

X_5 = Farm size (yrs)

X_6 = Educational status (1 for no education, 2 for primary education, 3 for secondary education, 4 for tertiary education, otherwise 0)

X_7 = Marital status (1 for married, 2 for single, 3 for devours, 4 for widower, otherwise 0)

X_8 = ICT availability (1 for availability, otherwise 0)

X_9 = ICT accessibility (1 for accessibility, otherwise 0)

X_{10} =ICT usage (1 for usage, otherwise 0)

X_{11} = ICT awareness (1 for awareness, otherwise 0)

X_{12} = Constraint (1 for problem, otherwise 0)

e = error term

Results and Discussion

Socio-Economic Characteristics of the Respondents

Table 1: Socio-economic characteristics of the respondents

Variable	Frequency	Percentage
Age (years)		
21-30	5	4.3
31-40	8	6.9
41-50	27	23.3
51-60	30	25.8
>60	46	39.7
Gender distribution		
Male	107	92.2
Female	9	7.8
Educational status		
No formal education	67	57.8
Primary education	22	19.0
Secondary education	19	16.4
Tertiary education	8	6.9
Marital status		
Divorced	3	2.7
Married	82	70.7
Single	8	6.9
Widow	23	19.8
Extension agent contact		
None	82	70.7
Occasionally	20	17.2
Rarely	14	12.1
Major occupation		
Farming	107	92.3
Motorcycling	1	0.9
Clergy	1	0.9
Hair dressing	1	0.9
Student	6	5.2
Teaching	1	0.9
Farming experience (years)		
1-20	45	38.8
21-40	38	32.8
41-60	33	28.4

Source: Field Survey 2014

Table 1 shows the distribution of farmers with respect to their socio economic characteristics. About 40% among the farmers have their ages above 60years, while 41 – 50years, and 51-60years were 26% and 23% respectively. The mean age of the farmers was 45 years. It means that majority of the farmers were adult who were fully involved in farming since their childhood and take farming as their major occupation. It also shows that the farmers still have the ability and capability for farming. The result further shows that about 92% of respondents were male, while only 8% were female. This could be due to the fact that men were more conversant with their environment and get first hand information when any technology is being introduced which they relate to their female counterpart who are into processing and marketing of agricultural produce. According to Odewale (1995), men have energy and ability to withstand the ruggedness and drudgery of farming than female.

Educational qualification represents a predetermined factor in information assimilation, dissemination and adoption of technologies among rural farmers in diverse socio-economy. The educational status of a farmer does not only raise his productivity and income, but also increases his ability to understand and evaluate the information on new techniques and processes. About 58% of the respondents have no formal education, while those with primary, secondary and tertiary education constitutes 19%, 16.4% and 7% respectively. The result shows that there exists high level of illiteracy among farmers which might be a menace to the use of ICTs in the study area. Majority (71%) of the respondents were married, while the widow, single and divorcee constituted about 19%, 7% and 3% respectively. The mean household size of the farmers was 6. Conversely, farming (91.4 %) was the major occupation of the farmers in the study area followed by teaching (5.2%). Few farmers engaged in private business such as clergy, motorcycling, bicycle repairing, hairdressing and student. Therefore, it could be deduced that farming is the major occupation in the study area. About 39% of respondents have

farming experience between 1 – 20years, while 21 – 40years, 41 – 50years have 32.8 % and 28.4 % respectively. A higher percentage of the farmers (71%) did not obtain their information from extension agents especially information on agriculture, while those that obtain information occasionally were 17.2% while only 12.2% of the respondents rarely get information from extension agents. This might not be unconnected to the fact that the farmers found it difficult to adopt new technology when considering the educational status and the low level of awareness.

Table 2: Perception of the respondents on the use of ICTs

Variable	Frequency	Percentage
Always	20	17.2
occasionally	49	42.2
Rarely	31	26.7
None	16	10.0

Sources: Field survey, 2014

Respondents frequency on the used of ICTs

Table 2 shows the perception of farmers in respect to the use of ICTs. It was revealed that 42.2% of the respondents use ICTs in getting information occasionally, 26.7% rarely make use of ICT, 17.2% always make use of ICT while 10% of the respondents either have no access or do not use ICT at all in relation to agricultural activities. This study was in line with the work of Helen and Amin (2002). The programme that are agricultural oriented are often held rarely in most part of Nigeria e.g. Agbeloba, Fadama project programmes, e.t.c.

Table 3: **Distribution of respondents according to usage of ICT**

Variable	Frequency	Percentage
Radio	88	75.9
Internet	9	7.8
Mobile phone	16	13.3
television	3	2.6

Sources: Field survey, 2014

Respondent usage of Information Communication Technologies

Majority (76%) of respondent use radio as source of information, 13% , 8% and 3% used mobile phones, internet and television respectively as their information sources (Table 3). This was because radio remains the most important channel/medium of communication in the rural areas due to its usefulness without electricity and it could cover large audience and also it is relevant to any strategy that involves rural development in Nigeria. It remains the most important medium for communicating with the rural and urban populations of the countries. Also it could be observed that the cost of purchasing radio is minimal according to it size and could be used with battery where power supply is erratic or not available. This is particularly true in Africa where according to the British Broadcasting Corporation World Service (BBC-WS) estimated about 65 million radio receivers in 1996 and this appreciably increase with the use of other media like newspapers, television, mobile phone e.t.c till year 2000 (Niang, 2001).

Table 4: Respondents access to ICTs

Variable	Frequency	Percentage
Yes	99	85.3
No	17	14.7

Sources: Field survey, 2014

Respondents access to ICT

Table 4 shows the ICTs accessibility by the farmers. The result shows that a majority of farmer (85.3%) have access of information and communication technologies while 14.7% do not have access to the information communication technologies. Several of the ICT devices such as Radio, Television, mobile phone and internet were collectively examined in term of accessibility and as a source of information out of which radio had the highest percentage frequency of access.

Table 5: Distribution of respondent according to constraints in uses of ICTs

Variable	Yes		No	
	Frequency	%	Frequency	%
Lack of constant power supply	105	90.5	11	9.5
Inadequate infrastructure to produce information	100	86.2	16	13.8
Lack of barriers	77	66.4	39	33.6
Lack of awareness	77	66.4	39	33.6
Inadequate knowledge about ICT	80	68.9	36	31.0
Poor use of information	86	74.1	30	25.9
Lack of time access to information	81	69.8	35	30.2
Lack of knowledge about the use of internet	87	75.0	29	25.0
Government policy	94	81.0	22	19.0
Time wastage	48	41.4	68	58.6
High cost of equipment	54	48.3	60	51.7
Distance to the town	56	48.3	60	51.7
Accessibility to the village	48	41.3	68	58.6
Lack of mast network	74	63.8	42	36.2
Rural poverty	95	81.9	21	18.1

Source: Field survey, 2014; *the respondents have multiple responses due to unlimited constraints

Constraints in the use of ICTs

Table 5 shows the constraints in the use of ICTs. The major aim of information technologies is to know the problem(s) encounter by respondents while using any information technology newly introduced to them thereby providing a lasting solution to it. A majority (91%) of the respondents was faced with lack/fluctuation/inadequate of constant power supply, 86.2% inadequate infrastructure and 66.4% lack of barrier. More than half of the respondents (66.4%) were faced with lack of awareness, 68.9% were faced with inadequate knowledge about ICT while other constraints like lack of time to assess the qualities information, lack of knowledge about the internet, Government policy, Time wastage, High cost of equipment, Distance to town, Accessibility of the village, lack of mast network and rural poverty were shown in table 5 above.

Logit Model Analysis Result

Table 6 shows the Logit model analysis result. Among the variable which influence the use of information and communication technologies among farmers were age, marital status, and major occupation (farming). Age was positive and significant ($p<0.01$), this implied that as farmers grow older there would be an increase in probability of using ICT by 4.4%. The farmers marital status (married) was positive and significant ($p<0.05$). This implied that being married increases the probability of using ICT by 3.9%. The farmers' major occupation (farming) was significant ($p<0.05$) which implies that as farming experience increases, there is increase in probability in the use of ICT.

Table 6: Logit model analysis result of the relationship between socio-economic characteristics on the uses of ICTs

Variable	Coefficient	P- value	Remark
Age	2.283	0.044**	S
Gender	2.943	0.135	NS
Marital status	4.924	0.039**	S
Educational status	3.917	0.156	NS
Major occupation	16.799	0.000*	S
Farming experience	0.029	0.415	NS

* Significant at 1% level of probability; **significant at 5% level of probability.
Sources: Field survey, 2014

Conclusion

The study examines the effect of information and communication technologies among the respondent in the study area. It observed that the mean age of the farmers was 45 years while majority (92%) were male and 8% were female, the study revealed that majority of the respondents did attend school while a high percentage (70.7%) of the respondents are married. The major ICTs usage by the respondents is (Radio) and accessibility to ICT constituted 76% and 85% respectively. It further reveals the types of ICTs use by farmers as sources of information like radio, internet, mobile phone and television. It shows that lack of constant power supply, inadequate infrastructure to produce information, lack of awareness, lack of knowledge about the information

among others were the constraints faced in the use of ICTs among rural farmers. Logit model shows that the independent variables like age, marital status, and major occupation were positively related to the use of Information Communication Technology and were significant at 0.05 level of probability meaning that a unit increase in age would bring about 4.924 level of maturity, the marital status will enhance increase family labour while the major occupation (farming) which is positively related will improved food security and standard of living of the farmers.

Recommendations

In the light of the forgoing the following recommendation are made in other to overcome problems that may arise in the nearest future: constant supply of electricity on a sustainable basic to all rural and urban communities and solar energy technology should be improvised where necessary; central internet facilities should be made available so as to exchange information; intensification of awareness on the use of ICTs; training workshops for extension officers on the use of ICTs and computer appreciation so as to improve delivery systems; farmers should be encouraged to get GSM and radio at the minimum possible cost and agricultural programmes should be scheduled towards evening time.

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