IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY ON PRODUCTIVITY OF FARMERS IN IBARAPA CENTRAL LOCAL GOVERNMENT AREA OF OYO STATE, NIGERIA

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Abstract

The study was carried out in order to investigate the determinants of mobile phone usage by farmers in Ibarapa central local government area of Oyo state and its effect on productivity. In order to achieve this, multi- stage sampling techniques were used to select one hundred and twenty (120) farmers from the population of farmers in the study area while data was collected with the aid of structured questionnaires and then analyzed with the aid of descriptive statistics, logistic regression and OLS regression model.

The result of descriptive statistics analysis showed that majority (77%) of the respondents have access to some level of formal education. The study also revealed that most of the respondents were between the age group of 26-36 years and majority of the respondents were male. This study also revealed that 64% of the respondents had 1-10 years of experience in farming. Almost 62% of the respondents used mobile phone to access agricultural related information. Some problems being encountered by the farmers include; inadequate access to credit facilities, lack of access to extension services among others. Adjusted Rsquared value of 0.1977 implying that about 20% of the dependent variable was explained by the explanatory variables fitted. Marital status (x_2), level of education (x_3), major occupation (x_5), enterprise on farm (x_6), membership of cooperative society (x_9) were found not to have any significant relationship with phone usage.

Key words: *Mobile phone usage, productivity, logistic regression*

Introduction

Agricultural production is carried out largely by small-scale farmers who have little or no contact with the exchange and sharing of crucial information, knowledge and skills needed for production, processing and marketing (Alleman, J., Hunt, C., and Micheals, D, 2002 , FAO, 2005). Consequently, yields are low, and incomes from agriculture leave little for the farmer to turn-over.

According to World Bank (2013), only ten tractors are available per 100 hectares of farmland in Nigeria as compared to 241 tractors per hectare in Indonesia. Also, IFDC (2013) affirmed that the average usage of fertilizer in Nigeria is 13kg/hectare while the mean fertilizer usage for the rest of the world is 100kg/hectare. Furthermore, the average usage in Asia reached up to 150kg/hectare. Asides, less than ten percent of Nigerian farmers could access improved seeds. Irrigation covers only 0.8% of the arable land as compared to 18.7% in Thailand (THAICIDnd, Earth trends, 2003).

Analysis of the relative increase in crop yields in developing countries shows that Nigerians crop yields have the lowest growth rate of 0.2% from 1968 to 2008 as against 1.2 % for China, 2.3% for Indonesia and 3% for Malaysia (World Bank, 2013). The farm outputs could hardly feed the farmers and his families. Hence a large percentage of farmers depend on imported foods for their family sustenance.

Agriculture in Nigeria is predominantly practiced in the rural areas; hence, there is the need to ensure that farmers in the rural areas have access to farm input such as fertilizers, seeds and market information in order to enhance their productivity (Jamaf. Gunt, C., and Micheals, D., 2007). The backbone of any agricultural revolution is access of farmers to modern agricultural inputs, especially fertilizers and seeds. There is considerable evidence that suggested that farmers' access to markets is constrained by asymmetric information which causes moral hazard, raises transaction costs, impedes output performance,

squeezes income and exacerbates poverty (Mittal and Kumar, 2000; Kumar and Rosegrant, 1994; Evenson, R.E., Pray, C. and Rosegrant, M.W 1999; Fan,S., Hazell, P. and Thorat, S. 1999).

Also, raising the productivity of smallholder farmers is a necessary condition for increasing incomes and improving livelihoods of the rural poor in most developing countries. But market and non-market information asymmetry has traditionally constrained smallholder farmers' productivity. Past studies (Evenson, R. E., Pray, C. and Rosegrant, M.W 1999; Fan,S., Hazell, P. and Thorat, S. 1999) indicate that it inhibits adoption of modern technologies that have the capacity to enhance productivity of smallholder farmers. Hence, farm productivity and agricultural transformation has been stifled, leaving smallholder famers in grinding poverty.

In agriculture, the role of information in enhancing agricultural development cannot be over emphasized. Frankwell D. and Honesta N. (2014) qouted Bachhav (2012) stated that, the use of information and communicating technology in agriculture sector is enhancing farming productivity in a number of ways: providing information on weather trends, best practice in farming and timely access to market and non-market information. ICT-based market interventions is therefore a potentially useful tool for improving farmers' access to markets for agricultural inputs by providing timely, reliable and accurate information about actual market conditions.

Smallholder farmers face higher information costs, both as producers and sellers, as a result of their typically greater isolation and the poor state of rural information and communication infrastructure. They require information to make informed decisions at each stage of the production cycle, from crop selection, to planting, to harvesting, to selling. Timely information about prices and consumer preferences not only informs production decisions about crop mix and the need for inputs, but enables farmers to balance their investment of family labour in farm and non-farm activities during the growing season. At harvest, this same knowledge helps farmers negotiate a better price from traders and other middlemen, and even to access a wider variety of markets, middlemen, and transport opportunities for their products.

The two most important ICTs for rural areas of developing and transition countries are the mobile phone and the internet. Whereas the mobile phone gives farmers the opportunity to quickly and flexibly connect with other people to share information, the internet provides access to a great amount of agricultural data that can easily be stored and the possibility to connect with people across regions or even internationally per email or social networks.
Hitherto, the effects of the different kinds of ICTs on farm productivity have not yet been quantified in a direct comparison.

This study is therefore designed to assess the degree to which the usage of mobile phones as a proxy for ICT tools usage affect productivity of farmers in Ibarapa central local government area of Oyo state by seeking answers to the following questions:
Do the socio-economic characteristics of farmers determine usage of mobile phone (proxy for ICT tools usage)?
What are the constraints to the farmers' ownership and usage of mobile phones (proxy for ICT tools) in improving their productivity?
Does farmers' usage of mobile phone (proxy for ICT tools) to exchange market and non-market information with trading partners influenced their productivity?

One of the overreaching goals of Nigerian agricultural development programs and policies is increasing agricultural productivity for accelerated economic growth. Particularly, majority of the poor in Sub-Saharan Africa (SSA) depend on agriculture for survival. Thus, agricultural sector has been recognized as a key fundamental factor for spurring growth, overcoming poverty, and enhancing food security. Productivity increases in agriculture can reduce poverty by increasing farmers' income, reducing food prices and thereby enhancing increments in consumption (Diagne et al., 2009).

Consistent with this argument of the Department for International Development (DFID) (2003) estimated that a 1% increase in agricultural productivity reduces the percentage of poor people living on less than 1 dollar a day by between 0.6 and 2%, and no any other economic activity generates the same benefit for the poor. It is also of considerable significance that when agricultural production increases through the use of improved varieties of crops in a given area, farmers and their communities derive added socio-economic

benefit. Such activities can increase the value of locally produced crops, generate local employment, stimulate local cash flow, and through processing, marketing, and related activities can bring about improvement in socio-economic status and the quality of life (Nwabu et al, 2006).

In Nigeria, the use of mobile phones as a mode of providing agricultural related information would depend on how far the mobile phone network has been able to link the farmers to markets information, timely and accurately. The impact on productivity can be directly measured in terms of increased returns to the farmers with a trickledown effect on the cropping pattern and potential yield of the sowed crop. Information on price factors, prices of inputs, and output, and non-price factors like information about availability of inputs, quality of seeds, modern techniques etc, would play the primary role in improving farm productivity.

According to Frankwell Dulle and Honesta Ngalapa (2014) and Richardson *et al*. (1998) the information needs of farmers change from time to time due to changing agricultural technologies, environmental changes, agricultural policies, and the emergence of agricultural innovations. This work is therefore designed to further articulate effect of ownership of mobile phone (proxy for ICT tools) and its usage on productivity of farmers using Ibarapa central local government as the study area.

Therefore the general objective of this study is to analyze the effect of mobile phone (proxy for ICT tools) usage on productivity of farmers in Ibarapa Central local government, while the specific objectives are to:

Describe the socio-economic characteristics of the farmers in the study area.

Investigate how farmers in the study area obtain market and non-market information.

Identify the constraints to ownership and usage of mobile phones (proxy for ICT tools) for agricultural purposes by farmers in the study area.

Determine the effect of mobile phone (proxy for ICT tools) usage on productivity of farmers in the study area

Hypothesis of the Study

H_o: there is no significant relationship between the productivity of farmers and phone usage (proxy for ICT tools) in the study area.

Materials and Method

Study Area

The study area for the research is Ibarapa Central Local Government area of Oyo State which is made up of two major communities namely; Igboora and Idere. Ibarapa falls between latitude 7^o15 and 7^o55 north and 3^o00 east , this region is bounded in the North by Oke-Ogun area of Oyo state of Nigeria. Ibarapa central was carved out of Ifeloju local government area in 1996. The area has the total land mass of $440km^2$ and a population of 122,000 as at 2013 census record.(NPC, 2006) The postal code of the area is 201. The area is located in the Southwestern part of Oyo State. The area shared boundary with Abeokuta, Ogun state in the south and Ibarapa North area of Oyo state. The vegetation of the area is largely rainforest and savannah, thus enabling the cultivation of wide array of arable and perennial crop such as maize, cassava, millet, melon, sorghum, soybean, cowpea and other crops such as apple, pear and oranges. The rainfall pattern in the area follows a tropical pattern with an annual rainfall ranging from 1000mm to 1400mm and fairly high temperature.

The major occupation or operation in the area is farming (mainly subsistence farming and trading). Also, few proportion of the dwellers were engaged in other government and vocational occupation such as civil service, trading, artisan work etc. the area is heterogeneously populated by many tribes of Nigeria and other communities from Oyo state. However, Yoruba language is the most common and predominate other languages. The area is known as the "home of twin" in that there is no family that does not have twin which show their identity anywhere and to the whole world.

Sampling Techniques

The target population for the study is made up of all farmers in Ibarapa Central Local government. The two major communities in the study area are Idere and Igboora. Since it is not possible to study the entire population in statistical studies, a sample is usually selected from the population and studied for a generalization of the entire population. About 120 farmers were therefore selected from the population of farmers in the study area and relevant data was collected from them with the aid of structured questionnaires.

The sampling procedure for selection of sample that was adopted for this study was the multi- stage sampling technique. In the first stage six villages each were selected from Igboora and Idere communities. In the second stage, simple random sampling was used to select ten farmers from each village. Overall, one hundred and twenty farmers were selected.

The basic instrument for data collection that was employed in this study was the questionnaire. A questionnaire contains questions prepared for a particular investigation. The questionnaire was designed such that all necessary data like household income, household size, level of education, as well as other socio-economic characteristics and crop production activities of farmers in the study area were collected. Secondary data used in the study were sourced from already existing records (in reports, monographs etc), mainly obtained from Federal Office of Statistics (NBS), Food and Agricultural Organization (F.A.O), National Livestock Units, Federal Ministry of Agriculture as well as research institutes all over the study area.

Analytical Technique

A combination of analytical tools that were employed to achieve the stated objectives of this research work includes descriptive statistical analysis and inferential statistical tool. Descriptive analysis involved the use of frequency distribution tables, measures of central tendency and percentages while the inferential statistical tools used were the logistic regression to determine phone ownership and OLS regression model to determine of of phone ownership on productivity of farmers.

The determinants of ownership and usage of mobile phone by farmers is measured in this study by using a dichotomous (binary) choice variable of "Yes" or "No" type indicating the *use* or *none use* of mobile phone by a farmer, respectively. This study uses the binary Logit regression model to identify the determinants of use of ICT tools (specifically, mobile phones).Following Maddala (2001) and Okello, J.; Kirui, O.; Njiraini, G.; Gitonga, Z.(2012), the probability, p, that a respondent owned and used mobile phone (proxy for ICT tool usage) for agricultural purposes is given by:

Usage of mobile phone = f (Income, age, occupation, marital status ,type of agricultural enterprises, household size, gender, farm size,level of education, access to credit facilities, farming experience, co-operative membership) + e

i.e $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 \ldots\ldots\ldots\ldots + \mu$

Where, Y is a dependent variable that takes the value of 1 if the farmer uses a mobile phone (or an ICT tool) and 0 otherwise. While explanatory variables (determinants of ownership and usage of mobile phones) include: Income, age, occupation, marital status ,type of agricultural enterprises, household size, gender, farm size, level of education, access to credit facilities, farming experience, co-operative membership

Also, OLS Regression analysis was used to determine the effect of mobile phone usage as (proxy for usage of ICT) on productivity of farmers in the study area.

In the regression analysis, the total income of the respondents was used as proxy for farmers productivity(dependent variable)

The implicit function is also stated as:

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 \ldots\ldots\ldots\ldots + \mu$

Y = total annual income of respondent in Naira

While Income, age, occupation, marital status ,type of agricultural enterprises, household size, gender, farm size,level of education, access to credit facilities, farming experience, co-operative membership Age in years, Household size, Farm size in acre, mobile phone usage for sourcing agricultural information were the independent variables

The different functional forms fitted were semi-log, double log, exponential and linear regression form and eventually, the best functional form was chosen on the basis of number of significant variables, signs of the coefficients, value of coefficient of determination (R), R^2 and adjusted $R^{2.}$.

Results and Discussions

Result of Descriptive Statistics

Table 1: Result of Descriptive Statistics

Variables		
Gender	**Frequency**	**Percentage**
Male	64.00	64
Female	36.00	36
Total	100.00	100
Marital Status	**Frequency**	**Percentage**
Single	27.00	27
Married	71.00	71
Divorced	2.00	2
Total	100.00	100
Level of Education	**Frequency**	**Percentage**
No formal education	23.00	23
Primary education	43.00	43
Secondary education	21.00	21
Tertiary education	13.00	13
Total	100.00	100
Membership of Cooperative Society	**Frequency**	**Percentage**
Yes	45.00	45
No	55.00	55
Total	100.00	100
Type of Enterprise	**Frequency**	**Percentage**
Livestock	17.00	17
Field	72.00	72
Both	11.00	11
Total	100.00	100
Size of Farm(IN ACRE)	**Frequency**	**Percentage**
1-2	38.00	38
3-4	32.00	32
5-6	22.00	22
7-8	2.00	2
9-10	6.00	6
Total	100.00	100
Total farm income per Season	**Frequency**	**Percentage**
5,000-10,000	88.00	88
11,100-19,600	3.00	3
19,700-29,200	5.00	5
29,300-38,800	2.00	2
38,900-48,400	1.00	1
48,500-58,000	1.00	1
Total	100.00	100
Sources of Information	**Frequency**	**Percentage**
Mobile phone	28.00	28
Radio	58.00	58
Internet	2.00	2
Television	5.00	5
Agricultural extension	1.00	1
Cooperative societies	4.00	4
Relatives and friends	2.00	2
Total	100.00	100
Constraints from Using ICT	**Frequency**	**Percentage**
High cost of ICT	39.00	39
Poor ICT infrastructure	5.00	5
Lack of ICT awareness	17.00	17
Lack of ICT training	37.00	37
Other	2.00	2
Total	100.00	100

Source: field survey, 2015

Table **1 above,** revealed that majority of the respondents were male (64%) while only (36%) of them were female. This is because farming is still perceived as male occupation in the study area. It was also revealed that majority (71%) of the respondents were married and (27%) of them were single, while 2% were divorced. This may implies that the household will have enough family labour to work for them on their farm. The table also showed that 23% of the respondents do not have any formal education, 43% of the respondents had primary school education certificate, 21% had secondary school certificate and 13% had tertiary education. This result indicated that the level of education of the respondents in study area is very low with majority (66%) having no or only primary school education and this may hinder adoption of new innovation. Also, 45% of the respondents were in cooperative society while 55% of the respondents were not members of any cooperative societies. This may implies that as a result of their low level of education they were oblivion of benefits inherent in being a member of cooperative society, also majority of the respondents did not have access to credit facilities (74%),while only 26% had access to credit facilities. This may be due to the fact that majority of them did not belong to any cooperative society and this may explain why most of them were smallholder farmers.

It also indicated that 72% of the respondents had field crop farming as their enterprise, 17% had livestock rearing as their enterprise and 11% had both livestock rearing and field crop farming as their enterprise. This implies that majority of the respondents were field crop farmers and this may be due to their lack of technical knowhow of livestock farming as a result of their low level of education. It was also revealed that 34% of the respondents grown maize on their farm, 8% grown vegetable, 15% grown Banana , 3% grown orange,25% grown cassava, 3% grown yam, 5% grown melon, 2% grown okro, 4% grown tomatoes, 1% grown okro on their farm. This implies that majority of the respondents in the study area are maize and cassava farmers. The result also revealed that 38% of the respondents cultivated 1-2 acres of land, 32% cultivated 3-4 acres, 22% cultivated 5-6 acres, 2% cultivated 7-8 acres and 6% cultivated 9-10 acres of land. This implies that majority of the respondents were small holder farmers (70%) who cultivated only 3-4 acres of land.

Majority (89%) of the respondents had N5,000-N10,000 income per season, 3% had N10100-N29200 income per season, 5% had N19700-N29200 income per season, 2% had N29300-N38800 income per season ,1% had N38900 - N48400 income per season and another 1% of the respondents had N48500 - N58000 income per season. This implies that majority (88%) of the respondents realized about #5000 - #10000 per season from their farm and this may due to the fact that majority of them were peasant farmers.

Majority (65%) of the respondents were not using phone for sourcing agricultural information. Out of those that made use of phone in sourcing for agricultural information 16% of the respondents were using mobile phone for marketing of farm produce, 9% of the respondents were using mobile phone for production activities decision, 10% of the respondents were using mobile phone for farm input procurement decision. The table also shows that 28% of the respondents used mobile phone as their source of agricultural information, 58% of the respondents used radio, 2% used internet, 5% used television,1% used agricultural extension ,4% used cooperative societies and 2% used relatives and friends as their own source of agricultural information. This implies that majority (58%) of the respondents used radio as their major source of agricultural information.

The result in the table 1 below also indicated that 39% of the respondents had high cost of ICT as their constraint to ICT usage, 5% had poor ICT infrastructure, 17% lack of ICT awareness,37% lack of ICT training and other 2%. This implies that the respondents were facing the problem of high cost of ICT as their major constraint to ICT usage. it was also revealed that 79% of the mobile phone users in the study area were facing network problem,11% lack of electricity, 2% lack of technical knowhow,4% poor ICT infrastructure and 4% high cost of ICT. This implies that majority (79%) of the respondents were facing poor network problem and this may be due to their distance from the nearest service provider or poor quality of service rendered by the service provider

Regression Analysis

In the OLS regression that was run with stata software, Dependent variable = Total annual income of respondent in Naira (proxy for farmer's productivity), While independent variables that were fitted include: Income, age, occupation, marital status, type of agricultural enterprises, household size, gender, farm size, level of education, access to credit facilities, farming experience, co-operative membership Age in years, Household size, Farm size in acre and mobile phone usage for sourcing agricultural information.

The implicit function is also stated as:

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_nX_n \ldots\ldots\ldots\ldots + \mu$

Where,

Y = Dependent variable = Farmer's annual income (proxy for farmer's productivity)

Independent Variables fitted include: X_1 =Age, X_2 =Marital Status, X_3 =level of education, X_4=Household size, X_5 =Major occupation, X_6=Enterprise on farm, X_7=Size of farm in acres, X_8 =Years of experience in farming, X_9 =Membership of cooperative society, X_{10}=Access to extension services

The different functional forms fitted were semi-log, double log, exponential and linear regression form. And eventually, the best functional form was chosen on the basis of number of significant variables, signs of the coefficients and values of coefficient of determination R^2 and adjusted $R^{2.}$.

From the result of OLS regression analysis in table 2 below, linear functional form gave the best fit and was chosen as the best functional form that explains the causal relationship between farmer`s annual farm income ( proxy for farmers` productivity) and Mobile phone usage (proxy for ICT usage). Based on the consideration of statistical and economic criteria, the results were explained as follows:

Table 2: OLS Regression Result for Effect of Mobile Phone Usage on Farmers` productivity.

Independent Variables	Coefficients	Standard Error	T Value
X1	-27703.21	27652.54	-1.00
X2	24340.99	12941.21	1.88
X3	82566.34	37923.44	-2.18
X4	-8.81226	40741.29	0.99
X5	39518.75	1848.779	-0.00
X6	32295.62	9112.454	4.34
X7	-11485.46	31003.52	1.04
X8	1396.801	19363.81	-0.59
X9	2904.519	4931.627	0.28
X10	.6106836	2656.63	1.09
X11	21576.89	38418.4	0.56
X12	-887.8626	1737.633	-0.51
X13	-37331.28	34054.29	0.82
Constant	1 12602.9	136596.3	0.54

Source: Field survey, 2015

** pc (t >2.5), value significant at 1% *** pc(1.95-2.45) value significant at 5% * pc (1.65-1.94) value significant at 10% R-squared = 0.4063 Adj R-squared = 0.3165

The R squared value of 0.406 and adjusted R-squared of 0.3165 indicated that 40% of the change that occurred in the dependent variable can be explained by the explanatory variables fitted. The result also indicated that out of explanatory variables fitted, Access to credit facilities, sources of agricultural information, Farm size, age and household size were statistically significant in explaining the variation in the annual income realized from the farm, which is a proxy, used to measure productivity of farmers.

However, the negative beta coefficient of age implies that farmer's productivity decreases with increase in age. This is expected because productivity of farmers decreases as they approach old age because of loss of agility and strength.. The negative beta coefficient of household size is also expected as increase in household size increases expenditure and this decreases farmer's saving. Annual incomes of farmers also increase with increase in the usage of mobile phone as a tool for sourcing agricultural information.

Table3: Logit Regression Result for Determinants of Mobile Phone Usage

Independent Variables	Coefficients	Standard Error	Z Value
X1	1.364856	1.065584	1.28
X2	5.448792	3.21897	1.69
X3	-7.826318	4.244254	-1.84
X4	-.0343809	.0777923	-0.44
X5	-.2173239	.3358595	-0.65
X6	-.329268	1.397591	-0.24
X7	-11485.46	31003.52	1.04
X8	-.0193686	.2650674	-0.07
X9	.1418403	.1126225	1.26
X10	4.932086	3.085234	1.60
X11	-.2570921	.1283158	-2.00
X12	-1.807256	1.664899	-1.09
X13	-8.76e-06	5.06e-06	-1.73
Constant	11.77988	7.097017	1.66

Source: Field survey, 2015
Log likelihood = -10.41165 Pseudo R^2 = 0.52895% Conf. Interval

The results of the logistic regression ran to determine the usage of mobile phone to source for agricultural information by farmers in the study area is shown in table 3 above.

The Logistic regression equation is given by: $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_nX_n$……$+ \mu$

Y is the dichotomous (binary) choice variable. Dummy Dependent Variable (Yes or No), indicating the use or none use of mobile phone to source for agricultural information by a farmer.

Mobile phone usage = f (Income, age, occupation, marital status ,type of agricultural enterprises, household size, gender, farm size, level of education, access to credit facilities, farming experience, co-operative membership) + e

Where,

Mobile phone (proxy for ICT) Usage for sourcing agricultural information as a dichotomous variable = Dummy Dependent Variable

Independent Variables fitted include: X_1 =Age, X_2 =Marital Status, X_3 =level of education, X_4=Household size, X_5 =Major occupation, X_6=Enterprise on farm, X_7=Size of farm in acres, X_8 =Years of experience in farming, X_9 =Membership of cooperative society, X_{10}=Access to extension services

The following could be deduced from the result of the Logistic regression in table 3 below.

Coefficient of age of Respondents is significant at 1% level of significance with a positive sign, this indicates that as the age of respondents is going higher they will have more access to mobile phone usage for agricultural purposes. Household size coefficient is also significant at 1% level of significance with a negative sign, and this implied that as household size increases, the chances of mobile phone usage would be decreasing. In the same vein, coefficient of Farm size (Acre) is significant at 5% level of significance with a positive sign which implies that farmers with large farm size has higher tendency of usage of mobile phone. Years of experience in farming is also significant at 10% level of significance with a negative sign. This implies that increase in years of experience in farming of the respondents will decrease their level of ICT usage as well as Access to Extension services which is also significant at 5% level of significance with a positive sign.

Summary, Conclusion and Recommendations

The study focused on determinants of mobile phone usage and its effect on productivity of farmers in Ibarapa central Local Government Area Oyo State. Multi- stage sampling techniques were used to select one hundred and twenty (120) farmers from the population of farmers in the study are while data was collected from them with the aid of structured questionnaire. Data collected was analyzed with the aid of descriptive statistics such as; frequency distribution tables, measures of central tendency and percentages while the inferential statistical tools used were the logistic regression to determine phone usage

and OLS regression model to determine of effect of phone usage on productivity of farmers.

The result of descriptive statistics showed that majority (77%) of them have access to some level of formal education. The study also revealed that most of the respondents were between the age group 26-36 years and majority of the respondents were male. This study also revealed that 64% of the respondents had 1-10 years of experience in farming. Almost 62% of the respondents have access to mobile phone usage. Adjusted R squared of 0.1977 implying that 20% of the dependent variable was explained by explanatory variables fitted. Marital status (X_2), level of education (x_3), major occupation (x_5), enterprise on farm (x_6), membership of cooperative society (x_9) were found not to have any significant relationship. Some problems being encountered by the farmers include; inadequate access to credit facilities, lack of access to extension services. The result of cross tabulation shows that level of education, marital status had influence on the choice of occupation of the respondents.

It is therefore, recommended that efforts should be made to improve the farm productivity of the respondents in the study area, this could be achieved by providing computers and computerized systems, mobile phones, data projectors and reduce the cost of ICT and also made amendments about poor network. From the foregoing, it is therefore imperative to conclude that Mobile phone (proxy for ICT tool) has much benefit on the productivity of farmers.

References

Alleman, J., Hunt, C., and Micheals,D.(2002): "Telecommunications and Economic Development; Empirical Envidence from Southern Africa; Technical Report" Sydney; International Communications Society. Retrieved on 17/02/2010 from http;// www.colorado.edu/ engineering/alleman/print files/soafrica paper.pdf

Arokoyo, T. (2005): "ICTs Application in Agricultural Extension Service Delivery". Journal of Agricultural Extension in Nigeria. Pp. 245-251.

Diagne, A ,S. A Adekanbi, F. P. Simtowe and G. Biaou,(2009): The impact of Agricultural Technology Adoption on Poverty. The use of Nerica Rice varieties in Benin. A Paper been presented as contributed paper at the 27th conference of the International Association of Agricultural Economists. August 16-20-2009, Beiging, China.

Dulle and Honesta Ngalapa (2014): Productivity and Employment Implication of Small Scale Farming (pp. 107-109). Sri-Lanka. Agrarian Research and Training Institute, Colombo.

Evenson, R.E., Pray, C. and Rosegrant,M.W(1999): Agricultural Research and Productivity Growth in India. Research

FAO (2005): " Nigeria's Agriculture and food security Challenges" Retrieved on 20/08/2010 from http;//www.fao.org/tc/ tca/work05/ nigeriappt.

IFDC (2013): Nigeria Agro-Dealer Support (NADS) Project Summary. International Fertilizer Development Centre (IFDC), Abuja. Nigeria

Fan,S., Hazell, PBR and Thorat, S. (1999): Linkages between Government Spending, Grwth, and Poverty in Rural India. Research Report No.110, International Food Policy Research Istitute, Washinton, D. C.

Kumar, P. and Rosegrant, Mark W.(1994): Productivity and sources of growth for rice in India, Economic and Political Weekly, 29 (52); Al83-Al88.

Kumar, Praduman and Mittal, Surabhi (2006): Agricultural Productivity trends in India; Sustainability issues, Agricultural Economic Research Review, 19;71-88.

Kenny, C. (2002): "The costs and Benefits of ICTs for Direct Poverty Alleviation."Economic and Political Weekly, 29 (52); Al83-Al88.

ITU, World Telecommunication Indicators Database, (2008):Available at http;//www. itu.int/ ITUD/ ict/statistics/material/graphs/Global ICT Dev 98-09.jpg Retrieved on 24th August,2012.

National Bureau of Statistics/Central Bank ofNigeria (2006): "Socio-Economic Survey in Nigeria". National Population Commision (NPC) (2006)

Okello, J.; Kirui, O.; Njiraini, G.; Gitonga, Z. (2012): Drivers of use of information and communication technologies by farm households: The case of smallholder farmers in Kenya. In: Journal of Agricultural Science 4 (2), pp. 111-124.

Rvarieteport No.109. International Food Policy Research Institute, Washinton, D.C.

THAICIDnd, Earth trends, (2003): Farmers online: drivers and impediments in adoption of Internet in UK agricultural businesses. Journal of Small Business and Enterprise Development, Vol. 11(3), 371–381

World Bank (2013): Enhancing Rural Development through Improved Infrastructure and Innovative Information Applications. Regional ESW Report No. 45438-EAP, East Asia and Pacific Region Sustainable Development Department and Policy Unit, Telcom and Infrastructure, Global Information and Communication Technology Department. World Bank, Washington DC