October 2013

Use of Information and Communication Technologies (ICTs) by Yam Farmers in Boluwaduro Local Government Area of Osun State, Nigeria.

Adewale Joel Sobalaje Mr.
Olusegun Oke Library, Ladoke Akintola University of Technology, Ogbomoso, Oyo State, Nigeria., walesoba@yahoo.com

Ganiyu Ojo Adigun Mr.
Olusegun Oke Library, Ladoke Akintola University of Technology, Ogbomoso, Oyo State, Nigeria., adiganfoly@yahoo.com

Use of Information and Communication Technologies (ICTs) by Yam Farmers in Boluwaduro Local Government Area of Osun State, Nigeria.

By
SOBALAJE, Adewale Joel and ADIGUN, Ganiyu Ojo*

Olusegun Oke Library, Ladoke Akintola University of Technology, Ogbomoso.

Abstract

This study focused on the use of ICTs by yam farmers in Boluwaduro Local Government Area of Osun State. The study made use of cross-sectional research design and data were collected with the aid of structured questionnaire from 150 respondents selected through random sampling technique from five towns in the local government area. The data collected were analyzed using descriptive statistics and regression analysis in finding relationships between variables. The findings show that most of the yam farmers in Boluwaduro that use ICTs as a source of agricultural information had secondary education and they were between the average ages of 35 years. The result supports the assertion that ease of access and availability were the major factors that influences the preference for ICTs use by the yam farmers in the LGA, and also, television, radio and mobile phone were the most preferred ICTs tools for agricultural information by the yam farmers. It was discovered that infrastructural facilities is the major problem constraining the use of ICTs by the yam farmers in Boluwaduro, and that demographic factors does not have any significant relationship with the use of ICTs by Boluwaduro yam farmers. While strong relationship existed between problem encountered and ICTs use by the yam farmers in Boluwaduro. Better infrastructure provision was also advocated to encourage the use of ICTs by the yam farmers.

Key Words: *Information and Communication Technologies (ICTs), ICTs Use and Farmers, Yam Farmers, Agricultural Information.*

E-mail: walesoba@yahoo.com **and** adiganfoly@yahoo.com*

***Corresponding author:** adiganfoly@yahoo.com

Introduction

All over the world, new Information and Communication Technologies (ICTs) have changed the lives of individuals, organizations, and indeed entire nations. In essence, the role of ICTs in poverty eradication can no longer be ignored. In Nigeria for example, the role of ICTs is recognized in Millennium Development Goal Number 8 (MDG8), which emphasized the benefits of new technologies, especially Information and Communication Technologies (ICTs) to fight against poverty. Despite the adoption and input of ICTs to development in the

urban areas, rural communities are neglected and deprived of substantial access to ICTs. Farmers are deprived information that would help to assist them in productivity and market survey for their yields and products. Yam farmers experience many challenges with respect to information dissemination and accessibility to ICTs to increase their agricultural information and knowledge. Lack of infrastructure is found as the biggest challenge in deploying ICTs to solve agricultural information dissemination problems in Nigeria. Without such resources as ICTs, there is no business that can thrive today all over the world.

Although most urban communities in Nigeria have adopted ICTs, this is not the case with our rural communities (UNDP, 2002). ICTs application in agriculture most especially to Nigerian rural farmers is highly limited because of insignificant level of attention on the part of the government on one hand, as well as the huge capital required for setting it up on the other hand. For these reasons, it has affected the free flow of information on production capacity of yam farmers in terms of land cultivation, pest and disease control, marketing of farm's produce and farm activities in developing countries such as Nigeria.

It is in the light of the above, that this study is being carried out to investigate the level of awareness and consequently use of ICTs by Yam Farmers in Nigeria using Boluwaduro Local Government of Osun State as a case study, so that appropriate steps will be taking to inculcate the use of ICTs in farm practices by the yam and other farmers. The study area is Boluwaduro Local Government, Osun State, Nigeria. The council comprises five major towns namely; Eripa, Otan-Ayegbaju, Igbajo, Oke-Irun and Iresi. The Local Government has over 300 villages and hamlets, all having common boundaries, homogeneous historical, political, commercial, and cultural back grounds. The major farm activities in the local government is yam production in large quantity, this justifies the reason for choosing the local government as the case study for this study.

Objectives of the Study:

The main objective of the study is to investigate the extent of ICTs awareness, access and use by yam farmers in Boluwaduro Local Government Area of Osun State, Nigeria. The study will also achieve the following specific objectives:

i. To determine whether yam farmers in Boluwaduro are aware of ICTs;
ii. To establish whether the yam farmers in Boluwaduro have access to and use ICTs;
iii. To determine the types of ICTs preferred by yam farmers in Boluwaduro and why;
iv. To determine the benefits of ICTs use to yam farmers in Boluwaduro, and
v. To identify the problems encountered by Boluwaduro yam farmers in their use of ICTs and how to solve the problems.

Research Questions:

This study investigates the awareness, access and use of ICTs by yam farmers in Boluwaduro Local Government of Osun State of Nigeria, to improve their yam production, market strategy, and facilitate access to relevant information that can aid yam farmers. The key questions asked are the following:

i. What is the level of awareness and frequency of ICTs use by yam farmers in Boluwaduro?
ii. Which ICTs tools are preferred and what factors are influencing the preference for ICTs by yam farmers in Boluwaduro?
iii. What are the benefits derived by Boluwaduro yam farmers in their use ICTs?
iv. What are the problems hindering ICTs use by yam farmers in Boluwaduro?

Statement of Hypotheses

$H_0$1: There is no significant relationship between the demographic factors of the yam farmers in Boluwaduro and their use of ICTs.

$H_0$2: There is no significant relationship between problems encountered by yam farmers in Boluwaduro and their ICTs use.

Literature Review

The Information and Communications Technologies (ICTs) that exist today have been designed and geared towards meeting the needs of people in the developed world. The digital divide phenomenon has caught up with the rest of the world especially the international organizations such as United Nations and donors agencies such as USAID, EU and NEPAD. The initial concern was with the widening gap between the West and the South and also between the haves and have-nots from those two regions. Recently the attention has shifted to women as well as farmers and the use of Information and Communication Technologies (ICTs), and the future impact such a divide could have on nations (Maphakwane, 2008). In short the emphasis is now on the marginalized and the impact their lagging behind on the use of modern ICTs could have on the future development of the world.

Information Communication Technologies (ICTs) are electronic technologies for creating, acquiring, storing, processing, communicating, and using information (Tiamiyu, 2002). The nature of relationship therein either with man or nature (environment) completely depends on the level and sustenance of development. This development in its part is determined and influenced by the level of Information and Communication Technologies (ICTs) a nation controls (Wogu, 2006). In fact, for the mere fact that the introduction of ICTs in most areas of human endeavors all over the world is usually followed with improved and increased success is a proof that ICTs are very significant and useful for sustainable development. Nigerians will not be quick to forget the transformation brought about by mobile communication in 2001.

ICTs Applications in Agricultural Developments:

ICTs plays essential role in poverty alleviation and have been identified to be a powerful tool in combating global food crisis. It provides useful strategies to transmit agricultural information to the rural areas where largest percentage of the farmers resides. Farmers need information to enhance agricultural production. Such information however should be accurate, complete, dynamic, concise, and must be in user friendly form (Nkwocha, et al., 2009). Aina (1991) and Kaniki (1995) opined that each agricultural information user usually have specific information needs based on their peculiarity. Some farmers need information such as sources of credit facilities, issues on land-ownership and marketing of agricultural produce and these are quite different from those of extension agents which include control of major pests and diseases, proper handling of insecticides and best cropping methods.

ICTs and Agricultural Development in Nigeria:

Okwusi et al. (2009) suggested that the ways government can make impact in ICTs for agricultural development is by the establishment of phone booths and cyber cafes in rural and urban areas for agricultural purposes. There is need to set up agricultural community ICTs centers which will be operated by farmer organizations. There is immense potential for technological development in Nigeria due to the resources the country is endowed with. The opportunities available for the use of ICTs in agricultural development in Nigeria are numerous and similar to those of economic development of the country if appropriate measures are taken.

ICTs usage has become more relevant in the modern days and agriculture is one of the sectors that benefited from it. ICTs has played an important role in addressing some of the challenges facing agriculture and in the uplifting the livelihoods of the rural people. ICTs are used for the delivery of agricultural information and knowledge services (i.e. market prices,

extension services, etc.). It has been used as a means of accessing market prices, weather and other advice. It enables rural communities to interact with other stakeholders, thus reducing social isolation. The role of ICTs in improving rural livelihood was officially recognized and endorsed at the World Summit Information Society (WSIS, 2003). This includes the use of computers, internet, geographical information systems, and mobile phone. ICTs provide better access to credit and rural banking facilities.

Effectiveness of ICTs in Agricultural Extension Service Delivery:

The attainment and sustenance of high levels of agricultural production and income is not possible without an effective agricultural extension and appropriate tools that is relevant to farmers' needs (Anil, 2008). Various extension services strategies have been put in place over the years in the country (Akubuilo, 2009). These extension efforts are meant to ensure that information on agricultural information communication technologies are made available to improve the productivity of farmers and to facilitate the role extension plays in national development. Bolarinwa and Oyeyinka (2011) stated that there will be quick exchange of agricultural information between the extension agents and farmers if ICTs components are integrated in delivery of agricultural information to farmers in Nigeria.

In the same vein, extension agents will relay farmers' information needs to researchers and rapidly access large amount of information from the researchers through mobile phone for onward dissemination to farmers. However, ICTs enable interactive communication unhindered by distance, volume, medium, or time. According to Ban and Hawkins (1996) research shows that the mass media can accelerate the existing change process. Yahaya, (2003) reported that incorporation of appropriate multi-channel communication strategies into extension programs can improve the situation of farmers. Oladosu and Akintonde (2004) reported that radio and television has become an important medium in countries with transmitters and where farmers have access to receiving sets.

Munyua, (2000) also stated that, traditional media were successful in developing countries and rural radio in particular has played a major role in delivering agricultural messages. Print machines, video, television, films, slides, pictures, drama, dance, folklore, group discussions, meetings, exhibitions and demonstrations were also used to speed up the flow of information.

Aboh (2008) opined that ICT tools that have great potential for use in agricultural extension include Radio, television, telephone (GSM), the web, search engines, packet digital assistants, cameras, video, email, computer, contact data bases and system, CDROM, DVD, current awareness, group ware, rural radio, etc. Regardless of these tools, the focus must be on the farmers who use the technologies and the content rather than the technologies themselves. Experience shows that most frequently used ICT tools were only radio, television, computer and mobile phones obviously because of their ease of use and wide coverage. Falola and Adewumi (2011) also reported the high frequency use of mobile phone (61%) by farmers for their farm operations.

Problem Militating Against the Use of ICTs by the Rural Farmers:

Farmers, most especially yam farmers experience many challenges with respect to information dissemination and accessibility of ICTs to increase their agricultural knowledge. Lack of infrastructure is found as the biggest challenge in employing ICTs to solve agricultural information dissemination problems in Nigeria. Akinola, et al. (2010) stated that, the cost of purchasing a radio and television sets, cost of purchasing printed media such as newspapers, magazines, bulletins, and lack of infrastructural facilities especially electricity, wrong timing of agricultural programs and low levels of literacy among the farmers are factors militating against the effectiveness of mass media communication channels.

According to Ahmed Qadeer, Deputy Project Manager of UNDP (Media Asia journal article) as quoted in Kahn (2000), “Many developing countries also lack sufficient electricity supplies, especially in rural and remote areas. Mostly affected with these problems of

infrastructure are the rural areas where the key producers of agricultural goods reside. Other challenge is the "un-readiness" of the Nigeria farmers to adopt the use of ICTs with many farmers actually believing in the old saying; "you cannot teach old dog new tricks" (Obayelu, 2010). It is line with the above and many other literatures that it becomes imperative to find out the level of awareness and use of ICTs by yam farmers in Boluwaduro Local Government Area of Osun State, Nigeria.

Methodology

The study was conducted in Boluwaduro Local Government Area of Osun State, Nigeria. The headquarters is located in Otan-Ayeghaju at 7^0 57^1 00^{11} N and 4^0 48^1 00^{11} E. It has an area of 144 km^2 and a population of 70,775 as at 2006 population census. The local government came into being on Wednesday, 4^{th} December, 1996 as a result of creation of additional 183 local government (Nationwide) by the then Federal Government of Nigeria. Boluwaduro local government area comprises five major towns, namely; Otan-Ayegbaju, Iresi, Igbajo, Eripa, and Oke-Irun.

A multistage sampling technique is adopted in other to choose towns and villages that are majorly known for yam production in larger quantities. Six villages were randomly selected from each major town in the local government area. Subsequently, from each of the villages, five yam producing farmers were also randomly selected. This brings the total number of respondents for each major town to thirty (30), and thereby bringing the total number of respondents for this study to one hundred and fifty (150) respondents. The simple random sampling procedure by balloting is employed for the selection of both the villages and the respondents.

Table 1: Summary of the sample size and sampling procedure used in the survey. **N = (150)**

	Towns	Num. of Villages Selected From a Town	Num. of Farmers Selected From a Village	Respondents Selected (Num. of Villages X Num. of Farmers) from a town
1	Otan-Ayegbaju	Six (6)	Five (5)	Thirty (30)
2	Iresi	Six (6)	Five (5)	Thirty (30)
3	Igbajo	Six (6)	Five (5)	Thirty (30)
4	Eripa	Six (6)	Five (5)	Thirty (30)
5	Oke-Irun	Six (6)	Five (5)	Thirty (30)

One hundred and fifty copies of the questionnaire were distributed among the selected farmers in the local government area. Because of literacy level of the farmers, the researcher in collaboration with the research assistance of Agricultural Extension Agents and friends of the researcher interpreted the questions to the respondents in Yoruba language for those respondents that cannot read the questionnaire. The questionnaires were filled based on their responses. In order to get the necessary information needed to answer the research questions and test the hypotheses, the responses obtained from the completed copies of the questionnaire were re-coded and analyzed using the Statistical Package for Social Science (SPSS). Both descriptive and inferential statistics were used to analyze the data collected from the respondents. Such descriptive statistics include the use of Percentages, Frequency distributions, and Regression Analysis was used in finding relationships between variables.

Presentation and Discussion of Findings

Table 2: Demographic Factors of Boluwaduro Yam Farmers by their use of ICTs
N = (150)

Demographic Factors	ICT USE			
	Use ICT		Do not use ICT	
Sex	Freq	%	Freq	%
Male	104	62.7	11	7.3
Female	22	14.7	13	8.7
Total	126	77.4	24	22.7
Age (years)				
21-30 years	38	25.3	8	5.3
31-40years	49	32.7	8	5.3
41-50years	30	20.0	6	4.0
51-60years	7	4.7	2	1.3
61years above	2	1.3	0	0.0
Total	126	84.0	24	16
Marital Status				
Married	90	60.0	12	8.0
Single	32	21.3	7	4.7
Widowed	3	2.0	3	2.0
Divorced	1	0.7	2	1.3
Total	126	84.0	24	16
Level of Education				
Primary	38	25.3	10	6.7
Secondary	52	34.7	4	2.7
Tertiary	27	18.0	2	1.3
Others	9	6.0	8	5.3
Total	126	84.0	24	16.0
Have other Occupation				
Yes	50	33.3	10	6.7
No	76	50.7	14	9.3
Total	126	84.0	24	16

Evidently from table 2, those who were male (62.7%) and aged 31-40 (32.7%) among the yam farmers, use ICTs to obtain agricultural information. Also, 52 (34.7%) of the yam farmers that had secondary education use ICTs as a source of agricultural information. Furthermore, the highest percentage of the respondents that do not use ICTs as a source of agricultural information, with respect to their level of education, came from the yam farmers who had primary education (6.7%), followed by others educational level (5.3%).

Table 3: Distribution of ICTs Awareness and Frequency of Use of ICT Tools by Yam Farmers

	ICT Use			
	Use ICT		Do not Aware Use ICT	
	Freq	%	Freq	%
Aware of ICT				
Yes	126	84.0	24	16.0
No	0	0	0	0.0
Total	126	84.0	24	16.0
For how Long have you been Getting Information through ICT?				
1 year	6	4.8	0	0
1-2years	48	38.1	0	0
3-5years	41	32.5	0	0
5 years above	31	24.6	0	0
Total	126	100.0	0	0
Use of ICT Per Week				
1 time	52	41.4	0	0
2 times	56	44.4	0	0
3-5 times	9	7.1	0	0
Above 5 times	9	7.1	0	0
Total	126	100.0	0	0

Table 3 shows the distribution of ICTs awareness and frequency of its use by the yam farmers in Boluwaduro. Majority of the yam farmers (84%) were aware of ICTs as a source of information for their yam farming activities, while only 24 (16.0%) of the yam farmers were not aware of ICTs as a source of information. In terms of length of time, 48 (38.1%) indicated that they use ICTs and had been getting information from ICTs for 1-2 years, while 41 (32.5%) accepted that they use ICTs and they had been getting information from ICTs for about 3-5 years. In terms of frequency of use, majority of the farmers 56 (44.4%) claimed they use ICTs twice per week.

Table 4: Types of ICT Tools Preferred by the Yam Farmers in Boluwaduro

Types of ICT	Least Preferred		Preferred		More Preferred		Most Preferred	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Radio	4	3.2	11	8.7	30	23.8	81	64.3
Television	2	1.6	9	7.1	53	42.1	62	49.2
Mobile phone	8	6.3	18	14.3	20	15.9	80	63.5
Internet Facilities	49	38.9	34	27	23	18.3	20	15.8
Printing Machines	15	11.9	25	19.9	42	33.3	44	34.9
Computer	49	38.9	44	34.9	26	20.6	7	5.6

From Table 4 above, radio (64.3%) and mobile phone (63.5%) are the most preferred ICTs by Boluwaduro yam farmers to get agricultural information. However, Internet and computer (38.9% each) are least preferred ICTs by the yam farmers as a source of agricultural information. This finding is in consonance with that of Munyua (2000) and Oladosu and Akintonde (2004) that Radio and Television has become the most important medium for farmers to obtain agricultural information. The study also supported the finding by Aboh (2008) and Falola and Adewumi (2011) that mobile phone is another ICTs tool embraced by farmers for receiving and sending information. This is not unexpected since the study shows that majority of the yam farmers had at least primary school certificate which means they can read and write relatively.

Table 5: Factors Influencing the Preference for ICTs Type by the Yam Farmers

Factors	Freq	%
Ease of access	47	37.3
Availability	35	27.8
Relevant content	18	14.3
Quality of information	14	11.1
Cost of obtaining information	12	9.5
Total	126	100.0

Table 5 shows the results of the analysis of some of the factors influencing the yam farmers' preference for ICTs facilities. However, ease of access is the major (37.3%) factor influencing the yam farmers' preference for ICTs in Boluwaduro; this is followed by availability of ICTs (27.8%), while cost of obtaining information (9.5%) has little or no influence on the farmers.

Table 6: Benefits Derived from Use of ICTs by Yam Farmers.

ICT Benefits	Use ICTs	
Benefit of ICT on Production Activity	Freq	%
High	86	68.3
Medium	40	31.7
low	0	0.0
Total	126	100.0
Benefit of ICT on Better Management Activities		
High	47	37.3
Medium	78	61.9
low	1	0.8
Total	126	100.0
Benefit of ICT on Harvesting		
High	50	39.7
Medium	74	58.7
low	2	1.6
Total	126	100.0
Benefits of ICT on Marketing		
High	60	47.6
Medium	64	50.8
low	2	1.6
Total	126	84.0

The distribution of respondents by benefits derived from the use of ICTs on their farming activities is presented in Table 6. The result shows that production activity (68.3%), and marketing (47.6%) respectively benefited mostly from the use of ICTs by the yam farmers. This agreement with the findings of Aina (1991) and Kaniki (1995), which affirmed that farmers need information to continuing production and marketing thereof and such information must be accurate, complete, dynamic and concise.

Table 7: Problem Militating Against the Use of ICTs by the Yam Farmers

Problems	Not a Problem		Serious Problem	
	Freq	%	Freq	%
Infrastructural problem	24	19	102	81
Awareness	94	74.6	32	25.4
Irrelevant content	90	71.4	36	28.6
Technical skill problem	87	69	39	31
Interest	112	88.9	14	11.1
Literacy level	98	77.8	28	22.2

The result from table 7 shows that infrastructure (81%) is the major problem militating against the use of ICTs by the yam farmers. This is because most of the infrastructural facilities are concentrated in the cities rather than the rural areas. This finding agreed with the findings of Kahn (2000) that lack of infrastructural facilities among others were the major hindrance to ICTs use by farmers. However, awareness, irrelevant content, technical skill, interest and literacy level are not seen as too serious problems confronting Boluwaduro yam farmers in their use of ICTs for farming activities. These findings also almost agreed with the findings of Akinola, et al. (2010) which stated that lack of infrastructural facilities especially electricity, wrong timing of agricultural programs and low levels of literacy among the farmers are factors militating against the effective use of ICTs by farmers.

Table 8: Regression analysis result

Predictor Variables	**B**	**Sig. Level**	**R Square**
Age	-0.028	0.675	0.016
Marital Status	-0.068	0.307	
Level of Education	0.005	0.902	
Sex	0.063	0.393	
Other occupation	0.047	0.479	
Dependent Variable = Use of ICTs			
Predictor Variables	**B**	**Sig**	**R Square**
Use of ICTs by Yam Farmers	-0.107	0.008	0.047
Dependent Variable=Problem Encountered by Yam Farmers in Using ICTs			

Test of Hypothesis

The test of the hypotheses is shown in table 8, indicating the relationship between dependent and the predictor variables.

$H_0$1: There is no significant relationship between the demographic factors of the yam farmers in Boluwaduro and their use of ICTs.

The above result shows that at $p>0.05$, there is no significant relationship between the demographic factors (i.e. age, marital status, level of education, sex and other occupation) of the yam farmers and their use of ICTs ($p=0.675, 0.307, 0.902, 0.393, 0.479$). Therefore, the null hypothesis is accepted.

$H_0$2: There is no significant relationship between problems encountered by the yam farmers in Boluwaduro and their ICTs use.

The result from table 8 above shows that at $p<0.05$, there is a negative and significant relationship between ICTs use by Boluwaduro yam farmers and problem encountered in while using the ICTs ($p=0.008, B= -0.107$). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted.

Conclusions and Recommendations

Conclusively, this study shows that yam farmers in Boluwaduro Local Government of Osun State, Nigeria were aware and use ICTs for information on production and distribution.

However, television, radio and mobile phone were the major ICTs preferred by the yam farmers to obtain agricultural information due to the accessibility. Infrastructural facilities were the major constraints to the use of ICTs by the yam farmers in Boluwaduro Local Government Area of Osun State.

Based on the findings of this study, the following recommendations are suggested to improve the use of ICTs by yam farmers in Boluwaduro Local Government Area of Osun State:

i. Better infrastructures such as electricity should be provided to enables the yam farmers to make use of Information and Communication Technologies.
ii. Policy makers should make policies and government agencies should enforce the policies that will bring about a decrease in the prices of information and communication technologies infrastructure to enable an average farmer have easy access to them.
iii. A strong awareness drive on the part of government, research institution and the extension agency on the advantages of using ICTs by yam farmers in the study area should be embarked upon to help farmers see the need to adopt and use ICTs so as to obtain agricultural information.
iv. Concerted efforts such as workshops, seminars, etc. should be embarked upon by Boluwaduro Local Government Authority to consolidate the prospects of ICTs so as to overcome the challenges posed by the impediments to the use of ICTs in the Local Government.

References

Aboh, C. L. (2008). Assessment of the Frequency of ICT Tools Usage by Agricultural Extension Agents in Imo State, Nigeria: *Journal of Agriculture and Social Research (JASR)*, 8(2).

Aina, L. O. (1991). The Informal Sector and the Environment in Nigerian Towns. *Research Journal of Environmental and Earth Science* 3 (1), pp. 61-69.

Akinola, O.; Ogunwale, A.B. and Okunade, E.O. (2010*).* Factors Militating Against the Effectiveness of Mass Media, Communication Channels on Maize Farmers in Ogbomosho Agricultural Zone of Oyo State. *Proceeding of the 44th Annual Conference of Agricultural Society of Nigeria* held in Ladoke Akintola University of Technology Ogbomosho, from 12-14 April,2010, Oyo State, Nigeria, pp. 1887-1891.

Akubuilo, C.J.C. (2009). "History of Agricultural Extension in Nigeria" In: Akinyemiju.O.A and Torimiro, D.O. (eds.) *Agricultural Extension-A Comprehensive Treatise.* Ikeja, Lagos: ABC Agricultural Systems Ltd, pp.109-120.

Anil, N. (2008). ICT for Agricultural and Rural Development. Accessed from: http://en.wikieducator.org/image/c/ce/information-&-communication(a-k-sahu)ppt.pdf on March 15th, 2013.

Ban, A.W and Hawkins, A. (1996). Agricultural Extension. Blackwell science publishers, p. 127.

Bolarinwa, K. K and Oyeyinka, R. A. (2011). Use of Cell Phone by Farmers and its Implication on Farmers' Production Capacity in Oyo State Nigeria. *World Academy of Science, Engineering and Technology* 51, pp. 653-658.

Falola, A and Adewumi, M. O. (2011). Constraints to Use of Mobile Telephony for Agricultural Production in Ondo State, Nigeria. *Journal of Research in Forestry, Wildlife and Environment*: 4(2), pp. 52-63.

Kahn, S. (2000). Communication accepted for inclusion in Thomson Reuters and New Online Submission System. *Journal of the Asian Media Information and Communication Center* 3 (20), pp. 45-50.

Kaniki, A. M. (1995). Agricultural Information User Populations and Critical Tasks In: Aina, L.O, Kaniki, I.O and Ojiambo, J.B (eds) *Agricultural Information in Africa*, Third World Information Services Ltd., Ibadan, pp. 56-70.

Maphakwane, G.G. (2008). Indigenous Women and ICTs: Are You Sure That is My Priority? Proceeding of the 1st National Conference of Botswana Library Association (BLA), 26-28 June, 2008 at University of Botswana Library Auditorium, Gaborone. Pp. 112-124.

Munyua, A. (2000). Farmers' perception of the Agricultural Information Resource. *International Journal of Agricultural Economic and Rural Development* 1 (3) p. 24.

Nkwocha, V.I.; Ibeawuchi, I.I.; Chukwueke, N.O.; Azubuike, N.O. and Nwkwoch, G.A. (2009). Overview of the Impact of Information and Communication Technology on Agricultural Development in Imo State, Nigeria. Proceeding of the 43rd Annual Conference of the Agricultural Society of Nigeria held in Abuja, from 15-20 August, 2009, Nigeria, p. 714.

Obayelu, A.O. (2010). Effect of Global Food Price Crisis on Nutritional States of Nigerians; Determinants, Coping Strategies, Policy Reponses and Implication. *ARPN Journal of Agricultural and Biological Science* 1 (2), pp. 45-60.

Okwusi, M.C.; Nwachukwu, N.O. and Adesope, O.M. (2009). Assessment of the Usefulness of Agricultural Information Obtained from the Internet Among Farmers in the South-East Nigeria, Global Publications, Lagos, Nigeria, p. 420.

Oladosu, I.O. and Akintonde, J.O. (2004). Introduction to Extensive Services. Age publications, Ogbomoso, Nigeria, p. 78.

Tiamiyu, M.A. (2002). Information and Communication Technologies (ICTs) for Social Development Issues: Options and Strategies. *African Journal of Library, Archives and Information Science*. 12 (1), pp.12-40.

Ugwu, B.O (1990). Economics Efficiency of Fadama Telfaira Production in Imo State. *American Journal of Agricultural Economics* 2 (7), pp. 303-310.

UNDP (2002). Adoption of Information and Communication Technologies in Developing Countries. *Journal of Information Technology Impact* 9 (1), pp. 37-46.

Wogu, A. (2006). Problem of Multicollinearity. *Pakistan Journal of Social Sciences* 4 (6), pp.778-781.

WSIS (2003). WSIS Plan of Action. *World Summit on Information Society*, Geneva, Switzerland, pp. 247-256.

Yahaya, M.K (2003). *Development Communications, Lessons from Change and Social Engineering Projects,* Corporation Graphics Limited, Ibadan, p. 481.