

Use of Information and Communication Technologies (ICTs) among National Agricultural Researchers in Southwest, Nigeria

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ABSTRACT

The effective utilization of scientific and technological findings is the main crux in achieving meaningful development. The advancement of agriculture depends on effective extension delivery which is fundamentally agricultural communication. This study examined the current state of the use of information and communication technologies by the national agricultural researchers in Southwest, Nigeria. A total of 150 researchers across selected research institutes in Southwest Nigeria were sampled for the study. However, only 119 research instruments were returned and used for data analysis. Findings reveal that majority (54.0%) had 1-5 years of research experience, 86.0% were the senior cadre officers, with an average age of 38 ± 4.5 years. While computer was mostly (93%) used among electronic ICT, print media, journal (87%) was mostly used among printed ICT. Computers (77.0%), Telephone (75.0%) were used on daily basis while Journals (87.0%) and Posters (49.0%) were only used when available. Respondents' rank in the organizations ($\chi^2 = 6.8139$, $p = 0.0331$) had a significant relationship with their use of ICTs for agricultural research and development while no significant relationship was established between the perceived importance of ICT and their use of ICTs for agricultural research and development. Well-funded ICTs department and infrastructure will promote the use of ICTs among agricultural researchers.

Keywords: Information and Communication Technology, Agricultural Researchers, Research and Development.

INTRODUCTION

Information is a major prerequisite for agricultural development and as noted by Adebayo, Adesope and Agumagu (2006) that when the right type of information is disseminated to the end users through the appropriate channel and in the right amount, meaningful progress will be made in agricultural development. Information and communication technologies contribute to improved agricultural research by enabling sharing and exchange of research data and information electronically and in managing agricultural research for greater efficiency and effectiveness. Agricultural research and development institutions are the channels through which newly developed technologies are disseminated. The Nigerian National Agricultural Research System (NARS) focuses on development efforts through strengthening of research supply by providing infrastructure, capacity management and policy support at the national level. Information creation, sharing and utilisation are vital ingredients to empower the poor to make the right decisions.

The use of Information and Communication Technology (ICT) will bring about a transformation of agriculture through the use of adequate innovation that is largely enabled through information sharing. It will also bring about an

exchange between agricultural stakeholders through ICTs-enabled information systems (Maru 2008). Building agricultural productivity and food security will require new and improved technologies, broad dissemination of newly developed and existing technologies as well as introduction of support services for improving farm yield. This is important in order to meet the challenge of feeding the consistently increasing population and it will necessitate the use of ICTs (Bientema and Stads, 2004). Where the services and technologies needed for improved production are not available to farmers, their productive performance will remain low.

Aina (1990) noted that the agricultural research information system in Nigeria is characterised by very few avenues for reporting research findings. According to the International Institute of Communication Development (IICD), ICTs have a great potential to enhance agricultural production, improve market access, aid capacity building and empower producers. Information and communication technologies offer a common ground for interaction among all segments of the agricultural system, crossing barriers posed by geographical, cultural and bureaucratic bottlenecks and shortens the gap and distance between members of the agricultural system. However, Aina, Kaniki and Ojiambo

(1995) and Oladele (2011) asserted that agricultural researchers' access to information through agricultural indexes, abstracts, databases in agriculture are only available in few libraries and documentation centres.

However, when ICTs are employed in the agricultural research and development system, there will be acceleration in agricultural development since the system depends on effective communication of the stakeholders in the sector. Communication using ICTs will bring about an increase in the efficiency and effectiveness of knowledge transfer and its utilization by all the players in the sector. However, poor flow of information both within government institutions and between the institutions and their stakeholders have resulted in ineffective research processes. When these institutions lack access to information about their clients and their needs, as well as knowledge about broader social and economic developments, they make short sighted decisions. Also, weak information, communication and knowledge flow bring about poor performance of markets and institutions resulting in reduction in economic growth for the economy. The sparseness of information on the use of (ICT) for agricultural research and development in Nigeria brings to fore the relevance of this study and it is against this background that this study sought to provide answers to the following questions:

1. What is the ICTs usage of agricultural researchers for research and development in South Western, Nigeria?
2. What is the perceived importance of agricultural researchers' ICT knowledge and skill needs for job efficiency?

METHODOLOGY

The study area is South-Western Nigeria. The population comprises the agricultural research institutes that have either their headquarters or sub-stations located in the zone. Multi stage sampling procedure was used to select the sample for the study. There are 11 research institutes in the south western Nigeria. They include Cocoa Research Institute of Nigeria (CRIN), National Horticultural Research Institute (NIHORT), Nigerian Stored Products Research Institute (NSPRI) and Nigerian Institute for Oceanography and Marine Research (NIOMR). Others are Institute of Agricultural Research and Training (IAR&T) and Nigerian Institute for Oil Palm Research (NIFOR). Fifty percent (6) of the institutes was randomly selected and a

representative sample of agricultural researchers were randomly selected from each institute. They include Cocoa Research Institute of Nigeria (CRIN), National Horticultural Research Institute (NIHORT), Nigerian Stored Products Research Institute (NSPRI) and Nigerian Institute for Oceanography and Marine Research (NIOMR). Others are Institute of Agricultural Research and Training (IAR&T) and Nigerian Institute for Oil Palm Research (NIFOR). A total of 150 researchers were then sampled across the selected Institutes, but only 119 questionnaires were returned and used for analysis

Measurement of variables

Variables considered in this study included:

- Researchers' use of ICTs in research and development

This was operationalized by asking the researchers to indicate whether they use any of the listed types of ICTs with response options of Yes or No with scores of 1 and 0, respectively. The frequency with which they use the ICTs was also determined as Daily (3), Weekly (2), Monthly (1), wherever possible (0).

- Researchers' perceived importance of their ICT knowledge and skill needs

This is based on ten items using a four-point scale of Very Important, Important, Least Important and Not important with scores of 3, 2, 1 and 0, respectively.

RESULT AND DISCUSSION

Years of involvement in agricultural research among respondents ranged from 1-20 years. Majority of the respondents (54%) had 1-5 years of research experience with only 14 % having above 15 years experience. Majority (86 %) of the respondents were senior cadre officers. This is supported by Kenny (2002) who noted that majority of internet users possess a university degree, majority (95 %) are below 50 years and the mean age of the respondents was 38 years. Oladeji (2010) revealed that the average age of public and private extension personnels in Oyo State, Nigeria were 44.0 and 32.0 years respectively. Only 19.3% of the respondents were females (Table 1). This corroborates the findings of Oladeji (2010) and Oladeji and Oyesola (2011) who reported small number of females among private agricultural organization workers and agricultural extension personnel respectively in Oyo State

Table 1
Frequency distribution of the personal and work characteristic of researchers

Personal and work	Frequency	Percentage (%)
Highest Level of Education		
HND	12	0.8
B.Sc	25	21.01
M.Sc	65	54.62
Ph.D	17	14.29
Rankinorganization		
Junior	3	2.52
Middle	13	10.92
Senior	103	86.55
YearsofExperience		
1-5	65	54.62
6-10	27	22.69
11-15	10	8.40
>15	17	14.29
Age (Years)		
20-30	20	16.81
31-40	54	45.38
41-50	37	31.09
>50	8	6.72
Sex		
Male	87	73.11
Female	32	26.89

The result on the use of information and communication technology by agricultural researchers from Table 2 indicates that use of computers by the researchers had the highest frequency (93.0%) with the fax machine having the least (10.0%). Mehdi (2009) asserted that interaction between organizations, governments, and communities have been revolutionized by the advent of the internet. The result also agrees with Akinbile and Alabi (2010) who reported a low

usage of fax among fish farmers in Oyo State. This difference can be attributed to relevant progress in the accessibility and utilization of electronic ICTs in these modern days than before. This confirms the findings of Otitolaye (2006) who reported that the most important factors considered by respondents in the use of communication channels for information dissemination was cost of use and accessibility. Among the print media, Journals (87.0%) enjoy the highest patronage by researchers, while posters had the least patronage of 5.1%. This is line with Oladeji, Bolarinwa and Ladokun (2010) who reported high usage of the print media among poultry farmers in south western Nigeria. The table also indicated that on the frequency of use of ICTs, those used on a daily basis by researchers include computer (77.0%), telephone (75.0%), television (68.0%) and radio (66.0%), while those that do not have specific pattern of use, but were used only when available are posters (49.0%), journals (87.0%), projector (42.0%) and newsletter (40.0%). This result agrees with Akinbile and Alabi (2010) who reported a high level of use of radio among fish farmers in southwestern Nigeria. The high use of information and communication technology among the respondents had a positive correlation with improved capacity to disseminate relevant information to farmers that could enhance their production.. This implies that the use of these ICTs among researchers must translate to adequate delivery of information to the farmers who are the recipient of research findings.

Table 2
Distribution of respondents on their use of ICTs and estimated number of hours of use per week

ICTs	Frequency of use				Average no. of hours spent/week
	Daily	Weekly	Monthly	Anytime available	
Radio	66.4	3.4	0.0	16.0	7.89
Television	68.9	3.4	0.0	12.6	11.55
Newspapers	58.0	10.9	0.8	16.8	3.94
Journals	16.0	21.9	10.9	38.7	3.15
DVD/CD	17.0	5.9	3.4	35.3	2.96
Telephone	75.6	3.4	0.8	6.7	17.53
Computers	77.3	10.1	1.7	4.2	16.50
Internet	48.7	21.0	2.5	19.3	13.95
Fax	0.8	0.8	0.0	9.2	4.34
e-mail	34.5	28.6	5.0	20.2	8.32
Video	11.8	13.5	4.2	33.6	6.39
Projector	0.0	2.5	7.6	42.9	1.16
GIS	2.5	0.0	1.7	12.6	4.25
Posters	1.7	4.2	2.5	49.6	1.89
Bulletin	0.0	9.2	6.7	45.4	1.23
Newsletters	5.0	7.6	16.8	40.3	1.54

*Figures in parentheses are percentages

Results on their perceived importance of ICT knowledge and skills needs for job efficiency reveals that most of the researchers perceived

infrastructural needs such as electricity (93.3%), connectivity (84.0%) as very important (Table 3).

Table 3
Distribution of respondents according to their perceived importance of ICT knowledge

Needs	Very important	Important	Least important	Not used
Provision of internet connectivity	100(84.03)	8(15.13)	1(0.84)	-
Provision of adequate power supply	111(93.28)	7(5.88)	-	1(0.84)
Increased provision of electronic resources	80(67.23)	37(31.09)	1(0.84)	1(0.84)
Establishment of a digital library	84(70.59)	31(26.05)	2(1.68)	2(1.68)
Establishment of a national research information databank for agriculture	80(67.23)	37(31.09)	2(1.68)	-
Training in publishing of research Findings via ICTs	73(61.34)	40(33.61)	4(3.36)	2(1.68)

*Figures in parentheses are percentages

Chi square analysis on researchers' personal characteristics and use of ICT (Table 4) reveals that only rank in the organizations ($\chi^2 = 6.8139$, $p = 0.0331$) had a significant relationship with respondents' use of ICT for agricultural research and development. This is expected as the researchers on the higher ranks may be more educated and exposed on the use of ICT, and

thereby enhancing their use of such ICT. This partially agrees with Oladeji (2010) who reported that farmers with high level of education used ICT more than those with low level of use. On the other hand, no significant relationship was established between the perceived importance of ICT ($\chi^2 = 0.0020$, $p = 0.9640$) and their use of ICTs.

Table 4
Chi square analysis of the relationship between selected variables of the researchers and their use of ICTs for research and development

Variables	χ^2	DF	P-Value	Decision
Educational level	5.1501	5	0.3978	Not Significant
Rank in organization	6.8139	2	0.0331	Significant
Years of research experience	3.6788	4	0.4512	Not Significant
Age	1.0717	4	0.8987	Not Significant
Sex	0.4790	1	0.4889	Not Significant
Perceived importance of ICT	0.0020	1	0.9640	Not Significant

CONCLUSION AND RECOMMENDATION

The study ascertained that the ICTs explored for research related purposes included the internet, e-mail, telephone and print media. Also, lack of infrastructures such as electricity, poor internet connectivity for improved research and development were perceived as important training needs and skills for job efficiency. Therefore, in order to promote the use of ICTs for research and development among researchers in the study area, there is need to provide well funded ICT departments and infrastructures and put in place a policy of training in the use of ICTs resources that will enable researchers to be better equipped to use the technologies as they evolve for productive work.

REFERENCES

Adebayo, E.L., Adesope, O.M., Agumagu, A.C. (2006) Comparative analysis of female extensionists and researchers' attitude towards information and communication technology in South western Nigeria. *Asian journal of information technology*. 5 (12). Pp1389-1393.

Aina, L. O, Kaniki, A. M and Ojiambo, J. B.(1995): Agricultural information in African Third world information services Ltd. Ibadan, Nigeria. Pp 23

Aina, L. O. (1990) Informing African farmers: Some obstacles to information flow. *Information Development*, 1 (6): 201-203.

Akinbile L.A. and Alabi O. E. (2010) Use of ICTs among Fish Farmers in Oyo State. *Journal of Agricultural Extension*. Vol. 14 (1)

Bientema, N.M., and Stad, Gert-Jan. (2004) 'Sub Saharan African agricultural research: recent investment trends'. *Outlook on agriculture* Vol. 33, No 4. <http://www.aasti.cgiar.org/pdf/outlook.pdf>. Accessed 12/07/2008. Pp 239-246.

Maru, A. and Pesce, V. (2008)'Adoption of information and communication technologies in agricultural research for development' for Global Forum on Agricultural Research (GFAR).

- Medhi K. (2009) Internet based information delivery for farming community. Session IV, pg 12
- Oladeji J. O. (2010) Information and Communication Technology (ICTs) by Public and Private Extension Agencies in Oyo State, Nigeria. *Journal of Agriculture, Forestry and the Social Sciences (JOAFSS)*, Vol 8. No. 2.
- Oladeji J. O. and Oyesola O. B. (2011) The Use of Information and Communication Technology (ICTs) among Private Agricultural Organization Workers in Oyo State. *Journal of Agricultural and Food Information*. Volume 12: 258-269.
- Oladeji, O. Bolarinwa, K. K. and Ladokun, B. (2010) Use of Information and Communication Technology to Boost Poultry Production in South Western Nigeria. *Nigeria Poultry Science Journal* 7: 75-83.
- Otitolaye O.O. (2006) Assessment of Extension Agents' Knowledge in the Use of Communication Channels for Agricultural Information Dissemination in Ogun State. An Unpublished B.Sc. thesis, University of Ibadan. Pp. 2, 10, 11.