



Information and Communication Technologies (ICTs) Compliance of Extension Personnel Inimo State Agricultural Extension Service Delivery System of Nigeria

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Abstract

Keywords:

Information communication technologies, Compliance, Extension personnel

The purpose of the study was to examine compliance of extension personnel in Imo state agricultural extension service delivery system of Nigeria. A purposive and multi-stage random sampling was used to select 105 extension personnel from the three agricultural zones of the state. Data generated were analyzed using descriptive statistics such as frequencies and percentages, as well as mean score and correlation analysis. Results showed that the extension personnel in the state had a favourable and clear perception of relevance of ICTs for extension service delivery but only used radios, televisions, mobile phones and short message service (SMS) frequently. Generally, they were not able to use computer-based ICTs to perform extension tasks. Results showed that level of education, work experience and income had positive relationship at 5% level of significance with the number of ICTs the extension personnel had access to. ICT training should be built into the regular or periodic training programmes of extension personnel to make them ICTs compliant for improved agricultural productivity and to keep abreast of the current global trend.

1. Introduction

Information and Communication Technologies (ICTs) have been conceptualized in various ways by various authors. In the views of Omotayo (2005), there is a broad consensus in the literature on the definition of ICT especially on its electronic nature and Information Technology (IT) based system. According to the Technical Centre for Agriculture and Rural Cooperation (CTA) (2006), ICT can be interpreted broadly as technologies that facilitate communication and the processing and transmission of information by electronic means. This definition accommodates the full range of ICT from radio and television to telephones (fixed and mobile), computers and the internet. Similarly, Chapman and Slaymaker, (2002) defines ICTs as a range of electronic technologies which when converged in new configurations are flexible, adaptable, enabling and capable of transforming organization and redefine social relations. ICT has again been defined as a set of activities that facilitate by electronic means, the processing, transmission and display of information (ADB, 2003). Greenidge

(2003) defines ICTs as those technologies that can be used to interlink information technology such as telephones and their telecommunication network.

According to Warren (2001), the term appears to be commonly used to embrace a multitude of media including telephone, television, video, telex, voice information systems and fax as well as those requiring the use of personal computer with a modem. Unagha (2006) saw ICTs as an omnibus term that encompasses process of using computer system and communication technology to produce, organize, analyze and distribute data, information and knowledge in a way that has hitherto been unimaginable. The foregoing definitions agree with the supposed consensus that ICTs has to use electronic means and information technology. However, the definition by Wirsy and Shafack (2002) appears to be a departure from this consensus. They defined ICT as a broad based term that encompasses the gathering (acquisition), organization (packaging), storage and retrieval of information that can be in textual or numeric (books and documents), pictorial and vocal forms (audio-visual) using

combination of all the above (multimedia) including computers and telecommunications (telephones). Their concept of ICT is not only elaborate but all encompassing. Their view largely agrees with USAID's draft of ICT for Development Strategies plan which defines ICT as the combination of hardware, software and the means of production that enable the exchange, processing and management of information and knowledge. ICTs thus include technologies and methods for storing, managing and processing information (computers, software, books, digital and non-digital libraries) and for communicating information (e-mail, radio and television, telephones, cell-phones, pagers, instant messaging and the internet).

It is perhaps on this premise that Okon (2005) and Agbamu (2006) classified ICTs into broadcast technology, print technology and telecommunication/computer technology. Broadcast technology includes radio, television, video films, projectors, media vans and audio cassette. Print technology includes among others newspapers, magazines, bulletins, posters, pamphlets, leaflets, newsletters and calendars of work. Telecommunication/ computer technology includes telephone (Global System of Mobile (GSM) and fixed lines), facsimile (fax), computers, electronic mail (e-mail), computer disc-read only memory (CD-ROM), the internet and geographical information systems (GIS).

ICT in agriculture is significant, especially now that its use has witnessed an upsurge in almost all areas of rural life in several Nigerian states where it has served as a medium of accessing agricultural information despite the persisting problems of access, literacy, connectivity, content and cost (CTA, 2003). As observed by Omotayo (2005), agricultural sector development depends largely on information exchange between and among farmers and a broad range of other factors. ICT as a tool for agriculture will enhance the flow of information in the application of its services (Olaniyi, 2013).

Information and communication technologies have been found to portend great potentials for agricultural extension service delivery. The most important objective of agricultural extension in developing countries is to improve the productivity (to attain self-sufficiency/security) and livelihoods of rural farm families (Arokoyo, 2005). Identified potentials of ICT application in agricultural service delivery include needs assessment, exploring production alternatives, exchange and sharing of information by peers, training and demonstration, community learning, among others (Arokoyo, 2005). Madukwe, (2006) stated that the promise of ICTs in agricultural extension and rural development is that

they can energize the collection, processing and transmission of data thus making it possible to extend quality information faster in a bottom-top and interactive channel of communication.

A major task in agricultural extension is the transfer of information on improved technologies to farmers. According to Salau and Saingbe (2008) the farmers are constrained to obtain information from various sources of information. Given the urgent need for current agricultural knowledge and information system (AKIS) by farmers, the use of conventional communication methods such as farm and home visits and the use of contact farmers for extension information delivery is counterproductive. This therefore calls for the use of new emerging information and communication technologies by agricultural information providers for the benefit of farmers. According to Meera et al, (2004) access to such new information source is a crucial requirement for the sustainable development of the farming systems. They added that ICT can be of immense help by enabling extension workers to gather, store, retrieve and disseminate a broad range of information needed by farmers, thus transforming them from extension workers into knowledge workers (KW). The emergence of such knowledge workers will result in the realization of the much talked about bottom-up, demand-driven technology generation, assessment, refinement and transfers.

Increasing use of ICTs in agricultural extension and rural development, as observed by Madukwe (2006) would narrow the gender disparities in terms of access to agricultural information. The extent to which ICTs are able to play these roles depends on how extension personnel and other stakeholders in the agricultural extension service delivery system are aware and ICT-compliant. The study therefore specifically sought to: (i) ascertain perception of the extension personnel in Imo State on the use of ICTs in Agricultural Extension Service delivery; (ii) identify extent to which extension personnel are able to perform extension tasks using ICTs and (iii) determine relationship between selected socio-economic characteristics of extension personnel and the number of ICTs they have access to.

2. Materials and Methods

This study was done in Imo state Nigeria. The population was made up of all field extension personnel in Imo State Extension Service. A purposive and multi-stage random sampling technique was used to select 105 out of the 133 substantive field extension personnel in Imo State Extension Service. In the first stage, 24 Block Extension personnel (Block Extension Supervisors (BESs) and Block Extension Agents (BESs) were

randomly selected from Owerri Agricultural Zone, 15 from Orlu Zone and 15 from Okigwe Zone reflecting the ADP farming blocks in the state.

In the second stage, village level Extension Agents were randomly selected in proportion of 25:14:12 from Owerri, Orlu and Okigwe agricultural zones again reflecting the distribution of these field workers in the state. Primary data were collected for this study. Semi structured questionnaire were used to collect data. Norminal data were collected through questions drafted on Likert-type scales. Analysis of data was done using descriptive statistics (frequency distribution and percentage. Mean score analysis and correlation analysis were also used. The mean scores were calculated by multiplying the scores of the frequencies with the scale points for every rating and dividing by the total number of respondents. The cut off mean was derived by summing the nominal value of the response option and dividing by number of response in each case. Correlation matrix was computed with the socio-economic variables using the implicit model; $Y = f(X_1, X_2, X_3, X_4, X_5, e_i)$

Where Y = the numbers of ICTs the respondents have access to: X_1 = Age of extension personnel, X_2 = Gender of extension personnel, X_3 = Level of education of extension personnel, X_4 = Work experience of extension personnel, X_5 = Income of extension personnel, e_i = Error term

3. Results and discussion

3.1 Perception of the relevance of ICTs for extension service delivery by extension personnel

The relevance of ICTs in extension service delivery in the perception of extension personnel in Imo State is presented in table (1). Table (1) showed that the extension personnel in Imo State had favourable and clear perception of the relevance of ICTs in extension service delivery. This is evident from their positive responses in support of those perception statements which highlighted the positive effects of ICTs on extension service delivery. Such statements include those which indicate that ICTs: increase networking of all researchers and access to information (mean score = 4.75); facilitate linkages between information sources and extension (4.72); make for global cross fertilization of ideas (4.45); ICTs can lead to increased contacts between extension and the clientele (4.48); incorporate feed-forward mechanism into research extension (3.74); make extension cost-effective (3.28) and increase the pace of rural development (4.31). These have mean scores above the cutoff of 3.0 (Okon, 2005). The respondents also disagreed with perception statements which portrayed ICTs as having negative effects on extension service and on their relevance on

collaboration among key stakeholders. Such statements are those which indicate that ICTs do not increase collaboration between extension and input supply agencies (2.39); ICTs not making extension more vibrant than before (2.15) and the benefits realizable from investments in ICTs not being justifiable (2.76). The finding of this study agree with Yekini and Hussein (2008) who studied the perception of research and extension personnel on the relevance of ICTs to agricultural and rural development in South Western Nigeria. According to Munyua, (2000) if the perception/attitude of extension personnel towards improved facilities like ICTs is positive, it would positively affect his/her use of those improved facilities. In all the extension personnel showed positive perception to the statements posed to them by not having a grand mean score less than 3.0.

3.2 Utilization of ICTs by Extension Personnel in Imo State

The frequency of utilization of ICTs by extension personnel in Imo State is presented in table (2). The table (2) showed that the broadcast/audio visual ICTs, majority (60%) of the extension personnel had never used the mobile cinema and 55.33% had never used the projector. Using the mean scores and a cut off of 1.5, the table further shows that only the radio and the TV among the broadcast/audio visuals were frequently used. Of the telecommunication/computer-based technologies, only the mobile phone (2.70) and the short message service (SMS) (1.99) were frequently used. All the print technologies except the newsletter were frequently put to use.

3.3 ICT-use competence of extension personnel

The extent to which extension personnel in Imo State are able to utilize ICTs in the performance of extension tasks is presented in table (3). The table (3) showed that extension personnel in Imo State were generally not capable of utilizing ICTs to perform extension tasks especially those which involve the use of computer-based technologies such as the internet, e-mails and CD-ROM. These had mean scores of 2.95, 3.30 and 2.43 respectively which are below the cut-off point of 3.50. The extension personnel were also not generally capable of utilizing broadcast/audio visual technologies in the performance of their extension tasks. Their areas of competence were in writing articles for publication (3.54), recording interviews into cassettes (3.52) and oral presentation on radio/TV (3.52). The result of this study indicates the level at which Imo State Extension Service is operating despite the global ICT explosion. This compares favorably with the findings of Aderinto et al., (2008), that extension personnel in

Ondo State Nigeria were principally able to use traditional ICTs-radio, television, newspaper and telephone. The result agrees with Oladosu, (2005)

that most extension agents in Nigeria lack the competence required for internet use.

Table 1. Distribution of extension personnel on the basic of their perception of the relevance of ICTs in extension service delivery

Perception Statements	Strongly agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly disagree (1)	Total	Mean
ICTs can lead to easy networking of all researches for easy access to information	400 (76.19)	96 (22.86)	3 (0.95)	0 (0.00)	0 (0.00)	499	4.75
ICTs can facilitate linkage between information sources and extension	380 (72.38)	116 (27.61)	0 (0.00)	0 (0.00)	0 (0.00)	496	4.72
ICTs can lead to global cross fertilization of ideas	275 (52.38)	168 (40.00)	24 (7.62)	0 (0.00)	0 (0.00)	467	4.45
ICTs can lead to increased contacts between extension and the clientele (farmers and rural dwellers)	285 (54.29)	172 (40.95)	9 (2.86)	4 (1.90)	0 (0.00)	470	4.48
ICTs may render extension institutions irrelevant	35 (6.67)	32 (7.62)	39 (12.38)	100 (47.62)	27 (25.71)	233	2.21
ICTs can incorporate feed-forward mechanism into research-extension.	95 (18.10)	192 (45.71)	87 (27.62)	18 (8.57)	1 (0.95)	393	3.74
ICTs will not increase collaboration between extension and input supply agencies.	35 (6.67)	52 (12.38)	60 (19.05)	78 (37.14)	26 (24.76)	251	2.39
ICTs will not make extension service delivery more vibrant than it has been.	35 (6.67)	40 (9.5)	21 (6.67)	98 (46.67)	32 (30.48)	226	2.15
ICTs will make extension service delivery more cost-effective	95 (18.10)	156 (37.14)	36 (11.43)	44 (20.95)	13 (12.38)	344	3.28
Cost of acquiring ICTs cannot be justified by the accruable benefits	55 (10.48)	72 (17.14)	78 (24.76)	70 (33.33)	15 (14.29)	290	2.76
The pace of rural development will increase and sustainable rural livelihood enhanced with the use of ICTs	250 (47.62)	168 (40.00)	27 (8.57)	6 (2.86)	1 (0.95)	452	4.31
Grand mean							3.45

Mean cut-off point = 3.0, Decision Rule 3.0 and above = perceived; below 3.0 = Not perceived, Parentheses are percentages.

Table 2. Frequency of Utilization of ICTs by Extension Personnel in Imo State (n=105)

ICT Type	Never		Rarely		Sometimes		Always		Mean Rating Max = 3
	f	%	f	%	f	%	f	%	
A. BroadCast/Audio Visuals									
Projector	56	55.33	27	25.71	20	12.05	2	1.90	0.69
TV Camera	47	44.96	19	18.09	29	27.62	10	9.52	1.02
TV	23	21.90	21	20.00	27	25.71	34	32.38	1.69
Video Recorder	32	20.48	13	12.38	39	37.14	21	20.00	1.24
Radio	11	10.48	4	3.81	32	30.48	58	55.24	2.30
Media van	40	38.09	21	20.00	36	34.29	8	7.62	1.19
Mobile cinema	63	60.00	16	15.24	18	17.14	8	7.62	0.80
B. Telecom/Computer									
GSM calls	1	0.95	1	0.95	27	25.71	76	72.38	2.70
SMS	19	18.04	9	8.57	31	29.52	46	43.81	1.99
Land lines	43	40.95	23	21.90	27	25.71	12	11.43	1.19
Intercom/PABX	91	86.67	5	4.76	9	8.57	0	0.00	0.22
Fax	81	77.14	14	13.33	7	6.67	3	2.86	0.34
E-mails	44	41.90	24	22.86	22	20.95	15	14.29	1.19
Computers	36	34.29	18	17.14	23	21.90	28	26.67	1.05
CD-ROM	67	63.80	14	13.33	13	12.38	11	10.48	0.69
Internet	52	49.52	20	17.04	17	16.19	16	15.24	0.82
C. Print Technology									
Newsletter	29	29.62	18	17.14	41	39.05	17	16.19	1.44
Research bulletin	20	19.04	8	7.62	59	56.19	18	17.14	1.71
Posters	10	9.52	18	17.14	49	46.67	28	26.67	1.90
Calendar of work	11	10.48	4	3.81	34	32.38	56	53.33	2.29

Cut off = 1.5

Table 3. Extent to which extension personnel are able to perform tasks using ICTs in Imo State

Special tasks	Very large extent		Large extent		Some extent		Little Extent		Very little extent		No Ability		WRTRS	Weighted mean
	f	%	f	%	f	%	f	%	f	%	f	%		
Demonstration with projector.	3	2.86	6	5.71	14	13.33	11	10.48	55	52.38	16	15.24	263	2.50
Recording events with TV camera	3	2.86	10	9.52	16	15.24	9	8.57	46	43.81	21	00.00	272	2.59
Oral presentation on Radio/TV	18	17.14	19	18.10	20	19.05	7	6.67	25	25.81	16	15.24	370	3.52
Conducting/recording interviews into cassettes	8	7.62	20	19.05	20	19.05	24	22.86	26	24.76	18	17.14	370	3.52
Writing information articles for publication	16	15.24	15	14.29	25	28.81	16	15.14	20	19.05	13	12.38	372	3.54
Writing computer programmes	1	0.95	10	9.52	14	13.33	23	21.90	32	30.48	25	23.81	270	2.57
Generating database	3	2.86	9	8.57	11	10.48	23	21.90	34	32.38	25	23.81	269	2.56
Topographic and Graphic designs	1	0.95	6	5.71	16	15.24	15	14.29	46	43.81	21	20.00	258	2.46
Preparation of slides and transparencies	3	2.86	5	4.76	9	8.57	19	18.10	48	45.71	21	20.00	253	2.41
Adapting communication technology facility	5	4.76	9	8.57	13	12.38	18	17.14	35	33.33	25	23.81	276	2.63
Soil mapping with GIS	3	2.86	6	5.71	9	8.57	15	14.29	47	44.76	25	23.81	248	2.36
Sourcing information with CD-ROM	5	4.76	4	3.81	9	8.57	19	18.10	44	41.90	24	22.86	255	2.43
Use of E-mail	13	12.38	16	15.24	17	16.19	19	18.10	23	21.90	17	16.19	346	3.30
Use of Internet	12	11.43	11	10.48	14	13.33	14	13.33	34	32.38	20	19.05	313	2.98

WRTRS = Weighted Respondents' Total Raw Scores, Cut off point = 3.5

Table 4. A correlation matrix of selected socio-economic variables of extension personnel and number of ICTs (Y) they had access to in Imo State

	Y	X ₁	X ₂	X ₃	X ₄	X ₅
Y	1.000					
Age	0.0291	1.0000				
gender	-0.1908	-0.1717	1.0000			
education	2.55575*	-2.3589*	2.1975*	1.0000		
work experience	2.4376*	-0.1082	-0.344	0.0758	1.0000	
income	2.3786*	0.1017	0.5150	-0.1113	0.1596	1.0000

*Significance level = 5%

3.4 Relationship between selected socio-economic variables of extension personnel and the number ICTs they have Access to

Table (4) is a correlation matrix of the relationship between age, gender, educational level, work experience, income of extension personnel in Imo State and the number of ICTs they have access to. The table showed that education, work experience and income were positively related to the number of ICTs the respondents had access to at 5% level of significance.

The positive significant correlation of educational level of the extension personnel and their access to ICTs implies that the more educated the respondents were, the better their access to ICT. This result agrees with Omotesho et al., (2012) who posits that education plays a significant role in creating awareness and interest in innovations and is also fundamental to the understanding of the usage, and functionalities of computer appliances.

In terms of years of work experience, It can be adduced from Table 4 result that the greater the

years of working experience of the extension personnel the more number of ICTs they have access to. The result agrees with Yakubu et al., (2013) but disagrees with Omotesho et al., (2012) that there exists a negative correlation between extension agents work experience and access to ICTs.

The table revealed that extension agents with higher incomes had more ICTs. According to Yakubu et al. (2013) increase in income improves the ICT purchasing power of an extension agent. The result is in consonance with Mwakeje (2010) who obtained a positive correlation between income and access to ICTs in Tanzania.

4. Conclusion and recommendations

Extension personnel in Imo State Agricultural Extension Service (AES) have a good perception of the beneficial effects of the use of ICTs in extension service delivery. This notwithstanding, they only used the radio, television, the mobile phone and the short message service (SMS) frequently.

Most print technologies were however frequently used. The low ICT compliance by Imo State extension personnel is brought to the fore by their inability to perform extension tasks using all ICTs. Their ICT use competence of computer-based ICTs – the internet and CD-ROM was abysmally low in spite of the current global ICT explosion. The study revealed a positive correlation between level of education, work experience, income and the number of ICTs the extension personnel had access to. It is therefore recommended:

That ICT training should be incorporated into training programmes for extension personnel in the state in order to meet the growing quest to enhance agricultural extension service delivery and improve agricultural productivity and growth.

In-service trainings, seminars, workshops and other capacity building efforts involving ICTs could be periodically planned by Imo Agricultural Development Programme (ADP) for extension personnel if they must catch up with the emerging global trend.

ICT centers housing a complement of ICT gadgets could be established in every agricultural zone in the state to give extension personnel the opportunity to try their hands on the ICT formats and become ICT compliant.

Financial inducements through soft loans or grants could be made to extension personnel to enable them own relevant ICT gadgets necessary for improved extension service delivery.

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