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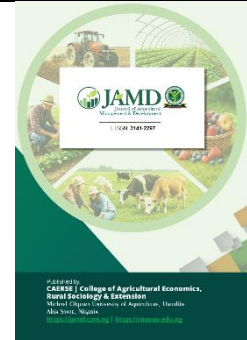
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Perceived Relevance and Benefits of ICTs in Extension Service Delivery Among Extension Agents in Abia State, Nigeria

Ukoha, E.O.

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Author(s) Affiliation(s):

Department of Agricultural Economics and Extension, Faculty of Agriculture, Abia State University, Umuhia Location, Nigeria.

Correspondence:

Email: obasiukoha@yahoo.com

Phone: 08039599796 and 09014653114

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ABSTRACT

This study analyzed the perceived relevance and benefits of Information and Communication Technologies among ADP extension agents in Abia State, Nigeria. Multi-stage random sampling technique was used to select 120 extension agents from whom data were collected using structured questionnaire. Data collected were analyzed using percentages, frequencies, mean scores from four-point Likert-scale ratings. Results showed that all the selected ICT facilities were perceived by extension agents as being relevant in extension service delivery, with exception of Facsimile (= 1.56) and sound recorder (= 1.79). Results further showed that ICTs were of immense benefit in extension service delivery (= 2.60). It was recommended that Abia State government should adequately equip the State's extension outfit with relevant ICT facilities and introduce a policy of continuous training and re-training of extension agents on the use of modern ICTs for improved job performance and extension service delivery.

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Introduction

The ADP is perhaps the boldest step taken by the Federal Government of Nigeria to develop the agricultural sector of the economy. The ADP was designed to improve the traditional systems of production and raise productivity by transfer of relevant and proven production technologies to farmers, easing constraints on inputs supplies and provision of rural infrastructure (Alotaibu, Yoder & Kassem, 2021). Effective communication of agricultural information to farmers is crucial in achieving optimum efficiency in agricultural extension administration and practice in Nigeria. Agricultural extension in this information age has been recognized as an essential medium for disseminating information and advice to farmers and this can be achieved through the use of ICT (Nasir, 2018).

According to Yekinni, Owolabi & Obaniyi (2023), ICTs are those technologies used in collecting, processing, storing, retrieving, disseminating, and implementing data and information using microelectronics, optics, telecommunication and computers. In agricultural extension, the ICTs used include: radio, television fixed and mobile phones, short message services (SMS), world wide web (www), search engines, packet digital assistants, cameras, video, e-mail, computer, contact data bases and systems, CD-Rom, DVD, rural radio and web publishing, to mention a few.

According to Enwelu, Enwereuzor, Asadu, Nwalieji, & Ugwuoke (2017), ICTs can be of immense help in 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. The potential relevance and benefits of ICTs in Agricultural Development Programmes (ADPs) to include capacity to reach large audience, for training and demonstrations and to make extension system and structures more efficient through better management of information and scarce resources. Other benefits of ICT are the search and packaging of information on demand, exploring of alternative productive option and technologies, weather forecast, warning system for diseases/pest outbreaks and other numerous benefits.

The use of ICT in Agriculture in Nigeria in general and Abia State in particular has been hindered by problems facing ADP. One of the problems is low ADP extension agents to farm family ratio of 1:3000 (Fawole & Olajide, 2012). Other problems are poor mobility of ADP extension staff due to dwindling fund, poor salary, non-payment of allowances, and delayed promotion of the ADP agents, among other problems (Arisa and Osondu, 2016).

In view of the above problems, this study seeks to address the following research questions: Are ICTs relevant to effective extension service delivery in Abia State? What are the perceived benefits of ICTs in extension service delivery in Abia State? Thus, the broad objective of the study is to analyze the perceived relevance and benefits of Information and Communication Technologies among ADP extension agents in Abia State, Nigeria. The specific objectives are to: (i) analyze the perceived relevance of ICTs in extension service delivery among extension agents in Abia State; and (ii) determine the perceived benefits of ICTs in extension delivery, in Abia State.

Literature Review

The theory of social change propounded by Rogers is the most relevant theory to this study and was therefore adopted. Rogers (1995) defines social change as the process through which alteration occurs in the structure and function of the social system. The theory focuses on how individuals influence and are influenced by the society, showing how the rules of the society are re-created through interactions with one another. This means that innovations and communication form the major part of the social structure and the relationships in the society. Social change in a social system can be referred to as a major change in behavior patterns, norms, and values over a period of time. Change occurs when an individual through feelings and actions is influenced or affected by other people. Influence takes many forms and can be seen in conformity with socialization, peer influence, obedience, leadership and persuasion. The two psychological needs that lead human beings to conform to the expectations of others include our need to be right, that is informational social influence, and our need to be liked, that is normative social influence.

Informational influence (social proof) is an influence to accept information from others as evidence about reality. This occurs when people are uncertain, either because stimuli are intrinsically ambiguous or there is social disagreement. Informational influence leads to private acceptance. On the other hand, normative influence is an influence to conform to positive expectations of others which leads to public compliance.

With the theory of social change, members of the society are taught the benefits of conforming to or accepting standard behaviors. This study is geared towards transforming a conventional person into a person of extension interaction, of modern system through communication in which a large number of audiences could be reached at a time. The use of radio, television, telephones and other internet facilities is a shift from traditional extension delivery to a modern way which is being advocated in the theory of social change.

Some studies have investigated into the relevance and benefits of ICTs in extension service delivery. For example, Tibi and Oyem (2018) assessed relevance of ICTs on Cassava Production in Isoko North Local Government Area, Delta State, Nigeria. A sample size of 130 respondents was selected using multistage

random sampling. Data collected were analyzed with descriptive statistics such as frequency, percentage and mean, and inferential statistics such as spearman correlation and independent sample t-test. Results showed that ICTs such as radio, GSM phone, television, video recorder, audio-cassette and camera were perceived as relevant in extension service delivery. It was recommended that there should be concentration of effort on agricultural information delivery through the available ICTs.

Olarewaju, Farinde, & Oloyede, & David (2017), undertook research on appropriateness of information and communication technologies (ICTs) use in dissemination of agricultural information. The study was carried out in Ogun State Nigeria. The study specifically described socio-economic characteristics of extension agents; assessed perceived relevance of ICTs in extension service delivery; and determined factors that are related with utilization of ICTs. The population of the study comprised all the farmers and extension agents in the State. Multistage random sampling technique was used to select 159 respondents (110 farmers and 49 extension agents) from whom data were collected using structured questionnaire. Data obtained were analyzed using frequencies, percentages and correlation analysis. Results revealed that ICTs such as radio, phones, internet, and compact discs (CDs) were relevant to extension service delivery. The study recommended that capacity building trainings on use of ICTs should be intensified. Furthermore, infrastructural development needs to be stepped up in the rural areas to enhance enabling environment for use of ICTs.

Okeke, Nwalieji, & Uzuegbunam (2015) undertook a review of the role of Information Communication Technologies in extension service delivery in Nigeria. The specific objectives of the study were to: identify the types of ICTs tools used by extension agents/ farmers; ascertain the emerging roles of ICTs in extension service delivery; ascertain the benefits/importance of ICTs to extension agents/farmers; and determine constraints limiting effective use of ICTs by extension agents / farmers. Based on findings, the study concluded that ICTs play numerous key roles in extension service delivery such as: helping in expanding outreach to a large number of farmers; offering a solution to resource and capacity issues within the agricultural sector; improving information flow and connecting people within the rural areas; answering questions relating to farm problems with the advantages of getting feedback using telephone; obtaining market price information and weather forecasts.

Oyetero, Adetunbi & Oladipo (2013) assessed the contributions of ICTs towards agricultural development among agricultural researchers in Ibadan North West Local Government, Oyo State, Nigeria. The population for the study comprised all the ninety (90) research workers in National Horticultural Research Institute (NIHORT) and Forestry Research Institute in Nigeria (FRIN). The study employed purposive and simple random sampling techniques in selecting 50 respondents for the study. Data were collected using interview schedules and analyzed with the aid of descriptive statistics such as frequency counts, percentage and Pearson Product Moment Correlation (PPMC). Findings revealed that contributions of ICTs to agricultural development were many and diverse and include among others: dissemination of new knowledge and technology (94%), improves access to updated agricultural information (86%), motivate in sustaining and enhancing agricultural production (82%), enhances effective extension service delivery (78%), and link researchers to organizations that finance research work (78%). The study therefore recommends that internet facilities should be made available and affordable to agricultural researchers to enhance their accessibility, usage and contributions to agricultural development.

Sa'adu, Norsida, Jasmin, Nitty, & Ahmadu, (2022a) undertook a study on factors influencing the adoption of ICTs in extension service delivery among the extension agents in North-east, Nigeria. Multistage random sampling technique was used to select 254 extension agents from whom data were collected via structured questionnaire. Frequencies, percentages and logistic regression were used to analyze the data collected. The results revealed that ICTs facilities such as GSM phones, radio, television, camera, internet, computer, CD/DVD player were perceived as being relevant in disseminating agricultural information to farmers. The study recommended that government should support the extension services with the most commonly used ICT facilities.

Rahman and Bashir (2018) investigated use of ICTs in agricultural extension services in Gedarif State of Sudan. Specifically, the study described socio-economic characteristics of extension agents, assessed their level of utilization of ICTs in extension service delivery, relevance of ICTs, and identified constraints militating against extension agents' use of ICTs in agricultural extension services. Field survey was used to

collect data from 94 extension agents in the State in 2016/2017 planting season. The data collected were analyzed using descriptive statistics such as percentages, frequencies and means. Findings showed that ICTs such as computer, radio, television, mobile phone and audio-visual were very relevant in extension service delivery as reported by the respondents.

Ibezim & Osundu (2014) assessed level of awareness and perception of the use of ICTs in agricultural extension service delivery in Imo State Nigeria. The study selected 300 respondents from whom data were collected using structured questionnaire. Data generated were analysed using means, frequencies, percentages and correlation analyses. Results showed that there was high awareness of ICTs, however, only the GSM Phones and radio were extensively used in information dissemination. Results indicated that the respondents had a clear and favourable perception of the relevance of ICTs in extension service delivery. The study recommended that extension service delivery using ICTs need to be beefed up to bring about improved farm productivity and income among farmers.

Methodology

The study was carried out in Abia State, Nigeria. The State has a land area of 7,677.20 square kilometers, with a total population of 2,833,999 persons, made up of 1,434,193 males and 1,399,806 females. Large proportions of the inhabitants of Abia State are farmers and live in rural areas with population density of about 580 persons per km² (National Population Commission (NPC), 2006). Abia State is located between latitudes 5° 49' N and 6° 12' North of the Equator and between longitudes 7° 23' E and 8° 02' East of the Greenwich Meridian (National Root Crops Research Institute (NRCRI), 2018).

Abia as an agrarian State is endowed with land suitable for growing various tropical crops. Abia State is made up of three agricultural zones within which are 17 extension blocks and 96 extension circles. The three agricultural zones in Abia State are: Aba zone made up of 7 extension blocks, Ohafia Zone made up of 5 extension blocks and Umuahia Zone made up of 5 extension blocks. The constituent extension blocks of the zones are as follows: Aba Zone: Aba South, Aba North, Obingwa, Osisioma Ngwa, Ugwunagbo, Ukwa East and Ukwa West extension blocks. Ohafia Zone: Arochukwu, Bende, Isuikwuato, Ohafia and Umunneochi extension blocks. Umuahia Zone: Ikwuano, Isiala-Ngwa South, Isiala-Ngwa North, Umuahia North and Umuahia South extension blocks.

The population of the study consisted of all the extension agents domiciled within Abia State Agricultural Development Programme. Multi-stage random sampling technique was used in this study. First, four (4) blocks were randomly selected from each of the three agricultural zones in Abia State to give twelve (12) blocks. Secondly, from each of the selected blocks, ten (10) extension circles were selected to give one hundred and twenty (120) extension circles. Lastly, the extension agents manning the selected 120 circles were taken to give a total of 120 respondents for the study.

The data used for this study were collected from primary sources only. The primary data were collected from the respondents through the use of structured and pre-tested questionnaire. Data were collected on the relevance and benefits of ICTs to extension service in Abia State.

To ascertain respondents' perceptions on the relevance of using ICTs in extension service delivery in the study area, the respondents were asked to identify from the list of items provided those ICTs they perceived as relevant in extension service delivery. Some ICTs that were on the list include radio, television, the internet etc. A four-point Likert type scale graded thus: highly relevant = 4, relevant = 3, irrelevant = 2, highly irrelevant = 1, was used to ascertain the magnitude of responses by extension agents on relevance of ICTs in extension service delivery. The values on the Likert type scale were summed up to 10 and divided by 4 to give 2.5. ICT tools with a mean score of 2.5 and above were regarded as relevant, while those with a mean score of less than 2.5 were regarded as not relevant.

Similarly, a four-point Likert type scale with four response options (strongly agree = 4; agree = 3; disagreed = 2; and strongly disagree = 1) was used to ascertain perceived benefits of ICTs usage. The values on the Likert type scale were summed to 10 and divided by 4 to give 2.5. The respondents mean score were obtained for each response item such that any one higher or equal to 2.5 was regarded as beneficial, while any one less than 2.5 was regarded as not.

Results and Discussion

Perceived Relevance of ICT Facilities in Extension Service Delivery

The mean ratings on perceived relevance of ICT facilities in extension service delivery is shown in Table 1. The ICTs facilities were ranked according to their perceived relevance and presented on the table. Telephone/GSM phone is the most relevant, followed by video and others, as presented on the table. The least relevant ICT facility to extension service delivery in Abia State is Global Information Services. Table 1 shows that all the selected ICT facilities were perceived by extension agents as relevant in extension service delivery, except Facsimile ($\bar{X} = 1.56$) and sound recorder ($\bar{X} = 1.79$).

These facilities had mean scores that were below the threshold value of 2.0. Overall, the grand mean value for perceived relevance of ICT facilities in extension service delivery was 2.07, implying that the extension agents perceived ICTs as playing important roles in extension service delivery. This is in line with Umar, Musa, Olayemi & Suleiman (2015) assertion that the relevance of Information Communication Technologies (ICTs) in the overall development of the world as a global village especially as it pertains to agricultural sector cannot be over emphasized.

Perceived Benefits of Using ICTs in Extension Service Delivery

The mean ratings on perceived benefits of using ICT facilities in extension service delivery is shown in Table 2. The table shows that typing letters and reports ($\bar{X} = 2.93$), improved linkages between researchers and extension service ($\bar{X} = 2.73$), fast access to the latest agricultural news and information globally ($\bar{X} = 2.72$), facilitate presentations and discussions using PowerPoint/projector ($\bar{X} = 2.58$), ICT use makes agricultural extension message delivery become more effective to farmers ($\bar{X} = 2.61$), ICTs help to reduce work stress and improve efficiency in extension service ($\bar{X} = 2.55$), use of ICTs generally improves efficiency within the extension service system due to improved coordination of activities ($\bar{X} = 2.54$), ICTs helps in facilitating farmers' access to available credit facilities ($\bar{X} = 2.52$), ICT enables me link farmers to farm inputs like seed, herbicides and fertilizer quickly ($\bar{X} = 2.51$), and summarize information using figures and charts ($\bar{X} = 2.50$), were perceived by the extension agents as benefits of using ICTs.

Conclusion and Recommendations

Information and Communication Technologies have great potentials in improving agricultural extension delivery. The study has shown that ICTs were very relevant and beneficial to extension service delivery in Abia State. The findings showed that the ICTs relevant to extension service delivery in Abia State are WorldWideWeb/search engines, Global Information services, Telephone/GSM phone, Data processor, Computer, social media (Whatsapp, Facebook, Twitter-X), Video conferencing (zoom), Radio, Television, Sound recorder, public address system/wireless amplifier, Video camera, Projector, Email and CD Rom/USB flash.

The perceived benefits of ICTs are fast access to the latest agricultural news and information globally, typing of letters and reports, linking of farmers to farm inputs quickly, presentations and discussions using power point/projector, improved linkages between researchers and extension service, improved coordination of activities, and facilitates farmers' access to available credit facilities. Other perceived benefits are faster delivery of extension message, reduction of work stress improved efficiency in extension service delivery, fast medium of receiving feedback from farmers and provision of medium through which innovations are introduced to farmers.

Drawing from the findings of this study, the following recommendations are hereby adduced:

- (i) Since the use of ICTs in extension service delivery is beneficial in Abia State, the state government should make the use of ICTs compulsory, in extension service delivery in the state.
- (ii) If the use of ICTs is made compulsory for the extension agents, then their training on the use of ICTs should also be made compulsory.
- (iii) The order of relevance of the ICTs should be considered in providing the extension agents with ICTs.
- (iv) Abia State government should provide adequate budgetary allocations to the ADP to equip the extension agents with relevant ICTs.

(v) To facilitate the use of ICTs by the extension agents, Abia State government should encourage the internet network providers to provide adequate network infrastructure in the rural areas.

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Appendix**Table 1: Perceived relevance of ICTs facilities in extension service delivery (n =120)**

ICT Facilities	Mean Score	Decision	R
World wide web/search engines	2.92	Relevant	4
Global Information services	2.50	Relevant	13
Telephone/GSM phone	3.12	Relevant	1
Data processor	2.61	Relevant	10
Computer	2.98	Relevant	5
Social media (Whatsapp, Facebook, Twitter-X)	2.56	Relevant	11
Facsimile	1.56	Not relevant	
Video conferencing (zoom)	3.05	Relevant	2
Radio	3.02	Relevant	3
Television	2.64	Relevant	9
Sound recorder	1.79	Not relevant	
Public address system/ wireless amplifier	2.67	Relevant	8
Video camera	2.55	Relevant	12
Projector	2.64	Relevant	9
Email	2.70	Relevant	7
CD-Rom/USB flash	2.78	Relevant	6
Grand Mean	2.07		

Source: Field survey, 2024. Decision Rule: Mean score ≥ 2.50 = relevant; < 2.50 = not relevant. R = Rank

Table 2: Perceived benefits of using ICT facilities in extension service delivery (n =120)

Benefits	Mean Score	Decision
Fast access to the latest agricultural news and information globally	2.72	Perceived
Typing of letters and reports	2.93	Perceived
ICT enables me link farmers to farm inputs like seed, herbicides and fertilizer quickly	2.51	Perceived
Prepare short video films through multimedia software	2.46	Not perceived
Facilitate presentations and discussions using power point/projector	2.58	Perceived
Improved linkages between researchers and extension service	2.73	Perceived
Use of ICTs generally improves efficiency within the extension service system due to improved coordination of activities	2.54	Perceived
Summarize information using figures and charts	2.50	Perceived
Learn about presentation skills for conferences/seminars	2.41	Not perceived
ICTs helps in facilitating farmers' access to available credit facilities	2.52	Perceived
ICTs use makes agricultural extension message delivery become more effective to farmers	2.61	Perceived
ICTs helps to reduce work stress and improves efficiency in extension service delivery	2.55	Perceived
Use of ICTs assist in recommending solution to farmers problems	2.53	Perceived
Fast medium of receiving feedback from farmers	2.94	Perceived
Document activities and extension programs delivered	2.52	Perceived
ICTs have provided medium through which innovations are introduced to farmers and many agricultural problems solved	2.57	Perceived
Grand Mean	2.60	

Source: Field survey, 2024. Decision Rule: Mean score ≥ 2.50 = perceived benefit; < 2.50 = not perceived.