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Nwaobiala, C. U.¹ and Ogbonna, M. O.²

¹Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria

²Federal College of Education (Technical), Gombe, Gombe State, Nigeria

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Access to Information and Communication Technologies among Farmers in Gboko Agricultural Zone, Benue State, North Central, Nigeria

Nwaobiala, C. U.¹ and Ogbonna, M. O.²

¹Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria

²Federal College of Education (Technical), Gombe, Gombe State, Nigeria

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Abstract

This research analyzed access to ICT technologies among contact and non contact farmers in Gboko agricultural zone of Benue State, North Central Nigeria. A structured questionnaire schedule was employed to collect data from 120 farmers (60 contact farmers and 60 non contact farmers). Data for the study was analyzed with descriptive statistics and paired Z-test analysis. Results from the study showed that good proportion of contact (58.40%) and non contact (56.60%) farmers were males and contact farmers (43.33%) were aged between 40-49 years while non contact farmers (40%) were between 50-59 years. A good proportion of contact farmers (50%) and moderate proportion of non contact farmers (38.33%) acquired secondary and primary education respectively as contact farmers (53.39%) and non contact farmers (46.67%) cultivated on farm sizes ranging between 2.1-3.0 hectares. The contact farmers had access to Broadcast/Audio – Visual Technologies such as radio, television, projector and video recorder, while the non contact farmers had access to radio and television. The contact farmers accessed Telecommunication/Computer technologies such telephone/GSM, computers, internet, e mail and satellite dish and the non contact farmers' accessed telephone/GSM. The contact farmers also accessed Print Technologies such as newsletters, newspapers, leaflets, posters, research bulletins, magazines, annual reports, diaries and agricultural journals, while the non contact farmers accessed newspapers and magazines. The result of Z – test analysis showed that contact farmers had more access ICT facilities than non contact farmers at 1.00% level of probability. The major constraints in accessing these ICT facilities were identified as restriction of ICT facilities in government offices, high cost of computers, epileptic power supply, illiteracy levels of farmers in reading printed materials and little air time and high charge in airing agricultural promoted programmes on radio and television. Policies aimed at providing steady power supply, regular training and retraining for both farmer groups, subsidizing ICT equipment and establishment of educational/telecentres to increase access of ICT facilities to farmers were advocated.

Keywords: Access, ICTs, Contact Farmers, non Contact Farmers, Agricultural zone

For corresponding author:

E-mail: info@esxpublishers.com

Subject: 0114-0211

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Introduction

The term, ICT can be used to embrace a multitude of media including telephone, television, video, internet, voice communication system and fax, as well as those requiring the use of a personal computer. These media are used in communicating, storing and accessing, manipulating and sending information, thus creating and improving the global economy. ICT plays an 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 rural areas where over 60% of the farmers reside in Sub - Saharan African countries (Harris, 2002). 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). Okwusi, (2010) affirmed that ICTs are foundation of the new global information based economy. Forecasts and prediction suggest that by 2020, emerging new technologies such as precision agriculture and sophisticated computer technologies will become possible in developing countries especially Africa for farmers to access (ECA, 2005). Jumba and Yee-Chung (2005) defined new technologies as including new applications regardless whether the technologies have been used in other parts of the world and include use of emerging technologies such as Information and Communication Technologies (ICTs). The United Nations Conference on Trade and Development (UNCTAD) (2007) in their view point stated that technological advances in small-scale agricultural production and trade are often crucial in initiating a catch-up process. Information and knowledge play a central role in rural agricultural development. Balit, (2000) stated that information and knowledge are essential, if farmers are to respond to opportunities and major challenges affecting their production. Van Audenhove (2004) described information and knowledge as the prime productive process.

Farmers would, however, require training and a change of attitudes to enable them access information and an arbitrary service through ICTs to make the services affordable and effective. Access of ICTs would also provide for more content diversification, provide links input, microfinance, information knowledge and markets. ICTs could further ensure a wider reach (IDRC, 2007). The challenge however will be the high literacy levels and inadequate skills on how to use computers and other ICTs. Other challenges include poor telecommunication infrastructure and electricity, computer viruses, inadequate technical expertise in rural areas, expensive equipment and availability of software and hardware. In order ameliorate these challenges a number of public access sites such as telecentres, rural resource centres, knowledge centres, market information points and information kiosk have been established by development partners, private sector and non-governmental organizations (NGOs) for providing access to agricultural knowledge and information (Benjamin, 2001; Harris, 2002; Munyua, 2002; Iibuodo, 2003).

Access to agricultural information on input supply, uses, product marketing and value addition could be transmitted through ICTs, thus cutting down the need to travel visitations by extension workers. An appropriate blend of ICTs could be used to free time of extension workers and cut down the number of change agents required and training by providing 'distance extension' through telecentres and other public access points. Traditional communication channels including messages captured in videos and DVD's have proved to extremely powerful in communicating agricultural messages to small-scale farmers. Content has been captured in form of manuals, handbooks, radio programmes, CD-ROM's, chat sessions, audio-cassettes, pamphlets, newsletters, market information and web sites. Some of the issues for information exchange using ICT applications include skills and capacity to repackage content, translations, sharing of existing content and cost of information exchange (Richardson, 2006). Access of farmers to timely and relevant information will improve their agricultural production, processing and marketing. These improvements will translate into higher income and better living standards for farmers (Okon, 2005). The effectiveness of specific ICT enhancements naturally depends on policy, infrastructure and human realities. Farmers have very little accesses to information source. They are mostly poor, illiterate, unable to afford even the very most basic forms of ICT's, such as radios and telephones. Nevertheless, they actively seek and disseminate information that must be appropriate to enable farmers gain access to information efficiently and cost effectively (Aderete and Ibitunde, 2010). These conditions include the ease of use or user friendliness of the technologies, regular electric power supply and availability of spare parts. It must be noted that even when ICTs are available, their accessibility depends on the type of technology. Information on the accessibility of ICTs in the study area could not be ascertained due to bureaucratic bottlenecks affecting extension delivery in the state.

It is against this backdrop that this study was designed to analyze accessibility of ICT facilities among contact and non- contact farmers in Gboko Agricultural zone of Benue State, Nigeria. Specifically the study; described selected socio-economic characteristics of the respondents, ascertained different types of ICT facilities accessible to contact and non-contact farmers in the study area, compared the accessibility of ICT's between contact and non-contact farmers and Identified constraints to accessing ICT facilities by farmers in the study area.

Materials and Methods

This study was conducted in Gboko Agricultural zone was purposively selected out of the three agricultural zones of the State. The choice of the zone was informed because the Local Government Areas (agricultural blocks) in the zone were located in Benue State metropolis. A list of all contact farmers were obtained from the Agricultural Development Programme (ADP) office in the state, which formed the sample frame. A multistage random sampling was used in the selection of agricultural blocks, circles, contact and non contact farmers. First, three (3) blocks each was randomly selected from six blocks (Local Government Areas) that make up the zone namely; Adikpo, Gboko, Guma, Makurdi, Gwe West and Oturukpo. Also four (4) circles each were randomly selected from the selected blocks (LGA's) and this give a total of (12) circles. Furthermore, five (5) ADP contact farmers were randomly selected from the selected circles and this gives a sample size of sixty (60) contact farmers. Also, non- contact farmers were randomly selected from the areas where the

contact farmers were selected. This gave a grand sample size of one hundred and twenty (120) farmers. A structured questionnaire was used in soliciting information from the farmers. Descriptive statistics such as frequency counts, percentages and inferential statistics (Z – test analysis) were used in the research. Objectives a, b and d were analyzed with frequency counts, mean ratings and percentages, while Z- test analysis captured objective c. The constraints to access to ICT facilities by the farmers were made up of three (3) sections. Section A (Telecommunication/Computer Technologies) consisted of six (6) item statements, section B (Broadcast/Audio Visual Technologies) consisted of three (3) item statements and section C (Print Technologies), three (3) item statements. These were measured and rated on a 5 point likert scale of high constraint = 5, constraint = 4, moderate constraint = 3, low constraint = 2, and no constraint = 1. A midpoint was obtained thus; $5+4+3+2+1=21/7=3.00$. Based on the mid score decision rule, any mean score greater than or equal to 3.00 implied constraint to access to ICT facilities by the farmer

Results and Discussion

The result in Table 1 shows selected socio economic characteristics of contact and non contact farmers in Gboko agricultural zone of Benue State, Nigeria. The Table 1 reveals that a good proportion (58.40%) and 56.60% of contact and non-contact farmers were males. This implies that men dominated farming in the study area. Also a fairly good proportion (43.33%) of contact farmers had age range of between 40 - 49 years while 40.00% of non- contact farmers were within the age range of 50-59 years. This result shows that contact farmers were in their productive ages than the non contact farmers. Furthermore majority (83.34%) of the contact farmers acquired secondary education while the non contact farmers (38.33%) had primary education. Nwaobiala, 2011 asserted that education enhance farmers ability to access and make good use of information about agricultural production technologies. A moderate proportion of contact farmers (38.33%) and non contact farmers (31.66%) had 11-15 years of farming experience while 53.30% and 46.67% contact and non contact farmers cultivated on farm sizes ranging between 2.1-3.0 hectares respectively. Idike, (2008) affirmed that majority of small scale farmers in Nigeria are categorized as having 0.1-3.0 farm holdings.

Results in Table 2 shows that contact farmers had access to radio, television, projector and video recorder with mean ratings of 5.11, 3.66, 2.56 and 2.35 respectively and a total mean rating of 2.39 for Broadcast/Audio – Visual Technologies. The non contact farmers only had access to radio (X=2.70) and television (X= 2.50) with a pooled mean rating of 1.83 for the technology. The result shows that the contact farmers had access to the technologies than the non contact farmers. The high access to these technologies by the contact farmers may be attributed to farmers need for information on improved farming practices through agricultural programmes aired via radio and television. Adeyinka (2005) asserts that radio and television can be used to broadcast programmes on appropriate technologies in local dialects thus facilitating the adoption of technologies. The contact farmers accessed Telecommunication/Computer technologies such telephone/GSM (X= 4.05), computers (X= 3.60), internet (X= 2.80), e - mail (X= 2.50) and satellite dish (X= 2.40) with pooled mean rating of 2.50. The non contact farmers accessed only telephone/GSM (X=2.55) indicating a pooled mean rating of 1.33. This result shows that the contact farmers had more access to the technology than their counterparts. ITU (2003) stated that over the past 25 years developing countries have considerably increased ICT access especially for telephone services. Mobile phone have made impact in reducing costs, broadening trade networks and facilitating search for technical information. The contact farmers also accessed Print Technologies such as newsletters (X= 3.30), newspapers (X= 3.20), leaflets (X= 3.03), posters (X=2.90), research bulletins and Magazines (X= 2.80), annual reports (X= 2.60), diaries (X= 2.56) and agricultural journals (X= 2.50) with a pooled mean rating of 2.60. The non contact farmers accessed newspapers (X= 2.35) and magazines (X= 2.30), recording a pooled mean rating of 1.15. This result indicates that the contact farmers had more access to print technologies than the non contact farmers since the pooled mean is greater than 2.0. Print Technologies such as newspapers, posters, leaflets, magazines and among others have been credited for their positive contribution in transferring agricultural information and further complementing extension news.

The results in Table 3 shows that the calculated Z (3.90) is greater than tabulated Z (2.0) value at 1.00% level of significance. Therefore the hypothesis of no significant difference in the mean responses of the groups of farmers on accessibility of ICT facilities in Benue State is hereby rejected. Accessibility of ICT facilities by contact farmers may be attributed to the effective extension system delivery in the state, whereby the farmers were exposed to such facilities. Also the economic and literacy levels of the contact farmers contributed to the purchase of such ICT facilities as television, radio, satellite dish and computers and among others which encouraged them to procure them. This result is in agreement with the findings of Okwusi and Ekumankama (2010) where access to ICT facilities enhance farmers' awareness on agricultural activities and new technologies in South Eastern Nigeria.

Results in Table 4 shows the perceived constraints encountered by farmers in accessing ICT facilities in the study area. The Table reveals that constraints relating to telecommunication/computer technologies indicate restriction of this technology to offices (X 3.40), high cost of telecommunication facilities (X 3.37), epileptic power Supply (X=3.62) and illiteracy of farmers (X 3.55) were identified by the farmers. Under Broadcast/Audio-visual Technologies, the farmers indicated that inadequate electricity in rural areas (X 3.21), little air time given to agricultural programmes on radio and television (X 3.26) and high charge paid for radio and television programme (X 3.20) as constraints in accessing ICT facilities in their farming operations. For print technologies, the farmers ascribed that only literate people can read printed materials such as journals, newsletters, posters, calendars and among others,(3.44) which hampered the access of these materials to target farmers.

Conclusion and Recommendations

This study has shown that majority of ICT facilities (telecommunication/computer, broadcast/audio-visual and print technologies) available in the study area were accessible to the contact farmers more than the non contact farmers. The accessibility may be attributed to contact of the farmers with Agricultural Development Programme (ADP) as their extension delivery agency. The constraints in accessing these ICT facilities were identified as restriction of ICT facilities in government offices, high cost of computers, epileptic power supply experienced in the country, illiteracy levels of farmers in reading printed materials and little air time and high charge in airing agricultural promoted programmes on radio and television. In view of the above, the study recommends steady power supply in order to use these facilities by farmers, regular training and retraining for both farmer groups on the application of computers, government and donor agencies should help subsidize ICT equipment to make it readily available and accessible to both contact and non contact farmers and educational/telecentres should be established to increase access of ICT facilities to farmers.

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Tables**Table 1:** Distribution of Farmers According to Socio economic Characteristics

Variables	CONTACT FARMERS		NON CONTACT FARMERS	
	Frequency	Percentage	Frequency	Percentage
Gender				
Male	35	58.40	34	56.60
Female	25	41.60	26	43.40
Age (years)				
20 – 29	10	16.67	12	20.00
30 – 39	16	26.67	8	13.33
40 – 49	26	43.33	13	21.67
50 – 59	11	18.33	24	40.00
60 – 69	---	--	3	5.00
Education				
No formal education	2	3.33	21	35.00
Primary education	3	5.00	23	38.33
Secondary education	50	83.34	9	15.00
Tertiary education	5	8.33	7	11.67
Farming Experience (years)				
1-5	16	26.66	7	11.67
6-10	3	5.00	8	13.33
11-15	23	38.33	19	31.66
16-20	6	10.00	7	11.67
21-25	4	6.66	9	5.00
26-30	8	13.33	10	16.67
Farm size (ha)				
0 - 1.0	10	16.67	8	13.33
1.1-2.0	12	20.00	16	26.67
2.1-3.0	32	53.30	28	46.67
3.1-4.0	6	1.00	8	13.33

Source: Field Survey, 2011

Table 2: Mean Ratings and Standard Deviation of Access of ICT Facilities to Contact and Non-Contact Farmers in Benue State, Nigeria

ICT Facilities	Contact Farmers		Non Contact Farmers	
	$\bar{X}$	SD	$\bar{X}$	SD
A. Broadcast/Audio-visual Technologies				
Radio	5.11	3.00	2.70	1.08
Television	3.66	1.88	2.50	0.71
Projector	2.56	1.04	1.05	0.01
Video Recorder	2.35	1.01	1.05	0.01
Pooled X and SD	2.39	1.30	1.83	0.30
B. Telecommunication/Computer Technologies				
Computer	3.60	2.08	1.65	0.66
Telephone/GSM	4.05	1.85	2.55	1.03
E-mail	2.50	1.01	1.21	0.42
Fax	1.00	0.00	1.00	0.00
Internet	2.80	1.03	1.05	0.01
Satellite Dish	2.40	1.00	1.00	0.00
Pooled X and SD	2.50	1.06	1.33	0.30
C. Print Technologies				
Newsletters	3.30	1.75	1.65	0.66
Research Bulletins	2.80	1.03	1.00	1.02
Leaflets	3.03	1.54	1.21	0.42
Posters	2.90	1.04	1.05	0.01
Calendar	1.80	0.70	1.00	0.00
Diaries	2.56	1.03	1.00	0.00
Annual Reports	2.60	1.03	1.00	0.00
Newspapers	3.20	1.61	2.35	1.02
Magazines	2.80	1.03	2.30	1.01
Agricultural Journal	2.50	1.01	1.05	0.02
Agricultural Maps	1.00	0.00	1.00	0.00
Pooled X and SD	2.60	1.07	1.15	0.21

Source: Field Survey, 2011

Midpoint >2.0 for category of ICT accessed

Table 3: Results of Paired Z - test on the Accessibility of ICT Facilities by Contact and Non-Contact Farmers in Benue State, Nigeria

Farmers	Mean	SD	N	df	t-cal	t-tab	Decision
Contact Farmers	2.49	1.14	60	118	3.90***	2.0	Reject
Non – Contact	1.14	0.09	60				

Source: Computed From Field Data, 2011

*** Significant at 1.00% level of probability

Table 4: Distribution of Farmers According to Constraints to Accessing ICT's in Gboko Agricultural Zone of Benue State, Nigeria

ICT Facilities	HC	C	MC	LC	NC	Mean
A. Telecommunication/Computer Technologies						
Poor telecommunication Network in Nigeria Telecommunication	12(60)	10(40)	20(60)	25(50)	43(43)	2.10
Access is restricted to the offices	46(230)	29(92)	15(45)	17(34)	10(10)	3.40*
Non accessibility of e-mail services	16(85)	31(124)	28(84)	20(40)	25(25)	2.98
High cost of Telecommunication Facilities	41(205)	22(88)	17(51)	21(42)	19(19)	3.37*
Epileptic power Supply	40(200)	32(128)	23(69)	15(30)	10(10)	3.62*
Illiteracy of farmers	32(160)	38(152)	23(69)	18(36)	9(9)	3.55*
B. Broadcast/Audio-visual Technologies						
Inadequate electricity in rural areas	38(190)	18(72)	15(45)	29(58)	20(20)	3.21*
Little air time given to agricultural programmes on radio and television	34(170)	26(104)	19(57)	20(40)	21(21)	3.26*
High charge paid for radio and television programme	36(180)	22(88)	17(51)	20(40)	23(23)	3.20*
C. Print Technologies						
Circulation is limited to Accessible areas	21(105)	19(76)	30(90)	30(60)	20(20)	2.92
Magazines/Newspapers are expensive to buy	25(125)	20(80)	28(84)	18(36)	29(29)	2.95
Only literate people can read printed materials	31(155)	35(140)	25(75)	19(38)	10(10)	3.44*

Source: Field Survey, 2011

Constraint 3.0 and above

No Constraint < 3.0

HC= High Constraint, **C** = Constraint, **MC=** Moderate Constraint, **LC=** Low Constraint**NC=** No Constraint

Values in Parentheses are Nominal Likert Values Multiplied by Frequencies

*Constraint