

Assessment of Socioeconomic Determinants of Access and Utilization of Icts Among Farmers in South-East Nigeria

Ezeh Ann NnennaDept. of Agricultural Economics
Management and Extension,
Ebonyi State University, Abakaliki
email: annezeh2007@yahoo.com**Eze A.V.**Dept. of Agribusiness and Management,
Michael Okpara University of
Agriculture, Umudike,
Abia State**Aleke B.**Department of Agricultural Economics
Management and Extension,
Ebonyi State University,
Abakaliki

Abstract: The study assessed the socioeconomic determinants of access and utilization of ICTs among farmers in Southeast Nigeria. Multi-stage sampling techniques were employed in selection of 240 Farmers as source of primary data for the study, using structured and validated questionnaire schedule. Both descriptive and inferential statistics were employed in the analysis of data generated from the field survey for study. The result of the analysis showed that the following socioeconomic variables: age, gender, family size, income level, membership of cooperative societies, farming experience, and distance from place of ICTs were statistically significant at 5% for farmers access to ICT facilities, while age, gender, educational attainment, income level, membership of cooperative societies, and presence of associated ICTs infrastructure showed statistically significant at 5% for farmers level of ICTs utilization in the area. This goes to shows that these variables are important determinants of farmers' access to and utilization of ICTs. The result of factor analysis showed that infrastructural, technical and socio-economic related factors constrained access and utilization of ICTs by farmers. The study recommends the institutionalization of programme such as extension education, training etc. that will promote the development of these socioeconomic variables, the strengthening of the use of contemporary ICTs such as phones and internet, rather than conventional ICTs such as radio and television through provision of advisory services to farmers on how to pool their resources together for the purpose of establishing rural viewing centre, provision of adequate training on the use of ICTs for greater effectiveness of ICTs access and utilization in farming operations in Southeast, Nigeria.

Keywords: Socioeconomic, Determinants, Access, Utilization, Farmers, ICTs.

1. INTRODUCTION

Information Communication Technology (ICT) is 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 computers fitted with a modem or supply technologies that facilitate communication processing and transmission of information by electronic means ranging from radio, television, telephone (fixed or mobile) and internet (CTA, 2003; Omotayo, 2005). Ezech (2013) cited Adejo and Haruna (2010) classified ICT into conventional ICT (radio, television) and contemporary ICT (telephones, computer/internet). She observed that ICTs are foundation

of the new global information based economy. ICTs are increasingly becoming the key drivers for socio-economic growth worldwide (Hellerstein, 2005). Infact, its capacity for immediacy and sharing of large volume of information at minimum cost has been documented (FGN, FAO, 2004).

In recognition of the importance of ICTs in agricultural information dissemination, the Federal government of Nigeria in 2012 introduced the Growth Enhancement Support Scheme (GES) which is designed to deliver government subsidized farm inputs directly to farmers via GSM phones. The GES scheme is powered by e-Wallet, an electronic distribution channel which provides an efficient and transparent system for the purchase and distribution of agricultural inputs based on a voucher system. The scheme guarantees registered farmers e-Wallet vouchers with which they can redeem fertilizers, improved seeds and other agricultural inputs from agro-dealers at half the cost, the other half being borne by the federal government and state government in equal proportions. As part of effort to ensure successful implementation of the GES Scheme, the Federal Ministry of Agriculture announced that the Ministry will equip 10 million farmers in the rural areas with mobile phones. According to the Minister, the project will link farmers directly to government and vice-versa so that government will be able to monitor the progress of farmers as well as disseminate valuable information to them (Punch Newspaper, 2012). Apart from facilitating the acquisition and absorption of information/knowledge networking, codification, teleworking and science system, ICT could be used to access global knowledge and communication with other farmers, extension workers and other people.

The search for an effective strategy for agricultural development calls for adequate use and application of ICTs, especially computers and the Internet, which are considered as among the principal drivers of economic growth and development worldwide (Abubakar and Abdulahi, 2009). Emphasis is being placed on the use of ICTs in boosting agricultural production among farmers. Farmers who are hooked up to new technologies far better (Adejo and Haruna, 2009). ICT plays essential role in poverty alleviation by providing powerful tool to rural farmers and other citizens to grow their business and create new opportunities, access production inputs and recommended techniques, marketing outlets and delivery

of services to rural areas. Farmers need information to enhance agricultural management, research and development (Nkwocha, Ibeawuchi, Chukwueke, Azubuike and Nkwocha, 2009).

However, while ICTs boosts information supply on improved farm technologies and the resultant effect on productivity and income of farmers, the great challenge is that most Nigerian farmers are illiterates, living in the rural areas, hence they have no knowledge of the use of ICTs facilities like computer and Internet (Omotayo, 2005). Technical Centre for Agriculture (CTA) Spore (2004) report noted that the numbers of farmer who are hooked to new technologies through ICTs are few and far better. This is further compounded by vicious cycle of poverty that continues to hamper the capacity of rural farmers to improve their standard of living. Assessors of rural ICT development have not only established a number of constraints to ICT development in rural areas, but also have the general consensus that the current trend of ICT development tends to be biased against the rural population (FAO, 2004). Nkwocha *et al.* (2009) in their study found out that, there were more prevalent factors limiting access to ICT in Okigwe zone (predominantly in the rural areas) of Imo State, South East Nigeria. Similarly, Shah (2009) reported that, access to broadband Internet services is substantially low in rural areas and poor urban neighbourhoods of many developing countries than in the metropolitan urban.

Presently, it is still quite unclear whether farmers in the south-east states of Nigeria are adequately exposed to information and communication technology. Punch Newspaper (2012) quoting the Minister of Agriculture based on survey carried out through GES on large samples from various local government areas in 13 different states showed that 71% of sampled farmers in the rural areas did not have a mobile phone, which in effect excludes them from the benefits of the GES' e-Wallet platform."

Despite the prevalent of various ICT facilities in Nigeria, little is known in terms of the socioeconomic determinants of farmers' access and utilization of these facilities for enhancing agricultural production in the area. Therefore, the need for unlimited access and utilization of current digital device (ICTs) for improving the living standard of farmers and agricultural production call for the adequate knowledge of the socioeconomic determinants of access and utilization of ICT among farmers in Southeast Nigeria. In order to focus this study properly to actualize its intended purpose, the following specific objectives were set out to achieve: determine the influence of farmer's socio-economic characteristics on their access to selected ICT facilities; determine the influence of farmer's socio-economic characteristics on their utilization of selec-

ted ICT facilities; and identify and analyze the constraints to effective use of ICT facilities among farmers in the study area.

2. METHODOLOGY

The study area was South-East Nigeria; which comprises of five states namely; Anambra, Abia, Ebonyi, Enugu and Imo states. The area has an approximated land area of 5824.7 sq.km and lies between longitude 6⁰50' and 8⁰15'E and latitudes of 4⁰30' and 7⁰15'N (Mamman, 2000). The South-East states have about a total of 16,381,729 people (NPC) who are mainly of Igbo tribe. The vegetation lies within the rain forest and dry savannah region of Nigeria. It has a tropical humid climate with two distinct seasons of the year namely, the rainy and dry seasons. The rainy season last from April to October and is marked by regular drop in ambient temperature. The dry season lasts from November to March. It is characterized by a hot dry spell. Within the two seasons, the temperature range varies from about 18⁰C to 34⁰C. Dominant arable crops of the area include yam, rice, cassava, maize, cocoyam, groundnut, pepper and various types of vegetables. Oil palm, banana, plantain and coconut are plantation crops dominant in the area. Small ruminant and backyard poultry production dominate the livestock industry and fisheries.

A. Sampling Techniques

Multistage sampling procedure involving simple random sampling techniques were employed. In the first stage, three (3) states out of the five (5) states that make up the South-East Nigeria states were randomly selected. These States include Abia, Ebonyi, and Enugu. The sample frame included all the farmers in the selected States. Secondly, from the three (3) selected States, two agricultural zones were randomly selected from each of the States as follows; in Abia State – Abia North and Abia South were randomly selected. In Ebonyi State – Ebonyi North and Ebonyi Central were randomly selected, while in Enugu state, Enugu East and Enugu North were randomly selected. Thus a total of six (6) agricultural zones were selected for the study. Thirdly, two hundred and forty farmers (240) were systematically selected out of the total number of estimated farmers in the selected zones (749,478) as in Table 1. The selection was done as follows; 2 local government areas (L.G.As) were randomly selected from each of the six selected zones to get a total of 12 LGAs. Furthermore, 2 communities were randomly selected from each of the selected LGAs to get a total of 24 communities, then 10 farmers were systematically selected from the selected communities to get a total of 240 farmers.

Table 1. Distribution of Selected Farmers According to Their Agricultural Zones

State	Estimated No. of farming household/state	Sampled senatorial zones	Sampled LGAs	Sampled Communities	Number of Sampled ff/community
Ebonyi	435,329	Ebonyi North	Abakaliki	Nkaliki Unuhu Ebia	10 10

			Ebonyi	Ishieke	10
				Nkaliki Achara Unuhu	10
		Ebonyi Central	Etza North	Umuohara	10
				Umuezekoha	10
			Ikwo	Ndufu-Achara	10
				Amagu	10
Enugu	207,488	Enugu East	Enugu North	Ogbete I	10
				Onuasata Ogui L/O	10
			Enugu South	Amechi Uwani	10
				Awkunanaw	10
		Enugu North	Nsukka	Opi	10
				Eha-Alumona	10
			Udenu	Obollo Afor	10
				Orba	10
Abia	451,345	Abia Central	Umuahia North	Afougiri	10
				Isieke	10
			Ikwuano	Oloko	10
				Ibere	10
		Abia North	Arochukwu	Amasu	10
				ObiezeIsu	10
			Isukwuato	Ukwu-Nwangwu	10
				Uturu	10
				Ugwuale	10
Total	1,094,162	6	12	24	240

Source: Field Survey, 2012

B. Data Collection and Analysis

The study was carried out using primary data source. Data were obtained primarily using structured questionnaires which were directed to the farmers. The data for this study were analyzed using inferential statistics. Objectives (i) and (ii) were actualized using inferential statistics such as multiple regression analysis and objective (iii) was achieved using principle factor analysis.

C. Model Specification

Multiple Regression Model Inferential analytical tool such as multiple regression using ordinary least square method (OLS) was employed in objective (ii) to determine the influence of respondents (farmers) socio-economic characteristics on access to and utilization of ICT facilities.

The model is stated as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, \dots, X_8) \quad (1) \text{ Implicit function}$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \dots + \beta_8 X_8 + \mu \quad (2) \text{ Explicit function.}$$

Where,

Y = Number of the ICT facilities farmers' have access to, and can efficiently utilize.

X₁=Age of respondent (years)

X₂=Gender of respondent (dummy, male = 1, female = 0)

X₃=Educational attainment of respondent (years)

X₄=Family size of respondent (number of individuals

involved)

X₅=Income level of respondent (₦)

X₆=Cooperative society membership (yes = 1, no = 0)

X₇=Farming experience of respondent (years)

X₈=Distance from place of ICTs (Km)/Presence of associated infrastructure e.g electricity (Dummy, Yes=1, No=0)

μ=Error or stochastic term

β₀=Constant

β₁-β₂=Parameters to be estimated.

3. RESULTS AND DISCUSSION

A. Farmers' socio-economic characteristics influence on access to ICTs

The result of analysis in Table 2 showed that the multiple regression co-efficient (R) was 0.788 or 78.8%. This is an indication that the included independent variables (age, sex, education attainment, income, family size, social organization membership and distance from place of ICTs) were highly correlated with the level of farmer's access to ICTs. The coefficient of determination (R²) was 0.621 or 62.1%, implies that 62.1% of the total variation observed in the dependent variable was attributed to changes in the independent variables included in the regression model. The fitness of the model was further confirmed by the low value of the overall standard error of the estimate (Std. error = 0.03219850) and the Durbin-Watson value of 1.819, indicating absence of autocorrelation in the model.

The co-efficient of Age (X₁) was negatively signed and

statistically significance at 5% level. The significance of age is an indication that it is a good determinant of farmers' access to ICTs in the study area. This is in contrast to the findings of Henri-Ukoha, Chikezie, Osuji, and Ukoha (2012) who reported a positive coefficient between farmers' age and level of access to ICTs. The negative coefficient implies that as the farmers become old their access ICTs reduces and vice versa. This result conforms with the a priori expectation and is in order, because the younger farmers will be too inquisitive for change, therefore, will have more demand for ICTs.

Gender (X_2) bore a negative co-efficient in farmers level of access to ICTs but was statistically significant at 5% level. This means that there was gender discrimination in access to ICTs for farming activities in the study area. Both male and female farmers do not have equal access to ICT facilities in the study area for their farming activities. This can be explained by the culture practice of the people, where male are regarded as the head of the family and owner of assets. In this case gender composition pose problem on access to ICT facilities in the area. However, the significance indicated by this variable implies that gender is a good determinant of farmers' access to ICT facilities in the area.

The educational attainment (X_3) of the farmers showed positive coefficient, but statistically insignificant. This implies that the higher the educational attainment of the farmers, the higher their level of access to ICT facilities in the study area. This is true and conforms to the a priori expectations because educated farmers are more knowledgeable and technically more competent in ICTs operation.

The coefficient of household size (X_4) was positively signed and statistically significant at 5% level. This implies that farmers who had large household size will have more access to ICT facilities more than those with small household size. This could be due to the fact that farmers with large household size have need for wide spread communication among members. Hence; will enhance their urge to possess the facilities which therefore increase level of access to ICT facilities.

The income level (X_5), had a positive coefficients and was statistically significant at 5% level. This implies that the higher the income levels of the respondents, the higher their level of access to ICT facilities in the study area. This is because farmers with high income level have sufficient capital to purchase to access ICT facilities. This is in consonant with the findings of Henri-Ukoha *et al.* (2012) who reported a positive correlation between the coefficients of income of the farmers and their level of access and utilization of ICT facilities. The statistically significant at 10% showed that income level is an important determinant of rate of ICT access in the area and required attention to harness ICTs access.

The coefficient of membership of cooperative society (X_6) was positively signed and statistically significant at 5% level. This means that farmers who belonged to cooperative societies have better access to ICT facilities more than those who were not members of cooperative

societies. This is true and conforms to the a priori expectations because those who belong to cooperative societies have quicker access to agricultural innovations/information through close contact with other members of cooperative organization. Based on the statistical significance, membership of cooperative societies is good attribute for farmers' access to ICT facilities in the study area.

The coefficient of farming experience of the farmers (X_7) was positively signed and statistically significant at 5% level. This means that farmers who had been in farming for many years would have more access to ICT facilities than those who are relatively new in farming. This is in line with the a priori expectation because it is expected that farmers who have been farming for long time will have more access to ICT facilities better than those who are new to farming enterprises. The statistical significance shown by this variable implies that working experience is a good determinant of access to ICTs in the area.

The coefficient of distance from place of ICTs (X_8) was positively signed and statistically significant at 5% level. This implies that the closer the place of ICTs to the farmer, the more access to facilities in the area. The significant value shows that distance of ICTs is a good determinant of access to ICTs in the area. This is in conformity to the a priori expectation.

The final regression equation is shown as:

$$Y = 0.0270 - 0.018X_1 + 0.029X_2 + 0.007X_3 + 0.589X_4 + 0.006X_5 + 0.016X_6 + 0.117X_7 + 0.57X_8$$

(0.316) (0.006) (0.223) (0.006) (0.038) (0.000) (0.007)
(0.093) (1.263)

B. Farmers' socio-economic characteristics influence on utilization ICTs

The result of analysis shown in Table 3 on the influence of socio-economic characteristics of farmers on their level of utilization of ICT facilities in the study area. The multiple regression co-efficient (R) was 0.83 or 83%. This showed that the included independent variables (age, sex, education, income, family size, membership of cooperative society, presence of associated ICTs infrastructure) were highly correlated with the farmer's level of utilization of ICTs. The coefficient of determination (R^2) was 0.796 or 79.6%, implies that about 79.6% change in the dependant variable (Y) was explained by changes in the independent variables included in the regression model. The determinant variables' coefficients having positive signs showed that increase in the considered variables will cause increase in the utilization (Y) of ICTs and vice versa. It is believed that the power of the explanatory variable was not exaggerated since R^2 (79.6%) was in numerical value closely related to the adjusted R^2 (78.7%). This was further confirmed by the value of the overall standard error of the estimate (Std. error = 0.5432) which constituted about 20.4% of the total variation that was not explained. The overall fitness of the model was further confirmed by the low value of Durbin Watson (1.448), indicating the absence of autocorrelation in the regression model.

The co-efficient of Age (X_1) was negatively signed and

statistically significance at 10% level. The significance expressed by age is an indication that it is a good determinant of farmers' level of utilization of ICTs in the study area. This is in line with the findings of Hill *et al.* (2008) who found age to be negatively associated with ICTs use, as people's age gets higher their utilization of ICTs reduces and vice versa, therefore, if the younger farmers in the area are supported with ICTs it will enhance their utilization and farming activities.

The coefficient of gender (X_2) was positively related to the level of utilization of ICTs and statistically significant at 10% level. This implies that both male and female farmers utilize ICTs for farming activities; there is no gender discrimination in ICTs utilization in the area. In other words, both male and female have need for ICTs utilization in their farming activities in the area. Again, the age is a good determinant of ICTs utilization as shown by the statistical significance.

The educational attainment (X_3) of the farmers indicated positive coefficient and statistically significant at 10%. This implies that the higher education the farmers attainment, the higher their level of utilization of ICT facilities in the study area. The significance expressed by this variable is an indication that educational attainment is a good determinant of farmers' utilization of ICTs. This is in line with the findings of Akinbile (2003) who reported that educational level of farmers will enhance their comprehension of technical information and make them able to manipulate the information and hence influence their choice of use of ICT facilities. Therefore, if farmers' education is improved it will enhance their utilization of ICTs for improved agriculture in the study area.

The coefficient of household size (X_4) was positively signed and statistically significant at 10% level. This means that farmers who had large household size will have utilized ICT facilities more than those with small household size. This result does not conform to the a priori expectation, because of the cost associated with the use of ICT facilities. However, the significance sign implies that household size is an important determinant of ICT utilization.

The income level (X_5), had a positive coefficients and was statistically significant at 10% level. This implies that the higher the income levels of the farmers, the higher their level of utilization of ICT facilities in the study area. This is because farmers with high income level have sufficient capital to purchase and use ICT facilities. This is in consonant with the findings of Henri-Ukoha *et al.* (2012) who reported a positive correlation between the coefficients of income of the farmers and their level of access and utilization of ICT facilities. The statistically significant at 5% showed that income level is an important determinant of ICTs utilization in the area for farming activities.

The membership of cooperative society (X_6) showed positive coefficient and statistically significant at 5% level. This implies that farmers who belonged to cooperative societies utilize ICT facilities more than those who were not members of cooperative societies. This in

line with the findings of Henri-Ukoha *et al.* (2012) who reported a positive relationship between the coefficients of membership of co-operatives and level of access and utilization of ICT facilities in Ukwa East Local Government Area of Abia state.

The farming experience of the farmers (X_7) showed positive coefficient but insignificant at all levels. This means that farmers who had farmed for many years would utilize ICT facilities more than those who have farmed for fewer years. The result not being significant for utilization means that working experience though can contribute to access to ICTs, is not a good determinant of utilization of ICTs in the area. This follows the findings of Wolcott *et al.* (2008) who suggested that experience gained in daily farm activities was positively associated with ICTs use.

Presence of ICTs associated infrastructure e.g. electricity (X_8) for utilization of ICTs, showed positive coefficient and statistically significant at 10%. This indicates that the higher the presence of associated ICTs infrastructure such as electricity, the higher the utilization of ICT facilities in the area. The significant at 10% level means that it is a good determinant of farmers' utilization of ICTs.

The final regression equation is shown as:

$$Y = 0.007 - 0.001X_1 - 0.030X_2 + 0.001X_3 + 0.002X_4 + 4.386E-8X_5 + 0.023X_6 + 0.002X_7 + 0.19X_8$$

(0.016) (0.000) (-0.005) (0.001) (0.001) (0.000) (0.005) (0.000) (0.003)

C. Factor Analysis on constraints to access and use of ICT facilities by farmers

The result of factor analysis as presented in Table 4, Identified three major constraints that limit access and effective use of ICTs facilities by the farmers in South east Nigeria. These were: infrastructural, technical and socio-economic constraints. Under constraint I, the variables that loaded high were; inadequate/lack of power supply, inadequate/scarcity of ICT facilities, poor/ lack of network coverage, poor electricity power supply, poor access to credit and high taxes. This finding conforms to the work of (Kenny, 2001) who observed that effective use of ICT facilities rely on physical infrastructure (electricity and telecommunication) and even when such infrastructures are in places, difficulties arise when they are poorly maintained or too costly to use.

Factor II, was named technical constraints due to the variables that loaded high in it. These variables were: lack of technical know-how, problem of connectivity, and drop in calls, poor/lack of network coverage and maintenance problems. These findings conform to the findings of Aboyade (1997) who opined that inadequate information, communication technology and poor rural connectivity had greatly affected rural farmers productivity since greater percent of them live in rural areas. It should be noted that most of the communication networks are not available in rural areas. Thus, communication between rural and urban dwellers is hampered. Grinmard (1998) observed that farmers face barriers to growth from poor wide market environment (demand and trends) and with poor communication between suppliers and marketers due

to technical problems. Thus, adequate investment in telecommunication services provides the necessary impetus for information delivery services among the rural farmers.

Factor III was named socio-economic constraints due to those variables that loaded high under it. These include among others Low level of literacy, poor access to credit, lack of awareness and high taxes. These findings conform to the observations of (Ezhar *et al.*, 2008). They observed that one possibility that drive to the problem of using ICTs was low educational achievement of most of them. Since most of ICT applications are run in English, those who have lower education achievement have problems to use ICT. Pierson (2006) stated that low self-esteem is also the main problem that must be overcome if agricultural community wants to be cultivated with ICT skill and knowledge. Due to low educational background of most farmers in Nigeria, they prefer to use traditional way of acquiring information such as asking their neighbour instead of using ICT facilities.

4. CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, it is concluded that the following socioeconomic variables: age, gender, family size, income level, membership of cooperative societies, farming experience, and distance from place of ICTs were important determinants of farmers access to ICTs in the area, while age, gender, educational attainment, income level, membership of cooperative societies, and presence of associated ICTs infrastructure were good determinants of farmers' utilization of ICTs in the area. It is expected that development of these variables will enhance productivity of farmers' outputs. ICTs provide the platform for reaching larger number of farmers in the shortest possible time on knowledge sharing and strengthen communication between farmers – extension agents – research stations and vice versa on varied information such as inputs supply, market information, recommended practice etc for improving farming activities and farm outputs. It is therefore recommended that farmers should be strengthened to access and use ICTs through provision of advisory services on how to pool their resources together for the purpose of establishing rural viewing centre. Moreso, adequate training should be organized for farmers on the use of ICTs for effective farming activities in the area.

REFERENCE

- [1] Aboyade (1997). *Gender and tele-centres: what have we learned?* Presentation at World Bank gender and the digital divide seminar series.
- [2] Abubakar, L. and Abdullahi, H.A. (2009). *Information and communication technologies in agricultural development in Nigeria: Challenges and opportunities*. Proceedings of the 43rd Annual Conference of the Agricultural Society of Nigeria, Abuja. Pp. 715-717.
- [3] Adejo, P.E. and Haruna, U. (2009). *Access of farmers to ICTs for agricultural development in Bauchi Local Government Area, Bauchi State*. Op.Cit. Pp. 704-707.
- [4] Akinbile, L.A. (2003). Farmers perception of the effectiveness of Fisheries Extension Services in Nigeria. *Journal of Extension Systems*, 19: 32-44.
- [5] Ezeh, A.N. (2013). Extension agents access and utilization of information and communication technology (ICT) in extension service delivery in South East Nigeria. *Journal of Agricultural Extension and Rural Development*, 5(11): 266-276.
- [6] Ezhar, T., Rahim, M.S., Zainal, A.M., Amin, M.A. Mohammed, R.H. and Zamre, Y. (2008). 'Are Malay Small-scale Agro-Entrepreneurs Ready to Face Future Challenges? An analysis of Attitudes towards work values'. *Pertanika Journal of Social Science and Humanities*, 16(00): 31-44.
- [7] Federal Government of Nigeria (FGN) and Food and Agriculture Organisation of the United Nations (FAO) (2004). *Farm Radio Network, Project Document*, Federal Ministry for Agriculture and Rural Development, Abuja, 31pp.
- [8] Hellersten, J. (2008). *Training workshop on ICT for Rural Development: Access and Applications*. <http://www.worldbank.org/XL89032600>.
- [9] Henri-Ukoha, A. C. Chikezie, Osuji, M.N. and Ukoha, I. I. (2012). Rate of Information Communication Technology (ICT) Use: Its Determinants among Livestock Farmers in Ukwu West LGA, Abia State of Nigeria. *International Journal of Agricultural and Food Science*, 2(2): 51-54.
- [10] Hill, R., Davies, P.B. and Williams, M.D. (2008). Older people and internet engagement: Acknowledging social moderators of internet adoption, access and use. *Info.Tech. People*, 21(3): 244-255.
- [11] Kenny C. (2001). *Information and Communication Technologies and Poverty: Technologies July/August*, 2001.
- [12] Mamman, A.B., (2000). *Nigeria: A People United, A future Assured* (Sokoto State) Gabumo Publishing Co. Ltd., Lagos, Nigeria pp: 298.
- [13] National Population Commission (NPC), (2006). *Official Population of Report of Southeast Nigeria*.
- [14] Nkwocha, V.I., Ibeabuchi, I.I., Chukwueke, T.C., Azubuike, N.O. and Nkwocha, G.A. (2009). *Overview of the impact of ICT on agricultural development in Imo State, Nigeria*. Proceedings, ASN. Op. Cit. Pp. 711-714.
- [15] Omotayo, O.M. (2005). *ICT and Agricultural Extension: Issues in transferring agricultural technology in developing countries*. Proceedings of 3rd annual conference of AESON Ilorin, pp. 132-135.
- [16] Pierson, J. (2006). *Studies on Media, Information and Telecommunication (SMIT)*. University of Vrejj, Brussels Belgium Report of CTA's 6th Consultative Expert Meeting of its observatory on ICTs CTA, Netherlands.
- [17] Punch Newspaper, December 28, (2012). *Growth Enhancement Support Scheme saved Agric Sector*. <http://www.punchng.com/business/industry/growth-enhancement-support-scheme-saved-agric-sector-adesina/>
- [19] Shah, P. (2009). *Operationalizing ICT in the rural space*. Available at: <http://web/worldbank.org>.
- [20] Technical Centre for Agriculture (CTA) Spore (2004). *Information and Communication Technology: Information for agricultural Development in ACP Countries*. *CTA Spore Magazine*, 100: 4-5.
- [21] Wolcott, P., Kamal, M. and Qureshi, S. (2008). Meeting the challenges of ICT adoption by micro-enterprises. *J. Enter. Info. Management*, 21(6):620-628.

Table 2: The Result of Multiple Regression Analysis on the Influence of Socio-Economic Characteristics of Farmers on Their Level of Access of ICT Facilities in the Study Area

Variables Code	Variables Name	Regression Coefficients	Standard Error	T – Value
Bo	Constant	0.007	0.016	0.443'NS



X ₁	Age (Yrs)	-0.001	0	-2.598**
X ₂	Gender (dummy)	-0.03	0.005	-5.808**
X ₃	Educational Attainment	0.001	0.001	0.531'NS
X ₄	Family size (Number)	0.002	0.001	2.253**
X ₅	Income level (Naira)	4.39E-08	0	13.308**
X ₆	Cooperative society membership	0.023	0.005	4.903**
X ₇	Farming Experience	0.002	0	5.925**
X ₈	Distance from place of ICTs	0.019	0.003	6.454**
R		0.788 or 78.8%		
R ²		0.621 or 62.1%		
Adj R ²		0.608 or 60.8%		
Std Error		0.0321985		
F – ratio		47.354		
DW		1.819		

Source: Data Analysis, 2012

** indicate significance at 5% level

Table 3: The Result of Multiple Regression Analysis on the Influence of Socio-Economic Characteristics of Farmers on Their Level of Utilization of ICT Facilities In The Study Area

Variables Code	Variables Name	Regression Coefficients	Standard Error	T – Value
Bo	Constant	0.27	0.316	-7.189**
X ₁	Age (Yrs)	0.018	0.006	-2.829**
X ₂	Gender (dummy)	0.029	0.223	3.476**
X ₃	Educational Attainment	0.007	0.006	1.143**
X ₄	Family size (Number)	0.589	0.038	15.378**
X ₅	Income level (Naira)	0.006	0	-2.872**
X ₆	Cooperative society membership	0.006	0	-2.872**
X ₇	Farming Experience	0.117	0.093	-1.258'NS
X ₈	Presence of associated ICT infrastructure e.g. electricity	0.057	0.025	1.263**
Multiple R		0.834 or 83.4%		
R ²		0.796 or 79.6%		
Adj R ²		0.787 or 78.7%		
Std Error		0.5422		
F – ratio		75.96		
DW		1.448		

Source: Data Analysis, 2012

** indicate significance at 5% level.

Table 4: Varimax Rotated Factor Matrix on Constraints to Access and Utilization of ICTs by Farmers

Variable code	Variables name	Factor I	Factor II	Factor III
		Infrastructure	Technical	Socio-economic
VO ₁	Inadequate/lack of power supply	0.625	0.118	-0.027
VO ₂	Inadequate/scarcity of ICTs supply	0.451	-0.106	-0.662
VO ₃	Lack of technical know-how	-0.324	0.725	-0.326
VO ₄	High cost of modern ICTs	0.101	-0.054	-0.497
VO ₅	Problem of connectivity	0.286	0.415	-0.605
VO ₆	Drop in calls	0.101	0.303	-0.017
VO ₇	Low level of literacy	-0.276	0.287	0.55
VO ₈	Poor/lack of network coverage	0.52	0.347	0.209
VO ₉	Poor electricity power supply	0.781	0.13	-0.238
VO ₁₀	Gender discrimination	0.058	-0.026	0.253
VO ₁₁	Lack of associate tech.	0.812	0.261	-0.107
VO ₁₂	Poor access to credit	0.936	-0.026	0.007
VO ₁₃	Lack of awareness	0.136	0.143	0.063
VO ₁₄	Maintenance problems	0.081	0.961	-0.107
VO ₁₅	High taxes	0.936	-0.026	0.907

Source: Data Analysis, 2012.

AUTHOR'S PROFILE

Dr. A.N Ezeh is a Lecturer, Department of Agricultural Economics Management & Extension, Ebonyi State University, Abakaliki. She obtained her Ph.D in Agricultural Extension Administration from Ebonyi State University, Abakaliki in 2014.



Anayochukwu V. Eze is currently an M.Sc student in the Department of Agribusiness and Management, Michael Okpara University of Agriculture, Umudike Abia State, Nigeria. His area of research interests are: Agricultural policy development, agricultural project development and management, and rural development.

Dr. Aleke Bartholomew is a Lecturer, department of Agricultural Economics, Management and Extension, Ebonyi State University, Abakaliki. He obtained his Ph.D in Business Information Technology from Northumbria University, Newcastle, UK in 2010.