

# Constraints to Effective Use of Information Communication Technologies (ICTs) among Small-scale Farmers in Anambra State, Nigeria

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The study was carried out in Anambra State, Nigeria. Questionnaire was used to collect data from a sample of one hundred and eight (108) small-scale farmers. Percentage, mean score, standard deviation and factor analysis were used for data analysis. The duration of the study was June 2009 and March, 2010. Results of the study indicated that the major constraints to effective use of ICTs by small-scale farmers were cost of mobile phones, computer, television, etc (M= 2.67); no electricity to charge phones (M= 2.65); poor network coverage for mobile phones, television and Internet services (M= 2.51); inability to pay service charge for Internet services (M= 2.36); high cost of air-time for mobile phones (M= 2.36); non-durability of electronic devices (M= 2.33), among others. The study recommends that efforts are highly needed by the government to invest in rural ICT infrastructure, training and development; this will necessitate effective use of ICTs by the end users. [E. N. Ajani. Mohammed et al. Constraints to Effective Use of Information Communication Technologies (ICTs) among Small-scale Farmers in Anambra State, Nigeria. International Journal of Agricultural Science, Research and Technology, 2012; 2(3):117-122].

**Key words:** Information Communication Technology, Small-scale farmers, Agricultural information, Anambra State, Nigeria.



Abstract

Received: 13 November 2012,  
Reviewed: 7 December 2012,  
Revised: 15 December 2012,  
Accepted: 22 February 2013

## 1. Introduction

Information Communication Technology (ICT) refers to all information and communication systems and technologies inclusive not only of digital formats such as the internet or the World Wide Web but also interfaces with radio, cable and television, video, cellular phones, and others (Hazelman and Flor, 2004). According to Uguru (2001), Information Communication Technologies are sets of technologies that facilitate communication, processing, storage, retrieval and transmission of information by electronic means. It is the acquisition, production, transformation, storage and transfer of data or information electronically in forms such as vocal, pictorial, textual and numeric so as to facilitate interactions between people and machines.

FAO (2003) noted that knowledge and information can greatly impact on agricultural production and food security. Improved communication systems can help rural communities to have access to relevant and timely information on agricultural and rural development issues. The dramatic expansion of various forms of electronic interchange, including electronic mail and Internet gave rise to unprecedented opportunities for knowledge and information sharing and dissemination among development agents, policy

makers and the beneficiaries. ICTs can be effective means of providing development workers with huge amount of relevant information on markets, technology prices, successful experiences, credit facilities, government services and policies, weather, crop, livestock and natural resources protection.

LEISA (2001) reported that rural communication and information management play an important role in spreading information on successful farmer innovations and in getting access to new knowledge. Participatory development programmes increasingly use rural radio, television and other mass communication media as tools for farmer-to-farmer exchange. In some places, farmers use mobile phones to get information on market prices. The use of Internet and CD-ROMs by development workers, researchers and farmers for networking and information exchange is gradually increasing as communication facilities improve. Yet in many rural communities, traditional methods of communication continue to have a significant impact on the spread of information.

However, in order to have a significant impact on development programmes, ICT services must be readily accessible and meaningful to broad segments of rural populations especially small-scale farmers and the information they carry must be

adapted and disseminated in formats and languages that they can comprehend. They must also serve people's needs for entertainment, cultural enlightenment and human needs (FAO, 2003).

Small-scale farmers face barriers to growth from poor or inadequate information regarding the wider market environment (pricing, demand, trends) and with poor communications between suppliers and markets (Grimard, 1998). Research suggests that strengthening local capacities is crucial for enabling small-scale farmers to carry out necessary administration and business forecasting and to be able to act upon the new information delivered over ICTs. In Botswana, China and Ghana, telephone services were found to be the most popular initial investment for businesses (Duncombe, 1999). Small-scale farmers' demand for basic telecommunication services (telephone and fax) is growing but awareness of and demand for higher services such as e-mail and Internet are low (Barton and Bear, 1999). In many countries, the prohibitively high cost of internet subscriptions, long distance calls and the paucity of relevant business content mean that in the short term, the benefits of information delivery systems and networks will not be exploited by small-scale farmers.

Unfortunately, small-scale farmers seldom have access to computers or sufficient telecommunication infrastructure, and lack of computer literacy may prevent full access to electronic text (Morrow, 2002). Snyman (2002) described the South African government's struggle to improve information quality and availability in rural areas through Multi-Purpose Community Centers (MPCC) and ascribed failures to poor management of MPCCs by inadequately trained managers, lack of Information Technology (IT) skills and technical problems. Although illiteracy has been cited as a major barrier to the use of ICTs, they have been found to be useful tools in promoting sustainable agriculture and facilitating networking (Carter, 1999; Mbozi, 2002). Harkin (2007) observed that too often ICTs were designed by information specialists without regard to the skills, aptitudes or educational background of the end user. When it comes to reaching small-scale farmers, the challenges of access and literacy remain substantial.

Over the years, ineffective efforts have been made by donors and African countries to bring about agricultural development without much to show for it. Much of the failure can be attributed to the adapted transformation approach to agriculture, which is characterized by the information of a wide variety of large scale farming and processing technology. It is however gratifying to note that there is now a shift in emphasis from the large scale

transformation approach to the small-scale improvement strategy approach which is attributed to African age-long practice. The failure can also be attributed to the treatment of information delivery as a matter of course by most African governments. Agricultural Information Communication Technology is not integrated with other development programmes to address the numerous related problems that face farmers. ICT is an essential ingredient in agricultural development programmes but small-scale farmers in Nigeria seldom feel the impact either because they have no access to such or because it is poorly disseminated. Most of the ICTs provided are exclusively focused on policy makers, researchers and those who manage policy decisions with less attention paid to the information needs of the targeted beneficiaries / farmers (Ozowa, 2000). Even though small-scale farmers' accessibility to agricultural Information Communication Technologies is often limited by unfavorable economic, socio-cultural and institutional conditions, they have achieved some level of efficiency through deployment of their indigenous knowledge, although sustainability remains a key problem. The question therefore is: What are the possible factors militating against effective use of ICTs by the small-scale farmers? And what are the possible ways of alleviating the problems faced by small-scale farmers on the use of ICTs?

The study therefore aims to:

- i. ascertain the socio-economic characteristics of the small-scale farmers;
- ii. identify constraints limiting effective use of ICTs by small-scale farmers; and
- iii. ascertain possible ways of alleviating problems faced by small-scale farmers on the use of ICTs.

## 2. Materials and methods

The study was carried out in Anambra State, Nigeria. The state is made up of four agricultural zones, namely; Aguata, Anambra, Awka and Onitsha. Three zones namely: Aguata, Anambra and Awka were purposively selected for the study. Aguata zone is made up of six extension blocks, comprising forty-five circles while Anambra zone comprises of four extension blocks and forty-five circles. Also in Awka zone, there are five extension blocks, comprising thirty-five circles. Two blocks and four circles were selected from each of the zones using a simple random sampling. In each of the circles selected, nine small-scale farmers were selected randomly for the study. Generally, the study comprised six extension blocks and twelve circles, giving a total of one hundred and eight respondents for the study. The

questionnaire used for data collection was divided into three sections based on the objectives.

The first section sought information on socio-economic characteristics of the small-scale farmers. Respondents were asked to indicate their level of education, years of farming experience, size of land holding (number of hectares) and type of farming (crop, livestock or mixed farming). Section two considered constraints that limiting effective use of ICTs by small-scale farmers. The respondents reacted to seventeen possible constraint variables, such as cost of mobile phones, computer, television; inability to pay service charge for Internet services; lack of knowledge of computer, e-mail and Internet usage; no electricity to charge phones; high cost of air-time for mobile phones; fear of use of computers; poor network coverage for mobile phones, television and Internet services, among others using a three-point Likert-type scale of “very serious (2)”, “serious (1)” and “not serious (0)”. The mean value of 1.0 was used to determine the constraints. The third section addressed possible solutions to the problems faced by the respondents in the use of ICTs. Respondents were asked to rate their perception of ten possible solutions, using a four-point Likert-type scale of “strongly agree” (3), “agree” (2), “disagree” (1), and “strongly disagree” (0). The mean value of 1.5 was used to determine the possible solutions as perceived by the farmers. Data were analyzed using percentage, mean score, standard deviation and factor analysis.

### 3. Results and discussion

#### 3.1. Socio-economic characteristics of the small-scale farmers

Table 1 show that 20.4% of the respondents were within the age range of 20–29 years while about 19% were within the age of 30–39 years. Similarly, 20.4% were within the age range of 40–49 years while about 20% and 19.4% were within the ages of 50–59 years and more than 60 years respectively. This shows that different categories of people were involved in small-scale farming. Both young and aged still produce at the subsistence level in order to feed members of their families.

Data in Table 1 show that 50.9% of the respondents were males, while 49.1% were females. This implies that both men and women in the rural areas were involved in small-scale food production.

Majority (80.6%) of the small-scale farmers were married, while 19.4% were single. ICTs such as radio, television, computer etc can be made available by husbands, wives or children of married small-scale farmers, thus ensuring easy access to agricultural information.

Table 1 also show that greater proportion (36.1%) of the respondents had secondary school

education while 13.9% had no formal education. About 28% and 21.3% attended primary school and tertiary institution, respectively. This implies that greater percentage of the respondents had formal education; this will help them to know how to make use of ICTs and appreciate their importance in their farming activities. Education according to Adesina and Baidu-Forson (1997) has been identified as a major factor of adoption and technological absorption.

Greater proportion (29.6%) of the respondents had 1–10 years of farming experience while 27.8% have been into agricultural activities for the past 11 to 20 years (figure 5). About 21% had 21–30 years of farming experience while 15.7% and 5.6% had 31–40 years and more than 41 years of farming experience respectively. The findings of this study show that most of the respondents have been into agricultural production for a long period of time. The long period of farming experience and the use of ICTs will help the small-scale farmers to achieve greater productivity as well as sustaining agriculture.

Entries in Table 1 show that majority (37.0%) of the small-scale farmers had a farm size of 1 – 2 ha, while about 35% had 3 – 4 ha of farmland. Also, 24.1% had less than one hectare of farmland while only 3.7% had 5 – 6 ha. This implies that the respondents still farm at a subsistence level due to inadequate farmland, even though most of them indicated that they had large expanse of land far away from their homes and this has made them to resort to cultivating small portions that were nearer to their homes.

Results in Table 1 also reveal that most (62.0%) of the respondents were involved in both crop and livestock production while 34.3% produce crops only. About 3% of the respondents were keeping livestock only. The ability of the respondents to be involved in mixed farming will make them to be economically stronger and be able to afford ICTs that will help them in their agricultural production.

#### 3.2. Factors limiting effective use of ICTs by small-scale farmers

Table 2 shows the constraints to effective use of ICTs by small-scale farmers. Based on the item loadings, factors 1, 2 and 3 were named capability, infrastructural and logistic problems respectively. These factors represent the major constraints to effective use of ICTs by small-scale farmers.

Factors which loaded under capability problems were cost of mobile phone, computer, television, etc (0.59), high cost of air-time for mobile phones (0.73) and inability to pay service charge for use of electricity for computer, television, Internet (0.62).

Table 1. Percentage distribution of the respondents according to their socio- economic Characteristics

Characteristics	Frequency	Percentage (n = 108)
<b>Age (years)</b>		
20 – 29	22	20.4
30 – 39	21	19.4
40 – 49	22	20.4
50 – 59	22	20.4
60 and above	21	19.4
<b>Sex</b>		
Male	55	50.9
Female	53	49.1
<b>Marital status</b>		
Single	21	19.4
Married	87	80.6
<b>Educational qualification</b>		
No formal education	15	13.9
Primary school	31	28.7
Secondary school	39	36.1
Tertiary institution (NCE, Polytechnic, University)	23	21.3
<b>Years of farming experience (years)</b>		
1 – 10	32	29.6
11 – 20	30	27.8
21 – 30	23	21.3
31 – 40	17	15.7
41 and above	6	5.6
<b>Size of land holding (ha)</b>		
< 1	26	24.1
1 – 2	40	37.0
3 – 4	38	35.2
5 – 6	4	3.7
<b>Type of farming</b>		
Crop production ( maize, yam, cassava, vegetable etc)	37	34.3
Livestock production( cattle, sheep, goat, poultry etc)	4	3.7
Mixed farming ( crop and livestock production )	67	62.2

The cost of ICTs and maintenance charges are usually high and may not be affordable by the small-scale farmers thus limiting their use of such ICTs thereby depriving them access to agricultural information provided through such ICTs.

Infrastructural problems comprised no electricity to charge phones (0.58), unavailability of business centers for Internet services (-0.70), no access to computer, e-mail and Internet (0.64), inability to open diskettes used for storing

information (0.75), information on computer are usually too tiny to read (0.68), information on video tapes cannot be stored for a long time (0.66) and non-durability of electronic devices (0.52). Irregular supply of electricity will discourage service providers from establishing business centers in the rural areas where small-scale farmers can easily obtain agricultural information that will boost their productivity.

The loadings under logistic problems include: lack of knowledge of computer, e-mail and internet usage (0.52), distance to business centers for e-mail and internet services (-0.71), fear of computer (0.52), no time to use computer (0.49), poor network coverage for mobile phones, television and internet services (0.51) and not literate to read information on computer, Internet, etc. (0.60). The three factors which were loaded based on the constraint factors confirmed a study carried out by Morrow (2002) which stated that small-scale farmers seldom have access to computers, sufficient telecommunication infrastructure and are not computer literate to interpret electronic text.

Entries in Table 3 show the mean scores of possible solutions to the problems faced by small-scale farmers on the use of ICTs. The major solutions indicated by the respondents include: adequate training on the use of computer, e-mail and Internet ( $M= 3.75$ ), regular supply of electricity for charging phones and use of computers ( $M= 3.69$ ), adequate connectivity of Internet services to rural communities ( $M= 3.68$ ), increased recognition of the government to provide electricity in rural areas to attract service providers ( $M= 3.63$ ), and delivery of agricultural information through appropriate communication channels such as radio, television, etc ( $M= 3.64$ ). Other possible ways include: provision of up to date information on weather; improved varieties of crops, prices of crops and livestock, pest and disease outbreak through ICTs ( $M= 3.64$ ), improved network coverage for mobile phones, Internet and television ( $M= 3.60$ ), low prices of mobile phones, computer, television ( $M= 3.59$ ), among others.

The findings of this study indicate that the possible solutions if considered will go a long way to help the small-scale farmers use ICTs effectively. It will ensure effective communication of agricultural research findings from extension agents to the farmers. FAO (2003) reported that farmers can improve agricultural productivity and ensure food security when up to date information are provided using appropriate languages and formats and delivered through proper communication channels.

Table 2. Constraints limiting effective use of ICTs by small-scale farmers

Constraints	Factor 1 (Capability problem)	Factor 2 (Infrastructural problem)	Factor 3 (Logistic problem)
Cost of mobile phones, computer, television	-0.02	-0.02	0.59
Inability to pay service charge for Internet services	0.30	-0.03	0.34
Lack of knowledge of computer, e-mail and Internet usage	0.22	0.52	-0.03
No electricity to charge phone	-0.02	0.25	0.58
High cost of air-time for mobile phones	-0.02	-0.02	0.73
Distance to business centers for e-mail and Internet services	0.32	-0.71	-0.02
Unavailability of business centers for Internet services	0.37	-0.70	-0.02
Fear of use of computers	0.52	-0.02	0.27
No time to use computer, Internet, etc.	0.49	0.21	-0.02
Poor network coverage for mobile phones, television and Internet services	-0.02	-0.10	0.51
Not literate to read information on computer, etc.	0.60	0.19	0.23
Inability to pay service charge for use of electricity for computer, television, Internet etc.	-0.02	0.11	0.62
No access to computer, Internet, etc.	0.64	-0.31	-0.02
Inability to open diskettes used for storing information on computer	0.75	-0.02	-0.11
Information on computer are usually too tiny to read	0.69	-0.02	-0.03
Information on video tapes cannot be stored for a long time	0.37	0.66	0.11
Non-durability of electronic devices	-0.02	0.52	-0.02

Extraction method: Principal component analysis, Rotation method: Varimax with Kaiser Normalization

Table 3. Mean scores of possible ways of alleviating problems faced by small-scale farmers on the use of ICTs

Possible solutions	Mean	Standard deviation
Providing adequate training in the use of computer, e-mail and Internet	3.75	0.643
Cheaper service charge for Internet services	3.49	0.743
Reducing prices of mobile phones, computers and television	3.59	0.737
Regular supply of electricity for charging phones and use of computers	3.69	0.662
Cheaper air-time for mobile phones	3.44	0.714
Nearness of business centers for e-mail and Internet services	3.09	0.768
Improving network coverage for mobile phones, Internet and television	3.60	0.669
Adequate connectivity of Internet services in rural communities	3.68	0.667
Increased recognition by the government to provide electricity in rural areas to attract service providers	3.63	0.781
Providing quality agricultural information on radio, television and Internet	3.33	0.710

#### 4. Conclusion and Recommendations

The urgent need to improve ICTs access and usage for small-scale farmers in Anambra State, Nigeria for exchange of agricultural information and knowledge sharing has important. Absence of that will continue to widening the digital divides thereby excluding significant numbers of the small-scale farmers from the opportunities it offers. Specifically, failure to take advantage of these tremendous resources will put the farmers at a disadvantage with their better informed, connected and educated counterparts in other countries. The study revealed

several constraints limiting effective use of ICTs among small-scale farmers. The constraints are substantial and challenging. Therefore, greater efforts are needed by the Government to invest in rural ICT infrastructure, training and development. Service providers and donor agencies support initiatives remain paramount.

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