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AN ASSESSMENT OF FARMERS' USE OF NEW INFORMATION AND COMMUNICATION TECHNOLOGIES AS SOURCES OF AGRICULTURAL INFORMATION IN USHONGO LOCAL GOVERNMENT AREA, BENUE STATE, NIGERIA

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ABSTRACT

The study aims at assessing the use of new information and communication technologies in agricultural extension service delivery in Ushongo Local Government Area (LGA) of Benue State. One hundred and thirty three farmer respondents (seven farmers per ward) were sampled for an interview using the simple random sampling technique. The results showed that only few of the respondents used Video and Global System for Global Communication (GSM) and none used internet in acquiring improved agricultural technologies. The chi-square analysis was used to determine the relationship between socio-economic characteristics of farmers and use of new ICTs. The results showed that sex, educational level, income, and farm size have significant relationship with use of the mobile telephone and internet. In addition, marital status has significant relationship with use of video. Farmers should therefore, be mobilized into forming cooperative organizations to enhance establishment of telecenters and opportunities for training in application and maintenance of Video, GSM, and internet facilities in order to obtain agricultural information. Also, the services and cost of ICTs should be subsidized so that rural farmers can afford them.

Keywords: ICT; Agricultural information; Farmers; Extension

INTRODUCTION

Communication makes technical know-how accessible to increase knowledge about the production, transformation, organization, and marketing dimensions of agriculture. Improved agricultural technologies have been disseminated to rural farmers using different communication channels. These include printed publications (newsletters, books, journals, leaflets, photo graphs, sketches, and posters), participatory resources (games, puzzles, theatre), interpersonal exchanges (meetings, seminars, conferences, and interviews), traditional broadcast media (television, radio, video) and new technologies such as internet, websites, on-line discussion groups, web logs, e-mails, data bases, mobile phones, or web cams (McBean, 2005).

The term, Information and Communication Technologies (ICTs) can be broadly interpreted as technologies that facilitate communication and the processing and transmission of information by electronic means. This definition encompasses the full range of ICTs from radio, and television to telephones (fixed and mobile), computers and the internet Technical Centre for Agricultural and Rural Cooperation (CTA, 2003). New ICTs are becoming more accessible and users can obtain information from various sources, and one computer could meet the need of a large rural community. They offer current and better-

focused access to information in a short time. Electronic mails (e-mails), internet, radio, and mobile phones are the most commonly used new information and communication technologies and have caused a cultural revolution in the way individuals and organizations interact, in terms of cost, time and distance. Another significant use of new ICTs is the World Wide Web, (www), which enables people to access information on millions of other computers (Munyua, 2000).

Conventional communication channels have been used successfully but these have been monologic and have not allowed for much interaction with users. Radio for example has been very effective for disseminating improved agricultural technologies to farmers, but broadcasting times are sometimes not appropriate for most people. Using new ICTs, radio could be linked to the internet, and a few initiatives have been started on this concept such as the project Internet Radio in Sri Lanka (*Internet Radio in Sri Lanka*).This enables users to access programs on the web at convenient times and send feedback through e-mail or chat. Broadcasters could disseminate the latest information promptly. So many internet and web-based systems or projects have been set up, managed and funded by international research centers, to help farmers by disseminating improved agricultural technologies to them. These information and technology services gotten from the use of new ICTs facilitate decision-making by rural farmers.

For instance, the International Fund for Agricultural Development (IFAD) is supporting an internet based system in Latin America and the Caribbean-FIDAMERICA-that has the objectives of strengthening and improving their quality of life. The system has used ICTs to assist the rural communities' access to agricultural markets, technological information, and to improve access to financial systems. It offers facilities for knowledge and information exchange through electronic conferencing, e-mails, databases, and websites. FIDAMERICA, now in its second phase, has 41 projects and programs in the region and involves about 3,600 community organizations and 500,000 families (*Fighting rural poverty*).

Rural dwellers that, by their very nature, are the most remote from modern technology and have made sure they are not left behind. In Niger, the village of Bankilare, in the extreme west of the country, has neither running water nor electricity, yet it can communicate with the entire outside world. The pilot radio station installed there by the Rural Radio and Information Center for Development Program (RURANET/CID) downloads documents via the Afristar Satellite. These are received by a digital receiver hooked up to a personal computer and powered by solar energy. On their wind-up radios, the nomadic herders and farmers of the region are able to listen to advice and news, translated into their own language by local radio presenters-information which opens a window onto the outside world. The Pacific Health Information Service (PAHIS) provides a database offering information about livestock disease and veterinary infrastructure with the help of ICTs. Also, with the advent of e-commerce, producers export without intermediaries therefore obtain better prices (*Information and Communication Technologies: Poor but plugged in,* 2004)

Meera, Jhamtani, and Rao (2004) identified some of the numerous areas where ICT can play an important role to include broad based agricultural extension activities; farming system, research and extension; location-specific modules of research and extension; market extension; sustainable agricultural development; participatory research, etc.

The Farmers' Information and Technology Services (FITS-Techno-Pinoy) a web-based information service initiative in the Philippines, contributes to the employment of farmers, processors, entrepreneurs and traders and provides information and technology services that facilitate decision-making by rural communities. This leads to improved production, processing, trading, and marketing (Maningas, Perez, Macaraig, Alesna, & Villagonzalo, 2000)

According to Richardson, Ramirez, and Haq (2000) and Bayes, von Braun, and Akhter, (1999), ICT has a very positive economic impact in rural areas, creating a substantial consumer surplus, and immeasurable quantity of life enhancements. For instance, the village phone in Bangladesh obviated the need for rural farmers to make a trip to the city to find out the market price of produce, reducing costs, and helping farmers keep in touch with their relatives in the cities.

Meera, Jhamtani, and Rao (2004) noted that ICT makes people living in the villages think and do things differently. For instance, many villagers in Bangladesh were able to start maintaining livestock and poultry stock as it now becomes possible to contact experts if there was ever an outbreak of poultry or livestock disease.

According to Singhal, Svenkerud, Malaviga, Rogers, and Krishna, (2005), by using ICTs, farmers can also learn the current price of the poultry products, achieving higher returns and sales. The supply of agricultural inputs like diesel and fertilizer become more stable in the villages and dealers could monitor and guard against any unforeseen contingencies.

Arokoyo (2005) enumerated the following as important potentials applications of ICTs in agricultural extension:

- capacity to reach a large target audience e.g. with the use of Radio, TV, and internet;
- can be used to make the extension systems and structures more efficient through better management of information and scarce resources e.g. with the use of data bases for managing information software (MIS) and Networking software;
- ICTs may be used effectively for not only normal weather forecast but also a warning system for disease/pest outbreaks and other disasters before they occur
- For the provision of timely and sensitive market information e.g. with the use of Radio, TV, and SMS;
- ICTs are important for networking among and between the key stakeholders in Research-Extension-Farmers-Inputs-Linkage System (REFILS) e.g. the use of telephone, video, conferencing, network software, SMS;
- ICTs can also be effectively used for community mobilization learning and action e.g. with the use of Radio, TV, public Address systems, and the web.

According to Munyua (2000) and Asian Development Bank (ADB) (2003), ICT therefore is thought to achieve information transfer more effectively than other communication methods in extension and has played a major role in diffusing information to rural communities, and show great unexpected potential. The potential applications of ICTs in extension are almost limitless and should be adopted in agricultural extension service delivery. This innovative technology has the potential

of transforming communications in the rural areas in Nigeria and offer new options for communications management in diverse fields of endeavor.

A strong connection between Research – Extension – Farmer – Input Linkage System (REFILS) complemented by flawless new information and communication technology use have served as a very good media through which rural farmers acquire improved agricultural technologies and are typically site specific, depending on climate, soil condition, cropping style, market requirement, etc.

In developing countries, Extension Service and other service providers and their clients are experimenting with new digital facilities that can be effectively used to process and communicate agricultural information. This to ensure more effective dissemination of research results to farmers (Arokoyo, 2005).

Ushongo Local Government of Benue State, though blessed with fertile land and other natural resources, has relatively low agricultural production. Farmers rely mainly on their traditional techniques, skills, knowledge, and practices. The much expected increased agricultural production is yet to be attained, despite a lot of improved agricultural technologies being turned out from our research institutes and universities. It is against this background that the researchers wish to assess the use of new information and communication technologies in agricultural extension services delivery in Ushongo Local Government Area of Benue State.

Objectives of the Study

The broad objective of this study is to assess the use of new ICTs by farmers to obtain agricultural information in Ushongo Local Government Area of Benue State. The specific objectives of the study are to: examine the socio-economic characteristics of farmers; assess the level of awareness of farmers about new information and communication technologies; determine farmers level of use of new information and communication technologies; identify factors affecting the use of new ICTs by farmers; determine the relationship between farmers' socio-economic characteristics and use of new ICTs in accessing agricultural information.

Hypothesis

The following hypothesis was stated for the study: There is no significant relationship between farmers' age, marital status, educational level, family size, income, farm size, membership of social group, and use of new ICTs.

Significance of Study

Farmers acquire improved agricultural technologies from researchers through different communication channels in order to improve their agricultural practices. In our modern age of information explosion, farmers need to use channels which offer timely and comprehensive dissemination of the ever dynamic technologies to achieve profitable agriculture. Following the great potentials of new ICTs in agricultural extension service delivery, an assessment of its use in agricultural extension service delivery in Ushongo Local Government Area of Benue State is worthwhile. It is hoped that the findings of this study

shall serve as guides to farmers, extension organization, researchers, and policy makers in use of ICT when it comes to agricultural development.

METHODOLOGY

The study was carried out in Ushongo Local Government Area of Benue State. The Local Government was created in May 1989 and derives its name from Ushongo hills. It is located north east of Benue State and predominantly inhabited by the Tiv speaking tribe

Ushongo Local Government Area is bounded to the north by Gboko and Buruku local government areas, to the south by Vandeikya local government area, to the east by Kwande LGA, and to the west by Konshisha LGA. The local government area has a total population of 188,341 people with a population density of about 456 people per square meter (National Population Commission, 2006). The vegetation in Ushongo LGA is mainly Savanna wood land, with grasses as the predominant vegetation cover. Agriculture is the mainstay of the people's economy. Agricultural products produced in commercial quantities in the area include fruits, grains, and tuber crops.

Ushongo Local Government Area has 19 council wards namely: Mbaagwa, Mbayem, Mbatoo, Mbaayam, Mbaswa, Mbatian, Mbagwaza, Mbajoho, Mbayav, Maav, Lessel Township, Mbakyobo, Mbaabunde, Mbaawe, Nyiarkyaa/Mbabion, Tyerev-ya/Tyerev-tiev, Utange, Daav, Ugee/Mbazune.

A total of 133 farmers, (7 each from the 19 council wards) from the study area were selected using simple random sampling procedure. The respondents were given identification numbers based on their council wards.

RESULTS AND DISCUSSIO

Socio-Economic Characteristics of the Respondents

An analysis of the respondents' socio-economic characteristics was carried out and the summary of the result is contained in Table 1. Majority of the respondents were males and of active farming age of 21 to 40 years. This result, to a large extent, agreed with that of Daudu, Igbashal, and Ejigonoja (2005) which gave the age range of 36 – 45 years as the most prevalent among farmers in Benue State.

The marital status distribution shows that majority of the respondents were married. The results also showed that majority of the respondents had between 6 and 15 persons per household. This showed that a high percentage of farmers had many hands to help them on their farms, which was in line with the finding of Daudu *et al.* (2005) that family members constitute a strong labor force.

Distribution of respondents according to level of education showed that most of the respondents had some formal education, ranging from primary education to higher education. This showed that most of the respondents (farmers) were literate enough to use ICTs. Income distribution of respondents showed that the farmers generally were of low income group who might not be in position to readily afford or access new ICT facilities. The farm size distribution showed that the respondents were

mostly small and medium scale farmers. Cooperative Society membership distribution of the respondents shows hat majority of the farmers sampled did not belong to cooperative societies.

Table 1: Socio-Economic Characteristics of Respondents (Farmers)

Variable	Frequency (F)	Percentage (%)
Age		
≤ 20	7	5.3
21 – 30	33	24.8
31 – 40	41	30.8
41 – 50	34	25.6
51≥	18	13.5
Sex		
Male	103	77.4
Female	30	22.6
Marital Status		
Single	29	21.8
Married	89	66.9
Widowed	8	6.0
Widower	3	2.3
Divorced	4	3.0
Family size		
1 – 5	27	20.3
6 – 10	53	39.9
11 – 15	26	19.5
16 – 20	9	6.8
21≥	18	13.5
Level of education		
No formal education	22	16.5
Primary education	23	17.3
Secondary education	61	45.9
Tertiary education	27	20.3
Income distribution of farmers		
10,000 – 50,000	19	14.3
50,001 – 100,000	33	24.8
100,001 – 150,000	21	15.8
150,001 – 200,000	16	12.8
200,0001 – 250,000	8	6.0
250,001 – 300,000	11	8.3
300,001≥	23	18.8
Farm size (Ha)		
1 – 4	82	61.7
5 – 8	33	24.0
9 – 12	12	9.0
13≥	7	5.3
Cooperative society membership		
Yes	48	36.1
No	85	63.9

Source: Field Survey, 2006.

New ICTs Usage in Extension Service Delivery

Awareness of Use of New ICTs in Extension Service Delivery

Table 2 shows farmer's awareness of use of ICTs in extension service delivery. The results show that only very few of the respondents were aware of the use of Video and telephone while none was aware of the use of the internet in extension service delivery.

Table 2 Distribution of Respondents on Awareness of Use of New ICTs in Extension Service

ICT Tool	**Frequency**	**Percentage**
Video	53	39.8
Telephone	48	36.1
Internet	39	29.3

Source: Field survey, 2006

ICTs Used by Farmers in Ushongo LGA

Table 3 shows distribution of ICTs used by farmers in the study area. The results show that only very few of the respondents used Video and telephone and none used internet

Table 3 Frequency Distributions of ICTs Used by Farmers

ICT Tool	**Frequency**	**Percentage (%)**
Video	16	12.0
Telephone	32	24.1
Internet	0	0

Source: Field survey, 2006.

Frequency of Use of ICTs by Farmers

Table 4 shows frequency of use of ICTs by farmers in the study area. The results showed that nearly half of the respondents rarely used video while a substantial number had never used it in obtaining information on improved agricultural technologies. A similar situation is obtainable in the case of telephone usage as well. None of the respondents had ever used the internet. The results indicated a general low usage of the new ICT by farmers in the study area.

Table 4 Frequency of Use of ICTs by Farmers

ICT Tool / Frequency	VCD/Video		Telephone		Internet	
	Freq	%	Freq	%	Freq	%
Regularly	8	6.0	9	6.8	0	0
Often	9	6.8	28	21.1	0	0
Rarely	63	47.4	53	39.8	0	0
Never	53	39.8	43	32.3	133	100.0
Total	133	100.0	133	100.0	133	100.0

Source: Field Survey, 2006.

Reasons for Non-regular Use of New ICTs by Farmers

Table 5 shows the reasons advanced by farmers for non-regular use of new ICTs as sources of agricultural information: could not afford it; erratic power supply; lack of technical know-how and non-availability of the facility. Power supply was the most prevalent problem mentioned for non-regular use of video. The most common problem indicated for non-regular use of GSM by the respondents was non-affordability. Most of the respondents (76.7%) attributed non-regular use of internet to non-availability of the facility

Table 5: Reasons for Non-regular Use of ICTs by Respondents

Reasons	VCD/Video		Telephone		Internet	
	Freq	**%**	**Freq**	**%**	**Freq**	**%**
Poor signals or reception	1	0.8	23	29.03	1	0.79
Cannot afford it	39	29.3	69	51.9	9	7.14
Erratic power supply	45	33.8	2	1.5	-	-
Lack tech know-how to use	19	14.3	3	2.3	14	11.11
Non-availability	21	15.8	14	10.5	102	80.95

Source: Field survey, 2006.

Results of Tested Hypotheses

Chi-square (x^2) was used to test the hypotheses of no significant relationships between farmers' socio-economic characteristics and their use of (i) VCD/Video (ii) GSM (iii) internet. No significant relationship was found between farmers' age, sex, family size, cooperative society membership and use of VCD/Video as sources of agricultural information. Table 6 shows the details.

Table 6: Relationship between Socio-economic Characteristics of Farmers and use of VCD/Video

Socio-economic Characteristics of farmers	X^2 Calculated	X^2 Tabulated	Df	Remark
Age	23.162	26.217	12	NS
Sex	6.275	11.345	3	NS
Marital Status	27.851	26.217	12	S
Family size	20.695	26.217	12	NS
Level of education	75.407	21.666	9	S
Income	80.571	34.805	18	S
Farm size	100.544	21.666	9	S
Cooperative society membership	3.005	11.345	3	NS

Note: NS = Not significant; S = Significant; Df = degree of freedom; Level of significance is 1%

Source: Field Survey, 2006

Farmers' marital statuses, level of education, income, and farm size were found to have significant relationships with use of VCD/Video. This is logical to some extent since rich and educated people are in better position to make use of VCD/Video. Similarly farmers with large farm sizes are richer and keener in searching for information on improved technologies.

Table 7 shows that farmers', age, marital status, family size and cooperative society membership have no significant relationship with use of telephone while sex, level of education, income and farm size have significant with use of telephone at 1% level of significance. This result implies that farmers who are educated rich and have large farm size are more favorably disposed to using telephone to obtain agricultural information.

Table 7: Relationship between Socio-economic Characteristics of farmers and use of telephone

Socio-economic Characteristics of farmers	X^2 Calculated	X^2 Tabulated	Df	Remark
Age	21.801	26.217	12	NS
Sex	13.780	11.345	3	S
Marital Status	9.680	26.217	12	NS
Family size	13.958	26.217	12	NS
Level of education	104.164	21.666	9	S
Income	74.256	34.805	18	S
Farm size	65.230	21.666	9	S
Cooperative society membership	84.875	11.345	3	NS

Note: NS = Not significant; S = Significant ;Df = degree of freedom ;Level of significance is 1%

Source: Field Survey, 2006

Farmers' sex, educational level, income and farm size were found to have significant relationship with use of internet as source of agricultural information, Table 8 gives the details. This implies that educated farmers with large farm size are more favorably disposed to use of internet in obtaining agricultural information.

Table 8: Relationship between Socio-economic Characteristics of Farmers and Use of Internet

Socio-economic Characteristics of farmers	X^2 Calculated	X^2 Tabulated	Df	Remark
Age	23.038	26.217	12	NS
Sex	0.600	11.345	3	S
Marital Status	17.704	26.217	12	NS
Family size	31.639	26.217	12	NS
Level of education	37.945	21.666	9	S
Income	32.506	34.805	18	S
Farm size	36.340	21.666	9	S
Cooperative society membership	3.706	11.345	3	NS

Note: NS = Not significant; S = Significant; Df = degree of freedom; Level of significance is 1%

Source: Field Survey, 2006

CONCLUSION AND RECOMMENDATIONS

Most of the respondents were aware of use of ICTs to acquire information about improved agricultural technologies but enumerated poor signals/reception, high cost of affording ICTs and non-availability of some ICTs facilities as reasons for their non-regular use.

The results of the study show that marital status, level of education, income and farm size are significantly related to use of VCD/Video as sources of agricultural information. Sex, level of education, income, and farm size appear to have significant relationship with use of telephone; level of education, family size and farm size are significantly related with use of internet by farmer.

Based on the findings and conclusions reached of this study, the researchers hereby make the following recommendations: Training opportunities on application, maintenance and skills development in ICTs for farmers and extension agents should be provided. Establishment and operation of telecenters, rural community-based information centers, that accommodate ICT tools like telephone, computer-based systems with internet connection, are required to enhance ICT usage by farmers in obtaining agricultural information. Increased mobilization of farmers into farmer's organizations as a strategy for agricultural development will not only enhance the use of ICTs but will also assist farmers in securing credit facilities and better bargain to establish multipurpose ICT centers from which they can source information about improved agricultural technologies.

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