ICTs as Enabler in the dissemination of agricultural technologies: A study in the East Akim District, Eastern Ghana.

E. ASIEDU-DARKO[*] & S. BEKOE

(E. A-D: CSIR-Plant Genetic Resources Research Institute, P. O. Box 7, Bunso, Ghana;

S. B.: CSIR-Institute for Scientific and Technological Information P. O. Box CT 2211, Cantonments, Accra, Ghana)

ABSTRACT

This study reports on the availability, use and information seeking behaviour of farming communities with specific reference to Information and Communication Technologies (ICTs) in Eastern Ghana. It fills a research gap by examining what people do with a medium when they have access to it, while also looking at barriers surrounding the use of ICTs arising due to differential access and capabilities. The study was conducted in the East Akim District of the Eastern Region of Ghana and sought insights into intentions and factors surrounding the use of various media by farmers. The study also threw more light on the socio-cultural context within which information seeking and use occurs in the district and tried to explain the reasons behind the use of ICT by farmers over other available sources. It was observed that accessing agriculture information by farmers through ICT's was not popular and needed to be given a boost. The farmers mostly relied on friends and relatives, and other local sources for agricultural information and this has been a drawback to the adoption of agricultural technologies. The need for pragmatic measures to bring about the use ICT by farmers in seeking agricultural information was emphasized. Also some adult education programmes would be required to help farmers in ICT usage.

Keywords: [*Information and Communication Technology, Enabler, Dissemination, Agricultural Technologies*]

*Tel: +233244987146
E-mail: easiedudarko@yahoo.com

INTRODUCTION

Application of new and contemporary information and communication technologies in rural and agriculture development has been advancing quite rapidly over the last decade. An analysis of published research literature in this area reveals a 10-year growth of about 100 percent (ICRISAT, 2009).However, the Agriculture Research for Development (ARD) community is not perceived to be in the lead or playing key role in the area. The value and effectiveness of ICTs in supporting greater involvement of stakeholders in research and technology generation is often dismissed (ICRISAT, 2009). The perceived limitation of effectiveness of ICTs in this regard is often due to definitions of ICTs which narrowly focus on highly sophisticated hardware and internet-based application.

Contemporary analyses accept that ICT's when applied in rural development would include, besides hardware, software and applications, processes for digital content generation, management and presentation (to the user), knowledge management sharing and aspects of institutional, organizational and community structures, processes and management of continuous change in all these aspects. This blend of practices and processes is broadly termed Information and Communication Management (ICM) where digital technologies play a significant if not dominant role (*Ibid*).

Effective adoption of Information and Communication Technologies (ICT) now has a proven record in many parts of the world and a demonstrated potential to attain significant economic, social and environmental benefits at local, national and global levels *(Ibid*). The past four decades have witnessed numerous attempts to understand the mechanism of the Adoption of Technological Innovation. Rogers, (1995) provides a general framework of user acceptance of ICT which has been discussed by Gelb and Parker (2008). The discussion has laid emphasis on the use of ICTs as a strong basis on diffusion of innovations.

Access to agricultural information by farmers poses a great challenge in most third world countries. Murithii (2009) attested to this fact and noted that access, efficiency and affordability of agricultural information are the major barriers in the efforts to uplift agricultural productivity among small scale farmers. However, according to Murithii with effective exploitation of innovative solutions that integrate

*Tel: +233244987146
E-mail: easiedudarko@yahoo.com

information and communication technologies in agricultural information, these problems could be alleviated. The role of ICT in enhancing agricultural productivity was captured in 2005 World Summit on Information Society, (WSIS 2005). The WSIS Plan of Action emphasized that governments should be prioritized access to agricultural information through promoting "e-agriculture. In conclusion, Hattotuwa (2003) believed that ICT's have become an effective and reliable force in transforming social, political and economic life globally. This point was stressed by Huyer and Sikoska (2003) when they posited that ICT's have immense potential to reshape, reorganize and restructure agriculture activities in every country where lack of information can be too costly for business.

Agricultural extension in Ghana is mainly managed by the Ministry of Food and Agriculture (MOFA). Extension services in the country are provided free of charge to farmers by extension officers, who are staff of MOFA. However, according to Sraku-lartey and Sam (2009) the extensionist-farmer ratio is quite low (1:1500) resulting in the inability of the extension officers to visit many needy farmers. To a large extent therefore, their impact on agricultural development is not being felt.

The Government of Ghana as part of its vision acknowledges the role that ICTs can play in agricultural planning, development, promotion and marketing. It has therefore pledged to facilitate the implementation of a reliable national agricultural information system (database) to facilitate planning, marketing and quality service delivery within the agricultural sector towards the development of an overall comprehensive National Information and Communication System. In line with the ICT for Accelerated Development (ICT4AD) Strategy Policy, MOFA's ICT Policy will seek to achieve the broad objective of promoting the deployment and exploitation of ICTs to support the activities of the agriculture sector including, the production, processing, marketing and distribution of agriculture products and services.

Some of the interventions being pursued by MOFA to facilitate the use of ICT in the dissemination of farming technologies include the setting up of information centres in the 110 districts in the country. So far 5 information centres have been set up. It is expected that the District Assemblies will take complete responsibility for these information centres. Ultimately, they are expected to be connected to the Agricultural Network (AGRINET) through a Wide Area Network (WAN). These centres to be managed by

*Tel: +233244987146
E-mail: easiedudarko@yahoo.com

extension officers who would try to link up with the research institutes so that they can easily transfer new technologies developed to the farmers would play a critical role in this vision. In the future it is expected that the farmers will learn how to use databases that will be created by MOFA staff to meet their information needs (Sraku-Lartey and Sam, 2009).

A study conducted by Kameswari *et al* (2011) on ICT's for Agricultural Extension in India reported that, initially, ICT-enabled development projects in India started off with a telecentre or community information kiosk model (Village Knowledge Centres, e-*Choupal*). In all such cases, the farmers had access to agricultural information using a PC with an internet connection . For example; telecentres (e-*Choupal*) set up by the Indian Tobacco Company (ITC) had more than 4 million users across the country. Farmers used these centres to access commodity prices at local and global markets, information on new farming techniques and place orders for inputs (seeds, fertilizers, etc.) at prices lower than those at the local market (Ibid)

Another study by Saravanan (2010) on ICT's for Agricultural Extension in India indicated that the widespread availability and convergence of Information and Communication Technologies in India, in recent years, has led to unprecedented capacity for dissemination of knowledge and information to the rural population. The experiences of ICT projects in rural India showcased encouraging results in providing agricultural information, education, health and e-governance to the rural population. Some of these projects have been named: e-Choupal, Akshaya, Bhoomi, Drishtee, N-Logue and Krishi Vigyan Kendras of Indian Council of Agricultural Research (ICAR) have shown some promise towards improving agricultural activities.

It is against this background that the study with the main objective of examining the importance of ICTs to the farming community with the view to explore ways of integrating ICTs with the existing public extension system was undertaken.

*Tel: +233244987146
E-mail: easiedudarko@yahoo.com

Objectives of the study

The specific objectives of the study were to identify the agricultural information seeking behavior of the farming communities in the study area and to answer to reasons why agricultural information is sought through certain sources/media by the farming community.

MATERIALS AND METHODS

The study was conducted in the East Akim District of the Eastern region of Ghana. The District has 111 rural communities divided into four zones for the purposes of extension work; five communities were selected randomly from each zone out of which 20 farmers were randomly selected for the study. The simple random sampling was used because the sampling frame was large. The list of farmers obtained from the extension unit was 4,234. The names of 100 farmers from each community were written on pieces of papers and 20 were randomly selected.

The communities randomly selected for the study were: Obodanse, Kukurantumi, Trontr, Nobi and Anweabeng (Tafo Zone); Old Tafo, Bosodumase, Bunso, Asikwa and Osiem (Osiem Zone); Asikam, Odumase, Amanfrom, Potroase and Apapam (Kibi Zone); Adjapoma, Addokwanta, Ntabea Akooko and Maase (Asafo Zone), The main occupation of the inhabitants in the communities is farming and major crops cultivated by farmers were maize, cassava, oil palm, cocoyam and vegetables.

In-depth interviews were conducted with 400 farmers in the district. The questionnaires were pre-tested in the communities for modification to meet the study requirements. Both closed ended and open ended questionnaires were used to collect data from key informants (people with some expert knowledge in farming activities in the communities). Individual farmers were interviewed using a questionnaire that had a mix of closed and open ended questions. Most of the items related to the demographic and socio-economic characteristics of the farmers were solicited using closed ended questions. On the other hand, items related to media usage, relationship and other information needs were solicited using open ended questions. Information was collected through one-on-one interviews by the research team.

*Tel: +233244987146
E-mail: easiedudarko@yahoo.com

From each zone, four extension officers from each zone were interviewed on the information seeking behavior of farmers in the farming communities.

RESULTS AND DISCUSSIONS

The age distribution of the respondents was quite even, 47% of the respondents were between the ages of 46 and 65 whilst 39.75% were between the ages of 25 and 45. It implies that people engaged in agricultural activities in the communities were active (Table 1).

About Gender out of 400 respondents 69.50% were men and the rest were women (Table). Though majority of the respondents have some levels of education, on the hand a substantial number (26.25%) had no formal education as indicated in the table.

Table 1: Demographic characteristics of respondents interviewed on the use of ICTs.

Age	Frequency	Percentage
26-35	59	14.75
36-45	100	25.00
46-55	122	30.50
56-65	66	16.50
66 and above	53	13.25
Gender		
Male	278	69.50
Female	122	30.50
Education		
No formal Education	105	26.25
Basic Education	248	62.00
Secondary	41	10.25
Post Secondary	6	1.50
N	400	100

*Tel: +233244987146
E-mail: easiedudarko@yahoo.com

The agricultural information seeking behavior of the respondents in terms of using ICT was the use of mobile phones, radio and television programmes and mobile vans as indicated in Table 2.

Farmers had various reasons for using different media. Mobile phones were primarily used to satisfy information and social needs (contacting extension agents and friends). Television and radio were used mostly for entertainment (pleasure) and sometimes for agricultural programmes.

Table 2: Information seeking channels used by the respondents

Medium	Frequency	Percentage
Mobile Phones	105	26.25
Radio and TV Programmes	60	15
Mobile Vans	10	2.50
Friends and Relatives	225	56.25
Internet kiosk	0	0
Total	**400**	**100**

Forty one percent of the respondents indicated that they obtained agricultural information through the use of mobile phones and radio, in view of the fact that each of them possesses the phone directory of the extension officers. It appears it would be more convenient and useful to explore the use of the Short Message System (SMS) in the dissemination of agricultural information in view of its cheapness and effectiveness among other benefits. Unfortunately most of the farmers interviewed were not conversant with the SMS.

Ilahiane (2007) believed that mobile phones have rejuvenated the way in which farmers access, exchange and manipulate information because they have enabled farmers to extract current and relevant information vital for decision making.

*Tel: +233244987146
E-mail: easiedudarko@yahoo.com

Apart from the traditional channel of obtaining information from friends and relatives, the use of mobile phones for the accessing of agricultural information appears to be the preferred channel of the farmers as they can easily reach the extension officers which offer them the opportunity to clarity and better understanding of issues.

The study showed that farmers dependence on mobile vans to access agricultural information was negligible (Table 2). The reason according to farmers was that the use mobile van to disseminate agricultural information was not popular in the district.

The need for the Ministry of Food and Agriculture (MOFA) to revive the use of mobile vans to disseminate agricultural information as it existed in the past was emphasized by farmers. They contended that the audio visuals shown by the vans encouraged them to invest more resources in their agricultural activities.

Despite the use of these media, only 44% of the respondents reported getting information using ICT devices (mobile phones, radio, television and mobile vans), an indication that farmers usage of ICT's to access agricultural information was still not encouraging. Majority of the farmers interviewed (56%) relied on friends and relatives for information.

It was observed that information seeking behaviour and sources/channels used by the farmers followed a distinct pattern. Most of the farmers made no effort to seek new agricultural information in the communities though agriculture was their main occupation. In these communities, farmers followed a traditional cropping pattern and relied on information passed on by their peers or elders (local interpersonal channels).

The use of internet kiosk (small facilities in the communities where information on agriculture could be accessed via internet) as existed in some parts of the world did not exist in the communities in the district. Farmers interviewed had not heard or seen such facility and this was confirmed by the extension officers. The use of mobile kiosk had played a significant role in shaping agricultural activities in some parts of the world especially some rural communities in India (Saravanan, 2010).

*Tel: +233244987146
E-mail: easiedudarko@yahoo.com

Judging from the experiences in India and other countries and its resulted benefits in terms of agricultural information dissemination activities, it is clear that if MoFA will live up to its commitment in promoting ICT's to accelerate the dissemination of agricultural information, then some of Indian experiences could be tapped to develop agriculture in Ghana. The extension officers interviewed argued that the use of ICT's in the dissemination of agricultural information should be given a further boost. They contended that at the moment the only avenues of disseminating agricultural information in terms of ICT's are mobile phones, radio and television programmes. In their assessment the use of mobile phones could be better if the farmers could maximize use of SMS. Additionally, some funds should be made available to Extension officers to purchase phone recharge cards which would afford them opportunity to interact with the farmers on regular basis.

On radio and television programmes the Extension Officers revealed that MoFA in collaboration with Good Life "FM", a local radio station, had instituted programme dubbed "You and Agriculture" which became a platform created to educate farmers on agricultural activities. The phone- in segment of the programme allowed farmers to call in to ask questions and contribute to the discussions. In Zimbabwe the country's major radio stations broadcast agricultural programmes in the vernacular and these can be accessed by the marginalized farmers. According to Chisita (2010) this has helped farmers to have access to current agriculture information.

The use of mobile vans to disseminate agricultural information in the district had been constrained by lack of logistics. The officers explained that there were only two of such vans in the region which were provided by the Canadian International Development Agency (CIDA), and the districts in the regions had been allotted a period to use the van on condition that the district would be able to fuel the van and provide other logistics. The extension activities in the district according to officers are already under-resourced making the use of the mobile van even more difficult.

In the assessment of the researchers, the difficulties faced by farmers in accessing agricultural information and constraints Extension Officers go through in discharging their core duties could be managed if MoFA put in place pragmatic measures to accelerate the use of ICT in the dissemination of

information on agriculture. The experiences in other countries could be piloted in some selected districts in the country for the results to be accessed to help make an informed decision.

The government's plan to establish Community Information Centres under the Agriculture Network (AGRINET) through a wide Area Network (WAN) to be managed by extension officers in all the 110 districts in Ghana should be accorded the necessary attention to meet the information needs of farmers.

The study has shown that with the right approach and active participation, farmers would be prepared to access information through the use of ICT's. According to Addo-Dankwa (2000), an E-Commerce project which was recently initiated with sponsorship from International Institute for Communication and Development (IICD) and aimed at helping to make international information on markets and prices available to the local farmers, thereby allowing them to react to the market changes and also to negotiate competitively, received farmers' full participation. Addo-Dankwa concluded that the interest shown by the farmers especially in the training is an indication that the farmers can indeed use ICT to improve on their livelihood when the right environment is created.

CONCLUSION

This study identified the agricultural information seeking avenues of the farmers in the district in which the use of ICT does not feature prominently. The farmers practically relied on friends and relatives for information in their farming activities more rather than using ICT.

The reason why farmers did not largely seek information through ICT sources was that the use of ICT in the dissemination of agricultural activities has not been accorded the necessary attention and also most of the farmers have no formal education. The continuous reliance on traditional ways of seeking agricultural information has to give way to the use of ICT.

The study concluded that farmers in the selected district had limited avenues of seeking agricultural information and the extension unit was poorly resourced in terms ICT logistics which does not support agricultural development. The need to assist farmers to benefit from current information on agriculture is most crucial.

RECOMMENDATION

The study recommends that the extension activities in the country should be given the needed boost in terms of logistics and funding to enable Extension Officers carry out their activities effectively. Again some adult education programmes could be put in place to help farmers with no formal education to be educated in the use of basic ICT activities.

*Tel: +233244987146
E-mail: easiedudarko@yahoo.com

The study strongly recommends that Government should speed up its plan of setting up Community Information Centres in the entire district to accelerate free flow of information in order to help the rural farmers to improve their farming activities.

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*Tel: +233244987146
E-mail: easiedudarko@yahoo.com