

Short Research Article

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

Abstract

This study reports on the availability, use and information seeking avenues of farming communities with specific reference to Information and Communication Technologies (ICTs). It fills a research gap by examining what people do with a medium when they have access to it, rather than looking at barriers surrounding the use of ICTs and digital divide issues 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's by farmers over other available sources.

It was observed that, accessing agriculture information by farmers through ICTs 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.

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 2000 percent.

22 However, the Agriculture Research for Development (ARD) community is not perceived to be in
23 the lead or playing key role in this area. The value and effectiveness of ICTs in supporting
24 greater involvement of stakeholders in research and technology generation is often dismissed.
25 (ICRISAT, 2009).

26 The perceived limitation of effectiveness of ICTs in this regard is often due to definitions of
27 ICTs which narrowly focus on highly sophisticated hardware and internet-based application.

28 Contemporary analyses accept that ICTs when applied in rural development would include,
29 besides hardware, software and applications, processes for digital content generation,
30 management and presentation (to the user), knowledge management sharing and aspects of
31 institutional, organizational and community structures, processes and management of continuous
32 change in all these aspects. This blend of practices and processes is broadly termed Information
33 and Communication Management (ICM) where digital technologies play a significant if not
34 dominant role. (ICRISAT, 2009).

35 Effective adoption of Information and Communication Technologies (ICT) now has a proven
36 record in many parts of the world and a demonstrated potential to attain significant economic,
37 social and environmental benefits at local, national and global levels. The past four decades have
38 witnessed numerous attempts to understand the mechanism of the Adoption of Technological
39 Innovation. Rogers, (1995) provides a general framework, user acceptance of ICT as discussed
40 by Gelb *et al* (2008) and Gelb and Parker (2006) which laid emphasis on the use of ICT's on
41 diffusion of innovations.

42 Access to agricultural information by farmers poses a great challenge in most third world
43 countries. Muriithii (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 Muriithii with effective exploitation of innovative solutions that integrate 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. The WSIS Plan of Action emphasized that governments should 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.

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. MoFA (2011).

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 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).

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.

The specific objectives of the study were to:

1. Determine the agricultural information seeking avenues of the farming communities in the study area and
2. Find answers 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.

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

94 In-depth interviews were conducted with 400 farmers in the district Two types of
95 schedules were developed for data collection. Both instruments were pretested in the
96 communities for modification to meet the study requirements. A closed ended questionnaire was
97 used to collect data; key informants were interviewed. Individual farmers were interviewed using
98 a questionnaire that had a mix of closed and open ended questions. Most of the items related to
99 the demographic and socio-economic characteristics of the farmers were closed ended. On the
100 other hand, items related to media usage, relationship and other information needs were open
101 ended. Information was collected through one-on-one interviews by the research team.

102 Four extension officers from each zone were interviewed on the information seeking behavior of
103 farmers in the farming communities.

104 **Results and Discussions**

105 The age distribution of the respondent was quite even, 47% of the respondents were between the
106 ages of 46 and 65 whilst 40% were between the ages of 25 and 45. It implies that people engaged
107 in agricultural activities in the communities were active (Table 1).

108 **Table 1: Age distribution of the Respondents**

Age	Frequency	Percentage
25-45	159	40
46-65	188	47
66 and above	53	13
Total	400	100

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110 Out of 400 respondents, 70% were men and 30% were women (Table 2). This is not unusual
 111 since most of the people involved in agricultural activities were men.

112 **Table 2: Gender of the respondents**

Gender	Frequency	Percentage
Male	278	70
Female	122	30
Total	400	100

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115 Though majority of the respondents were semi-educated, substantial number (25%) were has no
 116 formal education as indicated in table 3.

117 **Table 3: Educational level of the Respondents**

Education	Frequency	Percentage
No Education	105	25

Basic Education	248	66
Secondary	41	7
Post Secondary	6	2
Total	400	100

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

121 Farmers have various reasons for using different media. Mobile phones are primarily used to
122 satisfy information and social needs (contacting extension agents and friends). Agricultural
123 programmes, entertainment (pleasure) and escape are mostly aired through Television and radio.

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129 **Table 4: Information seeking channels used by the respondents**

Medium	Frequency	Percentage
Mobile Phones	105	26
Radio and TV Programmes	60	15
Mobile Vans	10	3

Friends and Relatives	225	56
Telecentres	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 enable farmers to extract current and relevant information vital for decision making.

The use of radio and television for the dissemination of agricultural programmes appears to be the preferred channels of the farmers as the use of these channels offers them the opportunity to call in to the studios of the media houses for further interactions with the presenters for clarity and better understanding of issues.

The study showed that farmers dependence on mobile vans to access agricultural information was negligible (Table 4). The reason according to farmers was that the use of mobile vans 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 existed in the past was emphasized by farmers They

149 contended that the audio visuals shown by the vans encouraged them to invest more resources in
150 their agricultural activities.

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

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

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

166 Podcasting of agricultural information has been adopted as a media to disseminate agricultural
167 information amongst rural farmers Gudza (2010). Podcasts had been adopted as an innovative
168 way of using ICT, s to disseminate agricultural information to areas that are constrained by poor
169 road network and limited communication infrastructure. Unfortunately such a system does not
170 exist in the district.

171 In a study conducted by Kameswari *et al* (2011), on ICT's for Agricultural Extension in India, it
 172 was reported that, initially, ICT-enabled development projects in India started off with a
 173 telecentre or community information kiosk model (Village Knowledge Centres, e-*Choupal*). In
 174 all such cases, the farmers had access to agricultural information using a PC with an
 175 internet connection . For example; telecentre (e-*Choupal*) set up by the Indian Tobacco
 176 Company (ITC) have more than 4 million users across the country. Farmers use these centres to
 177 access commodity prices at local and global markets, information on new farming techniques
 178 and place orders for inputs (seeds, fertilizers, etc.) at prices lower than the local market.
 179 Another study by Saravanan (2010) on ICT's for Agricultural Extension in India revealed that
 180 the widespread availability and convergence of Information and Communication Technologies in
 181 India, in recent years, have led to unprecedented capacity for dissemination of knowledge and
 182 information to the rural population. The experiences of ICT projects in rural India showcased
 183 encouraging results in providing agricultural information, education, health and e-governance to
 184 the rural population. The ICT projects like e-*Choupal*, Akshaya, Bhoomi, Drishtee, N-Logue
 185 and Krishi Vigyan Kendras of Indian Council of Agricultural Research (ICAR) have shown
 186 some promise towards scaling up.

187 Judging from the above studies conducted in India and its resulted benefits, it is clear that if
 188 MoFA will live up to its commitment in promoting ICT's to accelerate the dissemination of
 189 agricultural dissemination then some of Indian experiences could be tapped to develop
 190 agriculture in Ghana.

191 The extension officers interviewed argued that the use of ICT's in the dissemination of
 192 agricultural information should be given a further boost. They contended that at the moment the

193 only avenues of disseminating agricultural information in terms of ICT's are mobile phones,
194 radio and television programmes.

195 In their assessment the use of mobile phones could be better if the farmers could maximize the
196 use of SMS. Additionally, according to the Extension Officers some funds should be made
197 available to purchase phone recharge cards.

198 On radio and television programmes the Extension Officers revealed that MoFA in collaboration
199 with Good Life FM a local radio station, have instituted programme dubbed "You and
200 Agriculture" which is a platform created to educate farmers on agricultural activities. The phone-
201 in segment of the programme allows farmers to call in to ask questions and contribute to the
202 discussions.

203 Radio and television play an important role in providing agricultural information in many
204 countries. In Zimbabwe, the country's major radio stations broadcast agricultural programmes in
205 the vernacular and these can be accessed by the marginalized people. This according to Chisita
206 (2010) has contributed in helping farmers to have access to current agriculture information in
207 Zimbabwe.

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

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

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

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232 **Conclusion**

233 Agricultural extension in Ghana is mainly managed by the Ministry of Food and Agriculture
234 (MoFA). Extension services in Ghana to large extent are provided free of charge to farmers by
235 extension officers, who are staff of MoFA. According to extension officers interviewed, it is only

236 veterinary services which farmers pay small amounts. However, according to Sraku-lartey and
 237 Sam (2009) the extensionist-farmer ratio is quite low (1:1500) resulting in the inability of the
 238 extension officers to visit many needy farmers. To a large extent therefore, their impact on
 239 agricultural development is not being felt. The need for an alternative avenue like ICT's to
 240 disseminate information on agriculture is most crucial to agricultural development in Ghana.

241 **Recommendation**

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

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252 **References**

253 Addo-Dankwa (2000). Project description of the E-Commerce project of the Ministry of Food
 254 and Agriculture: <http://www.mofa.gov.gh/>.
 255
 256

- 257 Chisita, C. T., (2010). An investigation into the use of ICT in the provision of agricultural information
258 To small scale farmers in Harare. A paper presented at World Library and Information Congress:
259 76th IFLA General Conference and Assembly. 10th -15 August 2010 Gothenberg, Sweden.
- 260 Gelb, E., Maru A., Brodgen, J., Dordsworth, E., Samii, R., Pesce, V. (2008). *Adoption of*
261 *ICT enabled information systems for agricultural development and rural viability*. Pre-
262 conference workshop summary at the Global Forum on Agricultural research. Atsugi,
263 Japan. Retrieved October 10, 2010 from
264 http://www.fao.org/docs/eims/upload/258775/Workshop_Summary_final.pdf
- 265 Gelb, E., Parker., C., (2006). *Is ICT adoption for agriculture still an important Issue?*
266 Proceedings of the 5th European Federation for Information Technology in Agriculture
267 (EFITA) Conference, Bangalore, India.
- 268 Gudza, L.D. (2010). Podcasts can inform poor farmers. Available from [http://www.scidev.net/en/](http://www.scidev.net/en/agriculture-and-environment/farming-practices/opinions/podcasts-can-inform-poor-farmers.html)
269 agriculture-and environment/farming-practices/opinions/podcasts-can-inform poor farmers.html.
270 Accessed June, 2012.
- 271 Hattotuwa, S. (eds) (2003). CSCW in the North-Eastern Province in Sri Lanka, University of Queensland
272 <http://www.worldbank.org/gender/digitaldivide/worldbankpresentation.ppt>. Accessed July, 2012.
- 273 Huyer, S., and Sikoska, T., (2003). Overcoming the Gender Digital Divide: Understanding the ICT'S and
274 Their potential for the empowerment of women, Instraw Research Paper Series No. 1.
- 275 Ilahiane, H. (2007). Impacts of ICT's on agriculture: Farmers and mobile phones. [http://www.public.](http://www.public.laastate.edu/hsain/research/impacts%20of%20in%20agriculture%20Ilahiane.ppt)
276 [laastate.edu/hsain/research/impacts%20of%20in%20agriculture%20Ilahiane.ppt](http://www.public.laastate.edu/hsain/research/impacts%20of%20in%20agriculture%20Ilahiane.ppt).
277 Accessed August, 2012.
- 278
- 279 International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) (2009). Success
280 Stories in ICT/ICM in AR4D in Asia and Pacific regions.
- 281 Kameswari V.L.V., Kishore D. and Gupta V., (2011). ICT's for agricultural extension: A study
282 In the Indian Himalayan region. EJISDC (2011) 48, 3, 1-12. <http://www.ejisdc.org>

283 Ministry of Food and Agriculture (2011). A report on ICT Policy Statement. Accra, MOFA.
 284 Murithii, (2009). Information Technology for Agriculture and rural development in Southern
 285 Africa: Experiences from Kenya. Paper presented at the conference of International
 286 Research on Food Security, Natural Resources Management and Rural development,
 287 Tropetag: University of Hamburg.

288 Rogers, E.M. (1995). *Diffusion of innovation*, (4th ed.). New York: The Free Press.

289 Saravanan R. (2010). Agricultural knowledge information systems and innovations for
 290 technology dissemination and sustainable agriculture development. ISDA 2010,
 291 Montpellier June 28-30, 2010.

292 Sraku-Lartey M. and Sam J.(2009) iNARS: A framework for developing and implementing effective
 293 information systems for agricultural research and development.

294 WSIS, (2003). World Summit on Information Society declaration and Action Plan.

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