

1

1 Short Research Article

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

4 Abstract

5 This study reports on the availability, use and information seeking avenues of farming
6 communities with specific reference to Information and Communication Technologies (ICTs). It
7 fills a research gap by examining what people do with a medium when they have access to it,
8 rather than looking at barriers surrounding the use of ICTs and digital divide issues arising due to
9 differential access and capabilities. The study was conducted in the East Akim District of the
10 Eastern Region of Ghana and sought insights into intentions and factors surrounding the use of
11 various media by farmers. The study also threw more light on the socio-cultural context within
12 which information seeking and use occurs in the district and tried to explain the reasons behind
13 the use of ICT's by farmers over other available sources.

14 It was observed that, accessing agriculture information by farmers through ICTs was not
15 popular and needed to be given a boost. The farmers mostly relied on friends and relatives, and
16 other local sources for agricultural information and this has been a drawback to the adoption of
17 agricultural technologies.

18 Introduction Application of new and contemporary information and communication
19 technologies in rural and agriculture development has been advancing quite rapidly over the last
20 decade. An analysis of published research literature in this area reveals a 10-year growth of about
21 2000 percent.

UNDER PEER REVIEW

2

However, the Agriculture Research for Development (ARD) community
22 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

UNDER PEER REVIEW

3

of agricultural information are the major barriers in the efforts to uplift 44 agricultural productivity
45 among small scale farmers. However according to Muriithii (2009) with effective exploitation of
46 innovative solutions that integrate information and communication technologies in agricultural

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

55 The Government of Ghana as part of its vision acknowledges the role that ICTs can play in
56 agricultural planning, development, promotion and marketing. It has therefore pledged to
57 facilitate the implementation of a reliable national agricultural information system (database) to
58 facilitate planning, marketing and quality service delivery within the agricultural sector towards
59 the development of an overall comprehensive National Information and Communication System.
60 In line with the ICT for Accelerated Development (ICT4AD) Strategy Policy, MoFA’s ICT
61 Policy will seek to achieve the broad objective of promoting the deployment and exploitation of
62 ICTs to support the activities of the agriculture sector including, the production, processing,
63 marketing and distribution of agriculture products and services (MoFA, 2011).

64 Some of the interventions being pursued by MoFA to facilitate the use of ICT in the
65 dissemination of farming technologies include the setting up of information centres in the 110
66 districts in the country. So far 5 information centres have been set up. It is expected that the

UNDER PEER REVIEW

4

District Assemblies will take complete responsibility for these information 67 centres. Ultimately,
68 they are expected to be connected to the Agricultural Network (AGRINET) through a Wide Area
69 Network (WAN). These centres to be managed by extension officers who would try to link up
70 with the research institutes so that they can easily transfer new technologies developed to the

71 farmers would play a critical role in this vision. In the future it is expected that the farmers will
72 learn how to use databases that will be created by MoFA staff to meet their information needs
73 (Sraku-Lartey and Sam, 2009).

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

77 The specific objectives of the study were to:

78 1. Determine the agricultural information seeking avenues of the farming communities in
79 the study area and

80 2. Find answers to reasons why agricultural information is sought through certain
81 sources/media by the farming community.

82

83 Materials and methods

84 The study was conducted in the East Akim District of the Eastern region of Ghana. The District
85 has 111 rural communities divided into four zones for the purposes of extension work; five
86 communities were selected randomly from each zone out of which 20 farmers were randomly
87 selected for the study.

UNDER PEER REVIEW

5

The following communities were randomly selected for the 88 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

UNDER PEER REVIEW

6

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

109

Out of 400 respondents, 70% were men and 30% were women 110 (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

113

114

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

UNDER PEER REVIEW

7

Basic Education 248 66

Secondary 41 7

Post Secondary 6 2

Total 400 100

118 The agricultural information seeking avenues of the respondents in terms 119 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.

124

125

126

127

128

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

UNDER PEER REVIEW

8

Friends and Relatives	225	56
Telecentres	0	0
Total	400	100

130

Forty one percent of the respondents indicated that they obtained 131 agricultural information
132 through the use of mobile phones and radio, in view of the fact that each of them possesses the
133 phone directory of the extension officers. It appears it would be more convenient and useful to
134 explore the use of the Short Message System (SMS) in the dissemination of agricultural
135 information in view of its cheapness and effectiveness among other benefits. Unfortunately most
136 of the farmers interviewed were not conversant with the SMS.

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

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

144 The study showed that farmers dependence on mobile vans to access agricultural information

145 was negligible (Table 4). The reason according to farmers was that the use of mobile vans to
146 disseminate agricultural information was not popular in the district.

147 The need for the Ministry of Food and Agriculture (MoFA) to revive the use of mobile vans to
148 disseminate agricultural information as existed in the past was emphasized by farmers. They

UNDER PEER REVIEW

9

contended that the audio visuals shown by the vans encouraged them to 149 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.

UNDER PEER REVIEW

10

In a study conducted by Kameswari et al (2011), on ICT's for Agricultural 171 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

UNDER PEER REVIEW

11

only avenues of disseminating agricultural information in terms 193 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.

UNDER PEER REVIEW

12

The government's plan to establish Community Information Centres 215 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.

227

228

229

230

231

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

UNDER PEER REVIEW

13

veterinary services which farmers pay small amounts. However, according 236 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

245

246

247

248

249

250

251

252 References

253 Addo-Dankwa (2000). Project description of the E-Commerce project of the Ministry of Food

254

255 and Agriculture: <http://www.mofa.gov.gh/>.

256

UNDER PEER REVIEW

14

Chisita, C. T., (2010). An investigation into the use of ICT in the provision of 257 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. Pre262

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/>

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>.

276 iastate.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>

UNDER PEER REVIEW

15

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.

295

296

297

UNDER PEER REVIEW