

Use of ICT as Extension Tool by The Farmers of Gazipur District in Bangladesh

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ABSTRACT

In this digital era ICT has become a part and parcel of our daily life. It has also explored the field of agriculture. Thus, the present study focused on exploring the extent of use of ICT tools by the farmers and to find out the relationship between the selected characteristics of the farmers and their extent of use of ICT tools. The study was conducted in two upazilas named Kapasia and Gazipur Sadar of Gazipur district. A total of 100 farmers were selected as the sample of the study following proportionate random sampling technique. Data were collected using pre-tested interview schedule during November to December 2014. Simple statistics like number, mean, range, percentile and standard deviation were used. Pearson's coefficient of correlation was employed to explore relationships between extent of use of different ICT tools by the farmers and their selected characteristics. Findings revealed that most use of different ICT tools was found low among the respondents in the study area. Television as ICT tool was found more popular among the farmers in securing agricultural information. CD/DVD and Grameenphone Community Information service were the least popular ICT tools in dissemination of agricultural information. Level of education, annual income, innovativeness, and cosmopolitaness and ICT knowledge had positive significant relationship with the extent of use of different ICT tools by the farmers while age and farming experience showed negative significant relationship.

Keywords: Use of ICT; Extension tool; Farmers;

Information and communication technology (ICT) is the power house of global economy. It has been recognized as the mainstream development tool to lift the economic and social status of the citizens of Bangladesh under the vision 2021 (Malone et al, 2012). Information and Communication Technology is the full form of ICT. It refers to any electronic means of capturing, processing, storing and disseminating information (Saghir et al, 2013). Information has become an important input in ever-increasing knowledge-intensive agriculture. Information is more critical for the small-holder resource poor farmers and producers who have been facing challenges posed by income generation with the limited resources in the struggle for their livelihoods and sustenance (Paroda, 2010). Information and communication technologies offer the ability to increase the amount of information

provided to all participants in the agricultural sector and to decrease the cost of disseminating the information (Kurtenbach and Thompson, 2000). ICT in the agriculture sector facilitates knowledge sharing within and among a variety of agriculture networks including researchers, exporters, extension services and farmers. ICT enables vital information flows by linking rural agricultural communities to the internet, both in terms of accessing information and providing local content (Jayathilake, et al 2008). ICT has many potential applications in agricultural extension (Dhaka et al., 2010). Intensive cultivation without replenishment exhausts the soil fertility thereby production will not be sustained (Upperi et al., 2012). According to Salleemullah (2009), Technological revolutions in the last few decades and the consequential changes in the agriculture systems accelerated its cropping intensity in

the current century. ICTs do play an important role in disseminating a wide range of information and advice leading to knowledge and attitude change among rural communities (Sharma *et al.*, 2015). Agricultural extension which depends to a large extent on information exchange between and among farmers on the one hand and a broad range of other actors on the other, has been identified as one area in which ICTs can play a significant role (Kumar *et al.*, 2011).

The developments in Information and Communication Technologies (ICTs) and the internet in particular have revolutionized the entire Agriculture field, generating new market, changing the structure of the Agriculture distribution channels and re-engineering all processes. Agricultural extension which depends to a large extent on information exchange between and among farmers on the one hand and a broad range of other actors on the other, has been identified as one area in which ICTs can play a significant role (Raksha *et al.*, 2015).

In Bangladesh agricultural extension service is engaged to provide necessary information to the farmers. But due the number of poor extension workers and some other limitations agricultural extension service fails to provide the farmers with timely information. As a result, farmers lack access to relevant and timely information, knowledge about new technologies, skills, practices, ways to collaborate with the market and resources to overcome these limitations. Consequently, smallholders are vulnerable to crop related diseases, suffer productivity constraints and fail to take advantage of potential farming opportunities. Hence the government needs to think about ICT to facilitate the farmers with necessary information services. Bangladesh government with the help of some non-government organizations and foreign aids has undertaken some ICT projects. Some successful ongoing projects in Bangladesh for the rural people are Village Phone Program of Grameen Bank, Grameenphone Community Information Centre, *Pallitathya Kendra*, *e-Krishok* and some other projects. Now the question is what is the extent of use of ICT tools that has been facilitated by the governments of our country and what is the relationship between the extent of use of ICT tools and the socio-demographic characteristics of the farmers? In this regard the present study was conducted to explore the extent of use of ICT as extension tool and find out the relationship between the extent of use of ICT tools and the socio-demographic characteristics of the farmers.

METHODOLOGY

The study was carried out in two upazilas of Gazipur district viz. Kapasia and Gazipur Sadar. Gazipur was selected purposively as the locale of the present study because it is near the Dhaka city and extent of ICT use among the people is much appreciable. The total number of farmers' households of the selected villages was the target population of the study. The total number of famers of three selected villages of Kapasia upazila and two selected village of Gazipur Sadar was 1040, out of this population a number of 100 famers was selected as sample of the study following proportionate random sampling technique. A pretested interview schedule was used to collect data from the respondents. Extent of use of ICT tools was considered as the dependent variable. The formulated null hypothesis was there is no significant relationship between the selected characteristics of the farmers and their extent of use of ICT tools. To measure the extent of use of ICT tools, 17 statements were made and four scales along with score were assigned for each statement which was a) highly use (score 3) b) moderately use (score 2) c) hardly use (score 1) and d) don't use (score 0). Among the 17 statements, 12 statements were related to the agricultural purpose and remaining 5 were regarding non-agricultural purpose. The extent of use of different ICT tools by the respondents was computed by summing up the scores a respondent obtained from all the statements. Extent of use of different ICT tools for a respondent might vary from 0 (don't use any of the ICT tools) to 51 (highly use all the 17 ICT tools). Two rank orders were also made to explore which are the mostly used ICT tools by the farmers to get agricultural and non-agricultural information. On the basis of the 12 tools for agricultural information and 5 tools for non-agricultural the rank orders were made by multiplying the number of individuals with score of each scales for each tool and then summing up the obtained scores of scales for each tool. Descriptive statistical methods like range, mean, percentage distribution and standard deviation were used. Pearson's Correlation Coefficient (r) was computed to test hypothesis of this study. SPSS (Statistical Package for Social Sciences) computer program was used to analyze the data.

RESULTS AND DISCUSSION

Personal characteristics of the respondents:
Characteristics profile of the extension workers were

Table 1. Distribution of the respondents according to their socio-demographic characteristics

Characteristics	No.	%	Mean	SD
<i>Age</i>			38.2	11.12
Young aged (up to 35)	54	54		
Middle aged (36-50)	25	25		
Old aged (above 50)	21	21		
<i>Educational level</i>			9.95	3.66
Illiterate (0)	1	1		
Can sign only (0.5)	3	3		
Primary education (1-5)	11	11		
Secondary education (6-10)	48	48		
Higher education (above 10)	37	37		
<i>Farm size</i>			0.92	0.91
Landless (<0.20 hectare)	7	7		
Marginal (0.20 - 0.40 hectare)	16	16		
Small (0.41-1.00 hectare)	53	53		
Medium (1.01 – 3.03 hectare)	20	20		
Large (3.03 hectare and above)	4	4		
<i>Farming experience</i>			13.40	10.67
Low (2-10 years)	57	57		
Medium (11- 20 years)	24	24		
High (21 years and above)	19	19		
<i>Annual income (in Thousand)</i>			198	110
Low (94000-150000)	15	15		
Medium (150001-350000)	69	69		
High (above 350000)	16	16		
<i>Training exposure</i>			3.29	5.37
No (0)	59	59		
Low (1-6)	20	20		
Medium (7-13)	12	12		
High (14 and above)	9	9		
<i>Org. participation</i>			2.87	2.00
Low (0-1)	26	26		
Medium (2-5)	57	57		
High (6 and above)	17	17		
<i>Cosmopoliteness</i>			19.35	5.1
Low (up to 15)	61	61		
Medium (16-25)	65	65		
High (above 25)	14	14		
<i>Innovativeness</i>			11.19	4.75
Low (up to 6)	16	16		
Medium (7-16)	68	68		
High (above 16)	16	16		

determined and presented in Table 1. The findings indicate that most of the respondents were young aged (54%), having secondary education (48%), small family (65%) and farm size (53%) followed by short-term service experience (62.2%). It is also found that majority of had low farming experience (57%), medium annual income

(69%) and low training experience (59%). It was also indicating that most of them had medium organizational participation (57%), medium cosmopoliteness (65%), and medium innovativeness (68%).

Extent of use of ICT tools : Extent of use of ICT tools was measured to explore the current status of farmers' regarding the use of ICT tools both in agricultural and non-agricultural purpose. The use score of different ICT tools by the respondent farmers ranged from 1-31. The average use score was 13.09 with a standard deviation of 6.07. Based on the extent of use of different ICT tools respondents were categorized into three categories which is tabulated in Table 2. Results presented in Table 2 illustrate that majority (81.0%) of the respondents use ICT tools at low extent and only 19.0 percent of the respondents use ICT tools at medium extent. High extent of use was not observed among the respondents. Therefore, the extent of use of ICT tools was low to medium. Use of any tool depends on awareness and knowledge on the tool. The low and medium extent of use of different ICT tools might be due to lack of awareness and knowledge on the ICT tools. The cost of the ICT tools might be the another reason of low to medium extent of use as most of the farmers in the study area hold small farm size and have medium level of annual income.

Table 2. Distribution of the respondents according to their use of different ICT tools

Categories	No.	%	Mean	SD
Low extent of use	81	81.0	13.09	6.07
Medium extent of use	19	19.0		
Total	100	100		

Table 3 reveals that TV ranked in 1st position to watch *Hridoye Mati-o-Manush* and 2nd position to watch *Mati-o-Manush*. Radio occupied 3rd position to listen *Sonali Phashal* and 5th to listen *Desh Amar Mati Amar*. Mobile phone ranked in 4th position to get agricultural information. Sixth and 7th positions were occupied by internet and *Banglalink Jigyasha 7676*, respectively. Mobile application and *e-Krishok* service jointly ranked in 8th position while computer ranked in 9th position. Tenth position was occupied by both Grameenphone Community Information Center service and CD/DVD. The rank order of extent of use of different ICT tools indicates that television and radio which are considered as traditional ICT tools are mostly used tool to get agricultural information. Among the modern ICT

Table 3. Rank order of the extent of use of different ICT tools by the respondents in agricultural & non-agricultural purposes

Items	Highly use	Moderately use	Hardly use	Total score	Rank
<i>Agricultural purposes</i>					
Use computer to get agricultural information	0	0	3	3	9 th
Use mobile phone to get agricultural information	6	14	7	27	4 th
Use of any mobile application related to agriculture	0	4	0	4	8 th
Use internet for agricultural purpose	6	6	9	21	6 th
Use <i>Banglalink Jigyasha 7676</i> service for agril. info.	0	4	6	10	7 th
Use of Grameenphone Community Information Centre	0	0	2	2	10 th
Use of <i>e-Krishok</i> service in solving agril. problem	0	4	0	4	8 th
Use TV to watch <i>Mati-o-Manush</i>	63	56	14	133	2 nd
Use TV to watch <i>Hridoye Mati-o-Manush</i>	93	52	14	159	1 st
Use radio to listen <i>Sonali Phashal</i>	12	14	11	37	3 rd
Use radio to listen <i>Desh Amar Mati Amar</i>	9	10	4	23	5 th
Use CD/DVD to get agricultural information	0	0	2	2	10 th
<i>Non-agricultural purposes</i>					
Use TV to watch other program	231	30	6	267	1 st
Use radio to listen other programs	54	64	16	134	3 rd
Use computer other than agricultural purpose	75	24	10	109	5 th
Use mobile phone for non-agricultural purpose	207	38	8	253	2 nd
Use internet for other purpose	102	14	1	117	4 th

tools mobile phone ranked in 4th position and others are least used. Another rank order based on the score of extent of use of individual ICT tools in non-agricultural purposes was also made to explore their scope to be utilized in agricultural purposes which is tabulated below:

The rank order indicates that television ranked in 1st position among the five ICT tools while mobile phone held the 2nd position. Radio, internet and computer occupy 3rd, 4th and 5th positions, respectively. The rank order on extent of use of different ICT tools in non-agricultural purposes reveals that as modern ICT tools mobile phone along with internet have the ample opportunities to be utilized as extension tool to provide the farmers with necessary information.

Relationship between the selected characteristics of the farmers and their extent of use of ICT tools : Data presented in Table 4 indicate that level of education, annual income, innovativeness, and cosmopolitaness have positive significant relationship with extent of use of ICT tools by the farmers while age and farming experience have negative significant relationship. Family size, farm size, training experience and organizational participation has no significant relationship with the extent of use of ICT tools by the farmers. Age of the respondents had negative significant relationship with the extent of use of ICT tools. It means that the more

Table 4. Relationship between the characteristics of the farmers and their extent of use of ICT tools (Level of use of different ICT tools by the farmers)

Independent Variables	Observed (r) Values
Age	-.455**
Level of education	.550**
Family size	-.140 ^{NS}
Farm size	-.012 ^{NS}
Farming experience	-.411**
Annual income	.458**
Training exposure	.149 ^{NS}
Organizational participation	.126 ^{NS}
Innovativeness	.600**
Cosmopolitaness	.557**

**Significant at 0.01 level of probability, NS =Non-significant

the age of the respondents, the lesser their extent of use of ICT tools. This may be because older people are much experienced about farming activity and need less information and they are also unwilling to use modern ICT tools. Level of education of the respondents had positive significant relationship with their extent of use of ICT tools. It indicates that the higher the level of education of the respondents, the more their extent of use of ICT tools. Educated people are more willing to use ICT tools compared to the illiterate people or people with low level of education.

Farming experience of the respondents had negative significant relationship with their extent of use of ICT tools. It means that the more the farming experience, the lesser their extent of use of ICT tools. The cause of negative relationship might be that experienced farmers need less information while those are new in farming activity requires a lot of information and hence need to use ICT tools to get agricultural information. Annual income of the respondents had positive significant relationship with their extent of use of ICT tools. It specifies that the more the annual income, the more their extent of use of ICT tools. Though ICT tools have become cheap, farmers need to spend some money to use ICT tools. Thus the farmers with high annual income have the tendency to use more ICT tools. A positive significant relationship lies between the innovativeness and their extent of use of ICT tools. It signifies that the more the innovativeness of the respondents, the more their extent of use of ICT tools. Cosmopolitanism of the respondents also had positive significant relationship with their extent of use of ICT tools.

CONCLUSION

Information and communication technologies offer the ability to increase the amount of information provided

to all participants in the agricultural sector and to decrease the cost of disseminating the information. ICT in the agriculture sector facilitates knowledge sharing within and among a variety of agriculture networks including researchers, exporters, extension services and farmers. Based on findings of the study it can be concluded that the use of ICT tools was found low among the farmers in the study area. Among the ICT tools, television ranked in 1st position to get both agricultural and non-agricultural information. Grameenphone Community Information Center service and CD/DVD ranked in 10th position to get agricultural information. Computer ranked in the last position in non-agricultural purpose. Among the independent variables, level of education, annual income, innovativeness, cosmopolitanism and ICT knowledge had positive significant relationship with level of use of different ICT tools by the farmers while age and farming experience showed negative significant relationship. The study recommends that necessary measures must be taken to motivate the farmers to use modern ICT tools like mobile phone, agricultural mobile application, *e-krishok* service, internet etc. in securing agricultural information to solve different farm related problems.

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