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Communication Behaviour of Farmers with the Agricultural Extension Agents Using Cell Phone: A Case of Bangladesh

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Abstract

The cell phone is one of the potential Information Communication Technologies (ICTs) in agricultural development especially in developing countries like Bangladesh. Thus, this paper deals with the farmers' communication with the agricultural extension agents using mobile phone. The study was conducted in Mymensingh District in Bangladesh. Data were collected from a sample of 110 farmers while both descriptive and inferential analyses were used. The majority (53.64 percent) of the farmers had low cell phone contact while a good number (44.54 percent) of farmers had no cell phone contact, 1.82 percent had medium contact and no farmers had high cell phone contact with agricultural extension agents. Education, farm size, annual family income, extension contact, knowledge on ICT and cell phone use frequency correlated positively while only 'age' is correlated negatively to their cell phone contact with extension agents. Household size and organizational participation did not show any significant relationship. Small numbers of farmers were receiving information on seed, fertilizer, culture practices, pest control and market related through cell phone. Farmers' communication preferences through cell phone comparatively were Sub Assistant Agriculture Officer (SAAO), Trained Farmers (TF) and Seed and Fertilizer Dealers. Lack of awareness on receiving information through cell phone, apathy to getting agricultural information through cell phone, poor knowledge about cell phone operation were the major problems of farmers' communication with the agricultural extension agents using mobile phone. Respective authorities should encourage and train both farmers and extension agents to use mobile phone as easy, low cost and popular communication medium.

Keywords: Communication, Cell Phone, Farmers, Extension agents

1. Introduction

In Bangladesh, there are lots of modern, sustainable agricultural technologies as well as new technologies that have been coming regularly from research institutes with better solutions in agriculture, but these are not well adopted at the farm level (Alam and Chowdhury, 2015). In the context of agriculture, each extension agent provides adequate support to all the assigned farmers to increase agricultural productivity (Sadek, 2015). On the other hand, ICTs as an extension tool could enhance the flow of information in the application of agricultural extension services (Ballantyne and Bokre, 2003). As a ICTs based media, mobile phone provides new opportunities to support development by providing access to information and by building communication lines between people and communities around the world (Furuholt, 2009; Coyle, 2005). Mobile phone usage in third world countries is playing a vital role for the enhancement of farmers business towards agriculture (Chhachharand Hassan, 2013).

Mobile phones can significantly reduce transaction costs and encourage small scale vegetable

growers to participate in commercial agriculture (Silva and Ratnadiwakara 2010). Mittal et al. (2010) concluded that, for many of the farmers, mobile phones were the only convenient mode of communication. In this case, mobile phones were being used in agriculture to deliver services that enhanced agricultural productivity. Access to public telephones and especially individual mobile phones improves agricultural productivity, increases market access and expands marketing options for rural producers (Jansen et al. 2006).

Mobile phone technology has provided opportunities for increasing productivity and reducing socioeconomic inequalities in Bangladesh (Islam and Gronlund, 2011). Although smart phones have becoming increasingly popular in rural areas, only few cases were found where farmers used the device for receiving farm related information (Rahman et al. 2015). It has been revealed through a survey (KATALYST, 2013) that 84% Bangladeshi rural farmers use mobile phones, 67% farm families use more than one mobile phones and 73% farm families use more than one mobile SIMs in Bangladesh. It's a great indication that, extension agents and farmers can use mobile phone as a powerful communication channel between them. Although some researches (Barman, 2009; Mukta, 2010) conducted studies on farmers' cell phone use behavior and these studies were mainly limited on use of the device in getting market and input related information. However, very little is known about the actual usage of mobile phone by the farmers for accessing agricultural information from extension agents.

Hence, the present study was taken up to find out the extent of farmers cell phone contact with agricultural extension agents, their use for seeking what types of agricultural information by the farmers, to understand the correlation between farmers socio-economic characteristics and use of mobile phones for seeking agricultural information and problems faced by the farmers in receiving agricultural information through cell phone.

2. Materials and methods

The study was conducted in three randomly selected neighboring villages namely Charsrirampur, Chondopara and Payra in Dohakhola Union of Gouripursub-district under Mymensingh District, Bangladesh. The total numbers of the farm family heads (366) of the 3 selected villages of Dohakhola Union who have been using mobile phone constitute the population of the study. Thirty percent (30%) of the farm family heads from each of the three selected villages were randomly selected by using a Table of Random numbers (Blalock, 1960). Thus a total of 110 farmers, there was at least one cell phone own by one household, constituted the sample for the study.

Various socio-economic and cell phone use related characteristics of the farmers like age, education, household size, farm size, annual family income, organizational participation, extension contact, knowledge on ICT, use of cell phone frequency were considered as the independent variables of the study. Most of the explanatory variables were measured by developing scales based on the field scores. Farmer's cell phone contacts with extension agents was the focus variable of the study. For measuring cell phone contact of a respondent, a contact score was computed. To do this each respondent was asked their nature of contact with 9 selected extension agents. Farmers' responses for each contact were measured on a 4 - point rating scale (Mukta 2010). For each contact agents, score of 3, 2, 1 and 0 was assigned to indicate extent of contact as regularly, occasionally, rarely and not at all respectively. Respondent's obtained scores were added to compute his/her total score in a single dimension. Finally, the respondents were categorized into four categories according to their cell phone contact score.

A structured questionnaire was prepared to collect data for the study. All the variables were included in the questionnaire, while mostly closed forms of questions were set to elicit information in regards with the variables. The questionnaire was pre-tested among 15 farmers in the study area and it was improved on the basis of the observation made during pre-tasting. The empirical data were collected using personal interview method during the period of May to June, 2016. The collected data were coded, complied and analyzed by using SPSS statistical package. Pearson's correlation coefficient was used to determine relationship between the concerned variables.

3. Results and discussion

3.1 Demographic Characteristics

Nine selected individual characteristics of the respondents were selected as the independent variables of the study. The individual characteristics include: age, education, household size, farm size, annual family income, organizational participation, extension contact, knowledge on ICT and cell phone use frequency. In addition, salient features of the characteristics and basic statistical value of respondents have been presented in Table 1.

However, it is indicated average age of the respondents was around 46 that seems to be middle age while education of the respondents was lower which might be one of the limitations of the understanding the using of cell phones. The average farm size (0.80 ha) of the respondents also seem to be

small farmer while families sized of the farmers were 5.16 which is more than the national average of 4.50. The average annual income of the farmers in the study area was BDT 2, 30,770 ($2,884.63 US), which is more than the national average of household income BDT 1, 37,748 ($1721 US) (HIES, 2010). Average knowledge score of the respondents was 6.27 while possible ranged was 0-16 that indicating poor knowledge of the respondents. The similar finding on knowledge found in the study conducted by Asif (2016).

3.2 Farmers' cell phone contact

Farmers' cell phone contact with agricultural extension agents in receiving agricultural information was the major focus of the study. In the present study it was found that, farmer's cell phone contact score ranged from 0 to 10 with an average of 2.55 and standard deviation of 2.82. Based on their cell phone contact scores the respondents were classified into four categories as shown in Table 2. Data presented in the table 2 clearly show that extent of use of mobile phone by the farmers in receiving agricultural information is low in the study area. Although mobile phones have becoming increasingly in rural farmers hand, but except only few educated farmers were found where farmers used the mobile phone in receiving agricultural information. Farmers' cell phone contact behaviour with each agricultural extension agents has been presented in Table 3. Table 3 revealed that majority of the farmers had 'not at all' contact with selected nine extension agents. Few farmers had 'less frequently' contact with Farmers' Trainer (FT), dealers, market actors and NGO workers. There were very poor number of farmers had regular cell phone contact with extension agents. Study showed that farmers those have cell phone contact comparatively prefer contact with Sub Assistant Agriculture Officer (SAAO), Farmers Trainer (FT) and Dealers. The reasons behind of these aforementioned findings may be poor knowledge on using the cell phone, hard to buy the cell phone, not fully aware about the cell phone contact with extension agents, low literacy rate of the farmers etc. Moreover, lack of ability to understand the message given by the extension agents may be another reason having the above results. On the other way around, motivation to contact with extension agents using mobile phone may be not made enough by the extension agents specially SAAOs that was also responsible for getting the above findings.

3.3 Types of agricultural information receiving by cell phone

Farmers used cell phone for various types of information asking from extension agents. Six types of information selected with the help of others research paper (Rahman et al, 2015) and pretest of the interview schedule. Farmers' responses were recorded on six types of information that presented in Table 4. Table 4 showed that small numbers of the farmers were respond as 'Yes' category. Among them majority were asked for information related to fertilizer related information, as appropriate dose and time of fertilizing are very crucial for crops farming. Next information demanded by the farmers is market related information. Through mobile phones farmers directly communicate with buyers and customers for sell their produce in good price (Overa, 2006). Others inquiry were raised on insect/pest management, agronomic practices and seed related information. None of the farmers asked weather related information through cell phone. Fertilizer is one of the most important inputs of crop production, thus farmers are worried about its availability as well as applicability. Moreover, farmers are bit confused about its appropriate doses per unit area or for specific crop. So, these are may be the issues on which farmers contacted with extension agents. On the other hand, farmers always look for benefits where market is ensuring their profits. That is why, may be they are using mobile phone to get information their products market price.

Table 1. Characteristics profile of the respondent farmers.

Characteristics	Scoring system	Range		Mean	Standard Deviation
		Possible	Observed		
Age	Years	Unknown	22-75	45.45	12.08
Education	Years of schooling	Unknown	0-18	6.31	4.57
Household size	No. of members	Unknown	2-12	5.16	1.89
Farm size	Hectares	Unknown	.16-3.95	0.80	0.76
Annual family income	'000' Tk.	Unknown	78.92-616.09	230.77	90.87
Organizational participation	Scale score	Unknown	0-54	10.06	8.74
Extension contact	Scale score	0-36	1-20	8.95	4.23
Knowledge on ICT	Scale score	0-15	0-15	6.27	3.91
use of cell phone frequency	Scale score	0-3	0-3	2.09	1.13

Table 2. Distribution of the farmers according to their cell phone contact with extension agents score

Categories of farmers (score)	Number	Percent	Mean	Standard Deviation

Not at all (0)	49	44.54	2.55	2.82
Low (1-9)	59	53.64		
Medium (10-18)	2	1.82		
High (19-27)	0	0		
Total	110	100		

Table 3. Farmers cell phone contact with agricultural extension agents

Extension agents	Category (0 to 3 scale score)	Contact frequency (n=110)	percent	Mean	Sd
Farmers Trainer (FT)	Not at all	85	77.3	0.46	0.905
	rarely	4	3.6		
	Less frequently	16	14.5		
	regularly	5	4.5		
Sub Assistant	Not at all	72	65.5	0.65	0.971
Agriculture Officer	rarely	9	8.2		
(SAAO)	Less frequently	24	21.8		
	regularly	5	4.5		
Upazila Agriculture	Not at all	99	90.0	0.13	0.409
Officer (UAO)	rarely	8	7.3		
	Less frequently	3	2.7		
	regularly	0	0		
Upazila Livestock	Not at all	107	97.3	0.05	0.284
Officer/Veterinary	rarely	1	.9		
Surgeon	Less frequently	2	1.8		
	regularly	0	0		
Upazial Fisheries	Not at all	100	90.9	0.16	0.551
Officer (UFO)	rarely	3	2.7		
	Less frequently	6	5.5		
	regularly	1	.9		
Dealers	Not at all	84	76.4	0.45	0.863
	rarely	5	4.5		
	Less frequently	18	16.4		
	regularly	3	2.7		
Market actors	Not at all	93	84.5	0.32	0.777
	rarely	2	1.8		
	Less frequently	12	10.9		
	regularly	3	2.7		
NGO workers	Not at all	95	86.4	0.26	0.770
	rarely	3	2.7		
	Less frequently	10	9.1		
	regularly	2	1.8		
Call center	Not at all	105	95.5	0.05	0.265
	rarely	4	3.6		
	Less frequently	1	.9		
	regularly	0	0		

Table 4. Types of agricultural information receiving by cell phone

Types of information	Frequency (Yes)	Frequency (No)
Marketing information	27	83
Agronomic practices	23	87
Insect/pest management	26	84
Seed related information	20	90
Fertilizer related information	32	78
Weather information	0	110

3.4 Relationship of farmers selected characteristics and their cell phone contact A total of 9 selected characteristics of farmers were considered for understanding

relationship between those characteristics and farmers cell phone contact with extension agents. To test the relationships, Pearson's correlation coefficients were computed as the results have been presented in Table 5. Out of 9 independent variables, Education, farm size, annual family income, extension contact, knowledge on ICT and cell phone use frequency correlated positively with the farmers cell phone contact while only age is correlated negatively with the farmers' cell phone contact. Usually educated and youth farmers use the mobile phone frequently rather than old and uneducated farmers. Generally, educated farmers' shows interest to use mobile phones because they are well known to function and use of mobile phone or vice-versa. Results indicated that farmers those have large farm size, large annual income and good knowledge on ICT shows interest about use of mobile phone in receiving agricultural information. Study also revealed that extension contact had a great influence to use mobile phone. Thus, we can say that these aforementioned factors might be influential and take into consideration while policy measures in the same line. Similar study was conducted by the Asif, (2016); Mukta, (2010).

3.5 Problems faced by the farmers in receiving agricultural information using cell phone

Farmer's problem facing scores for 11 selected problems range from 2 to 21 with a mean of 14.40 and standard deviation (SD) 3.745. According to theiroverall problems faced score farmers were classified into three categories as shown in Table 6.

The majority of the farmers (75%) faced medium problems while 25 % farmers faced low problems but none of the belongs to high category of the problems. Supports from the government and non-governments organizations to the farmers in ICTs using especially cell phone using were the main reasons behind of the results found while farmers did not face any severe problems. Total observed score of a specific statement of the problems faced by farmers was calculated and rank order was made according to total observed score of a specific statement as shown in Table 7.

Table 7 indicate "lack of awareness about agricultural information receiving through cell phone" got the highest score (mean 2.77) and hence was considered as 1st ranked problem and "network problem" got the lowest score (mean 0.06) and hence was considered as11th ranked problem. Lack of mass communication (television, radio, poster, newspaper etc), farmers were unable to aware about the uses of cell phone to communicate with the extension agents. Basically mobile networking is not so developed in rural area as compared to urban area while frequent electricity problems, lower servicing of the networking might be the reasons of poor communication with each others. However, it can be concluded that these aforementioned problems may be the reasons behind the lower use of cell phone contact even no contact with extension agents.

Table 5. Relationship between socioeconomic characteristics of farmers and their cell phone contact with extension agents

Socioeconomic characteristics	Correlation co-efficient (r) values
Age	-.278**
Education	.474**
Household size	-.087
Farm size	.269**
Annual family income	.208*
Organizational participation	.181
Extension contact	.316**
Knowledge on ICT	.548**
Cell phone use frequency	.575**

** Correlation is significant at the 0.01 level
* Correlation is significant at the 0.05 level

Table 6. Distribution of farmers according to their overall problem faced in receiving agricultural information through cell phone.

Categories of farmers	Number	Percent	Mean	Sd

Low problems (0-11)	27	24.55		
Medium problems (12-22)	83	75.45	14.40	3.745
High problems(23-33)	0	0		

Table 7. Rank orders of the problems faced by the farmers in receiving agricultural information using cell phone.

Problems	Mean	Rank order
Lack of awareness about agricultural information receiving through cell phone	2.77	1
Apathy to getting agricultural information through cell phone	2.64	2
Poor knowledge about cell phone operation	2.35	3
Poor understanding of information received through cell phone	2.26	4
Poor level of education/illiteracy	1.89	5
Shyness/scared of using cell phone for receiving agricultural information	1.42	6
Inadequate information supplied by respective authority over cell phone	0.29	7
Very hard to purchase cell phone	0.28	8
Unavailability of respective information providing authority	0.24	9
Higher call rate	0.19	10
Network problem	0.06	11

4. Conclusion and recommendations

Integrated Information is one of the key inputs in agriculture whereby information deficit constraints agricultural productivity. Due to several constraints, extension system is unable to meet the information needs of the farming community. In this context, it is felt that Information and Communication Technologies (ICTs) can complement and supplement the efforts of existing information dissemination systems. This paper discussed the use of mobile phones by farmers for seeking agricultural information from agricultural extension agents. Results showed that farmers are falling in broader two categories, first majority had low cell phone contact and second majority had no cell phone contact with agricultural extension agents. Therefore, there have a great opportunity to encourage, trained and motivate farmers to use cell phone as an easy communication medium. Although few number, but it's a matter of encouraging that rural farmers are started to seeking agricultural information using cell phone. Easy, fearless and appropriate technological information will encourage farmers to use mobile phones. Education is an important factor to implement ICT based extension channel. Appropriate scheme should be taken to educate farmers enough to understand function and use of mobile phone. Extension agents themselves can play a vital role to implement ICTs based approaches in field of Bangladesh. Further study should be continued about use of cell phone by the farmers in receiving agriculture information to designated extension policy with up to date.

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