



Use of mobile phone in receiving information on fish culture: A case study of farmers in Bangladesh

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Use of the Mobile phone in agricultural arena specifically fisheries sectors is one of the issue in the concurrent world both in fish culture and its marketing. Thus, the study was under taken mainly to determine the extent of use of mobile phone by the farmers in receiving information on fish culture and to explore the relationship between the selected characteristics of the farmers and their use of mobile phone in receiving information on fish culture. The study was conducted in three villages of Kaladho union at Fulbaria Upazila in Mymensingh district. The Fish farmers of the three villagers at Kalabho Union of Fulbaria Upazila who have been using mobile phone as a communication media were the population (502) of the study while twenty percent of the fish farmers were selected as sample (100) following simple random method. Data were collected from 100 randomly selected farmers during the period from 15 September to 15 October, 2017 using a pre-tested interview schedule. Appropriate scales were developed and use in order to measure the concerned variables. Collected data were analyzed using descriptive statistics while Pearson's Product Moment Correlation were also used for the same. The findings indicated that 59 percent of them had low use of mobile phone while the rest 39 percent of them had medium use of mobile phone and 2 percent of them had high use of mobile phone. Among eleven characteristics of the farmer's education, annual family income, knowledge on fish culture and information seeking tendency of the fish farmers showed significant and positive relationship while age, family size, farm size, credit farming experience received, training received and organizational participation did not show any significant relationship with their use of mobile phone. Besides, the highest proportion (71 percent) of the respondents in the study area faced medium problem, while the rest 29 percent of the respondents faced low problem but none of them belong to high problems category. However, the findings of the study did not show satisfactory results may be because of several problems faced by the farmers in using mobile phone while low literacy, low annual income etc. were also responsible.

INTRODUCTION

Bangladesh is one of the world's leading fish producing countries with a total production of 41.34lakh MT, against a demand of 40.50 lakh MT in 2016-17 resulted in achieving self-sufficiency in fish production (DoF, 2017). Food and Agriculture Organization of the United Nations ranked Bangladesh as 4th largest aquaculture producing country in the world in 2015 (FAO, 2015). Fisheries sector's contribution in Gross Domestic Product was 3.69 percent while it contributed to 22.60 percent to the total agriculture sector of the country. Bangladesh exports 0.77 metric tons of fish and fish products, which accounts to Tk. 4,898 core and 2.01 percent of total export earnings (DoF, 2015).

Fisheries and aquaculture also play a major roles in nutrition, employment and foreign exchange earnings with about 12 million

people are associated with the fisheries sector, of which 6.0 million people rely exclusively on fisheries related activities (DoF, 2015; Shaha, 2003). In an old estimation, it was found that 9.5 million people (73 percent of total population) were involved in subsistence fisheries on the country's flood plains (Azim *et al.*, 2002), the number of fishermen increases dramatically to 11 million between June to October each year. At present there are 4.08 million fish farmers and 2.0 million fishermen in the country (DoF, 2003). It is also estimated that fisheries and related activities support more than 7 percent of the country's population.

On the other hand, communication media is very important in technology transfer in any country. Media play a vital role in agricultural technology transfer. Like in the other parts of the world, in Bangladesh, researchers have already established the importance of communication media in developing agriculture sector and technology transfer process (Halim and Miah, 1996; Kashem and Halim, 1991). Among a variety of communication media, mobile phones have very important roles in transferring information to the people like fish farmers.

Mobile phone technology has a great impact on agriculture sector of many developing countries. The recent explosion of mobile phone access has left agricultural information systems behind. The move to

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mobile phone based system is a natural and potentially more beneficial. Mobile phones have recently started being used for sending SMS-based information. Mobile phones have made the farmer awareness about the present market price information which reduces the role of intermediaries in market value chain.

Fishermen can reduce their transportation cost by using mobile phone which encourages the more production and more benefits of the fishermen. Imperfect information and high transaction costs can constitute major impediments in the fish marketing process (Dao, 2004). Mobile phone can help the farmers to obtain information on input and output prices, the weather and so forth. The information provided needs to be relevant if it is to enable farmers to improve their farm income and/or reduce production cost.

Any message can be diffused within a short time by using mobile phone. The use of mobile phone by the fishermen in receiving a fish culture related information is highly dependent on the selection of information, timeliness of information, its uses and scope of application in the real situation. However, it is necessary to ascertain the use of mobile phone by the fishermen is receiving fish culture related information having the following questions in mind:

- a) Which characteristics of the farmers are related to their use of mobile phone in receiving information on fish culture?
- b) To what extent farmers use the mobile phone in receiving information on fish culture?
- c) Does any relationship between the selected characteristics of the farmers and use of mobile phone?
- d) What are problems faced by the fish farmers in receiving information on fish culture?

Objectives of the Study

The following specific objectives were formulated in order to achieve the purpose of the study:

- a) To determine and describe the selected individual characteristics of the fish farmers.
- b) To determine the extent of use of mobile phone by the farmers in receiving information on fish culture.
- c) To explore the relationship between the selected characteristics of the farmers and their use of mobile phone in receiving information on fish culture.
- d) To identify the problems faced by the farmers in receiving information on fish culture.

METHODOLOGY

The study was conducted in three villages of Kaladho union at Fulbaria Upazila in Mymensingh district. These three villages of Kaladho Union were purposively selected as constitute the locale of the study. Moreover, these three villages are very important on the view of fish culture compared to other villages of Fulbaria Upazila and evidence of agro-based researches is almost absent in this localities. For this reason, the researcher selected these three villages purposively to conduct the research giving emphasis on fish farmers' mobile phone use behavior. The Fish farmers of the three villagers at Kalabho Union of Fulbaria Upazila who have been using mobile phone as a communication media and culture fish at least 0.05 hectare of land were the population of the study. For this purpose an up to date list of fish farmers using mobile phone were prepared with the help of local people and Upazila Fisheries Officers (UFO). The total numbers of the fish farmers using mobile phone in that union were 502 while twenty percent of the fish farmers

were selected as sample following simple random method. Thus, 100 farmers were selected as sample for the present study.

In order to collect relevant information an interview schedule is carefully designed and prepared keeping the objectives of study in view. The statements and questions were set with wide version and they were made simply and easily understandable to the farmers. It contained both open and closed form questions. The interview schedule was pre-tested with ten fish farmers and then final modification was given to the interview schedule according to the experience of pre-test. The researcher himself collected data during 15 September to 15 October, 2017.

Use of mobile phone by the farmers in receiving information on fish culture was the dependent variable of the study. The variable was measured on the basis of using mobile phone. The use of mobile phone score was measured using 4-point rating scale. Score assigned to each of the responses not at all, low, medium and high was 0, 1, 2 and 3 respectively. Thus, use of mobile phone score was computed by adding scores of all 9 information sources (contact with Upazila Fisheries Officer (UFO), contact with fish fry dealer, contact with businessmen for knowing market rate, contact with transportation agent, contact with NGO workers, contact with feed dealer, Local Extension Agent for Fisheries (LEAF), contact with aqua drug dealer and contact with progressive fish farmers). Possible mobile phone use score could range from 0 to 27, where '0' indicates no use and '27' indicates high use of mobile phone in receiving information on fish culture.

RESULTS AND DISCUSSION

Salient features of the respondents

Data contained in Table 1 indicate that largest proportion (45 percent) of the fish farmers were young aged, while 12 percent were old aged and 43 percent were middle. It can be said that the young people may lead the fish farming and make farm more profitable as they probably energetic and innovative as well. Table 1 indicates that most of the farmers (96 percent) were literate while only 4 percent were not literate assuming that farmers may be adopted new technology and innovative. More than half (54 percent) of farmers were belong to medium family size while 82 percent were belonging to small category of farm size. The highest proportion (84 percent) of the respondents had higher income compared to 14 percent having medium income and 2 percent had low income. This higher income may indicate the tendency of investment in the fish farming in the study area. The findings indicate that most of the respondents (99 percent) in the study area were in low to medium organizational participation, which may be indication of poor leadership quality. The most (66 percent) of the respondents belonged to the low category, while 29 percent respondents belonged to medium category and 5 percent respondents belonged to highly experienced category. The reason behind this situation may be the most of the farmers belongs to young to middle aged found in the study area.

A good number of farmers (36%) did not receive any credit while 43 percent farmers belong to low credit and 21% farmers belong to medium credit category. But none of the farmers belong to high credit category. The low results were found while reason may be the most of the farmers having small farm size not require much more credit. The findings indicate that the most (48 percent) of the respondents belonged to the no credit category, while 25 percent respondents belonged to low category and 23 percent respondents belonged to medium and 4 percent are highly trained category. Majority of the respondents (64 percent) had high knowledge on fish culture, while 33 percent had medium knowledge on fish culture and 3 percent had low knowledge on fish

Table 1 Salient features of the selected characteristics of the fish farmers

Characteristics	Measuring unit	Possible range	Observed range	Categories	Fish farmers N = 100	Mean	SD
Age	Number of Year	-	20-76	Young (18-35) Middle aged (36-50) Old (above 50)	45 43 12	39.32	1.13
Education	Years of schooling	-	0-16	Illiterate (0) Primary level (1-5) Secondary level (6-10) Higher secondary (11-12) Above higher (above 12)	4 20 60 13 3	8.70	3.07
Family size	Number	-	2-8	Small (2-4) Medium (5-6) Large (above 6)	34 54 12	4.99	1.46
Farm size	Hectare	-	0.5-2.17	Small farmer (up to 0.99 ha) Medium farmer (1-2.99 ha) Large farmer (3 ha and above)	82 18 0	0.69	0.32
Annual family income	'000' Tk	-	110-1100	Low income (120) Medium income (121-300) Higher (above 300)	2 14 84	4.46	1.43
Organization participation	Scale score	0-24	1-18	Not participation (0) Low (1-8) Medium (9-16) High (above 16)	0 22 77 1	10.33	3.58
Farming experience	Years of farming	-	2-20	Low (up to 6) Medium (7-12) High (above 12)	66 29 5	6.41	3.14
Credit received	Dummy	-	0-600	No credit (0) Low (up to 100) Medium (101-300) High (above 300)	36 43 21 0	80.30	1.15
Training received	Days of training	-	0-18	No training (0) Short training (up to 6) Medium training (7-13) Long training (above 13)	48 25 23 4	3.35	4.08
Knowledge on fish culture	Scale score	0-27	5-23	Low (up to 9) Medium (10-18) High (above 18)	3 33 64	17.09	3.49
Information tendency of fish farmers	Scale score	0-36	5-27	Low (up to 12) Medium (13-24) High (above 24)	12 87 1	17.45	3.73

SD stands for Standard Deviation

Table 2 Use of mobile phone by the farmers in receiving information on fish culture

Range		Categories	Fish farmers		Mean	SD
Possible	Observed		No.	%		
0-27	2-21	Low (up to 9)	59	59	8.50	4.79
		Medium (10-18)	39	39		
		High (above 18)	2	2		

culture. This is because of most of the farmers having secondary to higher secondary education enhancing higher knowledge of the farmers. The findings indicated that more than half of the respondents (87 percent) in this study area have medium information on fish culture. Farmers having knowledge may lead to seeking information from the different sources resulting higher production ensured.

Use of Mobile Phone by the Farmers in Receiving Information on Fish Culture

The observed score of using mobile phone in receiving information by the fish farmers could range from 2 to 21 against the possible score of 0-27. The computed mobile phone use with an average 8.5 and standard deviation 4.79. Based on the observed mobile phone use score the farmers were classified into the three categories as shown in the Table 2.

Data furnished in above Table 2 indicates that the majority (59 percent) of the farmers had low mobile phone use compared to 39 percent having medium mobile phone use while only 2 percent having

high mobile phone user. The finding indicates that the use of mobile phone by the farmers may be increasing day by day in receiving information on fish culture. The young farmers may be the good user while medium to old aged farmers were not for the same issue.

In order to make a rank order of the information sources of contact using mobile phone, the researcher used 9 common information sources relevant to use of the mobile phone. In respect of each source, each farmer was asked to indicate the intensity of information by indicating in favour of any of the four responses as high, moderate, low and no contact at all. The Information Sources Score (ISS) for each of the items was computed by using the following formula while similar formula was used by Khalak, 2017:

$$ISS = I_h \times 3 + I_m \times 2 + I_l \times 1 + I_n \times 0$$

Where,
ISS = Information Sources Score

Table 3 Rank order of information sources (N=100)

Information Sources	Number of respondents indicating problems				Total Information Sources Score (ISS)	Rand order
	High	Moderate	Low	Not at all		
Contact with Upazila Fisheries Officer (UFO)	4	25	52	19	114	1
Contact with fish fry dealer	6	19	47	28	103	2
Contact with businessmen for knowing market rate	4	20	51	25	103	3
Contact with transportation agent	1	19	60	20	101	4
Contact with NGO workers	3	23	40	34	95	5
Contact with feed dealer	1	22	43	34	90	6
Local Extension Agent for Fisheries (LEAF)	1	22	40	37	87	7
Contact with aqua drug dealer	2	20	39	39	85	8
Contact with progressive fish farmers	0	26	28	46	80	9

Table 4 Correlation between selected characteristics of fish farmers and their use of mobile phone in receiving information on fish culture (N=100)

Focus variable	Selected characteristics of the farmers	Correlation coefficient with 98 d.f	Tabulated value of (r) significant	
Use of mobile phone by the farmers in receiving information on fish culture	Age (X_1)	-0.075	0.196	0.257
	Education (X_2)	.208*		
	Family size (X_3)	.057		
	Farm size (X_4)	.103		
	Annual income (X_5)	.309**		
	Organization participation (X_6)	-.043		
	Farming experience (X_7)	-.022		
	Credit received (X_8)	.059		
	Training received (X_9)	.077		
	Knowledge on fish culture (X_{10})	.287**		
Information seeking tendency (X_{11})	.326**			

I_h = Number of farmers indicating high information

I_m = Number of farmers indicating moderate information

I_l = Number of farmers indicating low information

I_n = Number of farmers indicating no information at all

The results are placed in the Table 3. The Table 3 indicates the rank order of the information sources based on the respondent total scores while contact with Upazila Fisheries Officer (UFO) was got the first ranked followed by contact with fish fry dealer and contact with businessman for knowing market rate were got second and third ranked respectively. While contact with progressive farmers was the least choice of information source. However, fish farmers always looking for the person, organizations etc. who giving facilities especially training, credit, fry *etc* will get priority by them like UFO. While UFO provides training, assist to the farmers to get the credit and link with research or others organizations.

Relationship between the selected characteristics of the fish farmers and their use of mobile phone in receiving information on fish culture

Pearson's product moment coefficient of correlation (r) was used to explore the relationships between each of the selected characteristics of the respondents and their use of mobile phone in receiving information on fish culture. While rejection of a null values of 'r' were compared with relevant tabulated values for 98 degrees of freedom at the designated level of probability in order to determine whether the relationship between the concerned variables were significant or not. The results of correlation analysis between the concerned variables have been presented in Table 4.

Among the eleven characteristics of the farmer's education, annual family income, knowledge on fish culture and information seeking

tendency of the fish farmers showed significant and positive relationship while age, family size, farm size, credit received, farming experience, training received and organizational participation did not show any significant relationship with their use of mobile phone. Similar findings found in studied conducted by the Khan *et al.* 2017; Poddar *et al.*, 2017 and Asif *et al.*, 2017. It is predicted that education and knowledge are closely interrelated while it's influences the people especially the farmers to adopt any kind of innovation for their better livelihoods. Besides, knowledgeable farmers understand the issues that it leads to more yield production. So, an educated farmer understands the uses of mobile that make him more cosmopolite. On the other way, a farmer having more income lead to uses more technology like mobile phone that enhances them to make more versatile. Information seeking tendency of farmers indicates their interest on innovations that makes them more profitable.

Problems faced by the fish farmers in receiving information on fish culture

The observed score of problems faced by the farmer in receiving information ranged from 2 to 18. The computed mobile phone use with an average 11.19 and standard deviation 3.94. Based on the observed score the farmers were classified into the three categories as shown in the Table 5.

Data presented in the table 5 indicated that the highest proportion (71 percent) of the respondents in the study area faced medium problem, while the rest 29 percent of the respondents faced low problem but none of them belong to high problems category. It indicates that people living in the study area perceive that they don't have any severe problems because may be their high income, education level, higher knowledge etc.

Table 5 Problems faced by the Fish Farmers in receiving information on fish culture

Range		Categories	Fish farmers		Mean	SD
Possible	Observed		No.	%		
0-27	218	Low (up to 9)	29	29	11.19	3.94
		Medium (10-18)	71	71		
		High (above 18)	0	0		

Table 6 Rank order of the Problems faced by the fish farmers

Items of problem	Number of respondents indicating problems				PI	Rand order
	High	Moderate	Low	Not at all		
Expensive	58	22	16	4	234	1
Mobile phone operating problem	5	64	26	5	169	2
Electricity problem	3	24	64	9	121	3
High cost of repairing	1	37	38	24	115	4
Technical problem of phone	2	26	46	26	104	5
Network problem	1	21	57	21	102	6
Unexpected calls	2	21	53	24	101	7
Lack of servicing centre	1	30	38	31	101	8
Short length of battery charge	1	18	57	24	96	9

Besides, to make a rank order of the problem, 4 point rating scale was used and in respect of each item, each farmer was asked to indicate the intensity of problem by indicating in favour of any of the four responses as high, moderate, low and no problem at all. The Problem Index (PI) for each of the items was computed by using the following formula while similar formula was used by Roy, 2017:

$$PI = P_h \times 3 + P_m \times 2 + P_l \times 1 + P_n \times 0$$

Where,

P_l = Problem Index

P_h = Number of farmers indicating high problem

P_m = Number of farmers indicating moderate problem

P_l = Number of farmers indicating low problem

P_n = Number of farmers indicating no problem at all

The PI of each item thus could range from zero (0) to 300 while zero (0) indicated no problem and 300 indicated very high problem or severe problem by the farmers. Based on the PI value, problems were ranked out and placed in the Table 6.

Data (Table 6) revealed that among the nine selected problem items, “expensive” was got ranked first followed by mobile phone operating problem and electricity were got second and third ranked and also may treated as severe problems. Short length of battery charge was treated as least problems. Problems always hinders the production while these above mentioned problems especially those are treated as severe problems were the responsible not found the high mobile user (only 2 percent) in this study.

But, it is good news for the poor people especially the fish farmers that price of the mobile phone getting low and electricity situation may improve that might a good sign for increasing the mobile phone users. Besides, technical problem may be another important reasons for having the low mobile phone user but it could be improved by increasing the knowledge through educational programs, by providing services etc.

CONCLUSION AND RECOMMENDATION

The use of mobile phone by the fish farmers in the study area was not satisfactory level because of farmers may be faced problems in terms of buying mobile or may be operating the mobile etc. Contact with Upazila Fisheries Officer (UFO) was got the first ranked followed by contact with fish fry dealer and contact with businessman for knowing market rate were got second and third ranked respectively. While contact with

progressive farmers was the least choice of information source. Thus, it may be concluded that government officer especially UFO was very much close and familiar to the farmers resulting frequently come in contact with mobile phone. Among eleven characteristics of the farmer’s education, annual family income, knowledge on fish culture and information seeking tendency of the fish farmers showed significant and positive relationship while age, family size, farm size, credit farming experience received, training received and organizational participation did not show any significant relationship with their use of mobile phone. Therefore, it can be concluded that only education, annual family income, knowledge on fish culture and information seeking tendency of the fish farmers were treated as influential factors that might contribute the farmers to use the mobile phone. Out of the nine selected problem items, “expensive” was got ranked first followed by mobile phone operating problem and electricity were got second and third ranked and also may treated as severe problems. Short length of battery charge was treated as least problems. Thus, it is concluded here that these above-mentioned problem were the responsible for getting the low user of the mobile phone on fish culture. So, GOs, NGOs, policy makers should take into consideration while taking initiatives for improving the farmers’ socioeconomic conditions.

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