FARMERS' TECHNICAL KNOWLEDGE AND ATTITUDE TOWARDS MODERN TECHNOLOGY OF FISH CULTURE OF A SELECTED AREA IN BANGLADESH

Md. Zulfikar RAHMAN, Hidemi MIKUNI,
M. Golam Mahbubul ALAM[*1] and M. Abul KHAIR[*2]

Faculty of Applied Biological Science
Hiroshima University, Higashi Hiroshima 739, Japan

Abstract   The main theme of the study was to determine the technical knowledge about and attitude of the farmers towards modern technology of fish culture. However, 10 selected personal traits of the farmers were also determined to explore their relationship with technical knowledge and attitude towards modern technology of fish culture. The study area was the Chandpur Sadar Thana of Southern part of Bangladesh. Data were collected from randomly selected 250 farmers of 5 Union Parishads of this Thana during September to October 1994 using personal interview schedule in face to face situation. Product Moment Correlation Coefficient (r) has been used to findout the correlations among the variables. Findings showed that 60% of the respondents had their low level of technical knowledge and only 21% had their high level of knowledge. Data also showed that a little over two-thirds (70%) of the respondents had a favourable attitude towards modern fisheries and only 24% possessed unfavourable attitude. The 'r' values indicate that the 6 variables were significantly related to the technical knowledge of the farmers, only family size was negatively related. The education, cosmopoliteness, annual income, organizational participation and communication media use were positively related. On the other hand, repondents' education, cosmopoliteness, communication media use and fisheries problem confrontation were positively and only family members engaged in fisheries and fatalism were negatively correlated with their attitude towards modern technology of fish culture.

Key Words: Technical knowledge, attitude, fish culture, Bangladesh.

INTRODUCTION

Bangladesh is a land of rivers. Other than the three main rivers of the country, i. e. Padma, Jamuna and Meghna, there are so many small inland rivers, lakes and ponds also. The rivers are mainly from India falling into the Bay of Bengal flowing over the different parts of the country. From the bird's eye view, the rivers look like a net-like structure with so many marshes and ditches. Various kinds of fishes are produced in these rivers and ponds spontaneously. Though rice is the staple source of carbohydrate, fish contributes about 75% of the total animal protein consumption of this nation (KHAN, 1994). It is also

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[*1] Riverine Research Station, Fisheries Research Institute, Chandpur, Bangladesh

[*2] Fisheries Trainging Institute, Chandpur, Bangladesh

reported in the same study that the per capita fish consumption in Bangladesh is still low. Yields of inland fisheries are also among the lowest in Asia; 39% of inland fish is produced in ponds, 31% in rivers and 25% in beels and haors etc. But in the case of food grain production specially the rice is almost toward self-sufficiency for the country. The modern production techniques have also been adopted at a satisfactory level for crop cultivation.

But, the fish production practices and the Fisheries sector is still lagging behind compared to crop production. The traditional fish production system is prevailing in almost all areas except some for lobster and shrimp cultivation. Farmers' knowledge is also not upto the level for modern fish production techniques. As most of the farmers are illiterate, their attitude is also not clearly expressed towards modern fish culture. But to improve the overall fisheries system of the country, the producers' knowledge, technological know-how and attitude towards modern fish production practices should get basic priority and should be modified positively. It is needless to say that the economy of the country is fully agrobased. Earning of foreign exchange is also dependent on the export of agricultural products. Among these agricultural export materials, the frozen or processed fish contribute a lion share. Again to meet up the animal protein consumption and to earn foreign exchange, there is a lot of possibility to develop the fisheries sector of this country. However, with this end in view, the present piece of study has been taken into consideration with the following main objectives:

i) to determine the farmers' selected personal traits relating to fish culture

ii) to know the farmers' knowledge about and attitude towards modern practices of fish culture

iii) to reveal the relationships of the farmers' knowledge and attitude towards modern fish culture with their selected personal traits

METHODOLOGY

Study Area and Data Collection

The study area was the Chandpur Sadar Thana (i. e. subdistrict) of Chandpur district which is located in the Southern part of Bangladesh (shown in Map 1). In this Thana there are 9,503 ponds of which only 5,504 ponds are under active cultivation and the other 3,999 ponds are almost fallow. Again there are 2 *Zalmahal* (i. e. large open-water fishing ground under Government possession in which the only registered farmers can do fishing after giving tolls to the Government), 3 personal 'Hatchery' and 4 personal 'Nurseries'. Riverine Station of Fisheries Research Institute and Fisheries Training Institute of Bangladesh are also located in this area. However, this area deserves speciality regarding fish culture.

Fourteen Union Perishad (i. e. the lowest level of administrative unit of Bangladesh) comprise of this Thana. Among these 14 Union Parishad, only 5 were selected randomly. Again, 50 fish farmers were chosen randomly from each of the 5 Union Parishards making a total sample of 250 farmers. The list of population of these 5 Union Parishad were prepared in such a way that of the farmers was engaged in fish farming of their own though they varied in operational strength. However, data were collected during September to October 1994 in a face to face situation using structured personal interview schedule.
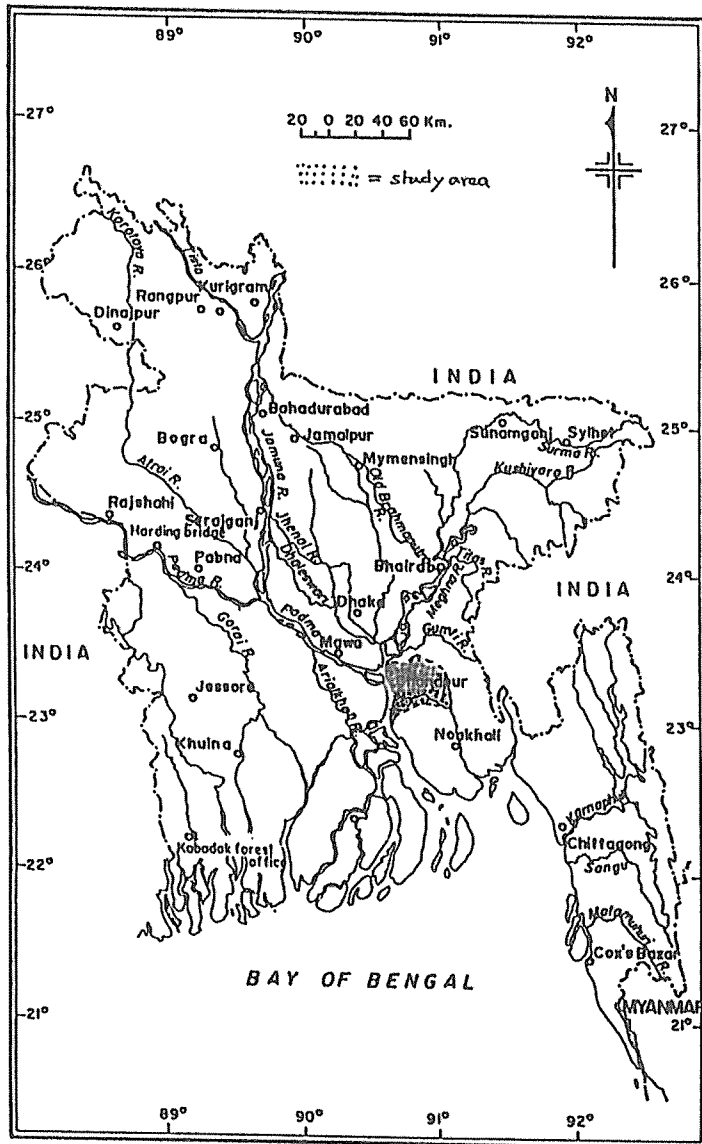
Map 1. Map of Bangladesh showing the river system and the district of study area (Adapted from Khan, 1994).

Variables of the Study

Ten selected personal traits of the respondents were considered as the independent variables of the study. The selected traits were – age, education, family size, number of family members engaged in fish farming, cosmopoliteness, annual income, organizational participation, fatalism, fisheries problem confrontation and use of communication media. On the other hand, farmers' knowledge about and attitude toward modern fish culture were the two dependent variables of the study.

Definition of Some Key Terms

Education: It was the length of schooling completed by the respondent upto the time of data collection.

Family size: It is the number of the individuals who live in the same residence and eat together. This includes the respondent himself, his wife and children, and dependent, if any.

Family members engaged in fish farming: It was meant as the total number of family members engaged in fish farming of different age category.

Cosmopoliteness: In this study cosmopoliteness is defined as the respondents' frequency of usual traveling to different public places, town or cities during a specified period of time.

Organizational participation: It was calculated by combining the respondents' number and types of organizations participated with positinal variation.

Fatalism: It was the respondents' belief that events are decided by fate and are outside human control.

Fisheries problem confrontation: It was the sum total of the problems faced by the farmers concerning modern fish farming.

Use of communication media: It meant the different sources of information consulted/used for fish farming in a scientific way by the respondents.

Technical knowledge: Knowledge means the state of being informed about something (LONGMAN, 1987). Here, technical knowledge means the knowledge about the fact, information, skills and understanding etc. for modern fish farming.

Attitude: It is a way of feeling or thinking about someone or something, especially as this influences ones behaviour (LONGMAN, 1987). Attitude contains three main elements i. e. knowledge, belief and action. In this study, attitude is considered as the outcome of behavioural thinking and action thereof as reflected against some selected and relevant statements about modern fisheries.

Statistical Analyses

Mean, standard deviation and minimum/maximum scores were obtained for each of the personal traits of the resapondents. Relationships of the personal traits of the respondents with their knowledge and attitude towards modern fish culture were computed using Pearson's Product Moment Correlation Coefficient (r). Five percent level of probability has been used for accepting or rejecting the observed 'r' value.

RESULTS

Personal Traits of the Farmers

As the knowledge and attitude of the respondents were the main focus of this study and to minimize the length of the article, the salient statistical values of the personal traits of the farmers are presented in a simple form in Table 1.

Farmers' Knowledge about Modern Fish Culture

It is already mentioned that the technical knowledge mentioned here is the state of being knowing about the fact, information, skills, technical know-how, understanding etc. for

Table 1. Some basic statistics about the personal traits of the respondents

Personal traits of the respondents	Possible score		Obtained score		Mean value	Standard deviation
	Maximum	Minimum	Maximum	Minimum		
1. Age	—	—	68.00	23.00	40.12	8.74
2. Education	—	0	14.00	00.00	05.70	3.12
3. Family size	—	1	09.00	02.00	05.85	1.55
4. Family members engaged in fish culture	—	1	05.00	01.00	02.43	0.98
5. Cosmopoliteness	—	0	13.00	06.00	9.65	1.61
6. Organizational participation	—	0	17.00	00.00	01.82	1.79
7. Fatalism	28	0	20.00	07.00	10.61	2.30
8. Annual income	—	—	110.00	10.00	41.00	18.69
9. Fisheries problem confrontation	68	0	68.00	04.00	50.54	8.34
10. Use of communication Media	80	0	32.00	10.00	19.43	3.71

modern fish production technologies. To measure the technical knowledge, 20 questions regarding modern fish culture were asked to the farmers each of which had been assigned a defined score for correct answer. The assigned score for each correct answer were varied according to the weight of the question. Hence, the scores for each correct answer were not all equal. However, if the assigned scores for each respondent is summated, it would be total 100. So, a respondent might get a maximum score of 100 and minimum of 'O'. A respondent may obtain a fractional score for partial answering of each of the questions.

The observed data indicate that the technical knowledge score of the farmers ranged from 21 to 77 with a mean value of 43.14. From Table 2 it is also observed that 60% of the farmers had their poor knowledge on modern fish culture techniques. But only 21% of the

Table 2. Distribution of the farmers according to their technical knowledge levels about modern fish culture.

Farmers' knowledge category	Respondents		Mean value	Standard deviation
	Number	Percent		
Low (score of ≦ 40)	150	60.0		
Medium (score of 41-65)	48	19.2	43.14	15.88
High (score above 65)	52	20.8		
Total	250	100		

farmers had their high level of technical knowledge about modern fisheries practices. In another Bangladeshi study conducted with the wheat growers it was found that a large proportion (49%) of the farmers had their high or medium level of knowledge gap (RAHMAN et al., 1992) indicating the low or medium level knowledge of the farmers about the existing modern wheat technologies. Similarly, 60% of the fish farmers of this present study

possess only a few knowledge about the modern fisheries which is not desirable at all.

Farmers' Attitude toward Modern Fish Culture

Human attitude is a very much complicated dimension and is associated with so many socioeconomic, environmental and hereditary factors. Hence, it is bit difficult to measure the human attitude. However, to ascertain the attitude of the respondents of this study, a total of 20 related statements were selected and farmers were asked to respond against each of these statements. There were the scope of 5 types of response categories – 'fully agree', 'agree', 'no opinion', 'do not agree' and 'do not agree at all' having a assigned score of 4, 3, 2, 1 and 0 respectively. Thus, a respondent could get a maximum of 4 and minimum of 0 for each of the statements and the total attitude score of a respondent might be upto 80 and minimum of 0.

However, the observed scores of the respondents ranged from 35 to 72 with an average of 50 (Table 3). Based on their attitude scores, the respondents were categorized as unfavourable, neutral and favourable. Data furnished in Table 3 reveal that a little over

Table 3. Distribution of the farmers according to their attitude levels toward modern fish culture.

Farmers' attitude category	Respondents		Mean value	Standard deviation
	Number	Percent		
Unfavourable (score of=39)	61	24. 4		
Neutral (score on exact 40)	15	6. 0	50. 55	10. 61
Favourable (score above 40)	174	69. 6		
Total	250	100		

two-thirds (70%) of the respondents had favourable attitude toward modern fish culture and only 6% of them were neutral possessing no opinion regarding the statements mentioned to them. Further, 24% of them had unfavourable attitude. The mean score of 50.55 and the attitude score range of 35 to 72, however, show that the overall expression of attitude of the respondents was quite good. So, it might be said that the respondent farmers possess a good and favourable mentality about the modern fish technology. But, Huque (1982) found that 60% of the Filipino rice farmers were either unfavourable or neutral toward M-99 program. Again, Mahboob et al. (1978) even found a higher proportion (38%) of the Union Assistants were unfavourable and 6% were neutral toward extension organization. But, in another study conducted with the Block Supervisors, Rahman (1991) found that nearly two-thirds (64%) of them had favourable attitude toward Training and Visit System of extension work. It is also opined in that study that if a significant portion of the clients or change agents remain unfavourable to any specific program or to the organization for planned change, it is impossible to make any program successful. Considering this comment in view, the favourable attitude of most of the farmers of this present study is quite alarming and is very much desirable for the process of fisheries technology transfer.

Relationship between the Selected Dependent
and Independent Variables

Pearson's Product Moment Correlation Coefficient (r) values among the independent variables (i. e. the personal traits of the farmers) and the dependent variables (i. e. the technical knowledge and attitude towards modern fish culture) are presented in Table 4. The 'r' values from Table 4 clearly indicate that out of total 10 independent variables only 6 were significantly related to both of the technical knowledge and attitude of the

Table 4. Relationship between the selected dependent and independent variables of the study.

Serial number	Independent variables (i. e. personal traits of the respondents)	Correlation coefficient (r)	
		Technical knowledge	Attitude
1.	Age	−0.1010	−0.0381
2.	Education	0.3096*	0.1567*
3.	Family size	−0.1513*	−0.0468
4.	Family members engaged in fisheries	−0.0835	−0.1420*
5.	Cosmopoliteness	0.4001*	0.1740*
6.	Annual income	0.1878*	0.1028
7.	Organizational participation	0.3463*	0.0416
8.	Fatalism	−0.0981	−0.3934*
9.	Communication media use	0.3366*	0.2275*
10.	Fisheries problem confrontation	−0.1159	0.7083*

* Significant at 5% level of probability
[Critical value (2-tail, 0.5)=/−0.12409; N=250]

respondents. Among the 6 variables related to the technical knowledge of the farmers, only family size was negatively and the other 5 were positively correlated. The negative significant relationship indicates that the decrease of technical knowledge occurs with the increase of family size. Probably, due to the burden of large families, the farmers got less chance to engage themselves in gathering scientitic knowledge about modern fish culture contacting with so many effective sources of scientific information. On the other hand, the positive significant relationship of 5 variables (i. e. education, cosmopoliteness, annual income, organizational participation and communication media use) indicate that the technical knowledge about the fish culture increases with the increase of the values of these 5 personal traits of the farmers.

Again, out of 6 significant correlated variables, respondents' education, cosmopoliteness, communication media use and fisheries problem confrontation were positively and only family members engaged in fisheries and fatalism were negatively related with the attitude towards modern fish culture. The negative correlation between fatalism and attitude towards modern concept of fish culture is normally found to be more or less logical. Because, fatalism of the farmers toward any thing or opinion expresses his backwardness and somewhat reluctance towards modern, logical, scientific technology as the fatalistic people normally tends to depend more on their fate. So, the same concept is expressed with the significant relationship that the high rate of fatalism of the farmers minimized their favourable attitude towards modern fish culture techniques.

DISCUSSION

Human knowledge about and attitude towards something/someone depends on so many factors concerned. Again, human nature is varied from individual to individual with their state of knowledge and attitude towards something. The present study has been conducted to determine the selected personal characteristics of the respondents and to explore the relationship with their knowledge and attitude towards modern technology of fish culture. However, based on the findings of the study the following conclusions were drawn and recommendations were put forwarded for policy implication.

1. Findings indicate that 60% of the farmers possessed the low level of technical knowledge and only 21% high grade of the same. So, it can be said that the farmers were still not well acquainted about the modern fisheries. Again, the coefficient r value (0.3096) indicates that their general education had a significant positive impact on their technical knowledge. Hence, it might be concluded that the necessary steps should be taken by the Fisheries Extension Department to enhance the technical know-how of the fish farmers of the study area through different educational programs, communication campaign, on-farm research, etc.

2. It is observed that most of the farmers (70%) had their favourable or neutral attitude towards the different aspects of modern fish culture. That is, the farmers possessed a good mentality towards accepting modern fish farming systems. So, their favourable attitude should be nurtured and concerned developmental programs can be launched among them easily utilizing their such favourable attitude. Again, farmers attitude is positively related to their educational achievements. So, it can be said that the farmers would possess favourable attitude if they are more educated.

3. The r value of −0.1513 and −0.0468 indicate that the larger family of the farmers affected negatively on their possessing of technical knowledge significantly and in a negative way on their attitude also. This effect might be due to the heavy load of their family. However, motivation campaign should be taken by the concerned family planning department so that the farmers might keep their family size reasonable to have a peaceful economy and to maintain the family easily.

4. The cosmopolitan behaviour of the farmers had a significant relationship with their knowledge and attitude. So, it can be told that if the farmers move to defferent public places and gatherings for their different purposes, their outlook would be broadened increasing their knowledge and attitude towards scientific techniques. Hence, it might be suggested that farmers should be motivated not to be localite and to secure views and opinions from different places to have their mental faculty developed.

5. Finding show that fatalistic behaviour of farmers had a significant negative relation with their knowledge and a simple negative trend is found for attitude towards modern technology of fish culture. It indicates that the fatalism affected their technical knowledge and attitude adversely. On the other hand, education of farmers increased their both technical knowledge and attitude. So, it might be concluded that the fatalistic expression of the farmers should be removed to make them inclined to scientific and modern views. In this regard mass literacy program might play an important role in

broadening their views and to teach them not to depend only on fate.

6. The correlation coefficient values indicate that the farmers' use of communication media for their fish cultivation had a significant positive effect on their increase of both technical knowledge and favourable attitude. That is, their contact with different communication sources increased their knowledge of technology and consequently helped form favourable attitude towards the same. So, farmers should be motivated by the concerned change agents towards the benefits of using modern and scientific technology so that they might be inspired to contact with different sources of information themselves. Because, the contact with so many channels makes them equipped with technical know-how and helps achieve favourable tendency towards modern thinkings. However, different types of communication media (e. g. individual, group, mass etc.) might be used simultaneously during the process of technology transfer for planned change of modern fish culture.

REFERENCES

HUQUE, M. M., 1982, Masagana-99 Farmers' Perception of the Effectiveness of Communication Media and Their Use in Bay, Laguna. *M. S. Thesis,* UPLB, Philippine.

KHAN, M. A. H. 1994, Environmental Aspects of Surface Water Development Projects in Bangladesh. In: *Environment and Development in Bangladesh,* (Rahman, A. A., Haider, R., Huq, S. and Jansen, E. G., editors) Vol. 2, University Press Limited, Dhaka.

LONGMAN, 1987, *Dictionary of Contemporary English.* Orient Longman Ltd., Madras.

MAHBOOB, S. G., RASUL, G., ALAM, M. S. and ISLAM, M. M., 1978, *A Study of Union Assistants in Bangladesh,* Dept. of Agricultural Extension & Teachers' Training, Bangladesh Agricultural University, Mymensingh.

RAHMAN, M. Z., 1991, Credibility of Block Supervisors in Sadar Upazila under Mymensingh District, *M. Sc. (Ag. Ext. Ed.) Thesis,* Dept. of Agricultural Extension & Teachers' Training, Bangladesh Agricultural University, Mymensingh.

RAHMAN, M. Z., ISLAM, K. M. M. and ISLAM, K. M. M., 1992, Technological Gap among the Wheat Growers of Sadar Thana under Kurigram District, *Bangladesh J. of Extension Edu,* 7(1 & 2):57-62.

バングラデシュにおける近代的漁業技術
に対する農民の技術知識と態度

RAHMAN, M. Z., 三國　英實,
ALAM, M. G. M. and KHAIR, M. A.

広島大学生物生産学部, 東広島市 739

　この研究の課題は近代的漁業技術に対する農民の技術知識と態度を確定することである。農民について10の選ばれた人格的特質が，これらと近代的漁業技術に対する技術知識と態度との関連を解明するために設定されている。この研究の対象地域はバングラデシュ南部のチャンドプール・ソードール・ターナ地方である。データは，1994年の9月から10月の間に，ターナ地方の5つのユニオン・パリシャドで無作為に選ばれた250人の農民から会見方式による聞き取り調査によって集められたものである。変数間の相互関係を解明するためにプロダクト・モーメント相関係数 (r) を採用した。調査結果は回答者の60%は低い水準の技術知識をもっており，わずか21%だけが高水準の技術知識を保有していることを示した。データはまた回答者の3分の2強（70%）が近代的漁業に対して好意的態度を持っていることを示し，わずか24%が非好意的態度を保有していることを示した。相関係数 (r) は，人格的特質のうち6つの変数が農民の技術知識と有意な相関関係にあり，ただ家族規模のみが負の関係にあることを示している。教育，コスモポライトネス，年間所得，組織的参加，伝達手段の利用は正の関係にある。他方，近代的漁業技術に対する農民の態度では，回答者の教育，伝達手段の利用，漁業問題への遭遇は正の関係にあり，漁業に従事した家族数，宿命的認識のみが負の関係にあることを示した。

キーワード：技術知識，態度，漁業，バングラデシュ