

## Problem Confronted by the Fish Farmers in Practicing Semi-intensive Climbing Perch (*Anabus testubineus*) Farming

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### Abstract

Climbing Perch is one of the most important aquaculture fish species for its production and popularity among the people in Bangladesh. The study was conducted to identify and describe the problem confronted by the fish farmers regarding practice of semi-intensive climbing perch farming; to describe the selected characteristics of the fish farmers; and to explore the relationships of the selected characteristics of the fish farmers with their problem confrontation. Data were collected from 105 farmers from Mymensingh district in Bangladesh during the period of March to April, 2011. Personal interview method was used to collect data from the farmers. To measure each of the items in rank order, Problem Confrontation Index (PCI) was developed. Among the twenty selected problems “Lack of marketing facilities” got the highest PCI (290) where “Social or political problems” got lowest PCI (2). The findings indicate that the highest proportion of the fish farmers (56%) confronted moderate level of problem in practicing semi-intensive climbing perch farming, while, 31% and 13% of them confronted high and low level of problem, respectively. Correlation analysis indicates that among selected characteristics of the fish farmers such as, age, educational level, annual income, fish farming experience, communication exposure, training exposure and knowledge on climbing perch farming had significant negative relationship with their problem confrontation. Thus, it can be concluded that the fish farmers confronted significant problems in practicing semi-intensive climbing perch farming. Department of Fisheries (DoF), the sole government extension services provider to fish farmers and other non-government organizations work for increasing fish production should take necessary steps to address those issues for minimizing farmer’s problems.

*Keywords: Problem, confrontation, semi-intensive, climbing perch farming, fish farmer*

### Introduction

Aquaculture is one of the most potential and important sector in Bangladesh where a core of the national economy comes from. About 5% of gross domestic product and 6% of foreign export earnings are accounted from this sector. Labor employment in this sector has been increasing by 6% approximately. No other sector in Bangladesh illustrates development potential more clearly than aquaculture. The total fish production in Bangladesh in 2011

was estimated at 2.8 million tons, of which 1.14 million tons (41%) were obtained from inland aquaculture, 1.08 million tons (38%) from capture fisheries and 0.58 million tons (21%) from marine fisheries (DoF, 2011). Bangladesh is blessed with the world’s richest and most diverse inland aquatic ecosystem having a wide variety of living aquatic resources scattered all over the country in the form of small ponds, beels, lakes, canals, small and large rivers and

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estuaries. But, the present rate of fish production is lesser than that of the population boom (Hasan *et al.*, 2010). Only 7.71% ponds all over the country are used for commercial venture and the rest are used for non-commercial practices (Hossain and Das, 2013). To fulfill the demand of increasing population it is important to practice fast growing fish culture. Among the live fishes climbing perch (*Anabas testudineus*), commonly known as Koi, is an indigenous and demandable fish in Bangladesh (Rahman, 1995). The species is considered as a valuable item because of its special nutritive and medicinal qualities and fast growing abilities as well. The farmers of the study area mostly have been practicing semi-intensive fish farming since 2008. Thai Climbing Perch (*Anabas testudineus*) was found as dominated species along with Thai Pangus

(*Pangasiadon hypophthalmus*) and other carp species in the study area where thai climbing perch is found to be trading overseas. However, during practicing semi-intensive climbing perch farming the farmers of the study area usually face some problems associated with it. On the other hand, there was not enough systematic study on the subject matter. Considering the above facts, the researchers undertook this research and formulated the following objectives: (i) to identify and describe the problem confronted by the fish farmers in practicing semi-intensive climbing perch farming; (ii) to describe the selected characteristics of the farmers producing climbing perch; and (iii) to explore the relationships between the selected characteristics of the fish farmers and their problem confrontation.

## Methodology

### Study area, population and sampling

The study was conducted at Muktagachha Upazila under Mymensingh district in Bangladesh. The study area was selected purposively for investigation, because there was large number of fish farmers have been practicing semi-intensive climbing perch farming since 2008. The farmers who culture climbing perch commercially were the population of the study. The total list of the fish farmers was obtained from the office of the Upazila Fisheries Officer of Muktagacha Upazila. Simple random sampling method was used for selecting the respondents from the list of fish farmers. A total of 419 climbing perch farmers constituted the population from where 105 farmers were selected as sample of the study. The empirical data were collected using personal interview method along with

Focus Group Discussions during the (FGDs) period of March to April, 2011.

### Selection and measurement of explanatory and focus variables

The explanatory variables of the study were 10 selected characteristics of the fish farmers practicing climbing perch. These were age, level of education, household size, farm size, fish farming experience, annual family income, communication exposure, training exposure, social mobility and knowledge on climbing perch farming. Most of the explanatory variables were measured by developing scales based on the raw scores (Table 1).

Problem confrontation of the farmers in semi-intensive climbing perch farming was the focus variable of the study. Researcher used a 4-point rating scale for measuring

problem confrontation score. The farmers were asked to give their responses against 20 selected problematic items which they confronted for climbing perch farming. The weights assigned for each response were: 3 for high problem confrontation, 2 for medium problem confrontation, 1 for low problem confrontation and 0 for no problem confrontation. The problem confrontation score was obtained by adding weights of responses of the problems and therefore, the problem confrontation score could range from 0 to 60, where 0 indicating 'no problem' and 60 indicating 'highest problem'. For making rank order Problem Confrontation Index (PCI) was computed as used by Hossain and Miah (2011). The PCI was computed by using the following formula:

$$PCI = Ph \times 3 + Pm \times 2 + Pl \times 1 + Pn \times 0$$

Where,

PCI = Problem Confrontation Index

Ph = Percentage of fish farmer with problem "high problem"

Pm = Percentage of fish farmer with "moderate problem"

Pl = Percentage of fish farmers with "low problem"

Pn = Percentage of fish farmers with "no problem"

Thus, the PCI of individual problem could range from 0 to 300, where 0 indicating 'no' problem and 300 indicating 'high' problem confrontation.

## **Findings and Discussion**

### **Socioeconomic background of the fish farmers**

The ten selected characteristics of the fish farmers related to socio-economic background of the study were considered. The characteristics profile of the climbing perch farmers has been presented in the Table 1.

Data in Table 1 reveals that majority of the fish farmers practicing climbing perch (42.86%) were middle-aged and highest proportion of the farmers (54.29%) had their education up to secondary level. The highest proportion of the respondents (41.9%) had the medium sized household

while the farm size of the highest proportion of the farmers (59%) was medium.

Data also indicates that the majority of the fish farmers (50.5%) were in medium income category while farming experience of the highest proportion of them (46.67%) was medium. It also found that the highest proportion of the respondents (61.9%) had low communication exposure and a significant proportion of them (75.24%) had no training on fish farming. Data also reveals that more than three-fifth of the farmers (61.90%) had medium social mobility while the highest proportion of them (44.76%) had medium level of knowledge on climbing perch farming.

Table 1 Characteristics profile of the respondents (n=105)

Characteristics (Measuring units)	Score ranges		Categories	Fish farmers		Mean	SD
	Possible	Observed		No.	%		
Age (Years)	unknown	21-65	Young (up to 35)	38	36.19	40.54	10.38
			Middle aged (36-50)	45	42.86		
			Old (above 50)	22	20.95		
Educational level (Total years of schooling)	unknown	0.5-18	Illiterate (0)	0	0	8.12	3.91
			Can sign only (0.5)	9	8.57		
			Primary (1-5)	22	20.95		
			Secondary (6-10)	57	54.29		
			Above secondary (Above 10)	10	16.9		
Household size (No. of members)	unknown	3-12	Small (up to 4)	23	21.9	6.18	2.15
			Medium (5-8)	44	41.9		
			Large (above 8)	38	36.9		
Farm size (Hectare)	unknown	0.22-3.87	Small (0.21-1.0)	32	30.5	1.21	0.845
			Medium (1.01-3.0)	62	59		
			Large (>3.0)	11	10.5		
Annual family income (000' Taka)	unknown	83.5-300.5	Low (up to 100)	9	8.6	350.03	242.0
			Medium (100-200)	53	50.5		
			High (above 200)	43	40.9		
Fish farming experience (Years)	unknown	1-6	Less (up to 2)	48	45.71	2.78	1.03
			Medium (3-4)	49	46.67		
			High (above 4)	8	7.62		
Communication exposure (Scores)	0-36	4-21	Low (up to 12)	65	61.9	11.59	3.48
			Medium (13-24)	40	38.1		
			High (above 24)	0	0		
Training exposure (Days)	unknown	0-9	No training	79	75.24	0.90	1.85
			Low (up to 1-3)	20	19.05		
			Medium (4-6)	1	0.96		
			High (above 6)	5	4.76		
Social mobility (Scores)	0-21	6-20	Low (up to 7)	15	14.29	11.55	3.34
			Medium (8-14)	65	61.90		
			High (above 14)	25	23.81		
Knowledge on climbing perch farming (Scores)	0-24	8-23	Low (up to 12)	20	19.05	16.45	3.82
			Medium (13-18)	47	44.76		
			High (above 18)	38	36.19		

**Problems confronted by the fish farmers**  
Fish farmers' problems in culturing climbing perch fish were measured by placing the problematic items in rank order. The farmers were asked to mention the extent of problems they confronted in

climbing perch farming where farmers mentioned the extent of confrontation of the each problem. For determining the extent of confrontation of the individual problem, rank order was made by computing Problem Confrontation Index (PCI).

Table 2 Rank order of the problems based on their extent of confrontation

Items of Problems	No. of farmers (105)				PCI	Rank order
	No (%)	Low (%)	Moderate (%)	High (%)		
Lack of marketing facilities	0	2	6	92	290	1
Low market price of climbing perch	0	5	1	94	289	2
High price of fish feed	0	0	18	82	282	3
High price of chemicals and drugs for disease control	0	0	30	70	270	4
High density of climbing perch	1	4	22	73	267	5
High price of farm labor	1	1	35	63	260	6
Lack of investment in climbing perch farming	0	5	40	55	250	7
Lack of quality fingerlings	2	6	34	58	248	8
Production cost high compared to low profit	5	2	40	53	241	9
Disease problem in climbing perch	0	10	60	30	220	10
Lack of technologies for management practices	4	16	69	11	187	11
Lack of knowledge in climbing perch farming	4	17	70	9	184	12
Lack of ingredients in the locality	4	21	70	5	176	13
Amount of feed supply	4	39	45	12	165	14
Bloom water in climbing perch farming	2	44	45	9	161	15
Gases on the pond bottom	2	45	48	5	156	16
Lack of water exchange capacity	41	27	19	13	104	17
Seasonal floods in the pond areas	86	12	2	0	16	18
Lack of security in the fish farm	95	4	1	0	5	19
Social or political problems	98	2	0	0	2	20

PCI= Problem Confrontation Index

The Table 2 reveals that lack of marketing facilities of climbing perch ranked first in the rank order with highest PCI -290. Marketing facilities include well transport system, freezing facilities, live fish marketing channel and value added system etc. Without proper marketing system the fish farmers become discouraged to culture fish and thus, they opined it as major problem. According to Hasan (2005), lack of opportunities and marketing was ranked fifth in the rank order. Islam (2010) found that lack of marketing facilities was one of the most important constraints for fish production which is in line with the present study. The another problem i.e. low market price of climbing perch ranked second in the rank order with PCI 289 which is also important aspect of increasing production of fishes. Farmers like to get profit from their investment but the farmers opined that the market price fluctuates overtime. And thus, they become vacillated whether will culture climbing perch or not. This problem was ranked fourth and sixth in two different studies carried out by Parvez (2009) and Rahman (2009), respectively. Rahman (2010) found that low price of fish was ranked fifth in his study about aquaculture management practices followed by the fish farmers.

High price of fish feeds and high price of chemicals and drugs for disease control were the major problems faced by the farmers. Related to the financial problem,

the farmers confronted problems of acquiring various fishing equipments and inputs. Haider (2008), in his study found that 62% of the respondents reported high price of inputs (fertilizers and feeds) is a constraint for fish rearing. Parvez (2009) found that high price of fertilizer, feed and other inputs was ranked third top problem in a rank order of fifteen selected constraints as faced by the farmers in small scale aquaculture. Shitote *et al.* (2010) found that unavailability and cost of commercially produced feeds has resulted stagnation in fish farming leading to household food insecurity and low contribution to livelihoods in Kenya. The Table 2 also reveals that among the 20 selected problems social or political problems in practicing semi-intensive climbing perch farming ranked at the bottom of the rank order with PCI 2. It might be that there was no political or social pressure in inhibiting the fish farming and thus, the farmers of the study area opined in this way.

#### Overall problem confrontation

The average problem confrontation score of the farmers is 34.18 with standard deviation of 11.36. Based on the problem confrontation score, the farmers were classified into three categories i.e. low, medium and high problem confrontation. Distribution of the respondents according to their problem confrontation has been shown in the Table 3.

Table 3 Distribution of farmers based on their overall problem confrontation

Categories	Respondents		Mean	SD
	Number	Percent		
Low problem (0- 20)	14	13	34. 18	11.36
Moderate problem (21-40)	59	56		
High problem (41-60)	32	31		

Data presented in the Table 3 show that the highest proportion of the respondents (56%) had medium problem in practicing semi-intensive climbing perch farming, while 31% and 13% of them had high and low problem, respectively. The findings indicate that majority of the farmers (87%) confronted medium to high problems in the study area concerning semi-intensive climbing perch farming. Islam (2009) also found similar findings in his study.

#### Relationship between the selected characteristics of the farmers and their problem confrontation

Pearson's product moment co-efficient of correlation (r) was used to ascertain the relationships between the selected characteristics of the fish farmers and their problem confrontation in practicing semi-intensive climbing perch farming. The results of correlation have been shown in the Table 4.

Table 4 Correlation between exclamatory and focus variables

Focus variable	Exclamatory variables	Co-efficient of correlation 'r'
Problems confronted by the fish farmers in practicing semi-intensive climbing perch farming	Age	- 0. 234 *
	Educational level	- 0. 297 **
	Household size	0.118 <sup>NS</sup>
	Farm size	0.134 <sup>NS</sup>
	Annual income	- 0.335**
	Fish farming experience	- 0.241*
	Communication exposure	- 0. 219*
	Training exposure	- 0. 274**
	Social mobility	0.162 <sup>NS</sup>
	Knowledge on climbing perch farming	- 0. 393**

NS = Not significant,

\* = Significant at 0.05 level of probability

\*\* = Significant at 0.01 level of probability

The findings indicate that age, educational level, annual income, fish farming experience, communication exposure, training exposure and knowledge on climbing perch farming had significant negative relationship with problem confrontation. Since age of the farmers had significant negative relationship with their problem confrontation, the farmers of higher age confronted lower problem in semi-intensive climbing perch farming. Education of the farmers enhances outlook to gain knowledge on different aspects of

fish as well as it increases the capability of the farmers to observe and understand a critical situation. And the findings indicate that education level of the farmers had significantly negative relation with their problem confrontation i.e. the farmers with higher level of education confronted lower problems. Rahman (2011), Hossain and Miah (2011) and Karim (2009) found similar relationship between the concerned variables. Annual income of the farmers had significant negative relationship with problem confrontation. Rahman (2011) and

Nahid (2005) found more or less similar findings in their respective study.

Experience enables the farmers to understand the farming situations and different farm related problems and the findings may be due to that the farmers having more experience in farming could be more aware about different aspects of fish farming. Communication exposure had significant negative relationship with their problem confrontation. The finding may be due to that the farmers who communicate regularly with other information sources got more information about their fish farm related problems. Rahman (2011), Hossain and Miah (2011) and Karim (2009) also

reported similarity in the findings. Training exposure enables farmers to critically manage their farming activities and thus, the findings indicate significant negative relationship between training exposure and problem confrontation. Rahman (2011) and Nahid (2005) found similar findings in their respective study. The findings also indicate that the farmers having higher knowledge on climbing perch farming opined low problem associated with fish farming activities. Rahman (2011), Hossain and Miah (2011), Karim (2009) and Nahid (2005) found the similar relationship in their respective research.

### **Conclusion**

It is found that majority of the farmers (87%) confronted medium to high level of problems in practicing semi-intensive climbing perch farming. The findings lead to conclusion that it would have negative impact on the farmers in their farming activities and the fish farmers may be discouraged to continue climbing perch farming activities. The findings also indicate that age, education level, annual income, fish farming experience, communication exposure, training exposure and knowledge on climbing perch farming

are significantly and negatively correlated with problem confrontation. So, it can be concluded that the farmers of the study area face significant problems in practicing semi-intensive climbing perch farming. The government and non-government organizations working with fish farmer in Bangladesh should take necessary measures to mitigate the problems and also to encourage them to practice climbing perch farming for better production which will ultimately lead them for improved livelihoods.

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