

## Present status of pond fishery resources and livelihood of the fish farmers of Mohanpur Upazila in Rajshahi District

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**Abstract:** A survey was conducted in Mohanpur Upazila, Rajshahi to determine the pond fishery resources and the livelihood status of fish farmers for a period of nine months (August 2005-April 2006). The survey was conducted on 90 fish farmers of 52 villages under 6 unions. Data were collected through personal visit and interviews following a detailed questionnaire. Pond sizes of the area varied from 15 to above 180 decimal of which maximum ponds (57.8%) were operated by single owner. Field observation revealed that 65.5% ponds were used for fish culture, whereas 28.5% and 6% ponds were culturable and derelict, respectively. Among the fish farmers 23.3% was illiterate whereas 14.4, 8.9 and 6.7% were educated upto primary, secondary and higher secondary or above level, respectively. Agriculture (51.1%) is the principal occupation of the pond owners followed by aquaculture (18.9%). The highest percentage (33%) fish farmers earned Tk. 25,000-50,000 per year, 32% earned Tk. 50,000-1,00,000 and the rest 25% earned above Tk. 1,25,000 annually. Fish farmers were found to face various problems such as social, economical and technical problems, which were identified during the study. Necessary overcome efforts are also suggested according to the problems.

**Key words:** Pond fishery resources, fish farmers, livelihood status

### Introduction

Fish and fishery resources play a vital role in improving the socio-economic condition, combating malnutrition, earning foreign currency and creating employment opportunities in Bangladesh. BBS (1997) reported that there are 52,77,572 hectare water bodies of which 9,15,506 hectare ponds are suitable for fish culture, but most of them remain unaccustomed. If the existing ponds are brought under fish culture through proper planning, suitable management and re-excavation of the water bodies, the present fish production level can easily be increased two to three times of the existing level.

Mohanpur Upazila can be considered as one of the ideal fish production area in the northwest region of Bangladesh. In this Upazila, there are 1,565 ponds, which cover the total area of 224.75 ha (Survey Report: UFO, 2003). Most of the ponds are suitable for fish culture. Therefore, if fishers adopt improved fish culture technology and community based fisheries management then fish production will be increased in this upazila through good aquaculture practices. In Bangladesh, the major constraints to increase fish production are lack of technical knowledge non-availability of credit and multiownership of pond (Hussain, 1999).

Fisher folk are considered as one of the most backward sections in our society. Information on socio-economic framework of the fish farmers forms a good base for planning and development of the economically backward sector. Lack of adequate and authentic

information on socio-economic condition of the target population is one of the serious impediments in the successful implementation of developmental programme (Ellis, 2000). Aquaculture practice has become a promising and gainful methodology to attain self-sufficiency in food sector and also to alleviate poverty in developing country like Bangladesh (Ahmed, 2003). A livelihood is sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets both now and in the future (Chambers and Conway, 1992). The social content is especially important particularly access arrangement and assessments of benefits to livelihood (Azucena *et al.*, 2001). The aim of this study was to assess the natural resources, relative economic performance (land holding, labour, utilization, gender etc.), evaluation the social changes (nutrition, housing, mobility, group involvement etc.) also to identify the constraints associated with fish culture and livelihood status of the farmers.

### Materials and Methods

*Study area and methods of observation:* The study was conducted at Mohanpur Upazila in Rajshahi District with an area of 162.65 km<sup>2</sup> for obtaining detailed information about pond fishery resources and livelihood status of fish farmers. The survey was conducted on 90 fish farmers of 52 villages under 6 unions. Various literatures and statistical data were collected from Upazila Fisheries Officer (UFO), Local Government and Engineering Department (LGED) office and Statistical Office at Mohanpur Upazila. For collecting data on

various aspects of livelihood and technological issues, three methods were used-interview, photograph and direct observation. For collecting data both individual and group interviews were conducted. In most of the cases, a range of PRA tools were applied with different degree of effectiveness of the farmer's information. The data were collected fortnightly from August 2005 to April 2006.

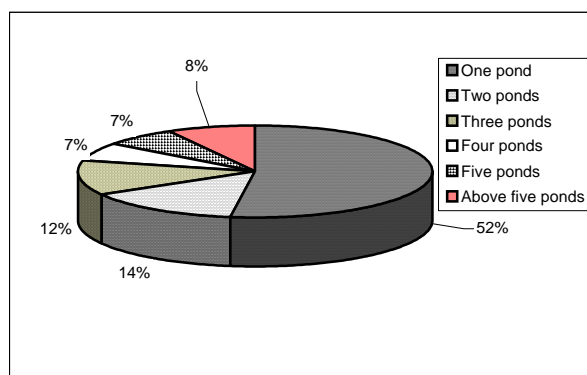
*Analysis of data:* All the collected information were accumulated and analyzed and then presented in textual, tabular and graphical forms to understand the present fishery resources and livelihood status of fish farmers. Lastly recommendation and conclusion was made on the total obtained results.

## Results and Discussion

*Pond fishery Resources:* It revealed that 119 ponds were perennial, where carp polyculture was mainly practiced and only 61 ponds were seasonal (Table 1). Khan *et al.* (1991) conducted a study on pond fishery resources and reported that 90% of the ponds were perennial while rests of the ponds were capable of retaining water for three to eleven months in Trisal Upazila. It was observed that the highest number of ponds (57.8%) was occupied by the single owners followed by joint or multiple owners (42.2%) Table 1. Hossain *et al.* reported that multiple pond ownership was a major constrains for pond aquaculture, where more than one fish farmer operated 66% ponds. During the survey it was found that the highest numbers of fish farmers (52%) had 1 pond, while 7, 7 and 8% fish farmers had 4, 5 and above 5 ponds, respectively (Fig. 1).

**Table 1.** Operation types and ownership patterns of ponds

Operation types	Seasonal		Perennial	
	No.	%	No.	%
Single	40	44.4	12	13.3
Multiple	20	22.2	18	20.0
Owned	34	37.8	19	21.2
Leased	25	27.6	12	13.3



**Fig. 1.** Number and total area of cultured ponds

**The multiple ownership is a problem for fish culture because the shareholders are usually unable to arrive at an unified decision in respect of fish farming. This problem can be solved by leasing out the pond to a person interested in fish culture.**

It was observed that most of the ponds (65.5%) were under culture condition and only 6% ponds were recorded as derelict, while the rest of the surveyed ponds (28.5%) were found as culturable (Table 2). DoF (2001) reported that about 5% ponds were derelict in our country. Water colour of the ponds was found to be variable due to variation of planktonic abundance and supply of feed and fertilizers. The majority of fish farmers had embankment around their ponds and were free from abundance of aquatic vegetation. From the survey it was found that 53.3% fish farmers used lime and fertilizers in their ponds properly (Table 3). Supplementary feed was used by the farmers, which showed a good sign about the awareness of fish culture by the farmers. Shil (2003) reported that 40% fish farmers did not apply lime and fertilizers in the fishermen community at Terakhada Upazila of Khulna District. Khan (1986) reported that in most cases they used cast net and sein net for harvesting fish partially (84.6%) or fully (15.4%). The fish farmers were much professional as because they used to monitor their ponds regularly.

**Table 2.** Types and culture system of ponds

Pond types	%	Culture system	%
Cultured	65.5	Monoculture	5.6
Culturable	28.5	Polyculture	75.5
Derelict	6	Fry rearing	18.9

**Table 3.** Use of lime, fertilizer, supplementary feed and pattern of harvesting

Lime	%	Fertilizer	%	Supplementary feeds	%	Harvesting pattern	%
Used properly	53.30	Used properly	53.30	Applied	57.80	Partial	84.6
Used partially	46.70	Used Partially	46.70	Not applied	42.20	Complete or Full	15.40

*Fish production and marketing:* During the present survey it was found that the average fish production was 7-8 kg/decimal. The average pond fish production was about 10-12 kg/decimal at Mohanpur Upazila (UFO, 2000). There are mainly two whole sale fish market in that Upazial, i.e. Moharpur and another is Keshorhat bazar, having daily turnover of about 0.5 MT fish. The time of wholesale starts at early in the morning about 6.30 am and continue upto 9.00 pm. The peak time for wholesale to the retailer was between 7:30-1:30 pm at both markets. From the

present sturdy it was found that the income capital of aratdars and wholesalers ranged from Tk. 500-50,000 seasonally. During transportation especially for long distances (mainly Nowabganj and Rajshahi) preservation is usually done by ice.

**Livelihood status of fish farmers**

*Income and living standard:* The farming sources included agriculture, vegetables, aquaculture and livestock. The annual income from different farming and non-farming sources are given in table 5 and 6. The level of non-farming income is one of the important socio-economic characteristics of the farm families or households. It was found that agriculture was the main profession, which accounts 51.1% and the second most common profession was aquaculture practice 18.9% (Table 4). Similar results were found by Islam & Dewan (1986). Women involvement in earning was some extent low but in some households it was at desired level. Most of fish farmers had improved their living standard through aquaculture practices. Majority of fish farmers used electricity in their house. The people preferred local songs, opera and television.

**Table 4.** Occupation status of the fish farmers

Occupation	Main Occupation %	Subsidiary Occupation %
Household work	4.4	15.6
Agriculture	51.1	41.1
Aquaculture	18.9	12.2
Business	6.7	20
Service	6.7	5.6
Labour	2.2	2.2
Student	8.9	-
Unemployed	1.1	3.3
Total	100	100

**Table 5.** Annual income from different farming sources (in thousand Tk)

Agricultural crops		Fish farming		Livestock		Vegetables and fruits	
Income	%	Income	%	Income	%	Income	%
Below 20	18.8	Below 25	23.3	Below 5	36.67	Below 3	15.5
20-40	4.4	25-50	13.3	5-10	21.11	3-9	13.3
40-60	3.3	50-75	17.8	10-15	6.67	9-12	21.2
60-80	14.5	75-100	7.8	15-20	11.11	12-15	26
80-100	24.5	100-125	10	20-25	8.89	15-18	16.7
100-120	34.5	125-130	27.8	25-30	15.56	18-20	13.3
Total	100		100		100		100

**Table 6.** Annual non-farming income and its sources (in thousand Tk)

Sources	Income	Number of farmers	%
Business	Below 20	8	8.89%
	20-40	13	14.44
	40-60	6	6.67
	60-80	11	12.22
Service	Below 10	3	3.33
	10-20	5	5.56
	20-30	2	2.22
	30-40	9	10.00
Wage labours	Below 2	0	0.00
	2-4	3	3.33
	4-6	5	5.56
	6-8	11	12.22
Others	Below 10	2	2.22
	10-20	4	4.44
	20-30	2	2.22
	30-40	6	3.67
Total		90	100

*Literacy and education:* Education is a basic right of all population, besides food, cloth and medicine. Majority (14.4%) of the fish farmers were educated up to primary level followed by secondary level (8.9%) and higher secondary or above (6.7%) levels while 27.8% persons can only sign (Table 7). Quddus *et al.* (1998) reported that there were no illiterate pond owners in Demra area in Dhaka.

**Table 7.** Educational status of the farmers

Educational status	Number of farmers	%
Illiterate	21	23.3
Can sign	25	27.8
Primary level (Class I-V)	13	14.4
Secondary level (Class VI-X)	8	8.9
SSC pass	11	12.2
HSC pass	6	6.7
Above HSC pass	6	6.7
Total	90	100

*Credit access issues:* Poor fish farmers had no access to bank loan due to lack of mortgage assets. Marginal farmers mostly borrow money from local moneylenders. Comparatively rich farmers used to borrow money from different NGO's and banks. The poor and marginal farmers who had managed membership in a co-operative society, borrowed money from there. Ramboll (1996) stated that the persistent indebtedness through the traditional credit system also binds fishers to their communities and occupation, as well as the 'ethos of the fisher' and the related sense of sub cultural identity. CPP (1996) reported that 70% fish farmers took loan from money lender in Tangail district. But Raju (2002) found 48% fish farmers took loan from neighbors.

*Housing condition:* Most of the poor fish farmers lived in very poor housing conditions. The majority of the houses in the villages were made of mud and bamboo fencing or roofing of chhan (one kind of weed leaves).

A few (35.5%) semi-permanent structures with corrugated iron roof were seen, owned by marginal farmers. Rest 13.4% rich farmers lived in pacca house.

*Religion and marital status:* Out of 90 fish farmers 90% was Muslims and the rest were Hindus. It was found that 87.8% was married and 12.2% was unmarried farmers, which proved, most of the fish farmers were familial (Table 8). Raju (2002) found 14.33% Hindus and 85.67% Muslims in Sailkupa Upazila. Mannu (1999) in Kuakata and Raju (2002) in Sailkupa obtained married fish farmers at 94% and 68% respectively.

**Table 8.** Religion, marital status and housing conditions of the farmers

Religion	%	Marital status	%	Housing conditions	%
Muslim	90	Married	87.8	Kacha	51.1
Hindu	10	Unmarried	12.2	Semi pacca	35.5
				Pacca	13.4

*Age, age structure and family members:* In contrast to the nuclear family, joint family was predominating family type in the Mohanpur upazila. They were aware of the family planning procedures that most of the households had a relative small average family size (4.56 Persons.) It was found that the active age groups varied from 15-19 to 55-59 years. The smaller representation of females in the old age groups was due to the lower life expectancy rate of females than males, which was a common scenario in the population pyramid of under developed countries.

*Nutrition, health and sanitary condition:* Most of the fish farmers were not very much aware about nutrition, health and sanitary conditions. From the survey it was observed that intake of vegetables was the highest whereas intake of meat was the lowest in a month. The entire fish farmers used tube-well which was as a source of drinking water and they also used ring well, pond and canal water for other purposes. 23.3% fish farmers had no latrine for defecation (Table 9). So, most of the fish farmers suffered from dysentery and also diarrhoea. Maximum fish farmer's family took quack treatment against disease, which showed the unawareness of getting treatment of diseases.

**Table 9.** Sources of drinking water and sanitation practice by the fish farmer

Sources of drinking water	Number of farmers	%	Sanitation practice*	Number of farmers	%
Only tube well	67	74.4	Open field	21	23.3
Tube well and ring well	7	7.8	Open pit	4	4.4
Tube well and pond	9	10.0	Closed pit	17	18.9
Open water body (beel)	2	2.2	Kacha latrine	22	24.4
Supply line	5	5.6	Sanitary latrine	26	29.0
Total	90	100		90	100

\* Places of defaecation

*Major problems confronted by the fish farmers:* The fish farmers under different types of management were found to face with many technical, social and economical problems. Technical problems are related to production techniques and technology such as lack of scientific knowledge and suitable technology, less extension services on aquaculture training, turbidity, non availability of quality fish seeds at proper time, occurrences of fish diseases, water scarcity during drought season, pond water irrigation for crop fields. Social problems were related to management complications of multi ownership of ponds, loss of fish due to poaching, fear from enemies for poisoning in culture pond and negligence in use of fertilizers. In private sector ponds, social conflict is less than in the public sector water bodies. Ali *et al.*, (1982) and Ali & Rahman, (1986) reported that lack of scientific knowledge, multiple ownership of ponds, attack of fish disease and non availability of good quality fish fry are a major problems in pond fish culture in Bangladesh. The main constraints in improving this living standard were the lack of inputs and the persistent indebtedness to the usurious traditional credit system. Chowdhury (1981) also reported that lack of fund for re-excavation of ponds ranked first among all the problems faced by the fish farmers of Bangladesh.

*Conclusion:* Considering the different observations during the present study Mohanpur Upazila was found to be potential area for fish culture and capture. In conclusion it can be said that, farmers should be given facilities on training program, and input availabilities, they should also be provided with credit facilities, motivated to utilize all types of water bodies for fish culture as well as integrated culture should be adopted. The fish farmers should be given amenities for education so that they can be well aware of their problems and prime rights. All the water resources should be utilized for fish culture to get maximum production by using suitable technology. More hatcheries should be established, so that farmers can get quality seeds easily.

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