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Assessment of the livelihood status of fish farmers in some selected areas of Kaharole Upazila, Dinajpur, Bangladesh

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Abstract

The investigation was carried out in Rasulpur, Ramchandrapur and Mukundapur unions in Kaharole Upazila under Dinajpur district during July 2015 to June 2016 to determine the livelihood status of the relevant fish farmers, and to reveal their constraints. Data were collected through the use of properly-structured questionnaire. Thirty farmers from each of the unions were selected who are directly involved with fish farming. Most of the fish farmers were belonged to the age group of 20 to 30 years and 67% families were represented as nuclear. About 54% farmers had secondary level education and among the respective farmers around 70% had electricity facility. Approximately 83% farmers accepted fish culture as their secondary occupation, and 67% of the fish farmers had ponds under proprietorship in which the average pond size was in between 10-20 decimal. In the study area the average income of the farmers (57%) was in between 10,000 to 20,000 tk. around 70% of the farmers were involved in fish farming to supplement their family income, where most of them usually sell their products in the respective Upazila market. The two foremost alarming constraints that were noted throughout the study period were the lack of technical assistance and co-operation of NGOs and local govt. with the fish farmers.

Keywords: Livelihood, fish farmers, constraints, Kaharole Upazila, Bangladesh

1. Introduction

Fish and fisheries are not only act as an indispensable part in the life and livelihoods (Sohel *et al.*, 2008) of the people of Bangladesh^[1] but also plays as an important part of their cultural heritage. Fisheries sector is one of the principal income and employment-generating sector in Bangladesh, which plays a vital role in the socio-cultural and economic life of the people of Bangladesh. A total of 1.3 million of people are directly and 12.5 million as partially engaged themselves in this sector for their livelihood (DoF, 2013)^[2]. Usually, livelihood comprises the capabilities, the assets (natural, physical, human, financial and social capital), the activities and the accesses to these (mediated by institution and social relations), that together determine living gained by the individual household (Chambers and Conway, 1992)^[3]. Various approaches have been adopted in different period of time (Sohel *et al.*, 2008)^[1] in Bangladesh in order to develop the rural areas and poverty alleviation, in which fishery sector plays an important role. A sustainable livelihoods approach is a manner of judgment about the aims, scope and priorities for development, in order to mitigate the property (Carney, 1999)^[4]. In poor rural communities, aquaculture can be an integral component of development, contributing to sustainable livelihoods and enhancing social well-being. Considering the financial constraints including other complication of the life of rural fish farmers, it is important to evaluate their livelihood status. In view of the above consideration; the present investigation was carried out to evaluate the livelihood status of the fish farmers in Kaharole Upazila under the district of Dinajpur and to find out the socio-economic constraints connected with fish farming.

2. Materials and Methods

2.1 Study area

The present study was conducted to assess the livelihood status and constraint faced by the fish farmers in the Kaharole Upazila under the district of Dinajpur. Three Unions namely, Rasulpur

Mukundapur and Ramchandrapur in Kaharole Upazila (Fig. 1) under Dinajpur district was selected for the study and data

were collected during July 2015 to June 2016.

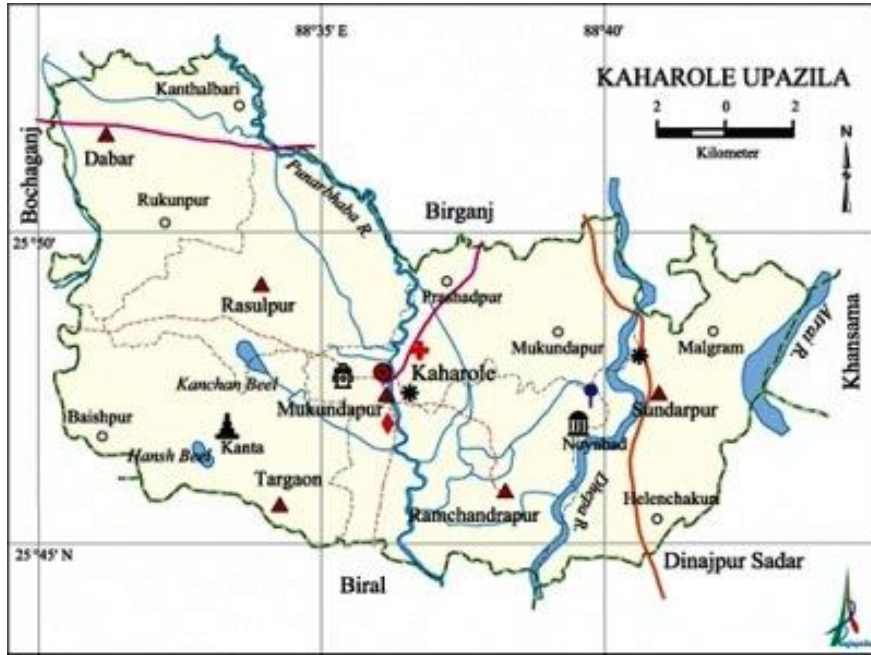


Fig 1: Geographical location of Kaharole upazila.

2.2 Selection of target group and sample size

The target group was the fish farmers in the selected areas who are already engaged in fish farming permanently and/or partially for their livelihood. About 30 fish farmers were randomly selected from each union of the Kaharole Upazila (90 fish farmers from the selected three unions) and the data were collected from the selected fish farmers. Fish pond with different types of culture system, management practices and farmer’s age, number of family members, family status, education and health status, electricity facility, occupation, monthly income and expenditure, intake of food and their social relationship etc. were included in the questionnaire.

2.3 Design and formulation of questionnaire for data

2.3.1 Data collection

A set of interview schedule was designed and data were collected from the fish farmers using well-structured questionnaire.

2.3.2 Data processing, analysis and presentation

All the collected data were accumulated, analyzed and presented in tabular forms in order to understand the present scenario of the livelihood status and constraints associated with fish farming in the selected areas.

3. Results and Discussion

3.1 Human capital

Ahmed (2001) [5] reported that human capital is skills, knowledge, education, ability of labor and good health that together enable people to pursue their livelihood strategies. So it is very important to the farmers to be in such a condition that is not making difficulties in making maximum use of these capitals.

3.1.1 Age distribution

Age of a fish farmer is an important factor in the case of hard work including fish farming. Among the total 30 farmers, the highest 33.33% belonged to the age group 20-30 years

whereas the lowest 10% belonged to the age group above 50 years (Table 1). In the study area it has been found that the majority of the fish farmers were 20-50 years old. Sohel *et al.* (2008) [1] have found that the pond owners age were in between 21-40 years in Bogra, whereas Reza *et al.* (2015) [6] have investigated majority of the fish farmers in Dinajpur were 31-45 years old, which is more or less similar to the present findings.

Table 1: Age distribution of the fish farmers in the study area

Age group	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
20-30	60%	10%	30%	33.33%
31-40	10%	20%	60%	30.00%
41-50	30%	40%	10%	26.67%
>50	0%	30%	0%	10.00%

3.1.2 Family size and status

The investigated families were divided into three categories. The highest 83.33% of the respondents had 4-5 family members whereas the lowest only 6.67% had 2-3 family members (Table 2) which corresponds well with Ali *et al.* (2009) [7]. In this current study, the family status was usually divided into two major groups such as nuclear and joint. Among the investigated families around 66.67% of the families lived in nuclear families whereas only 33.33% lived in joint family. The highest (50%) farmers lived as joint family in Mukundapur, while 80% farmers lived as nuclear family in Rasulpur (Table 3). Nuclear family was predominant in the study area which is somewhere similar to the findings of Reza *et al.* (2015) [6] in Dinajpur.

Table 2: Family size of the fish farmers in the study area

Family size	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
2-3	0%	20%	0%	6.67%
4-5	90%	70%	90%	83.33%
>5	10%	10%	10%	10%

Table 3: Family status of the fish farmers in the study area

Family type	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
Joint family	20%	30%	50%	33.33%
Nuclear family	80%	70%	50%	66.67%

3.1.3 Education status

In the investigation area the education status of the fish farmers were divided into three categories (Table 4). The highest 53.33% farmers belonged to the secondary level education where 13.33% of them could not go through the primary level. 33.34% farmer's education levels were above higher secondary level which is a good sign for that region. Khan (1986) [8], has stated that the level of education of the fish farmers is being considered as an important factor that can affect the utilization of pond for fish farming.

Table 4: Education status of the farmers in the study area

Education level	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
Primary	20%	20%	0%	13.33%
Secondary	30%	50%	80%	53.33%
Higher sec. and above	50%	30%	20%	33.34%

3.1.4 Health status

From the present study it was found that the rural farmers were not quite conscious about their health. In case of minor ailments mostly no farmers seek high level of doctor's consultancy. The highest 56.67% farmers belonged to low level consultancy where 43.33% belonged to medium level (Table 5). In case of major ailments all the farmers went for doctor's consultancy. The highest 60% farmers seek high level of doctor's consultancy where the lowest 40% seek medium level of consultancy (Table 6).

Table 5: Health service received by the farmers in case of minor ailments in the study area

Consulting doctors for minor ailments	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
Low	60%	50%	60%	56.67%
Medium	40%	50%	40%	43.33%
High	0%	0%	0%	0%

Table 6: Health service received by the farmers in case of major ailments in the study area

Consulting doctors for major ailments	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
Low	0%	0%	0%	0%
Medium	50%	30%	40%	40%
High	50%	70%	60%	60%

3.2 Electricity facility

In the study area 70% of the farmers have electricity facility whereas 30% farmers had no electricity facility. The highest 80% farmers of Rasulpur had electricity access where the highest 40% farmers in Ramchandrapur had no electricity access (Table 7). The uses of electricity in the study area were better than the national use of 35% (BBS, 2004) [9].

Table 7: Electricity facilities obtained by the fish farmers in the study area

Electricity facilities	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
Yes	80%	60%	70%	70%
No	20%	40%	30%	30%

3.3 Primary and secondary occupation

In the investigated area it was observed that more than half of the farmers (60%) were involved in agriculture as their primary occupation while only a short listed farmer's (10%) primary occupation was fish culture. In Mukundapur no farmer was involved with fish culture as their primary occupation (Table 8). In case of secondary occupation almost all the farmers (83.33%) accepted fish culture as their secondary occupation and only 3.34% farmers accepted agriculture (Table 9) which seem to be increasing the involvement in fish culture in comparison with the findings of Sarker (2004) [10].

Table 8: Primary occupation of the fish farmers in the study area

Primary occupation	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
Agriculture	60%	50%	70%	60%
Fish culture	20%	10%	0%	10%
Others	20%	40%	30%	30%

Table 9: Secondary occupation of the fish farmers in the study area

Secondary occupation	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
Agriculture	0%	10%	0%	3.34%
Fish culture	80%	80%	90%	83.33%
Others	20%	10%	10%	13.33%

3.4 Farm type

In the study area in case of farm type 66.67% fish farmers belonged to proprietorship and 33.33% belonged to partnership type farm (Table 10).

Table 10: Type of the farms of the fish farmers in the study area

Farm type	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
Proprietorship	40%	80%	80%	66.67%
Partnership	60%	20%	20%	33.33%

3.5 Size of ponds

The ponds used by the fish farmers in the study area were categorized into three categories as Small (10-20 decimal), Medium (21-30 decimal) and Large (Above 30 decimal). During the study it was found that almost half of the farmers (53.33%) in the study area had small ponds and only 16.67% farmers had medium ponds whereas only 30% of them had large ponds (Table 11). Khan (1986) [8] has stated that the efficiency of fish culture varies with the size of the pond.

Table 11: Size of the ponds used by the fish farmers in the study area

Pond size (Decimal)	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
10-20 (Small)	30%	50%	80%	53.33%
21-30 (Medium)	20%	10%	20%	16.67%
>30 (Large)	50%	40%	0%	30.00%

3.6 Monthly income

In the study area the investigated fish farmers were divided into four categories having monthly income of 10,000 to 20,000; 20,001 to 30,000; 30,001 to 40,000 and above 40,000. And according to the survey 56.67% farmer's monthly income was in between 10,000 to 20,000 and no farmer's monthly income was more than 40,000 (Table 12). Ali (2013) [11] has found the highest annual income ranged from 61,000 to 90,000 at Atrai River in Dinajpur district which is lower than the present study area that belongs to the same district.

The average annual income of the present study area is also higher than that of stated by Khan (2011) [12]. The contribution of fish farming in their total income was 18.27%, 11.62% and 10.39% respectively in Rasulpur, Ramchandrapur and Mukundapur.

Table 12: Monthly Income of the fish farmers in the study area

Monthly income (Tk)	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
10,000-20,000	50%	50%	70%	56.67%
20,001-30,000	20%	30%	30%	26.66%
30,001-40,000	30%	20%	0%	16.67%
>40,000	0%	0%	0%	0%

3.7 Monthly expenditure

The average monthly expenditure of half (46.67%) of the selected fish farmers in the study area is in between 10,000-15,000tk, where only 3.33% farmer’s monthly expenditure is more than 30,000tk (Table 13). The average income of the fish farmers of Ramchandrapur and Mukundapur is comparatively higher than that of Rasulpur.

Table 13: Monthly expenditure of the selected fish farmers in the study area

Expenditure (monthly)	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
10,000-15,000	30%	40%	70%	46.67%
15,001-20,000	40%	50%	20%	36.66%
20,001-30,000	20%	10%	10%	13.34%
>30,000	10%	0%	0%	3.33%

3.8 Intake of food

In the study area Intake of food by the selected fish farmers was medium in most of the cases (73.33%), 16.67% farmer’s was low where only 10% farmer’s food intake was high (Table 14).

Table 14: Food intake of the selected fish farmers in the study area

Food intake	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
Low	10%	10%	30%	16.67%
Medium	70%	80%	70%	73.33%
High	20%	10%	0%	10.0%

3.9 Reason for initializing a fish farm

In the study area most of the farmers (70%) involved themselves with fish farming to supplement their family income. Only 3% of them want to maintain their economic status through fish farming (Table 15). Whereas 20% of the farmers want to improve their social status and 6.67% farmers want to continue their family occupation.

Table 15: Reasons of the fish farmers to be engaged with fish farming

Reason	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
To supplement family income	60%	70%	80%	70%
To maintain economic status	10%	0%	0%	3.33%
To continue family occupation	10%	10%	0%	6.67%
To improve social status	20%	20%	20%	20%

3.10 Involvement in fish farming

A total of half of the fish farmers (50%) were engaged in fish

farming from the last 2-4 years, while 33.33% fish farmers have started fish culture in their aquaculture ponds from 5-7 years before and only 16.67% started before 8-10 years back (Table 16).

Table 16: Time (years) of involvement in fish farming

Years	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
2-4	30%	30%	90%	50.00%
5-7	50%	40%	10%	33.33%
8-10	20%	30%	0%	16.67%
>10	0%	0%	0%	0%

3.11 Markets used for selling fish

Most of the fish farmers (83.33%) sell their fish in Upazila markets while only 16.67% farmers sell in local markets which is quite different from the findings of Reza (2015) [6]. In Ramchandrapur all the fish farmers sell their fish in Upazila markets whereas no fish farmers in the consecutive unions sell their fish in District markets (Table 17).

Table 17: Markets used for selling fish in the study area

Market used	Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)	Total (n-90)
Local	30%	0%	20%	16.67%
Upazila	70%	100%	80%	83.33%
District	0%	0%	0%	0%

3.12 Social relationship

In the study area it was found that the relationship of the farmers with neighbors and local leaders was quite good but not with local government and NGOs. Reza *et al.* (2015) [6] have found that only 4% of fishermen had received training about fishing and 96% had not received any training which corresponds well with the present findings.

Table 18: Social relationships of the selected fish farmers in the study area

Relationship		Rasulpur (n-30)	Ramchandrapur (n-30)	Mukundapur (n-30)
Neighbor	Yes	100%	100%	90%
	No	0%	0%	10%
Local government	Yes	0%	0%	0%
	No	100%	100%	100%
NGO	Yes	0%	0%	0%
	No	100%	100%	100%
Local leader	Yes	100%	90%	90%
	No	0%	10%	10%

3.13 Constraints faced by the fish farmers

Almost all the fish farmers of the selected areas were self-motivated to be involved in fish farming. They did not get any motivation or training program or funding facilities regarding fish farming from GOs and NGOs. They started fish farming based on their own capital. Furthermore, a plenty of other constraints were also noted in the study area namely water scarcity, lack of quality fry, pricing information, lack of technical assistance and co-operation of NGOs and local govt. which were hindered the flourishing of the fish farming in the selected areas.

4. Conclusion

Although fish farming plays a significant role in the economy of Bangladesh, but the contribution of the northern region particularly in the respective unions of Dinajpur district was

quite low. However, several concerns have arisen such as water scarcity, lack of quality fry and awareness of pricing and technical assistance. Another most vital issue was lack of co-operation of NGOs and local govt. with the respective fish farmers. In order to improve their livelihood status through fish farming several steps should be initialized by the Govt. and NGOs. The selected farmers should be trained on sustainable aquaculture practices, availabilities of various types of inputs used in fish farming, adequate financial assistance as well as several motivation programs should be set for them, so that they can be motivated themselves to utilize their pond using well developed aquaculture practices. Besides, the Govt. should take necessary measures to improve their education status with the intention that they can be well aware of their obstacles and principal rights. Good relationship should be built among Upazila fisheries office, relevant NGOs and fish farmers.

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