

Original Article

A comprehensive analysis of socioeconomic structure and constraints of Fishers community of the Tetulia River in Bangladesh

Shaharior Hossen¹, Mir Mohammad Ali^{2,3}, M. Aminur Rahman^{4*}, A.M. Shahabuddin⁵,
Md. Shozibul Islam⁶, Muhammad Tanvir Hossain Chowdhury⁷, Md. Kamrul Islam⁷

¹Department of Fisheries Biology and Genetics, Faculty of Fisheries, Patuakhali Science and Technology University, Patuakhali-8602, Bangladesh, ²Department of Aquaculture, Faculty of Fisheries, Patuakhali Science and Technology University, Patuakhali-8602, Bangladesh, ³World Fish, Bangladesh and South Asia Office, Dhaka, Bangladesh, ⁴World Fisheries University Pilot Programme, Pukyong National University (PKNU), 45 Yongso-ro, Nam-gu, Busan 48513, Korea, ⁵Department of Aquaculture, Sher-e-Bangla Agricultural University, Dhaka 1207, Bangladesh, ⁶Forestry & Wood Technology Discipline, Khulna University, Khulna- 9208, Bangladesh, ⁷Department of Fisheries, Ministry of Fisheries and Livestock, Bangladesh

ABSTRACT

The Tetulia River owns the largest riverine ecosystem and supports diverse fisheries communities in south-western Bangladesh. The present investigation was carried out to assess the socioeconomic condition of the Tetulia River fishing community from January to December 2014 using semi-structured questionnaire. A substantial proportion (63%) of fishermen was found 21–40 years age group; mainstream (77%) belongs to Islamic believe and family size is medium (67%) with joint family structure (81%). The illiteracy rate was 59%. The overall sanitary situation was poor, only 4% toilets were found with proper sanitary facilities, 26% toilets were equipped with the moderate hygienic condition, 24% were found insanitary condition, and 18% fishermen had no sanitary conveniences at all. A substantial proportion (71%) of the fisherman community lived in shed roof house. A poor health status (only 9% got health service from registered doctors) was observed in the selected community area. All the fishermen lived on tube-well water, and the most part of them (77%) used government-owned tube-well in community schools' area. About 73% of them were dispossessed from electricity services. Among all the fishermen, 40% run their business by own capital or taking loan from money lender (35%). The Pearson's correlation coefficient represented strongly positive relation between age and experience ($r = 0.949$, $P = 0.01$). Likert scale technique was applied to identify the lack of education due to poverty as a most critical constraint. Being poor most of them were an ordinary person (85%) in the society and have no another livelihood options rather than fishing in the area. The government, as well as non-government organization, should come forward to consider these cynical impacts and develop some techniques or alternatives that can help the poor fishermen to hold their present profession of fishing in the Tetulia River of Bangladesh.

Keywords: Bangladesh, constraints, fishermen community, socioeconomic analysis, Tetulia River

Submitted: 21-04-2018, **Accepted:** 03-05-2018, **Published:** 29-06-2018

INTRODUCTION

Fisheries is a promising sector in Bangladesh in terms of creating job opportunities, meeting the demand for animal protein, earning of foreign exchange, and gross domestic growth.^[1-4] This sector is contributing to protein supplement

and livelihood to 80% of the total rural population of Bangladesh.^[4,5] It contributes 3.65% of the gross domestic product (GDP), about 1.92% of foreign exchange earning of Bangladesh.^[6] Total fish production in our country during 2014–2015 was about 3.68 million metric tons in which 3.08 million metric tons were came from freshwater including

Address for correspondence: M. Aminur Rahman, World Fisheries University Pilot Programme, Pukyong National University (PKNU), 45 Yongso-ro, Nam-gu, Busan 48513, Korea. Tel.: + 82 51 629 6675. Fax: +82 51 629 667. E-mail: aminur1963@gmail.com

culture fisheries and 0.05 million metric tons from marine water together with shrimp.^[6]

Most of the people in Bangladesh depend on fish for their animal protein, and it provides 63.00% of animal protein consumption.^[7,8] The fisheries subsector contributes 5.38% of GDP.^[9] Bangladesh earns a significant amount of foreign currency, i.e., 4.90% of total export earnings from fisheries products.^[10]

The sustainability of livelihood depends on the ability to cope with and recover from stress and shocks and maintain to enhance its competences and assets both now and in the future.^[11] The access arrangement and assessments of benefits to livelihood are particularly important as social content.^[12-14]

The fishermen community is the most vulnerable community in Bangladesh, and they are underprivileged indeed. They are poor by any standard, and over the years, economic ailment of the fishermen had further deteriorated.^[15] Alam and Bashir^[16] assessed the average per capita annual income of the fishermen families to be BDT 2,442, i.e., about 70% lower than the per capita income of the country as a whole. Being an isolated community, fishermen are deprived from many amenities of life.

The present study was intended to look at the socioeconomic patterns of marginal fishermen communities delimited the Tetulia River of Bhola district, Bangladesh. Fishing in Tetulia plays an incredibly key role in alleviating rural poverty and supplying protein to the deprived fishing community. However, socioeconomic status of this fisherman is not satisfactory; production of fish, as well as the species composition in this river, is also declining day by day.^[1-5] Considering the above fact, the present study was carried out to assess the socioeconomic status and constraints faced by the fishermen in the area. After all, the study focused on fisheries - a source of livelihood and the dependence of peoples on it, status and institutional support available, developmental initiatives, and suggestions for the improvements on the fishers community.

MATERIALS AND METHODS

Study Area

The present investigation area was a south-western district “Bhola,” the largest island of Bangladesh [Figure 1]. It is bounded by Lakshmipur and Barisal districts to the north, the Bay of Bengal to the south, by Lakshmipur and Noakhali districts, the (lower) Meghna River and Shahbazpur Channel to the east, and by Patuakhali district, and the Tetulia River to the west.^[17] Principally, Lalmohan and Burhanuddin Upazila of Bhola district were selected for the present study [Figure 1]. The areas were selected considering the intensity of fishermen

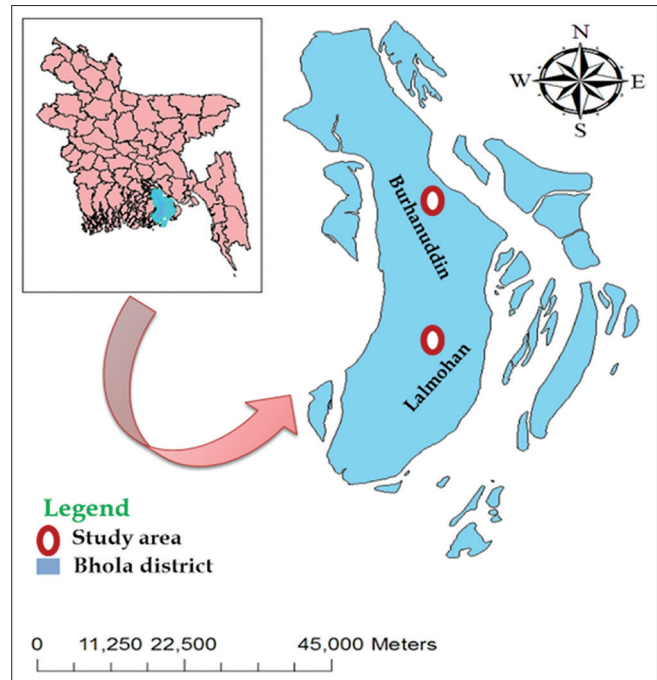


Figure 1: The study area alongside the Tetulia River in Bhola district, Bangladesh

and their fishing activities in Tetulia River.

Collection of Data

The present study was based on field survey among fishermen community. The data were collected from January to December 2014. A total of 200 sample fishermen in the Coast of Tetulia River from the Bhola district were selected. Data were collected through questionnaire interviews by “simple random samplings.” Both individual and group interviews were applied with a diverse degree of effectiveness of the data. In this research, focus group discussion (FGD) was used to get an overview of a particular issues such as constraints of fishing and socioeconomic condition. A total of eight FGD sessions were conducted where each FGD group size was five to seven fishermen. The FGD session was held in front of village shops, under the big trees, fisher’s houses, and school premises. After collecting the data through questionnaire interviews and FGD, crosscheck interviews were conducted.

Data Processing and Analysis

All the collected information and data were scrutinized and summarized carefully before conducting the actual tabulation. The SPSS (version 16.00), Microsoft Access and Microsoft Excel 2010 were used to analyze the data. The sitemap was tailored by the “Arc GIS (version 10.3)” software.

The Likert scale with values of 4, 3, 2, and 1 was settled to determine constraints faced by fishers in Tetulia River. In this method, the fishermen were enquired to rate their constraints

as “very critical,” “critical,” “to some extent critical,” and not “critical.” The variable mean score of 2.5 was used to discover whether the factor in question was critical or not. The variables with a mean score of 2.5 and above were considered critical while variable with <2.5 was not.

RESULTS AND DISCUSSION

Sociodemographic Characteristics of the Fishers

In the Tetulia River, both male (97%) and female (3%) fishers were involved with fishing activities to support their families.

Table 1 represents the overall socioeconomic and job-related profile of the fishers of Tetulia River. Majority of the fishers was Muslim (77%) whereas the least portion was Hindu (23%). The fisher’s age was from various age levels, comprising a wide range (13–68 years) of age with an average of 34.71 years was common in the fisher’s community. The study represented 81% fishers who lead their life with joint family whereas 67% fishers had medium (4–6 members) family size. Unsatisfactory educational status was observed from the study area where the majority of the fishers were illiterate (59%). Poor housing and sanitation facilities were discovered in the community where 24% lived in mud structured house, and 52% were used

Table 1: Socioeconomic characters of fishers in the Tetulia River

Variables	Categories with percentages (%)				Total	Relevant works
Sex	Male (97%)	Female (3%)			100%	[18]
Age	Young (10–20 years) 13%	Middle (21–40 years) 63%	Senior (41–60 years)	Old (<60 years) 19%	100%	[19]
Religion	Muslim (77%)	Hindu (23%)			100%	[20]
C	Joint (81%)	Nuclear (19%)			100%	[19]
Family size	Small (2–3) (14%)	Medium (4–6) (67%)	Large (7–9) (13%)	Very large (>10) 6%	100%	[19]
Educational status	Illiterate (59%)	Primary (34%)	Secondary (5%)	Higher Secondary (12%)	100%	[20]
Sanitation	Open (18%)	Kacha (52%)	Semi-pucca (26%)	Paka (4%)	100%	[19]
Electricity	Yes (27%)	No (73%)			100%	[21]
House	Kacha (24%)	Tinshed (71%)	Half cemented building (3%)	Cemented building (2%)	100%	[16]
Health	Village (33%)	Upazila (37%)	MBBS (9%)	Kobiraj (21%)	100%	[4,19]
Drinking water	Own (10%)	Neighbors (13%)	Government (77%)		100%	[6]
School going children	Yes (83%)	No (17%)				
Social status	Ordinary (85%)	Local Leaders (2%)	Respective Persons (13%)		100%	

Table 2: Job-related information of fishers in the Tetulia River

Variables	Categories with percentages (%)				Total	Relevant works
Source of Income	Fishing (52.22%)	Agriculture (18.89)	Day labor (16.67%)	Net Mending and others (12.22%)	100%	
Experience	Low (<15 year) 52%	Medium (16–30 year) 38%	High (<31 to above) 10%			[23]
Monthly income (BDT)	1000–3000 (12%)	3000–5000 (61%)	5000–7000 (22%)	7000 to above (5%)	100%	[24]
Status of fishing	Full-time (86%)	Part-time (14%)				[25]
Sources of credit	Self (10%)	Bank/NGOs (21.67%)	Mahajon (63.33%)	Others (5%)	100%	[26]
Saving	Yes (14%)	No (86%)				[27]

NGOs: Non-government organizations

unhygienic toilet. Besides this, irregular electricity supply was observed from the study area, where 73% fishers had no electricity in their houses. Among the communities, 100% fishers used tube-well water, wherein Government-provided open-access tube-well was 77%, and 10% was private-owned. Health service facilities were not satisfactory in the fishers community since 33% were depended on village doctor and 21% on local kobiraj.

Job-related Characteristics of Fishers

Most of the fishers ensured that their previous generation was involved with this fishing occupation, as a result, they inspired to involve with this profession. Table 2 represents the overall job-related profile of the fishers on Tetulia River. A wide range (2–43 years) of experienced fishers with an average of 15.06 years was observed in the areas of Tetulia River. The fishermen tried their best to lead a smooth life, but they were incapable because of financial limitations. In the present situation, they could not cope with the rise of the price of the daily essential commodities. Therefore, they had to manage other additional works along with fishing such as agricultural work, day labor, and net mending. The average monthly income of the fishermen was BDT 4500.00. The average annual income of fishermen in the study area was estimated at BDT 54,000.00, indicating better than the national average income of BDT 22,000.^[22] The most of the fishermen’s monthly income was 3000.00–5000.00 BDT (61%). Due to poverty, 86% fishers had no saving where 86% of fishers were full-time fishers. In the present study, it was found that 40% of the fishers used their own capital for fishing, while 35% of fishers received money

from a lender (traditionally called “Mahajon”), 8% received ordinary social status wherein 2 loan from bank, 15% from non-government organization (NGO), and 2% from other sources. Most the fishers (85%) had percentage were local leaders, and 13% were respectable persons in the society [Table 1].

Partial Correlation among the Different Variables

Age and experience of fishermen were positively correlated ($r = 0.949, P = 0.01$), which shows the experience of fishermen steadily increased with the momentary of year. Partial correlations within different variables are presented in Table 3. Figure 2 demonstrated the strong relationship between age and experience. Age and income exposed negative correlation ($r = -0.292, P = 0.01$) between income and experience [Figure 3]. Age and income were negatively correlated ($r = -0.279, P = 0.01$), which predict that income was not increased with increasing age. Income and savings presented the moderate positive correlations ($r = 0.673, P = 0.01$) because saving always depended on income. Income and fishing type exposed moderate positive correlation ($r = 0.603, p = 0.01$), which predict that income was dominated by full-time fishers.

Socioeconomic Constraints of the Fishermen

Most of the fishermen were facing a range of difficulties during fishing and other socioeconomic activities. The main problem

Table 3: Partial correlation among different variables of the fishermen

Variable	r value	P
Age and experience	0.949	0.01
Age and income	-0.279	0.01
Age and health	-0.374	0.01
Income and fishing	0.603	0.01
Income and experience	-0.292	0.01
Fishing and saving	0.169	0.05
Fishing and housing	0.540	0.01
Fishing and sanitation	0.537	0.01
Fishing and health	0.232	0.05
Saving and health	0.465	0.01
Saving and housing	0.472	0.01
House and sanitation	0.716	0.01
Income and saving	0.673	0.01
Income and sanitation	0.911	0.01
Income and house	0.709	0.01
Income and health	0.641	0.01

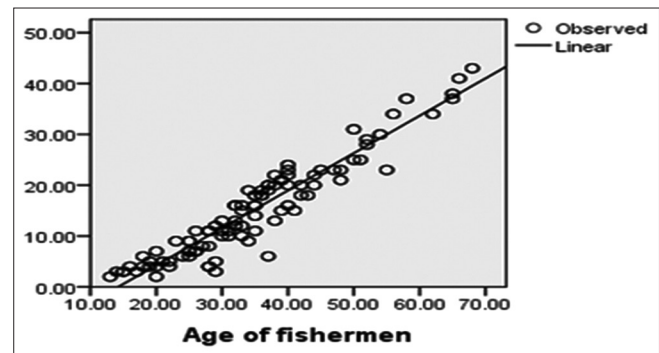


Figure 2: Regression curve of the age and experience of fishers

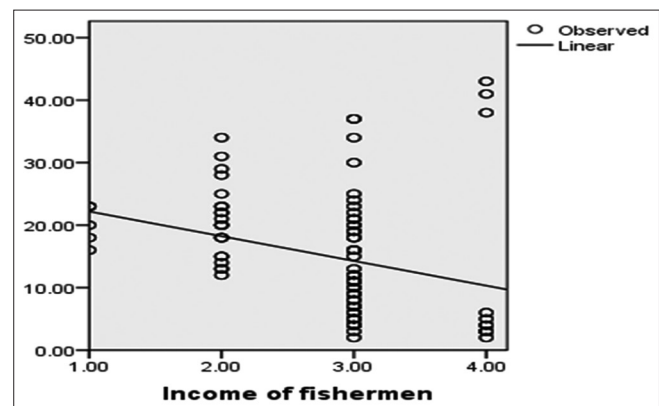


Figure 3: Regression curve of income and experience

was documented as lack of education due to poverty. Most of the fishermen were very poor, and they have limited resource to buy nets and other fishing crafts.

The Likert scale technique was used to analyze the constraints faced by the fishers of Tetulia River [Table 4]. The table revealed that the shortage of sufficient fishing crafts, climate-changing problems, lack of credit facilities, river erosion, lack of education due to poverty, poor housing condition, and the lack of electricity were critical in the studied area, while, the

lack of fishing gears and household pressure for large-size family were not found to be critical.

Problem Tree Analysis

A problem tree analysis can represent the problems, causes, and effects diagrammatically. In the present investigation, problem tree analysis was utilized to find the reasons for declining in fisheries resources and its effect on the living standard of fishers’ community.^[28] Brainstorming technique was applied to analysis the problem of fishermen in Tetulia River [Figure 4].

Table 4: Constraints faced by the fishers of the Tetulia River

Constraints	To sum				Scores	Points	Remarks
	Very critical	Critical	Extent critical	Not critical			
Lack of sufficient fishing craft	47	41	80	32	503	2.52	Critical
Lack of fishing gears	25	32	56	87	395	1.98	Not critical
Household pressure for large-size family	32	57	39	72	449	2.25	Not critical
Climate changing problem	49	87	64	00	585	2.93	Critical
Lack of credit facilities	48	56	63	33	520	2.60	Critical
River erosion	75	64	61	00	614	3.07	Critical
Lack of education due to poverty	88	72	24	16	632	3.16	Critical
Poor housing condition	73	62	50	15	593	2.97	Critical
Lack of electricity	104	48	16	32	624	3.12	Critical

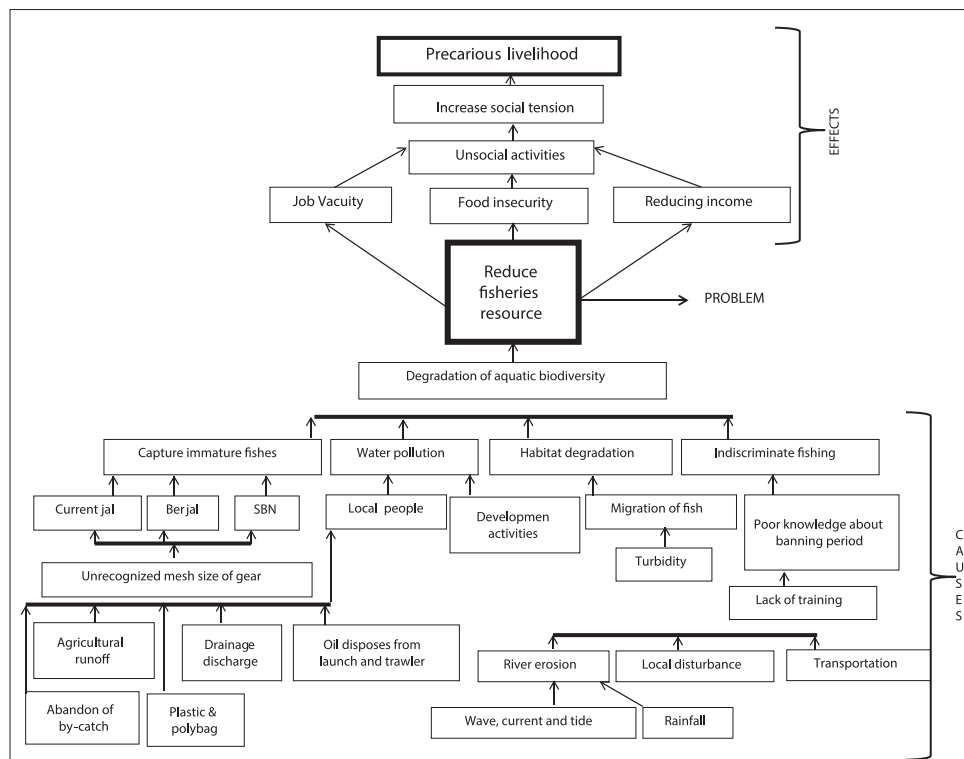


Figure 4: Problem tree analysis indicating the causes of reduction of fisheries production in the Tetulia River, Bangladesh

This tree analysis demonstrated that four major reasons were responsible for the degradation of aquatic biodiversity, namely capture of immature fishes, water pollution, habitat degradation, and indiscriminate fishing.

CONCLUSION

The study demonstrates that fisheries resources are the main support for the livelihood of the population. They earn a little per day for their livelihood and try their best to increase income for take care of their family. The fishermen are needed to be educated and trained to build consciousness as well as to improve their socioeconomic condition. Some forms of NGO's activities can ensure the improvement of fishermen status. In addition, health facilities can be ensured by the government assistance. Most of the fishermen use traditional fishing equipment, and they are incapable to sail further for fishing because of limited financial capacity. It is, therefore, recommended that the government and industrial companies should plan to enhance fisheries activities, provide adequate mitigating strategies, and encourage the expansion of alternative occupation. The complexities of the poor are diverse, which need to be addressed through a holistic approach regarding future fisheries development programs.

ACKNOWLEDGMENTS

We would like to express our grateful thanks and appreciation to local fishers (Bhola, Bangladesh) for collecting samples. Special thanks are extended to those people who were helped under different capacities during this research work.

REFERENCES

1. Ali MM, Hossain MB, Minar MH, Rahman S, Islam MS. Socio-economic aspects of the fishermen of Lohalia River, Bangladesh. *Middle East J Sci Res* 2014a;19:191-5.
2. Ali MM, Hossain MB, Rahman MA, Habib A. Diversity of fish fauna in the Chitra River of southwestern Bangladesh: Present status, threats and recommendations for conservation. *Asian J Appl Sci* 2014b;7:635-43.
3. Ali MM, Hossain MB, Rahman M, Rahman S. Post stocking management practices by the pond fish farmers in Barisal District, Bangladesh. *Glob Vet* 2014c;13:196-201.
4. Ali MM, Hossain MB, Masud MA, Alam MA. Fish species availability and fishing gears used in the Ramnabad River, southern Bangladesh. *Asian J Agric Res* 2015;9:12-22.
5. Ali MM, Ali ML, Islam MS, Rahman MZ. Preliminary assessment of heavy metals in water and sediment of Karnaphuli River, Bangladesh. *Environ Nanotechnol Monit Manage* 2016;5:27-35.
6. DoF. National Fish Week 2016 Compendium (in Bengali), Department of Fisheries (DoF), Bangladesh: Ministry of Fisheries and Livestock; 2016. p. 148.
7. Rahman MA. Year Round Pangus and Food Security: An Economic Analysis of Some Selected Areas of Mymensingh District. M.S. Thesis, Department of Agricultural Economics, Bangladesh Agricultural University, Mymensingh; 2009.
8. Murshed-E-Jahan K, Pems DE. The impact of integrated aquaculture-agriculture on small-scale farm sustainability and farmers' livelihoods: Experience from Bangladesh. *Agric Syst* 2011;104:392-402.
9. BER. Bangladesh Economic Review, Finance Division. Dhaka: Ministry of Finance, Government of the People's Republic of Bangladesh; 2012.
10. BBS (Bangladesh Bureau of Statistics). Statistical Yearbook of Bangladesh, Bangladesh Bureau of Statistics. Dhaka: Ministry of Planning, Government of the People's Republic of Bangladesh; 2009.
11. Chambers R, Conway R. Sustainable Rural Livelihoods: Practical Concept for the 21 centuries. Discussion Paper, IDS No. 296; 1992.
12. Azucena CW, Oliver MS, Jonen BP, Viray MH, O'Malley S. Utilizing Different Aquatic Resources for Livelihoods in Asia. A Resource Book. Philippines: IIRI; 2001. p. 361,
13. Hassan MN, Rahman MM, Hossain MM, Nowsad AA, Hossain MB. Post-harvest handling and marketing of shrimp and prawn in south-western region of Bangladesh. *World J Fish Mar Sci* 2012;4:651-6.
14. Al-Amin AQ, Alam GM, Hassan CH. Analysis of inshore economic benefit and growth through the proper uses of the utility and scope of fisheries and livestock: A guideline to the MOFL in Bangladesh. *Asian J Anim Vet Adv* 2012;7:477-88.
15. Kabir KM, Adhikary RK, Hossain MB, Minar MH. Livelihood status of fishermen of the old Brahmaputra River, Bangladesh. *World Appl Sci J* 2012;16:869-73.
16. Alam MF, Basha MA. Structure of cost and profitability of small scale riverine fishing in Bangladesh. *J Res Prog* 1995;9:235-41.
17. BBS (Bangladesh Bureau of Statistics). Statistical Year book of Bangladesh. Bangladesh Bureau of Statistics, Statistical Division. Dhaka: Government of the People's Republic of Bangladesh; 2010. p. 511.
18. Olatunji AE, Olah OM. The socio-economic status of artisanal fishers in cross river, Cross River State, Nigeria. *World J Fish Mar Sci* 2012;4:672-8.
19. Ali H, Azad MA, Anisuzzaman M, Chowdhury MM, Hoque M, Sharful MI. Livelihood status of the fish farmers in some selected areas of Tarakanda Upazila of Mymensingh district. *J Agroforestry Environ* 2009;3:85-9.
20. Mahabubur MR. Study on the Fisheries and Socio-Economic Condition of the Fishermen in the Baculiar Haor, Itna, Kishoregonj. M.S. Thesis, Department of Fisheries Management, Bangladesh Agricultural University, Mymensingh; 2001. p. 51.
21. Khatun S, Adhikary RK, Rahman M, Sikder MN, Hossain MB. Socioeconomic status of pond fish farmers of Charbata, Noakhali, Bangladesh. *Int J Life Sci Biotechnol Pharm Res* 2013;2:356-65.
22. BBS (Bangladesh Bureau of Statistics). Bangladesh Bureau of Statistics, Planning Division, Ministry of Planning, Govt. Of the People's Republic of Bangladesh; 2002.
23. Sandika AL, Hirimuthugoda NY. Socio-economic and livelihood related issues of crab collectors in Koggala Lagoon in Galle, Sri Lanka. *Trop Agric Res Exten* 2011;14:19-24.
24. Sarker C. Socio-economic Aspects of Pond Fish Cultured Women in Some Selected Areas of Habigonj District. M.S. Thesis,

Department of Fisheries Management, Bangladesh Agricultural University, Mymensingh; 2004.

25. Halim MA. Status on Fish Biodiversity of Beels and its Fishers' Livelihoods in Atghoria Upazila of Pabna District. M.S. Thesis, Department of Aquaculture, Bangladesh Agricultural University, Mymensingh; 2011.
26. Quddus MA, Rahman MS, Moniruzzaman M. Socio-economic conditions of the pond owners of Demra, Dhaka. Bangladesh J Fisheries Res 2000;4:203-7.
27. Reza S, Hossain MS, Hossain U, Zafar MA. Socio-economic and livelihood status of fishermen around the Atrai and Kankra Rivers of Chirirbandar Upazila under Dinajpur District. Int J Fisheries Aquatic Stud 2015;2:402-8.
28. Roy A, Manna RK, Sharma AP. Socio-economic and livelihood analyses of hilsa (*Tenulosa ilisha*) fishers of lower stretch of Ganga River, India. Indian J Fisheries 2016;63:83-8.



This work is licensed under a Creative Commons Attribution Non-Commercial 4.0 International License.