

Biosocio-economic analysis of fishing community around the *Titas* RiverMd. Mozammel Haque^{1,2}, Md. Akram Ullah¹¹Department of Fisheries and Marine Science, Noakhali Science and Technology University, Noakhali 3814²Department of Oceanography, University of Dhaka, Dhaka 1000***Correspondence:** Md. Akram Ullah, Department of Fisheries and Marine Science, Noakhali Science and Technology University, Noakhali 3814Email: akramnstu@gmail.com**ABSTRACT**

This study was conducted to update the biosocio-economic condition of fishing community around the *Titas* River of *Kasba* Upazila in Brahmanbaria district from July to December, 2016. This data were collected through PRA method, questionnaire survey and focus group discussion from randomly selected 45 different local fishermen communities of 3 villages. The results of the study revealed some interesting facts and showed that more than 47% of total catch was *Siluriformes* followed by *Perciformes* 20%. Two dominant exotic species were silver carp (*Hypophthalmichthys molitrix*) and Raj puti (*Puntius gonionotus*) there. Three species *Chanda*, *M. aculeatus* and *Notopterus notopterus* showed stable trends with contribution of 9.75%. Educational condition was medium about 30% were illiterate and 55% primary educated and only just 3 primary schools and 2 high schools. Guardians are not caring in nature about their children education. Majority were Muslim (54%). Early marriage is common phenomena. Tin shed made houses were common. Alternative income sources were poor but having few agricultural lands. No good hospital or health care center. The villagers go to Kasbah Health Complex in any serious condition. Lives are vulnerable during floods, storms etc. as currently there is no embankment to save the villagers. The annual average income was 70000- 80000 BDT and extreme poor was 30000-35000 BDT. But that income was not sufficient to spend their life in the present situation. No Vulnerable Group Feeding cards were provided by government for them in those areas. Lack of proper knowledge, illiteracy not as much of governmental support was the major constraints. No management option for fish exploitation was found in the *Titas* River. Catching of fish before maturity and overfishing are very common practices there. So the government should come forward as soon as possible to take necessary management steps and provide training facilities to the fishermen for improving the production of fish and socioeconomic condition of fishermen.

Key words: Titas River, Socio-economic conditions, No management, Training**1. INTRODUCTION**

Fish and fisheries products play a significant socioeconomic role of Bangladesh in terms of nutrition, income, employment and foreign exchange earnings and depend on fish as the principal source of animal protein. More than 80 percent of the animal protein in the Bangladeshi diet comes from fish products. Fisheries sector contribute about 60% of the nation's animal protein intake, nearly 3.65% GDP to national income and 23.81% GDP to the Agricultural income [7]. Annual fish production was 36, 84000 MT in 2014-15 where annual fish intake by an individual is 21.6 kg [7]. It is estimated that more than about 11% people are directly or indirectly engaged in fishing and other ancillary fishery activities and a large portion of rural family members are engaged in part time fishing from the beels. About 11.8 million people of the country directly or indirectly involved in fisheries and other ancillary activities [7]. Bangladesh occupied fifth position in the world fish production in the inland water body in 2014-15 [7]. Livelihood is sustainable when it can cope with stresses & shocks and maintain or enhance its capabilities to recover from it, while not undermining the natural resource base [5]. For sustainable rural development and poverty elimination, different approaches had been adopted and the sustainable livelihood approach has been gradually expanded with its own core and principles for poverty focused development activities [6]. The approach basically based on the fundamental principle analysis of capital assets in the context of the external environment [4]. [9] Addressed that a sustainable livelihood is a way

of thinking about the objectives, scope and priorities for development, in order to enhance progress in poverty elimination.

Kasba Upazila is adjacent to Brahmanbaria town that is one of the most important ecosystems [1]. This area plays a very important role in alleviation of rural poverty and supplying food to the poor fishing community. Large scope of fish culture system would be possible if fish farmers adopt improve technology and most of the fishermen in this area uses traditional fishing method. However, socioeconomic status of this fishing community is not reasonable; production of fish is also declining day by day. Considering the above fact, the present study was conceded to assess the livelihood status and constraint faced by the fishermen in the study. For this reason, *Kasba* Upazila was selected for the study to identify socio-economic condition of the fish farmers.

2. MATERIALS AND METHOD

2.1 Study area and duration

This study was carried out in Titas river of *Kasba* upazila in Brahmanbaria district that is in the east-central Bangladesh that occupies an area of 209.77 km². The geography of the upazila is characterized by low-lying land with small hills and hillocks of red soil. The study period was from June to December, 2016 (figure 1)

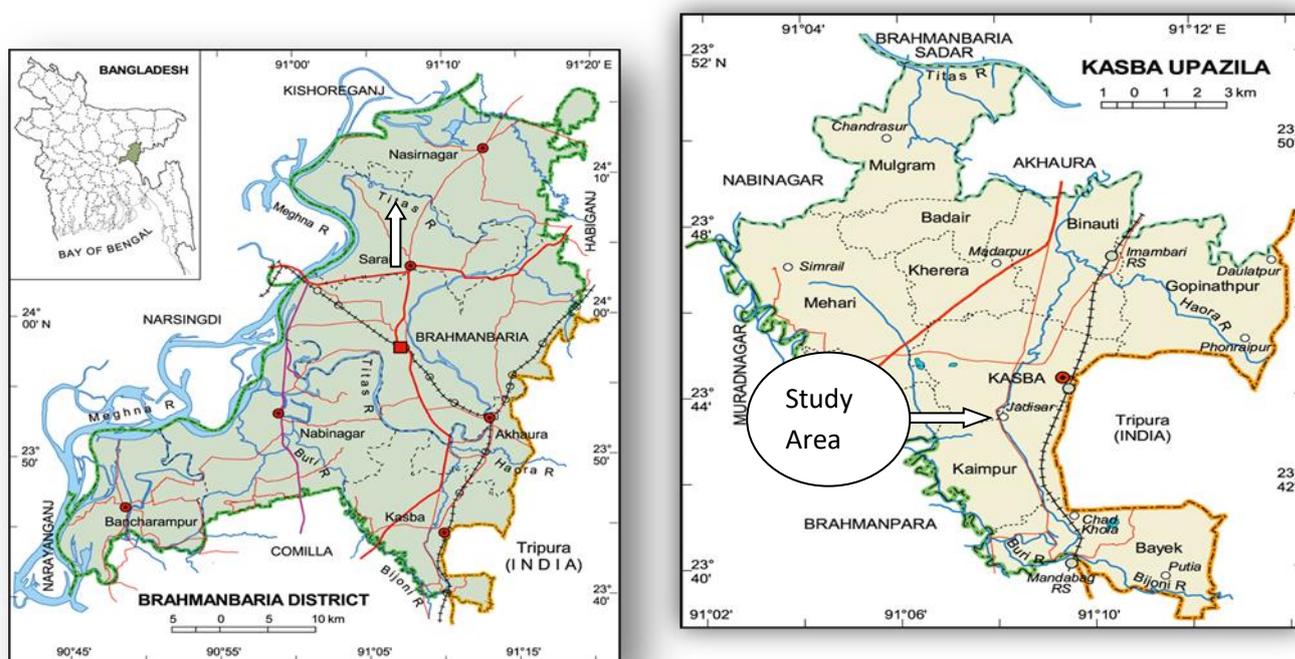


Figure.1 Map of Kasba Upazila showing the Study area

2.2 Sampling frameworks

The study was composed of a livelihood systems assessment in Bangladesh. The primary data were collected through the questionnaire, survey, group discussion and interview. Weekly field survey was carried out to collect the necessary information through random selection method. A total of 45 fishermen households were surveyed in three villages, viz-Mulgram, Shamnagar and Mayedagong union of *Kasba* upazila. However, all the data were cross-checked for ensuring the accuracy of data that collected from the respondents. The Focus Group Discussion were conducted to identify the problems and to collect fishermen's recommendations regarding the problems identified so that effective solution to the problems would develop. Necessary information on the socio-economic condition of fishermen was collected from regional fisheries, settlement, LGED and agricultural offices.

3. RESULTS AND DISCUSSION

The purposes of the study to investigation the bio-economic and socio-economic condition of the fishermen around the *Titas* River directly or indirectly depend on their livelihood. Total 45 fishermen families were interviewed around the *Titas* River adjacent near from 3 villages in various aspects of livelihood status of the fishermen and the main composition of the *Titas* River. The fishermen was the main aspects of this study and emphasizing on religion, age structure, educational status, occupational status, family size, family type, housing condition, drinking water facilities, electricity facilities, income and other socio-economic issues.

3.1 Fisheries bio economics

3.1.1 Species composition

Total 35 catching fish species was recorded from the *Titas* River including two exotic species Silver carp (*Hypophthalmichthys molitrix*) and Raj puti (*Puntius gonionotus*). More than 47% of total catch was comprised of *Siluriformes* (48%) followed by *Perciformes* (20%) and *Cypriniformes* (4%) and the rest 28% of the catch were small and medium sized fish and prawn. As a single species, *Wallagonia attu* (12.48%), *Mystus cavasius* (10.87%), *M. gulis* (9.99%), *Chanda nama* (9.84%) and *C. baculis* (8.25%) dominated the catch. Small prawns (*Palaemon styliformes*, *Macrobrachium lamarrei*). The catches species composition and Percentage of species composition in the study area is given in figure 2.

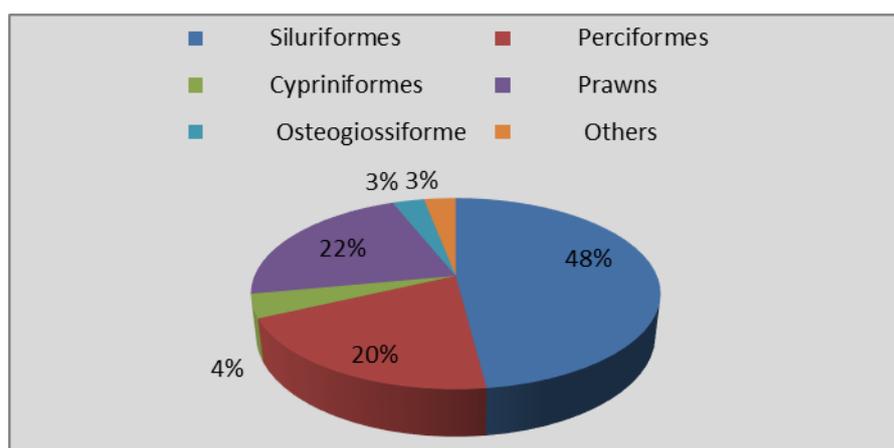


Figure.2 Percentage of species composition in the study area.

The contribution of *Chanda sp.* in the catch increased gradually after 2007. The contribution of *Labeo rohita* declined gradually up to 2001 but increased in 2002. But the Catching of *C. soborna* showed a declining trend from 1997 due to overexploitation of this species.

The most dominant species *Gudusia chapra*, *Puntius sophore*, *Nandus nandus*, *Mystus tengra*, etc showed positive catch trends representing 35.07%. Moreover, *Chanda spp.*, *M. aculeatus* showed stable trends with a combined contribution of 9.75% and seven species like *C. soborna*, *small prawn*, *W. attu*, *Chanda ranga* and *M. pancalus* showed negative trends with a combined contribution of 32.99% in the study area. *C. soborna* was the species with the highest contribution.

The fishermen are concerned due to decrease the composition of catches species in there. The highest catch composition was found in the month of February but October is known as the most suitable season for fishing in Bangladesh. The catch rate and composition was found lower in the rainy season which is different with the [2] study. Huge amount of carp and cat fish is caught in winter season.

Studied on the population parameters of those investigated area and found overexploitation of the most commercial species. The monthly production is about 250 MT. And the annual production in the *Titas* River is

about 3,000 MT. The trends of declining the composition of catches of the main species from 1997 to 2002 in the *Titas* River

Table. 1

Fishes	1997	1998	1999	2000	2001	2002	Overall	Annual trend
<i>G. chapra</i>	12.35	9.95	9.52	14.05	16	10.59	11.94	Slowly increasing
<i>P. sophore</i>	4.14	9.7	15.9	12	12.05	9.08	10.94	Slowly increasing
<i>C. soborna</i>	16.23	14.96	14.3	7.3	6.85	4.47	9.69	Sharply-decreasing
<i>Small prawn</i>	7.57	7.83	7.34	5.27	7.79	5.7	6.85	Decreasing
<i>N. nandus</i>	5.3	2.92	4.1	6.38	4.77	6.96	5.11	Increasing
<i>L. rohita</i>	8.85	8.03	2.89	3.44	2.14	6.54	5.11	Decreasing
<i>W. attu</i>	6.21	2.32	3.21	3.62	3.01	3.48	3.31	Decreasing
<i>M. tengra</i>	0.93	2.12	5.11	4.21	1.86	1.9	2.70	Slowly increasing
<i>C. ranga</i>	1.73	6.3	0.16	0.98	1.52	2.73	2.48	Decreasing
<i>M. armatus</i>	1.29	0.48	4.46	2.46	3.49	1.99	2.41	Increasing
<i>N. notopterus</i>	1.69	3.23	1.34	1.56	1.99	1.69	1.98	Slowly decreasing

[Source: Impact of community based management approaches on fishery resource diversity of flowing seven river systems in Bangladesh, October 2007]

3.2 Socioeconomic status of related fishermen community

3.2.1 Religion

From the survey, it was found that about 73% of the fishermen were Muslims and rest were Hindus in Mulgram, 80% Hindus and rest were Muslims in Shamnagar, 67% Muslims and rest were Hindus in Mayedagong that were shown in Table. 2

Table. 2 Religious conditions of the fishermen

Religion	Mulgram (15)	Shamnagar (15)	Mayedagong (15)	Mulgram (%)	Shamnagar (%)	Mayedagong (%)
Muslim	11	3	10	73%	20%	67%
Hindu	4	12	5	27%	80%	33%
Overall average	Muslim 54%		Hindu 46%			

Overall number of religions are 54% Muslim, 46% Hindu in the studied area where they lead a peacefully life is shown in Fig 3. Hossain *et al.* 2105 were reported that on an average 90% of fishermen were Muslim in the central coast of Bangladesh but 54% of Muslims in the western coast of Bangladesh (this study).

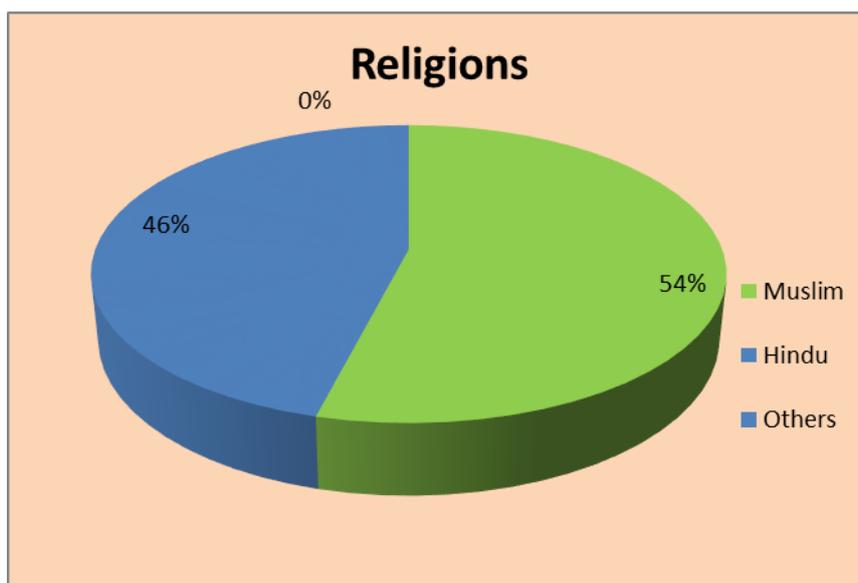


Figure.3 Overall percentage of Religions

3.2.2 Age structure

Different categories of age groups were found that young 16 % (10-25 years), middle aged 54% (25-35 years), old aged 22% (35-45 years) and 8%(55-65) were considered to examine the age structure is shown in Table. 3 Hossain et al. 2015 were also found in their research that 35-48 years old fishers (middle aged) were maximum (43-54%) in middle coast (Cahndpur, Ramgoti, Chairmanghat) of Bangladesh.

Table. 3 Age of the studied fisherman

Range Age	Number of fisherman			Percentage		
	Mulgram	Shamnagar	Mayedagong	Mulgram	Shamnagar	Mayedagong
Class	15	15	15			
10-25	1	3	3	7%	20%	20%
25-35	8	7	9	53%	46%	60%
35-45	4	3	3	26%	20%	20%
55-65	2	2	0	14%	14%	0%
Overall average	16%(10-25 years)		54%(25-35 years)	22%(35-45 years)		8%(55-65)

From the survey, it was found that the highest position of middle aged fishermen 54% (25-35) in the studied area. The Comparison of Age structure overall of fisherman in the 3 studied areas is shown in Fig 4.

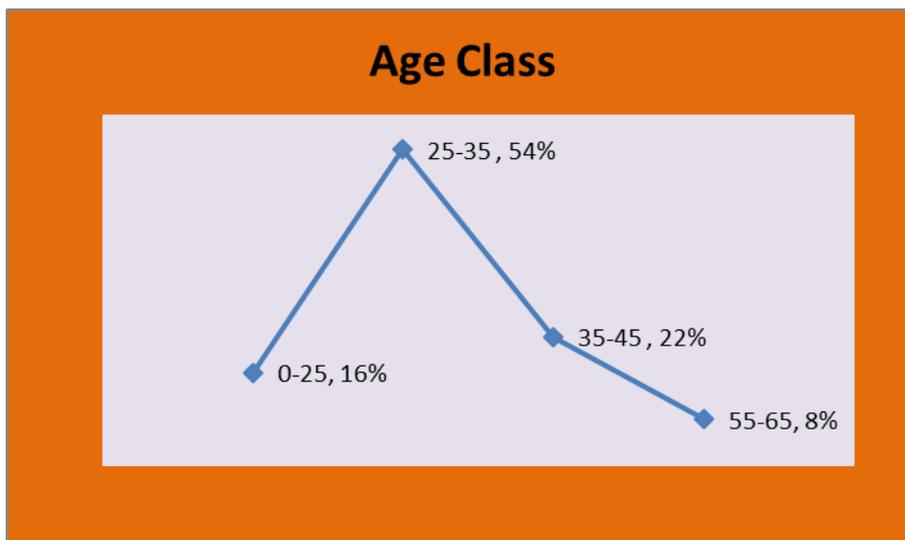


Figure 4. Age structure of fishermen

3.2.3 Educational status

The education condition of the Mulgram village moderate about 27% illiterate, 60% primary, 13% fisherman were secondary educated. In Shamnagar village about 27% illiterate, 53% primary, 19% secondary and only 1% were higher secondary educated. In Mayedagong village about 33% illiterate, 60% primary, 7% fisherman were secondary educated.

Comparison of Educational status of fisherman in the three villages that primary level is the highest in Mulgram and Mayedagong but secondary level is the highest in Shamnagar about 19% and illiterate rate is the highest in Mayedagong village about 33% that were shown in fig. 5.

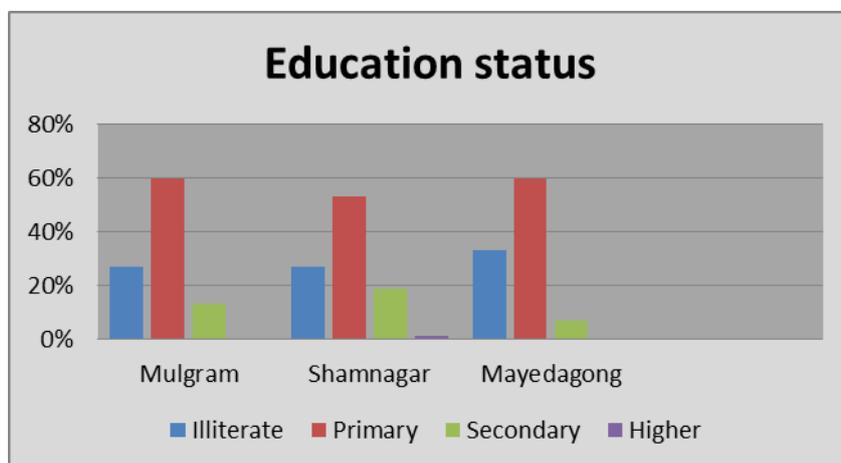


Figure.5 Comparison of Educational status of fisherman in the study area

The fishermen community of Titas River has limited livelihood opportunities, which is very much similar with the finding of the [3]. Most of the inhabitant of these villages were illiterate and have no training, to change the fishing and drying practice. The overall level of educational status of fishermen the study area was about 29% (Illiterate), 58% (Primary), 13% (Secondary), 0.33% (Higher). The condition of primary level is moderately good but higher level is negligible. It is shown in Figure 6. [8], were found that about 35- 40% fishers can sign only.

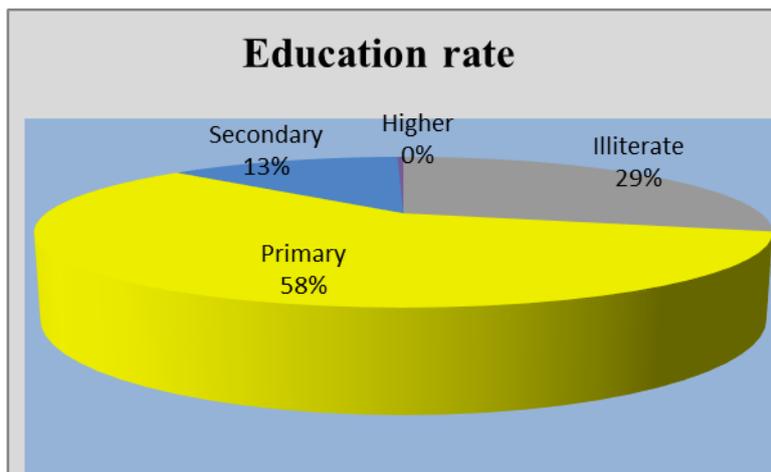


Figure.6 Educational statuses of fishermen in the study area

3.2.4 Family Size

The family size of the fishermen was divided into three categories according to the number of the family members. From the present survey; it was found that about had small family with 22 % (2 -3 members); had Medium family with 53% (4-5 members) and had large family with 25% (more than 5 members) is shown in Table 4.6.

Family size of the overall studied area is shown in fig. 7. That total 22% are small family, 53% medium family and 25% large family exist in there. The small family (up to 4 members) were more or less 50% then middle family (5 to 8 members) and very rare in large family (more than 8 members) found [8].

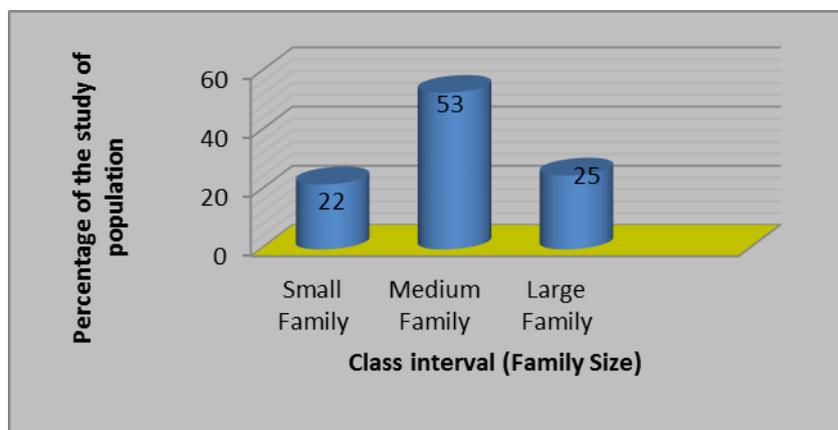


Figure.7 Family size of fisherman

3.2.5 Family type

From the survey of the study area, it was found Table 4 that 60% families of the fishermen were joints and 40% families were nuclear in Mulgram village. There were about 53% joints and 47% families were nuclear in Shamnagar village. On other hand, about 34% joints and 66% families were nuclear in Mayedagong village.

Table.4 Family pattern of studied fisherman

Type	Number of fisherman		
	Mulgram	Shamnagar	Mayedagong
Joint Family	9	8	5
Nuclear Family	6	7	10

Percentage of Joint	60%	53%	34%
Percentage of Nuclear	40%	47%	66%
Overall average	Joint Family 49%		Nuclear Family 51%

The family types of the three villages that can be compared to each others are shown in Fig 4.10 where the maximum families are nuclear family in Mayedagong village about 66% and maximum families are joint family in Mulgram village about 60%. The overall condition of 3 villages about 49% joints and 51% families were nuclear in the studied area that showed in figure 8.

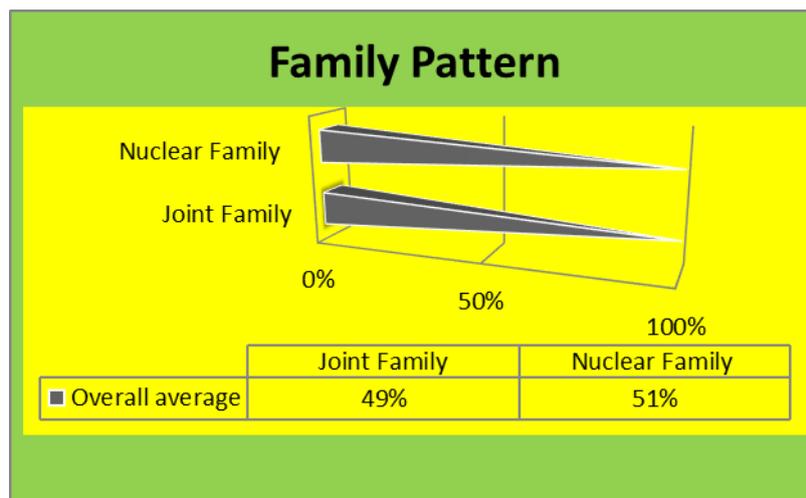


Figure.8 Family Pattern of studied area

3.2.6 Housing condition

The physical characteristics of the households have an important effect on the people's environmental exposure to disease and reflect the household's economic conditions. About 45% Households families in the study area live in structures with roof made of natural material such as bamboo or straw. The most fishermen have tin shed building.

3.2.7 Health facilities

The health condition of the fishermen in the study areas were not so good because there have no any hospital or other good Health Care Center in the villages. They go to Brahmanbaria sadar Upazilla Health complex serves people as well as the fisherman but there are only one health care centers in there that is not enough for the people.

3.2.8 Drinking water facilities

From the study it was found that most of the family about 98% of fisherman family have own tube well and the other remaining have ponds which are used as the sources for drinking water.

3.2.9 Electricity facilities

The study revealed that only 23% of the fishermen had electricity access while majority about 77% of them had no electricity access show in figure 9.

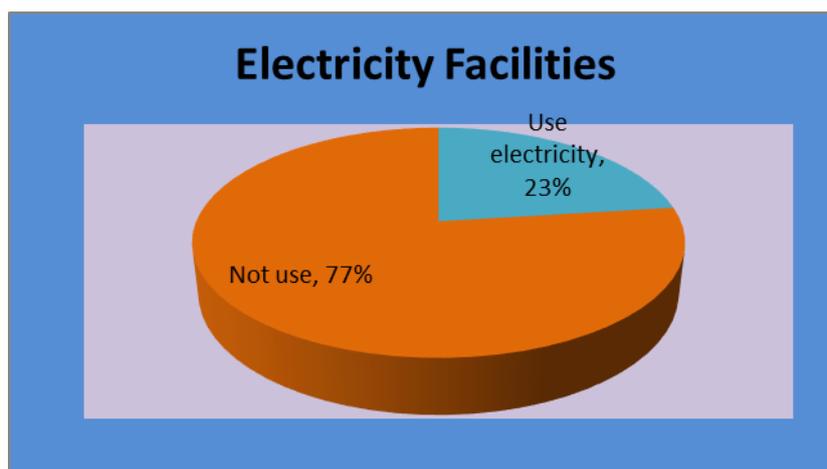


Figure. 9 Status of the electricity consumption by the study area

3.2.10 Annual income

Annual incomes of the fishermen were varied from BDT 20,000 to 1, 50,000. The selected fishermen were grouped into five categories based on the level of income and it was found that about 54% of the fishermen had annual income between BDT 80,000 to 90,000 and 24% of the respondent had income in the ranged BDT 70,000 to 80,000. About 22% of the fishermen had annual income over than BDT 1, 00000. Annual income of fisherman in the study area is shown in Table. 5 The annual income of the fishermen were found in BDT 12,000 to 54,000 in Chanpur, Ramgoti and Chairmanghat in 2015 [8].

Table 5. Annual income of fisherman in the study area

Annual income of the fishermen (BDT)	Percentage of annual income		
	Mulgram	Shamnagar	Mayedagong
70,000-80,000	13%	12%	46%
80,000-90,000	60%	54%	48%
Above 1,00000	27%	34%	6%

The Annual income of fisherman in the studied area was found that the annual income of Mulgram village fishermen was moderately high to compare other two villages.

3.2.11 Cost and earning

From the present survey, it was found that the studied area about average per day income , Off season income per day, On season income(BDT/yr), fishing source income(BDT/yr), other source income(BDT/yr) and Marketing cost of the fishermen. Per day income of each fishermen in Mulgram was 260 (BDT.), per day income of each fishermen in Shamnagar was 275 (BDT.) and per day income of each fishermen in Mayedagong was 228 (BDT.).

Marketing average cost of the three villages more or less same as 110 BDT. From the present study, it was found that per day income (BDT) rate of each fisherman in Shamnagar was the highest position followed by

Mulgram and Mayedagong on the basis of per day income (BDT) of each fisherman. All of the income and cost has been given in Table 6.

Table. 6 Marketing cost and earning of the fishermen

Name	Per day average income	Off season average income per day	On season average income per year	Average fishing source income per year	Average other source income per year	Average Marketing cost
Mulgram	260	116.67	93600	67200	25733.33	110
Shamnagar	275	119.33	95933.33	79133.33	15533.33	110
Mayedagong	228	113.33	81600	64200	17400	110

3.2.12 Mobility Chart

Mobility chart was prepared for knowing the areas where the people goes for their needs and also where they go frequently and their connection with the urban areas. The common mobility chart of the villagers is given here in Figure 10.



Figure.10 Mobility chart of villager's community.

3.2.13 Vulnerability Context

Due to lack of education and skill manpower, the major portions of the working force are unemployed. They have limited access to private and public institution for credit to run small scale businesses or other engage in income generating activities. The system of education is not job oriented, such that even educated man and women are unable to find employment.

3.2.14 Seasonal vulnerable

The community is particularly vulnerable to storm and other natural calamities from April to May. The village households are heavy affected under heavy rainfall. Seasonal various diseases, such as diarrhea, dysentery, pox etc.

3.2.15 Shocks

Shocks include theft of productive assets such as fishing nets and boats. Poverty damage from natural disaster, illness and death of an income earning family member. The common practice of praying dowry for marrying daughters.

3.2.16 Trend

Since there have no any fish landing centre, so they cannot get exact value of fish. The poor often resort to money lenders and traders as a means to access to credit, characterized by extremely high interest rates, and fall in to a “never ending credit cycle”.

3.2.17 Management options

There was found not so management options there. Huge amount of fish is caught before maturity here. No rules by government are followed here as it is a remote area from the Kasba Thana. A police station has established recently. But their number is small and they have not so activities about management or rules.

4. Conclusion and Recommendation

The development Bangladesh depends on agriculture. Fishery greatly contributes to expand economic growth. Purpose of this study to assess the fish production, impacts on the socioeconomic condition of the fishermen and tried to find out some management options. Besides, data was also collected from the fishermen, retailer, wholesaler and key informants and through observing the major markets at adjacent area in the Titas River. The socio-economic condition in the adjacent area was not satisfactory. The education level of the fishermen was not good. The fishermen were deprived of many facilities. So some educational institutes should be built up in the adjacent area. Besides, some fishermen still used current net in the study area which is threatened for depletion of fish biodiversity in the Titas River. So, the Govt. should take some important step by providing some sorts of management policy as well as providing of some extra providence during the ban season of the fishing. That may be done within the providing of the VGF card. Some NGO's activity must be ensured in the adjacent area for the improvement of the life leading status of the fishermen. The NGO's must be helpful about the providence of the loan which may be used for the up gradation of the income procedure. As well as health facilities should be ensured by the government assistance. Alternative livelihood opportunity should be given to the fishermen and his family during the banning period to protect the fish stock. It is needed urgently to establish effective sanctuaries in the study areas. The number of seine nets and gill nets (mono filament) should be reduced during peak fishing season in the *Titas* River. Finally, The Fish Act should be strictly enforced through active participation of fishers. Based on the findings of the study, the above mentioned recommendations can be made to improve the fish production and the socioeconomic condition of the study area.

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