The Socio Demographic Status of Small Scale Fishers of Inland Open Water Area: A Case Study from Chalan Beel Area of Bangladesh

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Abstract

Fisheries are significantly contributing to the different aspects of a community such as livelihoods, supplying of food and ensuring security of food at both local and global levels. It also provides a vital source of protein as well as cash income for many families in the developing world. Though, fisheries sector is supporting about 11% of the total population's livelihood of Bangladesh but fisherman is one of the most vulnerable communities in Bangladesh. Moreover, like other developing countries in Bangladesh, small-scale fisheries (SSFs) are making significant support regarding food nutrition and ensuring food security, alleviating poverty and sustainable livelihoods of the people. However, the livelihood of SSFs are undervalued both in the global and national scale by the scholars. Considering the above fact, it is very necessary to overview the current livelihood status of small scale fishing communities of inland open water area of Bangladesh. This study discussed the socio demographic status of SSFs in the Chalan Beel area of Bangladesh. Using a primary data survey this study discussed the SSF household head's sex, age, marital status, education, household size, household dependency ratio, livelihood, general health, food and water management and social networking, for three upazilas (subdistricts) which are part of Chalan Beel of Bangladesh.

Keywords: Small Scale Fishers; Inland Open Water; Inland Fishing; Socio Demographic Status

1. Introduction

Fisheries are significantly contributing to the different aspects of a community such as livelihoods, supplying of food and ensuring security of food at both local and global levels. Conferring from the statistics of Food and Agriculture Organization [FAO] (1), both directly or indirectly fisheries sector supports more than 600 million people for their livelihoods and this number is still counting. Additionally, more than 4 billion people are getting essential nutrition from fish and of which at least 50 percent of animal protein and essential minerals are provided to 400 million people in the poorest countries (1)**.** On the other hand, trade in fish and fisheries products is also important for societies and economies. Fish remains among the most traded food commodities worldwide with more than 37 percent by volume of world production traded internationally (2). Therefore, fish provides a vital source of protein as well as cash income for many families in the developing world.

Moreover, in Bangladesh, from the centuries the role of fisheries is very crucial in terms of nutrition, and also in economy of Bangladesh. Bangladesh is one of the top ten countries in aquaculture (3). In Bangladesh 66% of the total population lives in rural areas (4). However, fisheries are often available in those areas which are remote and rural and also those places, where other economic activities are limited. However, for this reason this sector is an important source for economic growth and livelihood

in rural areas with few other economic activities (5). Additionally, according to a study of (6), fishing is not consider just as a activity for living but also guiding a way of life which determines both the social identity of a person and relationships among the people. Moreover, except direct dependency, fisheries are providing other economic activities generated by the supply of fish (e.g., fish processing, packaging, manufacturing, transportation, distributions etc.) (5). It also provides supporting activities such as (building boat, net and gear making, manufacture and repair engines, ice production and supply, supply of services to fisherman and fuel to fishing boats etc.)(5).

In developing countries especially in Bangladesh, small-scale fisheries (SSF) are making significant support regarding food nutrition and ensuring food security, alleviating poverty and sustainable livelihoods of the people. However, the livelihood of SSFs are undervalued both in the global and national scale by the scholars. In many countries it is found that the small-scale fisheries sector are usually located in the rural local communities with holding their local traditions and norms. Most of the SSFs catch fish for consumption within their households or communities. According to FAO (2), in the SSF sector more than 90 percent people directly depend on capture fisheries work. Although, SSF contribute about half of the total world fish catches but if the catches are considered for human consumption, the share is increased to two-thirds of the total global catches (1). Various studies have done either on fish populations and aquatic ecosystems or on in macro level scale regarding economies related

with fishery-dependent and their livelihood. Some studies on coastal fishing communities as well as on vulnerability and adaptation in agricultural based communities. Very limited studies conducted on inland open water fishing communities especially on the small scale fishers. In addition with, small scale fishing based communities are poorly focused by different policy makers both on global and national scale. Considering the above fact, it is very necessary to overview the current socio demographic status of small scale fishing communities of inland open water area of Bangladesh from the local perspective.

Moreover, this study is conducted in three upazilas (sub-districts) of the Chalan Beel area of Bangladesh to understand the socio demographic status of the small scale fishers (SSFs) of Chalan Beel area of Bangladesh. The remaining of the paper is organized in the following way. In section 2, the literature review for this study is discussed. Section 3 presents the methodology of the study. We analyze and discuss the result and findings from the study in section 4 and section 5 concludes the paper.

2. Literature Review

Traditionally in a fishing community those people are included whose involvement are directly related with fishing activities. However, personnel who are involved in both pre-harvesting as well as post-harvesting works that are related with fishing processes are also considered as fishing community. Additionally, these people are depending on fisheries either on a full-time basis or on a part-time basis. Though, people who are involved in full-time basis, fisheries remain as their only source of their livelihoods, but who are involved in part-time and occasional basis, fisheries is considered as a part of their livelihood strategies which are very diversified (7,8).

Furthermore, the small-scale fisheries (SSF) sector tends to be firmly rooted in local communities, traditions and values. Many SSFs are self-employed and usually provide fish for direct consumption within their households or communities. It is estimated that about 90 percent of all people directly dependent on capture fisheries work in the small-scale fisheries sector. SSFs contribute about half of global fish catches (FAO, 2014). Moreover if fish catches are considered that are destined for direct human consumption, the share contributed by the small-scale fisheries increases to two-thirds. Inland open water fisheries are particularly important in this respect where the majority of the catches from SSFs are directed to human consumption. As such, SSF serve as an economic and social engine, providing food and nutrition security, employment and other multiplier effects to local economies while underpinning the livelihoods of riparian communities.

The precise characteristics of SSFs vary depending on the location; indeed, small-scale fisheries tend to be strongly anchored in local communities, reflecting often historic links to adjacent fishery resources, traditions and values, and supporting social cohesion. In addition to employment as full- or part-time fishers, fish farmers and fish workers, seasonal or occasional in the sectors activities provide vital supplements to the livelihoods of millions. Many small-scale fishers, fish farmers and fish workers are self-employed and engaged in directly providing food for their household and communities as well as working in commercial fishing, processing and marketing. Moreover, poverty exists in small-scale fishing communities, it is of a multidimensional nature and is not only caused by low incomes but also due to factors that impede full enjoyment of human rights including civil, political, economic, social and cultural rights. These communities are often located in remote areas and tend to have limited or disadvantaged access to markets, and may have poor access to health, education and other social services. Other characteristics include low levels of formal education, existence of ill health and inadequate organizational structures.

Though, fisheries sector is supporting about 11% of the total population's livelihood of Bangladesh (9) but fisherman is one of the most vulnerable communities in Bangladesh. They are poor by

any standard and over the years economic condition of the fishermen has further deteriorated (10). Moreover, the livelihood of fishing communities have lack of their own resources. On the other hand, the gradually declining riverine fish production in recent years has added to their adversities. Furthermore, the impact of climate change on this community is much more severe than the other communities. It is because these people are deprived in terms of cash income, education and other social benefits (10).

3. Methodology

In this section the methodological part of this study is discussed which includes background of the study, study method, location of the study areas and sample size of the study.

3.1. Background of the study area

According to the definition of Banglapedia (2004), "The 'Beel' is a Bengali term used for relatively large surface, static water body that accumulates surface run-off water through an internal drainage channel". The Chalan Beel is not only an important water resource in the North-West region of Bangladesh and but also it is considered as the biggest beel of the country. Geographical location of the Chalan Beel is situated between 24.35° to 24.70°N and between 89.10° to 89.35°E. Historically, the Chalan Beel spreads over the 18 upazillas (sub-districts) of six districts of Bangladesh. The Chalan Beel incorporates 21 rivers with other 93 small beels and their floodplains, 12,817 ponds and 214 borrow pits. The total area of this beel in monsoon season is about 37,500 ha whereas in dry season the area decreases down to about 5,229 ha (See Table 1). Most of the areas of the Chalan Beel has water depth of about 2-2.5 meters. This vast drainage network endows rich diversity of fishes providing livelihood for large number of people. In fishing households, almost every family member engages in fishing activities during the monsoon season.

3.2. Method of the Study

Table 1: Water bodies under Chalan Beel and its Area

Types of Water body	Number	Area (ha)	
		Dry Season	Monsoon
Rivers	21	709	3300
Beels	93	2,227	9,164
Flood Plain	-	-	22,369
Ponds	12 817	2,293	2,617
Borrow Pits	214	-	50
Total	-	5,229	37,500
Source: Department of Fisheries (DoF), 2015			

To achieve the objective of the study, data has been collected using a structured questionnaire from 352 SSF households from three upazilas of Chalan Beel area of Bangladesh. In order to meet the objective, the entire study is based on primary data and data have been collected through face-to-face interview during December, 2017 to February, 2018.

3.3. Study Location

The entire Chalan Beel area is spreading over 18 upazilas of 6 districts (Bogra, Natore, Naogaon, Pabna, Rajshahi, Sirajgonj) of Bangladesh. For this study, 3 districts (Natore, Pabna and Sirajgonj) are randomly selected and after that one upazila from each districts is randomly selected for this study. The upazilas are Chatmohor, Gurudaspur, and Tarash from Pabna, Natore and Sirajgonj districts respectively. More precisely, three unions (Chaikhola from Chatmohor, Khubjipur from Gurudaspur and Saguna from Tarash) from three upazilas are selected for collecting data. The reasons behind the selection of these unions are for the availability of a reasonable number of respondents and availability of easy communication to each of the area. In Figure 1 the location of the study areas are shown.
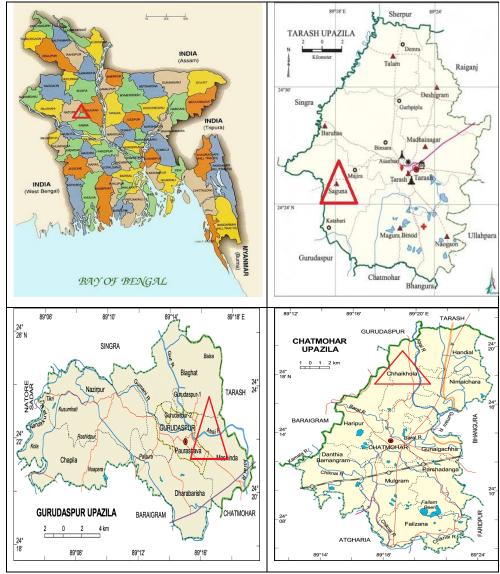
Fig. 1: Map of Bangladesh, Map of Tarash Upazila, Gurudaspur Upazila and Map of Chatmohor Upazila of Bangladesh
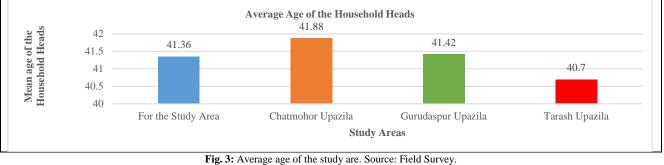
3.4. Sample Size

This study have used (12) prescribed formula to calculate the sample size for conducting a primary research which is especially designed for household survey. Using this formula the sample size for Chatmohor upazila is 115, for Gurudaspur Upazila is 121 and for Tarash upazila is 116. On the basis of random sampling, all 352 SSF households were randomly selected and the household heads of the selected households were interviewed. After collecting data, it have been checked and verified to make sure that answer to each item had been properly recorded. Collected data have been tabulated and analyzed using descriptive statistics. Figures and diagrams are used to represent the findings of the present study.

4. Results and Findings

Moreover, data have been collected to describe the socio demographic status of the small scale fishing communities of the Chalan Beel area of Bangladesh. In this section the socio demographic variables such as age, marital status, household size, education, livelihood, health assessment, food and water management, social networking are discussed below.

4.1. Age Structure

The overall age structure of the household heads lies between 18 years to 85 years in the study areas. Moreover, 65% household heads' age is between 33 to 55 years. Whereas, 25% household head's age is between 18 to 32 years and 10% lies between 56 to 85 years. The average age of the household heads for overall sample is 41.36 years. Furthermore, the average age of the household heads for Chatmohor upazila is 41.88 years, for Gurudaspur upazila is 41.42 years and for Tarash upazila is 40.7 years. In figure 2 the mean age of the SSF household heads are shown.

Fig. 3: Average age of the study are. Source: Field Survey.

4.2. Marital Status

In terms of marital status, 336 household heads reported that they are married and 7 reported that they are unmarried. Despite this two status this study also found that there are 8 household heads who are either widow or widower and also found 1 divorcee household head. The percentage of marital status for the overall study area and for three selected upazilas are shown in Figure 3. From this figure it is clear that in terms of married status Tarash upazila is higher considering 97.41% household heads are reported as they are married. On the other hand, in terms of unmarried and other marital status the Chatmohor upazila is higher considering 2.61% household head as unmarried and 3.48% household head as in other marital status category that is either widow/er or divorcee. Additionally, the only one divorcee status household is also found in Chatmohor upazila.
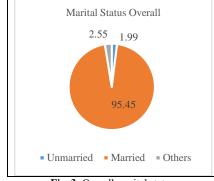

Fig. 3: Overall marital status

4.3. Household Size and Household Dependency Ratio

The household size range for the overall sample is 2 to 7 and the average household size is 4.07. On the other hand, the average dependency ratio is 0.57 which range from 0 to 2. For Chatmohor upazila the average household size is 4.04 and the average dependency ratio is 0.53. For Gurudaspur upazila the average household size is 4.12 and the average dependency ratio is 0.66 and for Tarash upazila it is 4.03 and 0.53 respectively.

Moreover, Table 2 shows the distribution of household sizes in three study areas. The most frequent household size is 4 and the least frequent is 7. Moreover, the Shapiro-Wilk test value for the household size is 0.24 which means the household size is normally distributed.

Table 2: Distribution of Household Size in the Study Areas

HH Size	Chatmohor	Gurudaspur	Tarash	Total
2	10	9	8	27
3	28	29	26	83
4	41	41	46	128
5	20	27	28	75
6	15	10	6	31
7	1	5	2	8
Total	115	121	116	352

Source: Field Survey

4.4. Education

46.59 % of the household heads have attended school in the study area. Moreover, 48.70 % attended in Chatmohor, 52.89% attended in Gurudaspur whereas only, 37.93 % have attended in Tarash upazila. The average years of schooling for the household heads are 7.2 years whereas for Chatmohor it is 7.5 years, for Gurudaspur it is 6.66 years and for Tarash it is 7.66 years. Additionally, 50% of the total household heads have their schooling years between 1 to 6 years, and 14.63% households have 10 years of education.

4.5. Housing Status

According to this study, most of the SSF households live on their own houses. More precisely, 334 (94.89%) households have reported that they live in their own house. On the other hand 18 households (5.11%) reported that, they live on rental basis. Among this 18 households 8 are from Chatmohor upazila, 6 are from Gurudaspur Upazila and 4 are from Tarash Upazila.

Moreover, the households are living in their houses on average for 39.99 years. However, households who have their own houses are living on average for 41.63 years and those who are living in rented houses are living on average for 9.89 years. The Shapiro-Wilk test for living years in the house is 0.1 which shows that years of living in the house is normally distributed.

Furthermore, most of the households (88.07%)) use wood for their primary fuel for cooking. Only 36 households use animal dung of which 15 households from Chatmohor, 8 households from Gurudaspur and 13 households from Tarash upazila use animal dung as their primary fuel for cooking. In addition with, 6 households use gas for their cooking.

4.6. Livelihood of the Small Scale Fishing Households

As along with this study found that most of the households (59.1%) catch fish around 6 to 8 months. However, the average fish catching month is 7.41, whereas, for Chatmohor and Gurudaspur it is higher 7.62 month and 7.74 months respectively. For Tarash the average fish catching month is relatively lower which is 6.86 month. Additionally, no household have reported that they have changed their fish catching spots due to any reason. From year after years they catch fish in the same areas.

In addition with, 347 household heads have reported that they do other part time income generating activities (IGA) other than fishing. For instance, 309 (88.54%) household heads said they do as agriculture labor and 21(6.02%) household heads reported that they do general labor (See Figure 4). The remaining household heads do other works such as Mason (8 households),Carpenter (5 households), Private Sector worker (3 household) and Trading (3 Households).
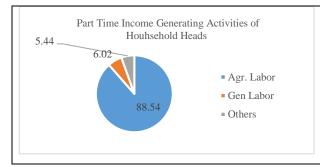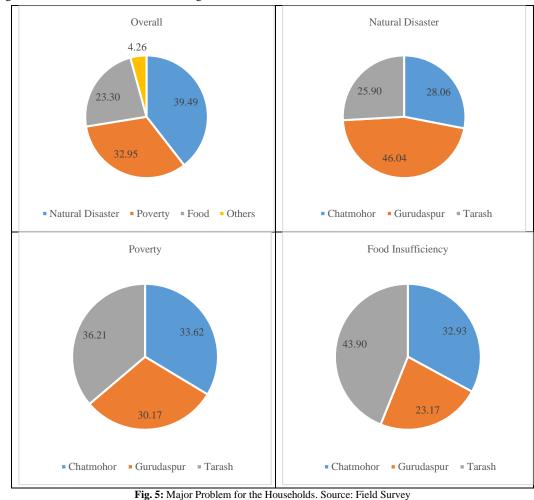
Fig. 4: Part time income generating activities of Household Heads for the whole study area. Source: Field Survey.

However, in Chatmohor Upazila 93 (80.87%) household heads involved in agriculture labor, 7 household heads do general labor,

5 household heads are mason, and 5 household heads are carpenter. On the other hand for Gurudaspur upazila 114 (94.21%) household heads are involved in agricultural labor and 5 households do general labor work. For Tarash upazila 102 (90.27%) reported for agricultural labor and 9 household reported as general labor.

4.7. General Health and Social Assessment

In terms of general health and social assessment, 39.49 percent households reported that natural disaster are the biggest problem in their family encounters. 32.95 percent household reported poverty is their main problem. 23.20 percent household reported that insufficiency of food is their main problem. The remaining household reported poor health (3.13%), unemployment (0.57%) and lack of schools (0.57%) are their main problem.

Fig. 5: Major Problem for the Households. Source: Field Survey

Furthermore, 46.04% households said natural disaster is their main problem in Gurudaspur, where as in case of Poverty 36.21% households are from Tarash and for food insufficiency 43.90% households are also from Tarash. Figure 5 summarize the main problem for the households.

In addition, the average time to go to the nearest health facility for the study area is 15 minutes. However, it is higher for Tarash which is 16.70 minutes and for Chatmohor and Gurudaspur it is lower which are 14.14 and 14.55 minutes respectively. Moreover, 57 households reported that they have at least one chronically ill family member of which 23 are from Chatmohor, 22 from Gurudaspur and 12 are from Tarash. Moreover, 36.36% household reported that in the past year at least one family member has missed school or work due to illness. Out of 128 household 38 households are from Chatmohor and 45 each from Gurudaspur and Tarash upazila.

4.8. Food and Water Management

In terms food management 71.59% household reported that they grow their primary food (Rice, Wheat, Vegetables etc.) in family farm and remaining 28.41% household reported that they get their food from buying in the shop. Moreover, 58.81% household reported that they have food for the whole year. Furthermore, the household struggle for food on average for 2.56 months. Additionally, 44.60% household reported that their daily food item is decreasing, 39.20% reported that it is unchanged and remaining 16.19% reported that their daily food item is increasing. 81.25% households reported that they collect water from their own tube well, whereas, 14.49% households reported that they collect water from natural sources like the river, lake or pond. The average distance from the water source is 0.97 minute. Though, 84.66% households said that the water is available everyday but 8.81% households reported that they store water for drinking.

Additionally, 79 households reported that their water source is been changed for the last 5 years. Among them 60 household said that the new source is far from the older one and 19 household said it is nearer than the older source. This statistics are shown in Figure 6.
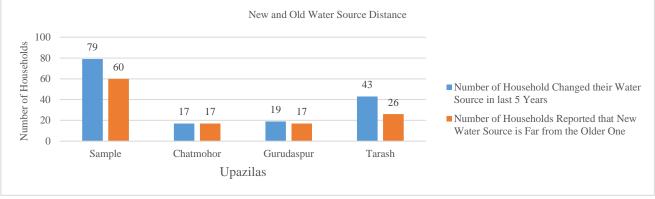

Fig. 6: New and Old Water Source Distance in the Study Area. Source: Field Survey

Moreover, 89.20% households said that they drink safe water whereas, 7.67% household said their drinking water is not safe. In Tarash 10.34% household reported that they don't drink safe water which is higher than the other two study areas (Chatmohor 6.09% and Gurudaspur 6.61%). Furthermore, in the whole study area 3.13% household are unsure about their drinking water whether it is safe or not safe. In Chatmohor this value is even higher which is 5.22%. In Figure 7 the drinking water status of the study area is shown.
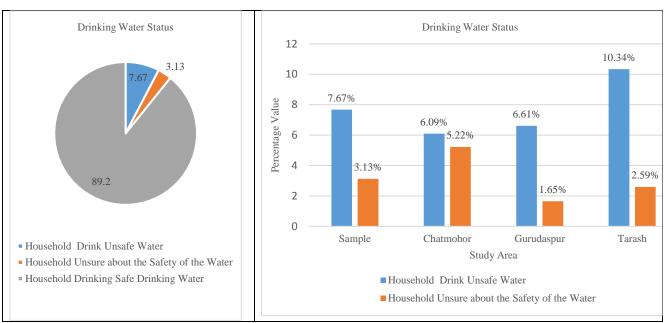

Fig. 7: Drinking Water Status of the Study Area. Source: Field Survey

4.9. Social Networking

In terms of social networking 36.93% household reported that they have borrowed money from either relatives or friend in the past month. However, in terms lending money surprisingly only 15.06% household reported that they have lend money to the relatives and friends in the past month. On the other hand, 22.44% household said they got help from their friends and relatives. Moreover, only 4.26% household reported they have help their friends and relatives in the past month.

5. Conclusion

The findings of this study reveal that most of the SSF households are less educated and they have very limited choice for their livelihood. Moreover, their average family size is more than 4 person per family which makes very difficult for them to maintain just by doing fishing. For this reason they do other income generating activities but unfortunately these choices are also very limited due to their lack of knowledge and skill. They also face many other problems like water safety, health problem, poverty, natural disasters, less social networking etc. Additionally, the catch fish on average 7 month in a year which indicates other 5 months they have to struggle for their living. Though small scale fishers are contributing a lot to the national economy, this sector has not been sufficiently appreciated. This study will help the future researcher to get better knowledge about the socio demographic status of the small scale fishing communities of inland open water of Bangladesh.

References

[1] Food and Agriculture Organization. The State of World Fisheries and Aquaculture 2016. Rome.; 2016.

[2] Food and Agriculture Organization. The state of world fisheries and aquaculture 2014 [Internet]. Rome; 2014. Available from: http://www.fao.org/3/a-i3720e.pdf

[3] Food and Agriculture Organization. The State of World Fisheries and Aquaculture 2013. Rome.; 2013.

[4] World Bank. World Development Indicators: Bangladesh. 2015.

[5] Food and Agriculture Organization. The State of World Fisheries and Aquaculture 2005. Rome.; 2005.

[6] Coulthard S, Johnson D, McGregor JA. Poverty, sustainability and human wellbeing: a social wellbeing approach to the global fisheries crisis. Glob Environ Chang. 2011;21(2):453–63.

[7] Allison EH, Ellis F. The livelihoods approach and management of small-scale fisheries. Mar policy. 2001;25(5):377–88.

[8] Coulthard S. Adapting to environmental change in artisanal fisheries—insights from a South Indian Lagoon. Glob Environ Chang. 2008;18(3):479–89.

[9] Department of Fisheries. Annual Report. Government of People's Republic of Bangladesh,Dhaka, Bangladesh; 2015.

[10] Baki MA, Islam R, Hossain M, Bhouiyan NA. Livelihood Status and Assessment of Fishing Community in Adjacent Area of Turag-Buriganga River, Dhaka, Bangladesh. Int J Pure Appl Zool. 2015;3(4):347–53.

[11] Banglapedia. National Encyclopedia of Bangladesh. Dhaka, Bangladesh: Asiatic Society of Bangladesh; 2004.

[12] UN. Designing household survey samples: Practical guidelines. Studies in Methods. New York: Department of Economic and Social Affairs, Statistics Division, United Nations.; 2005.