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## Socio Economic Status of Fry Collectors at Sundarban Region

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BM Newaz Sharif, Md Habibur Rahman, Sayeed Shahriyar**

### Abstract

The study was conducted on the livelihood approach of fry collectors at Shyamnagar upazila under Satkhira district. The objective of the study was to assess the present livelihood status, to identify the socio-economic condition and problem associated with the alternative livelihood approach of fry collectors. The survey was conducted on three unions of Shyamnagar upazila adjacent to Sundarban as study area. In the study area average family size was 5 persons per family. The maximum age level was 20-30 years old. Among the fry collectors 66% was male and 34% was female. Among them 62% was Muslim and 38% was Hindu. About 78% of total fry collectors are landless in the study area. Literacy was 31% of them where female literacy was 28% and male literacy was 72% and most of them can sign only. Most of the collectors about 63% lived in mud walled with golpata shed house. About 73% families have two earner and 68% have single family. Peak season of fry collection was March to May. For collecting fry they use push net, set bag net mainly. They collect fry in the early morning and in early evening for about 6-8 hours. Men collect 150-200 pieces of fry per day in peak season and 40-60 pieces of fry by women. Price varies from 800-3500 Tk. per thousand golda fry. Price is higher in the month on March-May. About 52% collectors engaged in fishing during off season as alternative income source. Their preferable alternative income source are sustainable agriculture, fry nursing, poultry farming, planned fish cultivation, cattle and goat rearing etc. The main problem of converting of fry collection to other profession was lack of other training of other works, lack of capital, poor infrastructure facilities, absence of industrialization, lack of land, government and NGO level work is very limited.

**Keywords:** Sundarban region, Socio economic, planned fish cultivation

### 1. Introduction

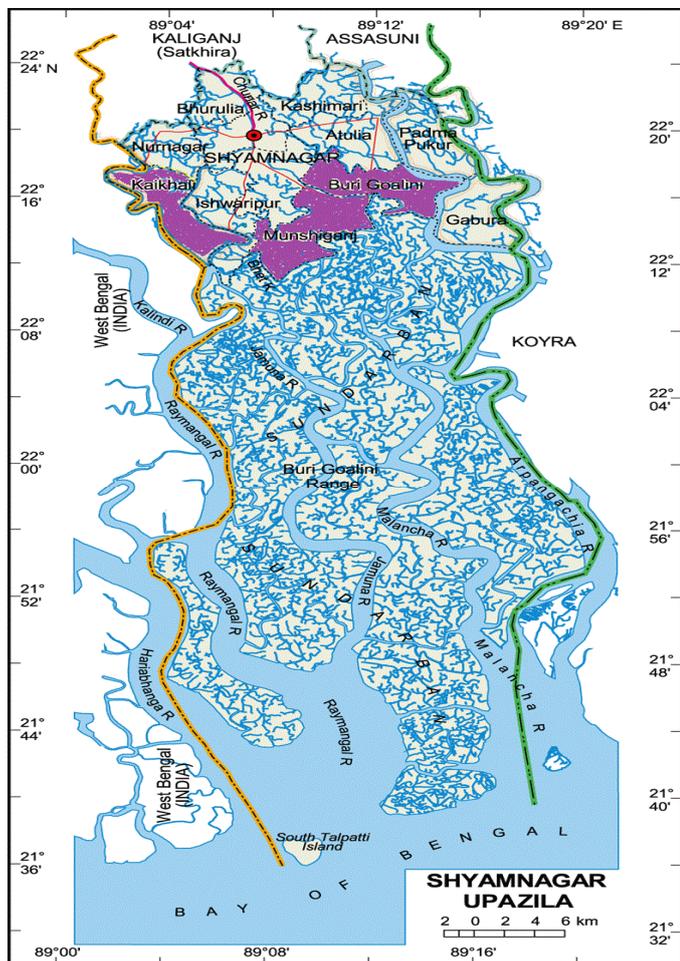
Shrimp aquaculture is an important economic activity in the coastal areas of many tropical and sub-tropical countries and offers opportunities to contribute to poverty alleviation, employment, community development and foreign exchange income generation (Huntington, 2002) [13]. Bangladesh has a vast coastal plain with 710 km of coastline (CZP, 2005) [8]. Coastal zone population will increase from the current (2001) 36.8 million to 60.8 million in 2050 (WRPO, 2006) [21]. These people make their living primarily by agriculture, fishing, shrimp farming, mangrove forest extraction, salt manufacturing, boating, sand mining, tourism and port and harbor related activities. People in south-west coastal region were highly dependent on the natural resource to sustain their livelihoods (Halim *et al.*, 2001) [12]. Coastal shrimp aquaculture was initiated in Bangladesh in the 1970s. The Bangladesh shrimp sector has grown significantly since the 1970s (BCAS, 2001) [5]. It is estimated that between 100,000 and 300,000 people are involved in fry collection (Frankenberger, 2002) [11]. In 2001, Department of Fisheries and DFID estimated that 74% of children involved with fry collection are school dropouts. Female fry collectors are discriminated against due to both their economic status as well society that largely discounts women as the stigmatization resulting in a patriarchal wage earner (BCAS, 2001) [5]. Shrimp fry collection is mainly concentrated in 40 upazilas under 12 coastal districts along (Nuruzzaman, *et al.*, 2002) [16]. Approximately, 1.5 to 2.0 billion fry is collected annually from wild (Banks, 2002) [7]. From the ecological point of view, it is necessary to consider this waste which occurs during Bagda chingri (*Penaeus monodon*) fry collection. About 384 larvae of other shrimp species, 208 finfish and other macro zooplankton were destroyed during the collection of only one PL of *P.monodon* (Islam, *et al.*, 2001) [14].

In September 2000, the Government of Bangladesh imposed a ban on wild fry collection. The

lack of alternative livelihoods for PL collectors is one of the principle constraints on implementing any policies, laws and/or regulations geared towards the development of a sustainable resource use strategy as well as conservation effort for the wise use of the marine, coastal and estuarine resources of Bangladesh (Ahmed, *et al.*, 2012) [1]. For this, in February 2002 the Government placed the enforcement of the fry collection ban into abeyance pending further review of how the resource and biodiversity could be conserved at the same time as protecting the livelihoods of 300,000 fry collectors (Williams, 2002) [20].

**Materials and methods**

The study was conducted at Shyamnagar upazila which is situated in Satkhira district from September to December in the year of 2013. Area of the Shyamnagar upazila is about 455.31 sq.km (1,903 sq. km. with Sundarban) (Source: Upazila parishad). About 55% villagers are directly involved in fry collection seasonally in this region. A questionnaire was developed to collect data on socio-economic condition, livelihood status and alternative ways of livelihood during season of fry collection from Sundarban and its adjacent rivers. The primary data were collected through field survey at the study area by using the developed questionnaire. Data on fry collector's activities were collected both by physical observation and interviewing with fry collectors at the 3 unions of Shyamnagar upazila. Secondary data and information related to the study was collected from Shyamnagar upazila parishad, union parishad, scientific journal articles, different national (BBS, DOF) and international (FAO, DFID) organizations.



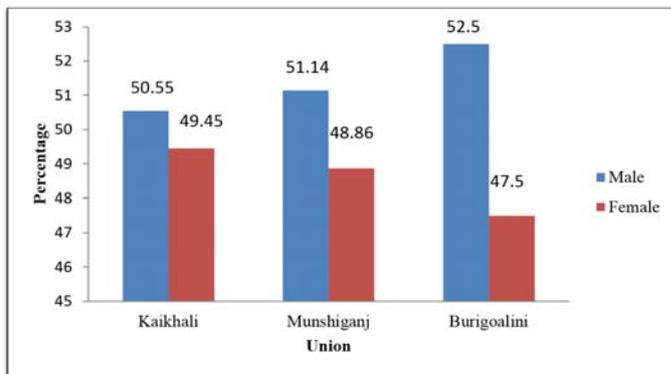
**Fig 1:** Location of the study area (Shyamnagar upazila).

**Result**

**Socio-economic condition of fry collectors**

**Population**

The study was conducted at Kaikhali, Munshiganj and Burigoalini union into 100 peoples were interviewed. Total family members were 518 that means their average family size was about 5 persons/family. In 518 people 266 was male and 252 was female that means the ratio of male and female was 1.05:1.



**Fig 2:** Population Structure of three Union Shyamnagar

**Age structure**

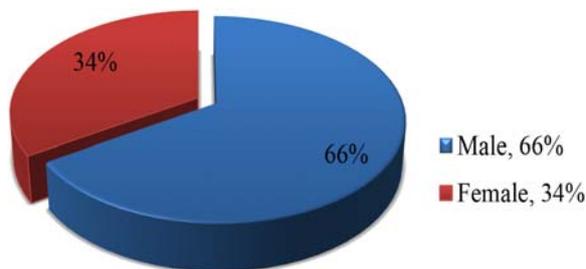
The average age of the respondents has been 25 years, which ranges from 10 to above 50 years. Majority of them in Kaikhali, Munshiganj, Burigoalini are respectively 33.93%, 31.22% and 33.82% are in the age of between 20-30 years. About 17% of fry collectors are children aging between 10 to 20 years. About 15.2% average respondents are in the middle age between 40 to 50 years and only 4.32% average respondents are old aging above 50 years.

**Table 1:** Age structure of fry collector at different union.

Union	Age structure (years)					Total
	10-20	20-30	30-40	40-50	50+	
Kaikhali	17.34 %	33.93 %	31.54 %	13.75 %	3.44 %	100%
Munshiganj	18.35 %	31.22 %	29.32 %	15.54 %	5.57 %	100%
Burigoalini	15.35 %	33.82 %	30.53 %	16.33 %	3.97 %	100%

**Sex ratio of the fry collector**

About 66% of the respondents were men and 34% were women who worked as fry collector. Percentage of women was increasing because men cannot catch frequently due to restriction but women can easily catch near the river sites. Since the collection of wild fry is usually a family operation, several members engaged in collecting fry. With many collectors, this can represent a significant income source for poor families. Children were engaged due to poverty.



**Fig 3:** Sex ratio of fry collectors

**Religion**

There are two main religion groups- Muslim and Hindu are living peacefully without any conflicts. Only tribal communities living in this area is Munda. In 518 people 321 people are Muslim and 197 people are Hindu that means 62% are Muslim and 38% are Hindu.

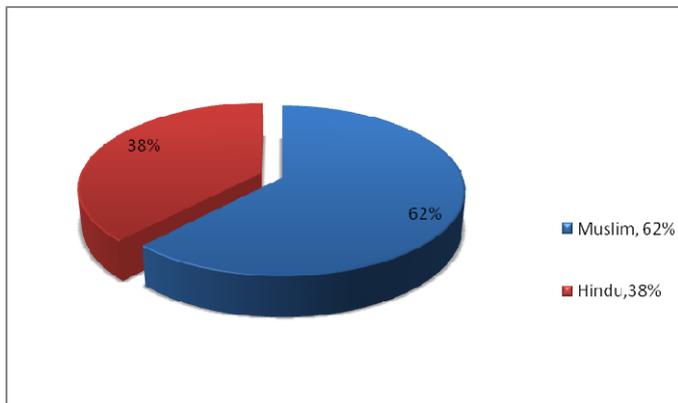


Fig 4: Percentage of different religion of fry collector's family.

**Education**

Among the fry collectors about 31% was literate and 69% fry collectors are illiterate. Literacy rate was 28% and 72% for female and male respectively. Among literate people 48% of them were up to sign only, 36% were up to primary level and 16% were up to SSC level.

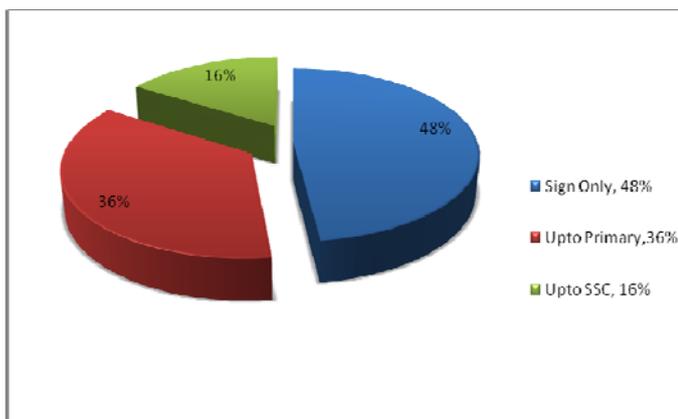


Fig 5: Educational status of the people in the study area.

**Housing Condition**

Most of the collectors (63%) lived in mud walled with golpata shed, whereas 26% lived in tin shed houses, 8% lived in semi-pucca houses and others 3% lived in pucca houses. Electric services facilities were absent in some areas of study area.

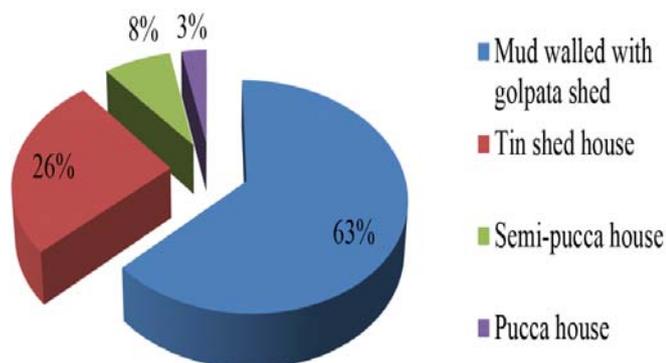


Fig 6: Housing Condition of people in the study area.

**Health and Diseases**

The fry collectors have poor access to limited or no access to health care. Poor women and children suffer the most socially and economically as a result of the expansion of shrimp culture. Standing in cold salty water using push/pull nets for 6-10 hours a day can expose women and children to Malaria, Dengue, and Diarrhea. There are few health facilities available to women especially in the Sundarbans where they are forced to migrate in search of fry. Still malnutrition is a common phenomenon. The birth of some underweight baby could not be avoided so far.

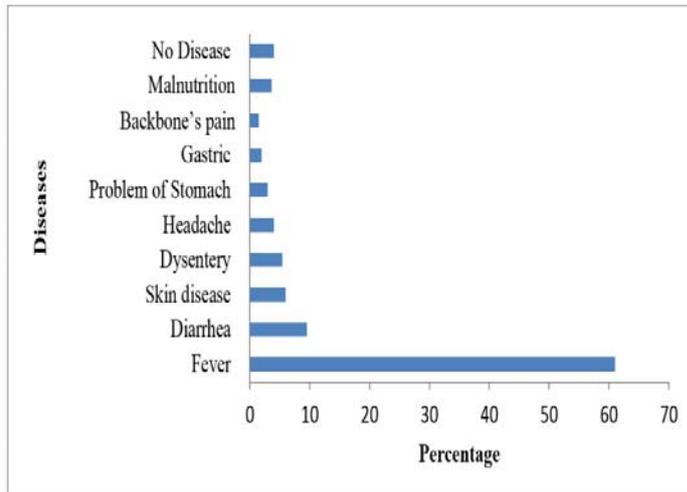


Fig 7: Diseases affected in the study area.

**Sanitation**

Only 37% of the households have the access to sanitary latrine, 52% of the households use the non-sanitary latrine and 11% of the households do not have latrine facilities. Among latrine users approximately 25% of the villagers used semi-pucca latrine, 9% used pucca latrine, 22% use hanging latrine, 33% use kacha latrine.

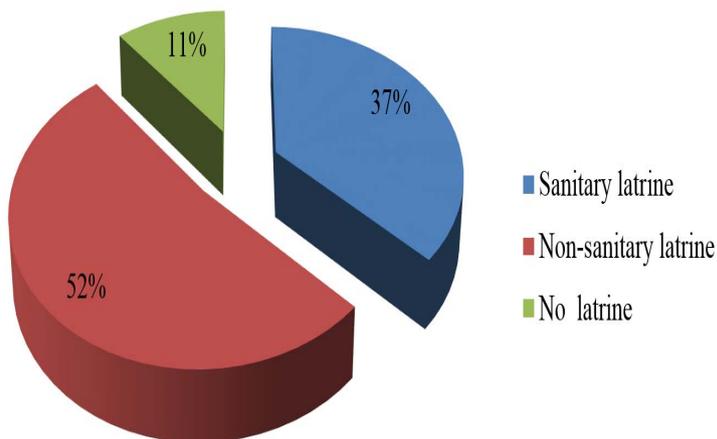


Fig 8: Sanitation in the study area.

**Sources and Use of Water**

People in the study area do not have access to safe drinking, cooking, bathing and washing water properly. The study shows that in the survey area 27% households are use pond water, 22% households are use tube-well water, 44% households use filter water or PSF and 7% households collect and reserve rain water as the source of drinking water.

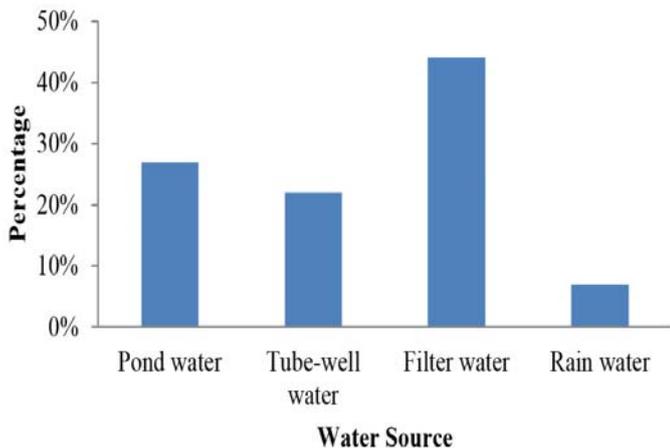


Fig 9: Sources and use of water in the study area.

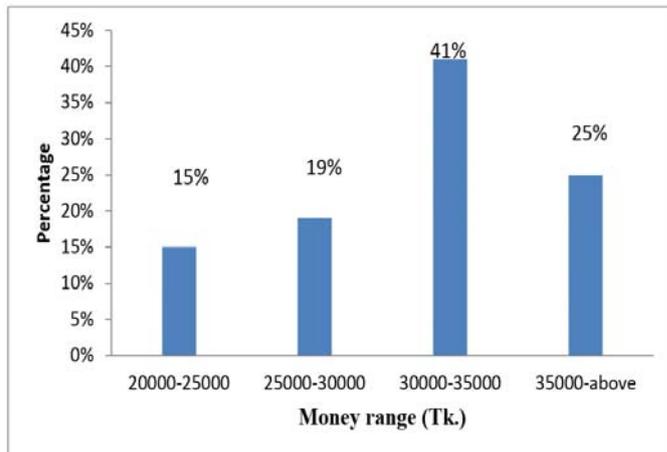


Fig 11: Yearly income of the fry collector's family.

**Earners of the fry collector's family**

In the study area about 73% of the fry collector's families have two earner groups and 11% have one earner and more than two have rest 16%.

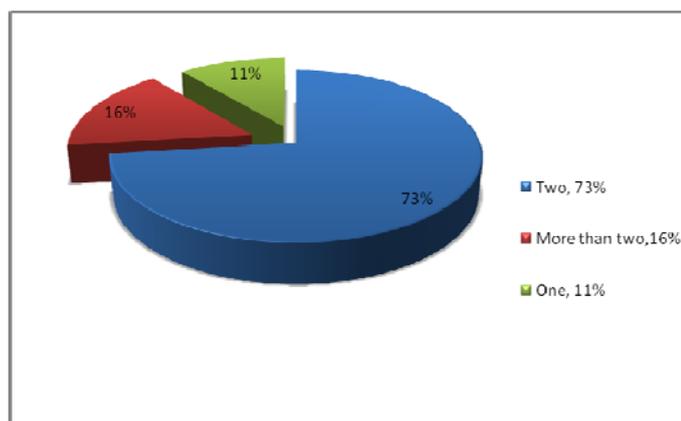


Fig 10: Earner of the fry collector's family.

**Season and Time of fry collection**

The main season of fry collection is in the month of December to June. In the beginning of the season found more shrimp fry than the last months and price also high in the beginning of the season that the peak-season for shrimp fry collection is March-May. Generally the fry catchers go out twice a day, usually from 4am to 10am and 3 pm to 5pm.

**Price of the fry in different month**

Price of fry was Tk.3500-4000/thousand, Tk.2500-3000/thousand, Tk.1500-1800/thousand and tk.800-1000/thousand in the month of April, May, June-July and August-March respectively. Price of fry is higher in the month of April and May because the demands of fry in this month are highly increased.

**Yearly income of the fry collector's family**

About 15% family had an annual income of Tk. 20000-25000, 19% family had an income of Tk. 25000-30000, 41% family had a highest income of Tk.30000-35000 and 25% family had an income of Tk.35000 above.

**Daily income of the fry collector during peak and off-peak season**

Average daily income of a fry collector was about Tk. 150-250 in peak season and about Tk. 100-150 in off-season of fry collection for men and about tk. 80-100 in peak season and Tk.40-60 in off-season for women. Income increases during April-May from fry collection.

**Poverty cycle**

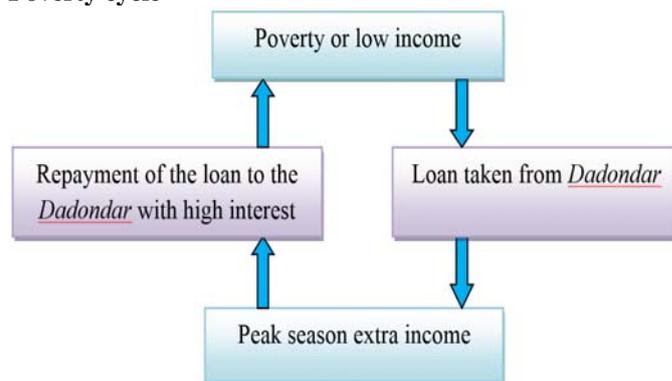


Fig 12: Poverty cycle of the shrimp fry collectors in the study area.

**Source and amount of borrowing money**

The loan amount varies from tk. 1000 to 15000 mostly. About 29% fry collector borrow Tk.1000 to 5000; 44% fry collectors borrow Tk.5000 to 10000; 16% fry collectors borrow Tk. 10000-15000 and 11% fry collectors are borrow money above 15000. At present most of them about 75% get money from Dadondars.

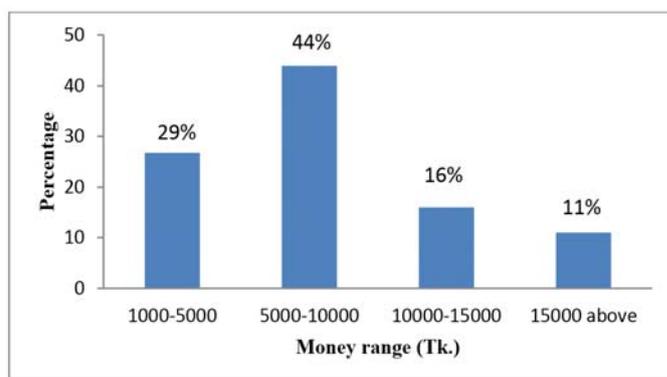


Fig 13: Different amount of money borrowed by fry collectors.

## Discussion

In the report of BOBP (1990)<sup>[6]</sup> it was found that fry collectors in Satkhira and Khulna districts, women lived in more oppressive conditions despite their hard work in various activities, their position in the family and society was distinctly subordinate. Discrimination found in average wage rate, based on gender and age. This study is more or less similar to our study.

Employment in fry collection is significantly depending upon the demand and supply of shrimp fry. Because alternative economic activities such as share-cropping and agricultural laboring are declining with the expansion of shrimp culture, many fry collection households are abandoning traditional occupations and becoming more dependent on fry collection (DOF and DFID 2001a)<sup>[9]</sup>.

Mahmood (2013)<sup>[16]</sup>, reported as fry collectors primarily come from the lower social strata and are looked down upon by the rest of the community. This study is more or less similar to our study.

Shyamnagar upazila consists of 12 unions and there are about 3, 64, 922 people lived within the upazila (Shyamnagar Upazila Parishad, 2013)<sup>[18]</sup>. In another study by Quddus, *et al.*, (2001)<sup>[14]</sup> stated that the mean family size is 5.7 in the sundarban region. The family size of female fry collectors is smaller (5.3) than those of the male fry collectors (6.2) in this region. While the national mean was about 5.8 according to last census (BBS, 2001)<sup>[4]</sup>. Which is almost similar to our study where we showed the average family member are 5 in this region.

In a study of DOF and DFID (2001b)<sup>[10]</sup> age range of adult fry collectors varies between 16 to 72 years, the majority being between 25 to 44 years. The mean age of fry collectors is about 34 years which is higher from my study where the average age was 25 years because most of the middle age collectors are now involved in alternative livelihoods. Men and women don't differ much regarding the mean age. The average age of a child fry collector was 14 which are similar with my study (15 years). This study is more or less similar to our study. We found about 66% of the respondents was men and 34% were women who worked as fry collector.

According to BBS (2001)<sup>[4]</sup> in Shyamnagar upazila 77.52% of total population are Muslim, 22.36% are Hindu and rest 0.12% of other communities, which is not similar with my study where we found that 62% fry collectors are Muslim and 38% fry collectors are Hindu because all communities reside permanently in the study area adjacent to Sundarban than other region of the country. This study is more or less similar to our study.

In a study of DOF and DFID (2001b)<sup>[10]</sup> more than 80 percent of fry collectors are functionally illiterate, who is higher than my study where it was found that 69% illiterate people. Because Upabritt is provided and food for education system is initialized by Govt. to school going children. This study is more or less similar to our study.

Mahmood (2013)<sup>[15]</sup> reported that the shrimp fry collectors lived in four types of houses such as mud wall with golpata shed, mud wall with tin shed, semi *pucca* and *pucca* houses. Most of the collectors (55%) lived in tin shed houses which is much differ from this study where it was found that most of the collectors (63%) lived in mud walled with golpata shed house because after tidal bore Aila occurred in 2009 all their houses devastated. About 7.4% of the dwelling households have access to electricity (BBS, 2001)<sup>[4]</sup>. This study is more or less similar to our study.

Halim, *et al.* (2001)<sup>[12]</sup> in the study of women and children at shrimp sector showed that almost all of the respondents suffer from any kind of diseases. Of them 80.8% of the respondents suffer from fever while 10.5% suffer from diarrhea, which is about same to our study where the predominant types of diseases like fever (61%), diarrhea (9.5%), skin diseases (6.0%), dysentery (5.4%), gastric (2%), malnutrition (3.6%) are found. This study is more or less similar to our study.

The national statistics (BBS, 2001)<sup>[4]</sup> shows that 51.5% households have sanitary latrine facilities in Bangladesh. It was found that 69% and 31% of fish farmers used semi-*pucca* and *pucca* toilet respectively (Asif *et al.*, 2015)<sup>[3]</sup>. The study shows that the rate of having sanitary latrines in the study area is 37% which is lower than the national average. Because people does not properly concerned about sanitation facilities in this region yet. In another study of UNBINIG (1991)<sup>[19]</sup>, reported that only 44% households have private latrines of sorts. This study is more or less similar to our study. According to population census of BBS (2001)<sup>[4]</sup> in Shyamnagar the sources of drinking water are tube-well 35.94%, pond 50.74%, tap 6.46% and others 6.86%. While in the study area it has been found that most of the respondents are used pond water for multipurpose both drinking and cooking because there is few available alternative source of water. 27% are use pond water, 22% are use tube-well water, 44% use filter water or PSF and 7% collect and reserve rain water as the source of drinking water. This study is more or less similar to our study.

Fry collection is the major occupation of 83 percent of total people in the Sundarban region (Quddus, *et al.*, 2001)<sup>[17]</sup>. Those that are primarily dependent on fry collection earn 70-80 percent of their income from it. Most of the families have two earners because women are often forced to get involved in fry collection because they have no other viable alternative (DOF and DFID 2001b)<sup>[10]</sup>, which are similar with this study. Frankenberger T.R. (2002)<sup>[11]</sup> reported that in the Khulna Division, the main fry collection period is mid-November to mid-July. However, in Southwestern Bangladesh, the fry season has become extended to almost a year round activity. The peak season for golda fry is April-May, which is likely similar to my study where it was found that the peak season for golda fry collection is March-May. This study is more or less similar to our study.

According to the study of UBINIG (1991)<sup>[19]</sup> during a full moon and a new moon, the fry catch can more than double. It is during this time that number of fry collectors increases. During the non-peak season, they collect fry during the full and the new moon periods (August and October). This study is more or less similar to our study.

Quddus, *et al.* (2001)<sup>[17]</sup> reports that the mean annual income of all respondents from all sources is Tk. 26,316. On an average a male fry collector's household annual income is Tk. 30,140 as against Tk. 21,862.0 of a female one, which is about same to my study where I found that their highest mean annual income of Tk. 30000-35000. This study is more or less similar to our study.

In the study of shrimp seed collectors of Bangladesh UBINIG (1991)<sup>[19]</sup> the price depends on the demand from the *Gher* (shrimp farm), rather than on the supply of fry. During the season, the catch amounts to 1000 to 5000 fry per catcher per day and a catcher can earn Tk. 50-250 per day. On the other hand, during off-season, the catch is between 300 to 400 per day, and the earning is only Tk. 45-72 per day, which is much differ with my study where it was found that The average

number of fry collection by man was 150-200 pieces per day and 40-60 pieces per day by women and children during peak season. Because the referred study was conducted about 23 years ago from now and recent environment of Sundarban and its adjacent areas has changed due to natural disaster like tidal bore (Aila, Sidr), manual devastating of forest, population increase etc. This study is more or less similar to our study. Seventy percent of the fry collectors borrow 2,000 to 10,000 Tk. (Frankenberger, 2002)<sup>[11]</sup>, Eighty percent of the fry traders that borrow from the Dadandars are then obligated to sell fries to them (DOF and DFID, 2001b)<sup>[10]</sup>, whereas it was found that in the study area about 75% get money from Dadondars and its amount varies mostly Tk. 5000-10000 which is higher than previous work because poor fry collectors have lost their properties due to natural disaster occurred last few years ago. So they have to borrow more than past. Asif *et al.*, (2014)<sup>[2]</sup> reported that it was observed that 24% farmers got loan from bank whereas 31% farmers took loan from local moneylenders with high interest of credit This study is more or less similar to our study.

### Conclusion

The Southwest Coastal Region of Bangladesh has been identified as one of those regions that would be mostly affected by global climate change. As a result, farming systems have been seriously disrupted with few coping mechanisms that are never suitable to adjust with the new situation. Shrimp seed supply is the main input of shrimp farming. At the initial stage shrimp fry from wild sources was only the source of this input with the expansion of the shrimp farms. The demand of fry increased very rapidly depending on the hatcheries for artificial PL production. On the basis of this demand shrimp fry collection from the wild sources has now become popular occupation. Majority of the people of the fry collector in the study area possess some land property and homestead pond and they also interested to take aquaculture and agriculture as their alternative livelihood options.

### References

- Ahmed F, Hossain MY, Fulanda B, Ahmed ZF, Ohtomi J. Indiscriminate exploitation of wild prawn post larvae in the coastal region of Bangladesh, A threat to the fisheries resources, community livelihoods and biodiversity. *Ocean & Coastal Management*, 2012, 56-62.
- Asif AA, Samad MA, Rahman BMS, Rahman MA, Rahman MH, Yeasmin SM, and Nima A. Study on management of fish fry and fingerling marketing of jessore in Bangladesh. *International Journal of Business, Social and Scientific Research*, 2014, 2(2): 127-135.
- Asif AA, Samad MA, Rahman MH, Farid MA, Yeasmin SM, Rahman BMS. Socio-economic Condition of Fish Fry and Fingerling Traders in Greater Jessore Region, *International Journal of Fisheries and Aquatic Studies*, 2015, 2(4): 290-293.
- BBS (Bangladesh Bureau of Statistics). Population Census. Bangladesh Bureau of Statistics, Dhaka, 2001.
- BCAS (Bangladesh Centre for Advanced Studies). The coastal shrimp sector in Bangladesh, Review of the literature with annotated bibliography, Dhaka, Bangladesh, 2001.
- BOBP (Bay of Bengal Programme) Shrimp Seed Collectors of Bangladesh, Bay of Bengal Programme for Fisheries Development, WP Madras, India, 1990, 63.
- Banks R. Brackish and marine water aquaculture. Poseidon Aquatic Resource Management Limited for DFID, Bangladesh, 2002.
- CZP (Coastal Zone Policy). Ministry of Water Resources. Government of the People's Republic of Bangladesh, 2005.
- DOF (Department of Fisheries) and DFID (Department for International Development). Feasibility study for the shrimp component of the Fourth Fisheries Project (FFP), Fry collector's livelihood study, Bangladesh Centre for Advanced Studies (BCAS), 2001a.
- DOF (Department of Fisheries) and DFID (Department for International Development). Feasibility Study for the Shrimp Component of the Fourth Fisheries Project (FFP): Women and Children Study. Bangladesh Centre for Advanced Studies (BCAS), 2001b.
- Frankenberger TR. A livelihood analysis of shrimp fry collectors in Bangladesh. Future prospects in relation to a wild fry collection ban. TANGO International Inc. for Department for International Development. Dhaka, Bangladesh, 2002.
- Halim S, Mallick D, Reza O, Hasan SR, Kabir SA. Feasibility study for the shrimp component of the Fourth Fisheries Project (FFP). Women and Children Study. Bangladesh Centre for Advanced Studies (BCAS), Dhaka, Bangladesh, 2001
- Huntington T. Fry collection action plan, scoping study for the certification of shrimp aquaculture in Bangladesh. Poseidon Aquatic Resource Management Ltd. for DFID, Bangladesh, 2002.
- Islam MS, Ahmed SU. By catch mortality during collection of *penaeus monodon* post larvae (PL) from the rivers of Khulna, Bangladesh. Brackishwater station, Bangladesh Fisheries Research Institute (BFRI), Paikgacha, Khulna, Bangladesh. *J Natn. Sci. foundation Srilanka*, 2001, 107-115.
- Mahmood SMS, Ansary BS. Shrimp fry collection as alternative livelihood, A case study on the southwest coastal region of Bangladesh. *ASA University review*, 2013, 2.
- Nurzzaman M, Williams D. Environmental awareness of harvesting wild shrimp fry: training needs assessment for fry catchers and traders. An output of the shrimp action plan, Funded by IDA / DFID / GEF and GOB, 2002
- Quddus AHG, Kashem MB, Alam S, Mainuddin K, Mallick D. Fry collector's livelihood study, Feasibility Study for the Fourth Fisheries Component (FFP), Bangladesh Centre for Advanced Studies (BCAS), 2001.
- Shyamnagar Upazila Parishad, 2013. <http://shyamnagar.satkhira.gov.bd/>
- UBINIG (Unnayan Bikalper Nitinirdharoni Gobeshona, the Policy Research for Development Alternatives), Shrimp seed collectors of Bangladesh, Bay of Bengal Programme (BOBP/WP/63), Small-scale fisherfolk communities (GCP/RAS/118/MUL), Food and Agricultural Organization (FAO) of the United Nations, 1991.
- Williams D. Management options for the shrimp fry fishery. Regional stakeholder workshop in Khulna, Bangladesh, 2002, 8.
- WRPO (Water Resource Planning Organization), Coastal Development Strategy, Ministry of Water Resources Government of the People's Republic of Bangladesh, 2006.