

Research Article

COLLECTION PRACTICES AND SOCIO-ECONOMIC STATUS OF CRAB COLLECTORS AT SHYAMNAGAR UPAZILA, SATKHIRA DISTRICT IN BANGLADESH

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ABSTRACT

This study evaluated the mud crab (*Scylla olivacea*) collection techniques and socio-economic conditions of crab collectors in Shyamnagar Upazila. The results showed that 48% of the collectors collected crabs from the Sundarbans mangrove forest; on the other hand, 42% of the crab collectors collected crabs from coastal rivers, and 10% collected crabs from canals and shrimp farms. In the study area, 63% of crab collectors used doon with Cuchia fish as bait, 6.66% used thopa with Tilapia fish as bait, and the rest used net or hand-picking techniques to collect crabs. Most crab collectors were Muslims (56.9%), and the rest were Hindu (43.1%) regarding religious belief. Regarding gender, 58.1% of crab collectors were female, whereas 41.9% were male. Almost half of crab collectors (41.9%) had no institutional education. In this area, 33.72% were landless and lived on 'Khas' land. A significant number of people (29.5%) were married at an early age. The crab collectors (36.2%) earned less than Tk. 200 daily. Natural calamities and other constraints are making the livelihood of crab collectors vulnerable, but they are trying to continue their occupation to sustain their lives.

Keywords: *Mud crab, Crab collectors, Socio-economic status, Coastal region, Bangladesh*

Introduction

The mud crab, mangrove associated fauna is extensively distributed in the coastal areas of Indo-West-Pacific Ocean and adjacent seas (Macintosh *et al.*, 2002). Mud crabs occur plentifully in the coastal region of Bangladesh including estuaries, tidal rivers of the Sundarban mangrove forests and shrimp ghers (Khan and Alam, 1992) which is locally known as 'Kakra', 'Shilla Kakra', 'Habba kakra' (Jahan and Islam, 2016). It is harvested from the coastal region of the Bay of Bengal and associated creeks, canals and ghers (Khan and Alam, 1992, Sultana *et al.*, 2019). Only 6 crab species are used as food among 16 available species on the coast of Bangladesh. Most of them are marine/brackish water species and only 4 are freshwater species (Ahmed, 1992). Pen and cage cultures are popular and at the same time mud crab is also cultured with shrimp in

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shrimp farms (Chakraborty *et al.*, 2018). Consequently, crab farming replace shrimp farming as it has less disease risk, easy culture method, more adjustable to climate change and has a better market price comparison to shrimp (Salam *et al.*, 2012).

In the year of 1977-78, mud crab export started and within 5 years it seems to be a stable business and graded the third exported frozen food of Bangladesh (SEAFDEC, 1998; and Ali *et al.*, 2004). The export of live mud crabs from Bangladesh has increased many creases in the last decade (from US\$ 31,000 in 1989-90 to US\$ 57,92,000 in 1995-96 and sharply decreased from US\$ 55,35,000 in 1996-97 to US\$ 2,83,000 in 1999-2000 (BEPB, 2004). Now a days, crab is an significant exportable commodity of Southeast Asian Countries, whereas earlier crab was cultured as inconsequential product in shrimp and other fin fish farms (Ali *et al.*, 2004). Recently, the global demand of mud crab fisheries and aquaculture has swiftly increased and is anticipated to continue to increase (Azra and Ikhwanuddin, 2016; Hungria *et al.*, 2017).

The fishery has been gaining popularity among the coastal communities of Khulna division with around 300,000 people in many ways involved in mud crab cultivation activities because of its increasing demand in home and abroad (Begum *et al.*, 2009; Rahman *et al.*, 2017). In the current value chain of mud crab, fishermen and crab collectors are the more suppressed party whereas they are the main performer in collecting the crab from Sundarbans. The middlemen (locally called *Farias* or *Aratdars*) are the most beneficiaries in the present system (Ferdoushi *et al.*, 2010). Crab harvestors are greatly exploited by middleman in current unstructured crab marketing system and rarely receive any government support (Sanoara, 2018).

The south-west region of Bangladesh is well known for crab collection, crab farming and trading and crab collectors are the prime operators in the mud crab value chain in this region. Due to limited livelihood options in the south-west coastal region crab collection and trading becomes alternative livelihood and have a great prospect in Bangladesh. Marketing system of crab, value chain analysis of crab fishery and socio-economic status of crab farmers were focused in several previous research works. However, the total crab value chain in this region depended on crab collectors and fishermen but they often poorly focused. Therefore the aim of this study is to discover the general practices of crab collection and socio-economic status of crab collectors in this region of Bangladesh.

Materials and Methods

Study area

This study was conducted from July, 2022 to December, 2022 in the Southwest region of Bangladesh. Shyamnagar Upazila situated in the coastal district Satkhira is renowned for crab harvesting, crab farming and trading. Therefore, Shyamnagar Upazila was selected as the study area for this study. Shyamnagar Upazila is located in between 21°36' and 22°24' North latitudes and in between 89°00' and 89°19' East longitudes.

Sampling and Data Collection

Primary data from crab collectors was collected by direct personal interview using both structured and semi-structured questionnaires. At the same time, crab collection and transportation practices were observed directly and the data were noted. The random sampling technique has been applied

as a sampling procedure for conducting the survey and the sample size was 86 in number. Key Informant Interviews (KII) was also used in order to collect information from a wide range of expert people. Researcher, Upazila Fisheries officer and Local NGO representatives were selected as the Key Informant. Ten Key Informant Interviews (KII) were collected for this study. Five Focus Group Discussion (FGD) was conducted with crab collectors to gather collective opinions about the socio-economic condition. Accordingly, all of the important data of every session were noted.

Data processing and analysis

First of all, the primary data were inserted in Microsoft excel sheet. Several compulsory pre-tabulation tasks were conducted before the final tabulation and analyzed on the basis of the preset objectives. After data processing, Microsoft Excel of office 2010 version was used for analysis. Descriptive method of analysis was used to describe the survey results using percentage. Some diagrams were prepared from the data to depict the findings.

Results and Discussion

Crab Collection

The species (*Scylla olivacea*) prefer mangrove swamp, they also exist in large numbers in shrimp farms and in the burrows of the peripheral dikes (Molla *et al.*, 2009). It was observed that 48% of the crab collectors collected crabs from the Sundarbans mangrove forest staying there for 3-5 days, whereas 42% of the crab collectors collect crabs from rivers on daily basis and 10% collected crabs from canals and shrimp farms, respectively. In the study area, 63% of crab collectors used doon with cuchia fish as bait, 6.66% of them used thopa with tilapia fish as bait whereas 21.66% used atol, 5% used net and 3.33% of them used other things. Hand-picking was also found as the procedure to collect crabs. Molla *et al.*, (2009) observed that 45% of the crab collectors collected crabs from the Sundarban mangrove forest, whereas 40% and 15% collected crabs from ghers and rivers/canals, respectively which was more or less similar to the present study.

Transportation

Refrigeration or other facilities is not essential for crab survival at the time of their transportation. Only water was sprayed over them to keep them moist and thus to reduce mortality. In this study, it was observed that all crab collectors transported the harvested crab from Sundarbans and tidal rivers to locality by small wooden boat and all most all of them (90%) sold their crab to farias (middle men) whereas the rest (10%) transported their harvested crab directly to depots by non-machanized van, motorcycle or bicycle. At that time, they used plastic caret and gunny bags (Fig. 1). It was also investigated that 80% of the faria transported their collected crab to depots using bamboo basket whereas 8% and 12% of them used plastic caret and gunny sac. Most of the farias (95%) used motor van as vehicle for transportation and the rest 5% used motorcycle as transportation vehicle. Following this, crabs of different grades are stocked into separate bamboo baskets covered with gunny bags and are transported to Dhaka City by truck or piuck up van generally at night for further processing.



Fig. 1. Several means of crab transportation

Socioeconomic conditions of crab collectors

Age structure

There are various aged group of people were involved in crab collection as children to elderly people. The highest percentage (32.8%) of mud crab collectors were belonged to the age structure of 31-40, whereas 11.6%, 22%, 21%, 8.1%, and 4.7% of them were belong to the age groups of 10-20, 21-30, 41-50, 51-60, and 61 above years respectively (Table 1). According to Molla *et al.*, (2009), 40% of crab collectors were within the age group of 31-40 years. Zafar and Ahsan (2006) conducted research on marketing and value chain analysis of mud crab (*Scylla sp.*) in the coastal communities of Bangladesh and reported 39% of crab collectors were in the age group of 33-41years.

Table 1. Age structure of crab collectors

Age group	No. of crab collectors	Percentage (%)
10-20	10	11.6
21-30	19	22
31-40	28	32.6
41-50	18	21
51-60	7	8.1
61 and above	4	4.7

Sex ratio

In Shyamnagar both male and female collectors were found. The main source of mud crab is Sundarbans mangrove swamps, estuaries and the tidal rivers. Therefore, the female used to collect crab from the tidal rivers and from the surroundings of the Sundarbans at daily basis but the male used to go to Sundarbans for crab collection and stay there for 3-7 days. However, 58.1% of crab collectors were female whereas 41.9% of crab collectors were found male in the study area (Table 2). Molla *et al.*, (2009) reported that in Khulna and Satkhira district 80% of crab collectors were male and the rest 20% were female. Zafar and Ahsan (2005) observed almost similar result to Molla *et al.*, (2009) in the Satkhira district where 82% of the crab collectors were male and the rest (18%) were female. Both of the research conducted before 2009, so present findings may be reflection of increasing women activities of Bangladesh within last 15 years.

Table 2. Sex ratio of crab collectors

Type	No. of crab collectors	Percentage (%)
Male	36	41.9
Female	50	58.1

Educational status

In the investigated area 34.9% crab collectors were possessed primary education and 12.8%, 8.1%, 2.3% of the crab collectors were possessed JSC, SSC and HSC level of education. On the contrary 41.9% of the interviewed crab collectors were found no academic education (Table 3). Zafar and Ahsan (2006) noted that more than half of the crab collectors were educated at the level of class one to two, only 10% at the level of class five to nine and the rest were completely illiterate. However, the present study revealed that the education scenario is changing slowly than before.

Table 3. Education status of crab collectors

Type	No. of crab collectors	Percentage (%)
No academic education	36	41.9
Up to primary	30	34.9
Up to JSC	11	12.8
Up to SSC	7	8.1
Up to HSC	2	2.3
Above HSC	0	0

Family type and family size of crab collectors

It was investigated that 53.5% crab collectors lived in nuclear family and 46.5% of them lived in joint family (Table 4). It was also observed that 50% of the crab collectors had 5-7 members in their family whereas 39.53%, 8.14%, and 2.33% of the respondents had family members of 2-4, 8-10, and above 10 respectively (Table 5). Molla *et al.*, (2009) reported that most of the crab collectors family had above 6-10 members however, the current study result showed a different scenario.

Table 4. Family types of crab collectors

Type	No. of crab collectors	Percentage
Joint	40	46.5
Nuclear	46	53.5

Table 5. Family sizes of crab collectors

Number of family members	Crab collectors	Percentage (%)
2-4	34	39.53%
5-7	43	50.00%
8-10	7	8.14%
Above 10	2	2.33%

Marital status

Investigation was made to find out the marital status of the crab collectors and it was observed that 55.8% of them were married, while 15.1% were found unmarried, 12.8% were divorced and 16.3% of them were widow (Fig. 2). Molla *et al.*, (2009) reported that 75% of the crab collectors were married and 25% of them were unmarried but this study observed a diversified result which reflected that divorced and widow were also included in crab collection.

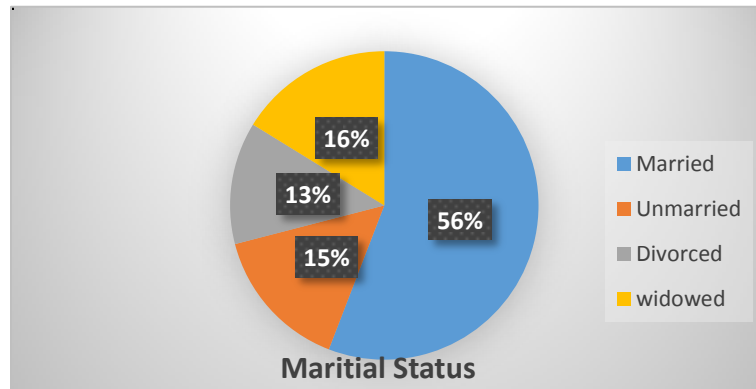


Fig. 2. Marital status of crab collectors

Marital Age

This study also investigated the marital age of the crab collectors and found that the highest percentage (37.21%) of the crab collectors got married within the age range of 16-20 years. However, a substantial percentages (26.74%) of the crab collectors got married at the early age of 10-15 years, while 17.44% and 9.30% of them got married within the age range of 21-25 and above 25 years respectively (Table 6).

Table 6. Marital ages of crab collectors

Age range	No. of crab collector	Percentage (%)
10-15	23	26.74
16-20	32	37.21
21-25	15	17.44
Above 25	8	9.30
Unmarried	8	9.30

Housing Condition

Most of the crab collectors were poor and their financial status were below the average level. They lived in different types of houses (i.e. mud wall with tin shed, mud wall with golpata shed, semi-pakka and pakka). The present study revealed that most of the crab collectors (61.63%) lived in tin shed houses where as only 5.81% of the crab collectors lived in pakka type houses. However, the percentages of semi-pakka and kacca types of housing were almost similar which were 15.12% and 17.44% respectively (Fig. 3). Ferdoushi (2013) observed 46% tin shed housing,

22% mud thatched, 24% half building and 8% full building housing condition. Molla *et al.*, (2009) found (62.50%) crab collectors lived in tin shed houses, 12.50%, 16.67% and 8.33%, crab collectors lived in mud walled with golpata shed, semi-pakka and pakka houses, respectively which were very similar to the present study.

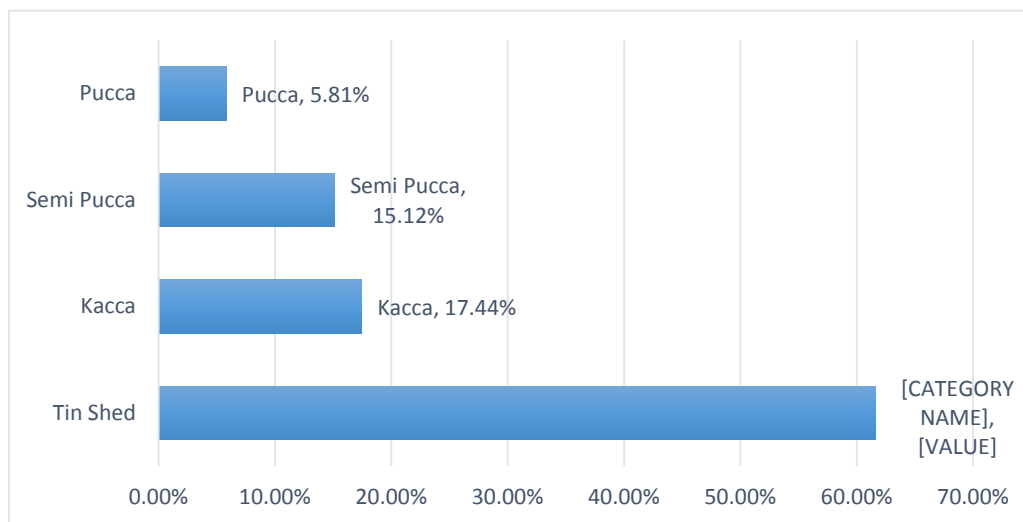


Fig. 3. Housing status of crab collectors

Religion status

It is commonly known that Hindu community is mostly engaged with crab collection and farming rather than Muslims but the present study observed an opposite result of this phenomenon. The crab collectors were dominated by Muslims (56.9%) over Hindu community (43.1%) (Table 7). Zafar and Ahsan (2006) stated that most of the collectors (about 89%) were Hindus and only 11% were Muslims. Molla *et al.*, (2009) found 70% crab collectors were Hindus whereas only 30% Muslims were involved in crab collection. Ferdoushi (2013) reported that coastal Hindu community is more interested in crab farming (73%) while 27% Muslims are involved in crab farming. The above findings do not agree with this study findings may be the study area was dominated by Muslims or may be the Muslims of the coastal regions are taking crab collection as an alternative livelihood option.

Table 7. Religious status of crab collectors

Type	No. of crab collectors	Percentage (%)
Muslim	49	56.9
Hindu	37	43.1
Other	0	0

Land ownership

The study revealed that 33.72% crab collectors had no own land while 37.21%, 17.44%, 6.98% and 4.65% crab collectors had land ownership of 0-5, 6-10, 11-15 and above 15 decimal (Table

8). The landless crab collectors lived in khas land. Zafar and Ahsan (2006) observed more or less similar findings.

Table 8. Land ownership of crab collectors

Land (decimal)	No. of crab collectors	Percentage (%)
No land	29	33.72
0-5	32	37.21
6-10	15	17.44
11-15	6	6.98
Above 15	4	4.65

Drinking water facilities

The study was conducted in climate vulnerable and salinity prone area therefore tubewell water was not usable for drinking purposes thus the percentages of public tubewell water and own tubewell water consumers were zero. However, by the sake of non-government organizations drinking water supply project some desalination plants were installed in the study area and even a few fresh water ponds were installed with pond sand filters. In addition some NGOs were supplied rain water harvesting tank as grant and on the basis of loan also. Hence, 20.93% of the crab collectors were use only desalinated water while 10.47% were found to use pond sand filter water and the major portion (68.60%) of crab collectors were found using rain harvested water and desalination water (Table 9).

Table 9. Drinking water facilities of crab collectors

Sources	No. of crab collectors	Percentage (%)
Public tube-well	0	0
Own tube-well	0	0
Only Desalinated water	18	20.93
Pond sand filter water	9	10.47
Only Rain water harvest	0	0
Rain water harvest +DW	59	68.60

*DW= Desalinated water

Sanitation facilities

The crab collectors used three types of toilet such as (i) Pakka toilet and (ii) Semi-pakka (tin or asbestos walled, ring slave with concrete floor (iii) Kacha (bamboo or asbestos walled, ring slave with mud thatched floor). In the study area, 76.74% of the collectors used kacha type of toilet whereas 19.77% of the crab collectors used semi-pakka toilet and 3.49% of the crab collectors used pucca or safety toilet (Table 10). Molla *et al.*, (2009) reported 12.5% crab collectors used kacha toilet, 77.5% used semi-pakka and 10% of them used pakka toilet but the present study result differed mostly by the earlier result.

Table 10. Sanitation facilities of crab collectors

Latrine types	No. of crab collectors	Percentage (%)
Kacha	66	76.74
Semi-pakka	17	19.77
Pakka	3	3.49

Health facilities

In the south-west region most of the crab collectors (70.93%) received treatments from quacks (village doctors) while 19.77% of the crab collectors go for Upazila health complex to get treatment. Inversely, 9.30% crab collectors depended on private clinic for getting treatment (Table 11). Zafar and Ahsan (2006) reported that only 10% received health services from qualified doctors of local government health center and most of the crab collectors (90%) were dependent on village doctors (unqualified practitioners, homeopathy doctors, kabiraj, etc.) for their health treatment.

Table 11. Health facilities of crab collectors

Treatment facilities	No. of crab collectors	Percentage (%)
Upazila Hospital	17	19.77
Quack Doctor	61	70.93
Private Clinic	8	9.30

Primary and Secondary occupation

Primary occupation of crab collector was collect crab and sale those.

However, the highest percentage of crab collectors (44.1%) has secondary occupation as day labor in construction, brick kiln labor and agriculture or aquaculture labor. The second highest percentage of secondary occupation of the crab collectors (37.2%) was fishing and the rest were involved in tailoring (9.3%), rickshaw pulling (5.8%) and small business (3.6%) (Table 12). Molla *et al.*, (2009) observed that secondary occupation of crab collectors were related to agriculture (30%), fishing (25%), crab fattening (10%), wood collection (10%) from the Sundarban, shrimp culture (10%), furniture making (5%) and day laborers (10%).

Table 12. Secondary occupations of the crab collectors

Secondary occupation	No. of crab collectors	Percentage (%)
Fishing	32	37.2
Tailoring	8	9.3
Day labor	38	44.1
Rickshaw puller	5	5.8
Small Business	3	3.6

Daily income of crab collectors

In south-west region, daily income of most of the crab collectors (36.2%) were less than Tk. 200, while 11.6% of the crab collectors earned more than Tk. 1000. The rest 32.5%, 15.1%, 2.3% and

2.3% of the crab collectors earned Tk. 201-400, 401-600, 601-800 and 801-1000 respectively (Table 13). Zafar and Ahsan (2006) observed that in Satkhira district, about 39% of the crab collectors earned very poor amount of money (i.e. Tk. 31-60/day) and 33%, 16%, 9% and 3% of them earned Tk. 61-90, 91-120, 121-150 and more than 150/day, respectively. The present study revealed that daily income of the crab collectors increased than earlier.

Table 13. Daily income of the crab collectors

Amount (taka)	No. of crab collectors	Percentage (%)
< 200	31	36.2
201-400	28	32.5
401-600	13	15.1
601-800	2	2.3
801-1000	2	2.3
> 1000	10	11.6

Credit facility & loan

The majority of the crab collectors (97.67%) took loan from the local NGOs working in their locality whereas only 2.33% of them took loan from bank (Table 14). This study revealed that none of the crab collectors were involved in dadon system. Zafar and Ahsan (2006) reported that 60% crab collectors in Satkhira go to the money lenders for *dadon* with a high interest rate. Molla *et al.*, (2009) stated that 25% crab collectors took loan or dadon from NGOs and only 5% loan from money lender in Khulna and Satkhira district. A large number of crab collectors did not take any loan or dadon. However, the present study found opposite scenario from the previous research findings that no crab collectors took dadon from money lenders and most of them involved in NGOs for getting credit facilities.

Table 14. Sources of loan facilities of the crab collectors

Type	No. of crab collectors	Percentage (%)
Local money lender/Dadon	0	0
NGO	84	97.67
Bank	2	2.33

Major professional problems

The present study identified a numbers of challenges as natural disasters like cyclone, flood, tidal surge, increasing duration of Govt. embargo of catching crabs, difficult to getting entry pass to Sundarbans from forest office without bribe, high charge of entry fee (earlier it was Tk. 300, now it becomes Tk. 800), decreasing number of wild stock in nature, increasing attack of ferocious animal of Sundarbans most likely by Royal Bengal Tiger. They also face challenges of piracy, and exploitation by market actors. The problem which cannot be neglected at all is that the women face eve-teasing when they go to catch crabs. Molla *et al.*, (2009) also reported similar constraints in his study.

Conclusion

The socio-economic status of crab collectors is not well at all though they are continuing this occupation as an alternative livelihood option due to limited income-generating activities in south-western region of Bangladesh. Crab collectors play a key role in the crab sub-sector as economically successful crab hatchery is not established in Bangladesh and therefore crab farming and trading is solely dependent on them. Therefore, training on crab collection techniques and transportation systems is needed for them to reduce mortality and injury during collection and transportation causing a substantial loss. The crab industry of Bangladesh is fully export market oriented and several intermediaries are involved here who are exploiting the crab collectors. So, the Government might take the necessary initiatives to develop local crab markets of all types (live, frozen, and ready-to-cook) and infrastructure. Moreover, micro-credit facilities should also be assured to them with low interest rates. It is also urgent to develop a strategic policy to improve the living standard of this specific coastal community therefore, they can live sustainably with this occupation.

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