

**Understanding the livelihood of coastal people involved in catching
crabs from the Sundarbans Reserve Forest(SRF)**



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November, 2012

Understanding the livelihood of coastal people involved in catching crabs from the Sundarbans Reserve Forest(SRF)

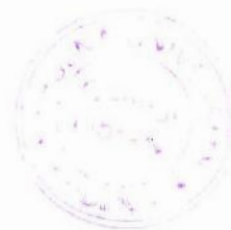
A Thesis

By

Shirin Akter

Examination Roll No: MS-120605

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A project thesis submitted to the Fisheries and Marine Resource Technology Discipline, Khulna University, Khulna, in partial fulfillment of the requirements for the degree of

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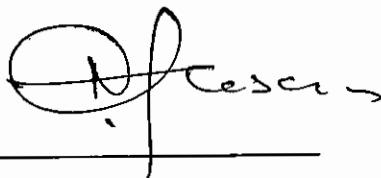
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**Understanding the livelihood of coastal people involved in catching
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Declaration

Understanding the livelihood of coastal people involved in catching crabs from the Sundarbans Reserve Forest(SRF)

The results submitted in this project thesis are entirely of the candidate's own investigations and no part of the results has been accepted for any degree, nor it is being concurrently submitted for any degree.

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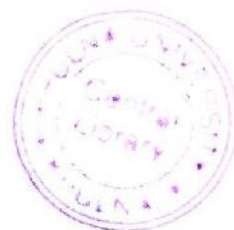
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DEDICATED TO

MY BELOVED PARENTS

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At first all my admiration goes to the supreme creator and ruler of the universe, Allah, for His great mercy to create me alive and enables me to pursue my education in Fisheries & Marine Resource Technology Discipline and to complete my project thesis for the degree of MS in Fisheries and Marine Resource Technology.

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Abstract

A field level survey was conducted to observe the livelihood of coastal people involved in catching crabs from the Sundarban Reserve Forest (SRF) from July, 2011 to February 2012, during the season of crab collection. It was found that about 82% of them were male and the rest (18%) were female. All the collectors (100%) were Hindus. It was observed that 28% of the collectors were illiterate and 55% of them leaved the school before class two. About 31% of them had 6-7 members in their family, whereas 47%, 13% and 9% of them had 4-5, above 7 and 2-3 members in their family, respectively. Most of the collectors (62%) lived in mud walled with golpata shed, while 29%, 7% and 2% lived in mud walled with straw, mud walled with tin/asbestos and wood walled with tin shed house, respectively. It was found that 30% of the collectors were landless, while 41%, 18%, 7% and 4% of them had 0-5, 6-10, 11-15 and above 15 decimal lands, respectively. The main occupation of them was crab collection and secondary occupation were fishing (24%), craft and gear making (4%), labor (61%), wood collection from the Sundarbans (3)% and van pulling (8%). Most of the crab collectors (60%) earned at average 200-300 taka per day whereas the another 25% and 15% of them earned at average 150-200 taka and 300-400 taka per day, respectively while most of the crab collectors (62%) spent at average 180-250 taka per day whereas the another 24% and 14% of them spent at average 90-180 taka and 200-350 taka per day, respectively. About 63% of them took dadon from money lenders, whereas only 36% did not take dadon. Most of them (66%) sold their catches to the depot, whereas 12% and 22% of them sold crabs to the foriah and local market, respectively.

Table of Contents

List of contents	Page No
Acknowledgement	I
Abstract	II
Table of Contents	III-V
List of Maps	VI
List of Figures	VII
List of Tables	VIII
Chapter-1: Introduction	1-3
1.0. Background of the study	1-3
1.1. Objectives of the study	3
Chapter-2: Review of Literature	4-5
Chapter-3: Materials and Methods	6-10
3.1 Study site	6
3.2 Data collection	6
3.3 Data processing and analysis	7
Chapter-4: Results and Discussion	11-31
4.1. Human Capital	11-17
4.1.1. Age Structure	11
4.1.2. Religious Status	12
4.1.3. Sex Ratio	13
4.1.4. Marital status and Family structure	13-14
4.1.5. Educational Status	14-15



4.1.6. Years of involvement in Crab Collection	15-16
4.1.7. Formal knowledge in crab harvesting	16
4.1.8. Help of family member in crab harvesting	16
4.1.9. Occupation	16-17
4.1.9.1. Primary Occupation	16
4.1.9.2. Secondary Occupation	16-17
4.2. Social Capital	17-18
4.2.1. People involved in crab collection	17
4.2.2. Business relation of crab collectors with crab traders	18
4.2.3. Member of cooperation	18
4.3. Natural Capital	18-20
4.3.1 Ownership of Land	18-19
4.3.2. Ownership of Livestock	19-20
4.3.3. Season wise crab Collection	20
4.4. Physical Capital	20-26
4.4.1. Housing Condition	20-21
4.4.2. Type of Cooker	21
4.4.3. Cooking and Drinking water Facilities	21-22
4.4.4. Sanitation facilities	22-23
4.4.5. Use of Electricity	23
4.4.6. Healthcare facilities	24
4.4.7. Transporting System	24
4.4.8. Transporting materials	24
4.4.9. Types of Gear	25
4.4.10. Types of Bait	25

4.4.11. Number of traps per boat	26
4.5. Financial Capital	26-27
4.5.1. Credit Facilities	26
4.5.2. Selling System	27
4.5.3. Selling Price of Crabs	27
4.6. Livelihood Strategies	28
4.7. Vulnerability	28-31
4.7.1. Daily Income from Crab Collection	28-29
4.7.2. Daily Expenditure	29-30
4.7.3. Shocks	31
4.7.4. Seasonality	31
Chapter-5: Problems	32-33
Chapter-6: Recommendation	34-35
Chapter-7: Conclusion	36
Chapter-8: References	37-38

List of Maps

SL. Code	Title	Page No.
Map 1	Location of the study area of Paikgachha Upazila, Khulna.	8
Map 2	Location of the study area of Shymnagar Upazila, Satkhira.	9
Map 3	Location of the study area of Mongla Upazila, Bagerhat	10

List of Figures

SL. Code	Title	Page No.
Figure 1	Age structure of the crab collectors	11
Figure 2	Religious status of the crab collectors	12
Figure 3	Sex ratio of the respondents of the crab collectors	13
Figure 4	Family size of the crab collectors	14
Figure 5	Educational status of the crab collectors	15
Figure 6	Member of cooperation of crab collectors	18
Figure 7	Ownership of land of the crab collectors	19
Figure 8	House type used by the crab collectors	21
Figure 9	Cooking and Drinking water facilities of the crab collector	22
Figure 10	Sanitation facilities of the crab collectors	23
Figure 11	Facility of electricity for the crab collectors	23
Figure 12	Types of bait used for crab collection	25
Figure 13	Percentage of respondents took dadon	26
Figure 14	Daily income from crab collection	29
Figure 15	Daily expenditure of crab collectors	30

List of Tables

SL. Code	Title	Page No.
Table 1	Help of family members in crab harvesting	16
Table 2	Secondary Occupation of crab collectors	17
Table 3	Healthcare facilities of crab collectors	24
Table 4	Selling system of collecting crabs	27
Table 5	Average selling price of crabs in different places	27
Table 6	Different costs for a 7 days trip for mud crab harvesting inside the SRF	30

Chapter One

INTRODUCTION



Introduction

1.0. Background of the study

Bangladesh is a deltaic country endowed with various ponds, lakes, canals, beels, haors, boars, rivers and creeks. It has also vast coastline of 710 km with 310 km² EEZ (Economic Exclusive Zone) in the Bay of Bengal. The area of closed water body is 4,12,341 ha and the open water area is 49,20,316 ha. The area of territorial water is 2,640 sq. n. miles with 6,18,780 ha of mangrove tidal flat. There are 260 freshwater fish species, 475 marine water species, 24 fresh water prawn species, 36 marine shrimp species and crab, snail, mussel, turtle etc in this vast water body (DoF, 2003).

The mud crab (*Scylla serrata*) is widely distributed in the Indo-West-Pacific region as mangrove associated fauna (Macintosh *et al.*, 2002). Crabs belong to the family Portunidae of the class Crustacea play a vital role in the ecological balance. There are 15 species of crab available in our country, among them 4 species inhabit fresh waters while the remaining 11 species inhabit marine waters (Ahmed, 1991). However, only the mud crab inhabiting marine or brackish waters is commercially important. Mud crabs occur abundantly in the whole coastal region of the Bangladesh particularly in the estuaries, tidal rivers of the Sunderbans mangrove swamps and vast coastal *ghers* or shrimp polders (Khan and Alam, 1991). It offers excellent food for estuarine crocodiles, sharks, estuarine groupers turtles and grey headed fishing Eagles (Lee, 1992).

Along with various types of livelihoods in the coastal region of Bangladesh such as finfish fishing, shrimp culture, agriculture, wood collection, and shrimp fry collection, mud crab has become an export fishery playing an important role in national and international markets. It can generate employment directly and indirectly in terms of people employed in the harvesting, production, marketing and other associated business. The annual production of crab is estimated to be more than 10,000 tons (Zafar and Siddique, 2000). During winter (November to January), the largest number of crabs are harvested from the mangrove areas and the tidal rivers. During rainy season (June to August), shrimp *ghers* are the main sources of mud crab. The maximum number is catch occurs during spring tide and neap tide locally known as *goun* (Uddin, 2002). Export of mud crab started in 1977-78 and became a stable business in 1982 and

ranked third among frozen foods that were exported for earning foreign currency from Bangladesh (SEAFDEC, 1998; and Ali *et al.*, 2004). The export of live mud crabs from Bangladesh has increased many folds 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).

Considering the increasing demand of mud crab in the local and international markets, it has been gaining popularity among the coastal communities in greater Khulna and Chittagong regions (Azam *et al.*, 1998). Millions of poor fishers, traders and transporters are directly or indirectly dependent on crab fishery in Bangladesh (Zafar, 2004; Patterson and Sainuel, 2005). More than 0.4 million people (*pers. Communcn*) are involved as fishers, traders, transporters and exporters in this sector. Mangrove forest area (the Sundarbans), tidal river and ghers are the wild sources of mud crab harvesting. For this reason, most of the mud crab depots are located nearby the river to ease landing of harvested crabs. The depots are also connected with the roads and highways for easy transportation to the market. Fishermen capture mud crabs from mangrove areas and tidal rivers by using rope line, hook line, set bagnet, etc. Boom, thopa, scoopnet, bait stick, iron hooks etc. are also used to harvest crab from the ghers (Moinul, 2006). There are mainly two types of crab collectors and harvesters in Bangladesh. Within these types the two most important one is the wild collectors who collect the crabs from wild sources such as mangrove area, tidal rivers and lakes. Another one is fattener. Wild collectors and fatteners sell their catch to fariah or directly to the depot owners. Then depot owners gather the collected crabs from where it is distributed to the local agents. Exporting agents collect the crabs from local agents. Then exporting agents sell the crabs to the foreign countries.

The mud crab fishery is not now solely taken over by the traditional fisher-folks but is increasingly exploited by the marginal poor coastal people who have become climate refugee. As Bangladesh is recognized severely vulnerable to climate change (UNDP, 2004), the people, especially in the coastal areas, have been severely exposed to a number of natural hazards (Hasanuzzaman *et al.*, 2010). Day by day the coastal people are losing their lands, crops, and livelihoods, and thus becoming climate refugee. Such climatically suffered people are seeking for alternative livelihood options which are very limited in Bangladesh, and have been taken mud

crab harvesting as their potential livelihood means. Over the very recent years, an increasing number of poor coastal people have been going to the Sundarbans Reserve Forest (SRF) for harvesting mud crabs, and thus putting pressure on the mud crab fishery of the SRF.

With considering the aforesaid facts, the present study was conducted to find out the socio-economic conditions of the collectors and explore the potential alternatives for improving their livelihoods. The present study may outline such information as to be worthwhile for determining the sustainability of SRF mud crab fishery upon which the livelihoods of community notably dwelling in and around the Sundarbans region depending on.

1.1. Objectives of the Study

- ❖ To analyze the livelihood of coastal people involved in catching crabs from the Sundarbans Reserve Forest (SRF).
- ❖ To understand the socio-economic state of coastal communities involved in mud crab collection.

Chapter Two

REVIEW OF LITERATURE

Review of Literature

A limited number of studies on the livelihood of coastal poor people involved to catching crabs have been conducted in Bangladesh. Different researchers just mentioned about the abundance of mud crab (*Scylla serrata*) with some economic information in the context of Bangladesh.

Mahmood (1977) reported 16 crab species of the coast of Bangladesh. Bhuyan and Das (1976) made a taxonomic investigation and reported 15 species of crab from the intertidal zone. Among them 7 species are commercially important in Sundarbans region (Ali, 1998). They reported that the mud crabs are a significant component of the Sundarban ecosystem in terms of energy transfer, nutrient trapping, substrate modification, and a food item. Live export of the species contributes significantly to the national economy.

Khan and Sharif (1991) mentioned that in recent years, live mud crab has become one of the most important exportated commodities due to high price and demand in the international market. The mud crab leading the supreme position among the various crab species in Bangladesh in the view of market demand, economic profit, excellent food quality, large size than the other countries and as profession of the minority group. The export of the live *Scylla serrata* from Bangladesh has increased significantly in the past few years.

Khan and Alam (1991) reported that Bangladesh also rich as natural resource of mud crab around the coastal region (including river) of Cox's Bazar, Chittagong, Barisal, Potuakhali, Satkhira, Noakhali, and the inshore islands of Moheshkhali, Kutubdia, Sandwip, Hatia and Dubla, i.e. all inshore islands, except Saint Martin. Mangrove forest areas and Chokaria Sundarbans areas are mostly suitable places for wandering of mud crab and remaining abundantly as well as containing a great resource potentiality in future.

Ahmed (1991) mentioned about the seasonal abundance of mud crab. He mentioned that the peak abundance of adult crab occurs during mid and late monsoon (June-August). The early monsoon (April-May) and post monsoon (September-October) are the seasons of fairly good abundance. Less abundance appears during the winter months from November to February.

Khan and Alam (1991) mentioned that shrimp and crab live in similar environmental conditions. They are quite abundant in places 40-50 km inland from the Bay, in the creeks and canals of the brackish water estuaries.

Molla *et al.* (2009) reported that there are various types of livelihoods in the coastal region of Bangladesh such as finfish fishing, shrimp culture, agriculture, wood collection, shrimp fry collection and crab collection and fattening. The crab harvest and culture is new alternative livelihoods and have a great prospect in Bangladesh.

Zafar and Ahsan (2006) reported that Crab collectors in most of the cases did not get actual price of their products due to intervention of brokers and loan burden. The crab collectors were bound to sell the crabs at a low price to the specified brokers or wholesalers who provided them loan in their lean period. Likewise, wholesalers were to sell their products to certain distributors who gave them loan in their business.

Chapter Three

MATERIALS AND METHODS

Materials and Methods

3.1 Study site

The field survey was conducted in three upazilas namely Paikgacha under the district of Khulna, Shymnagar under the district of Satkhira, and Digraj (Mongla) under the district of Bagerhat. All the above mentioned upazilas are important for crab collection.

3.2 Data collection

Data were collected from July, 2011 to February 2012, during the season of crab collection. A combination of the following survey techniques were used for data collection:

3.2.1. Questionnaire interviews

3.2.1.1. Crab collectors

For questionnaire interviews, simple stratified-random sampling method was followed for a total of 80 crab collectors from the three upazilla. Crab collectors were interviewed at their houses and/or on boat at rivers. The interviews focused the social status of crab collectors such as age, sex ratio, education, religion, sanitation, family size, drinking water facilities, medical facilities, economic status like occupation, sources of income, daily expenditure, credit facilities, crab collection techniques, shocks like economic shocks, health shocks and natural shocks, seasonality for crab collection etc.

3.2.1.2. Participatory Rural Appraisal (PRA)

PRA is a group of methods to collect information in a participatory fashion from rural communities (Chambers, 1992). The advantage of PRA over other methods is that it allows wider participation of the community. The information collected is likely to be more accurate. For this research, PRA tools such as Focus Group Discussion (FGD) was conducted with crab collectors. FGDs were considered to get the clearest overview of particular issues. A total of 6 FGDs sessions were conducted for crab stakeholders in three upazilla, 2 from each upazilla.

3.2.1.3. Crosscheck interviews

Crosscheck interviews were conducted with key informants such as conscious farmers, school teachers, local leaders, social workers, Upazila Fisheries Officers and relevant NGO workers. Where information was got contradictory further assessments were carried out.

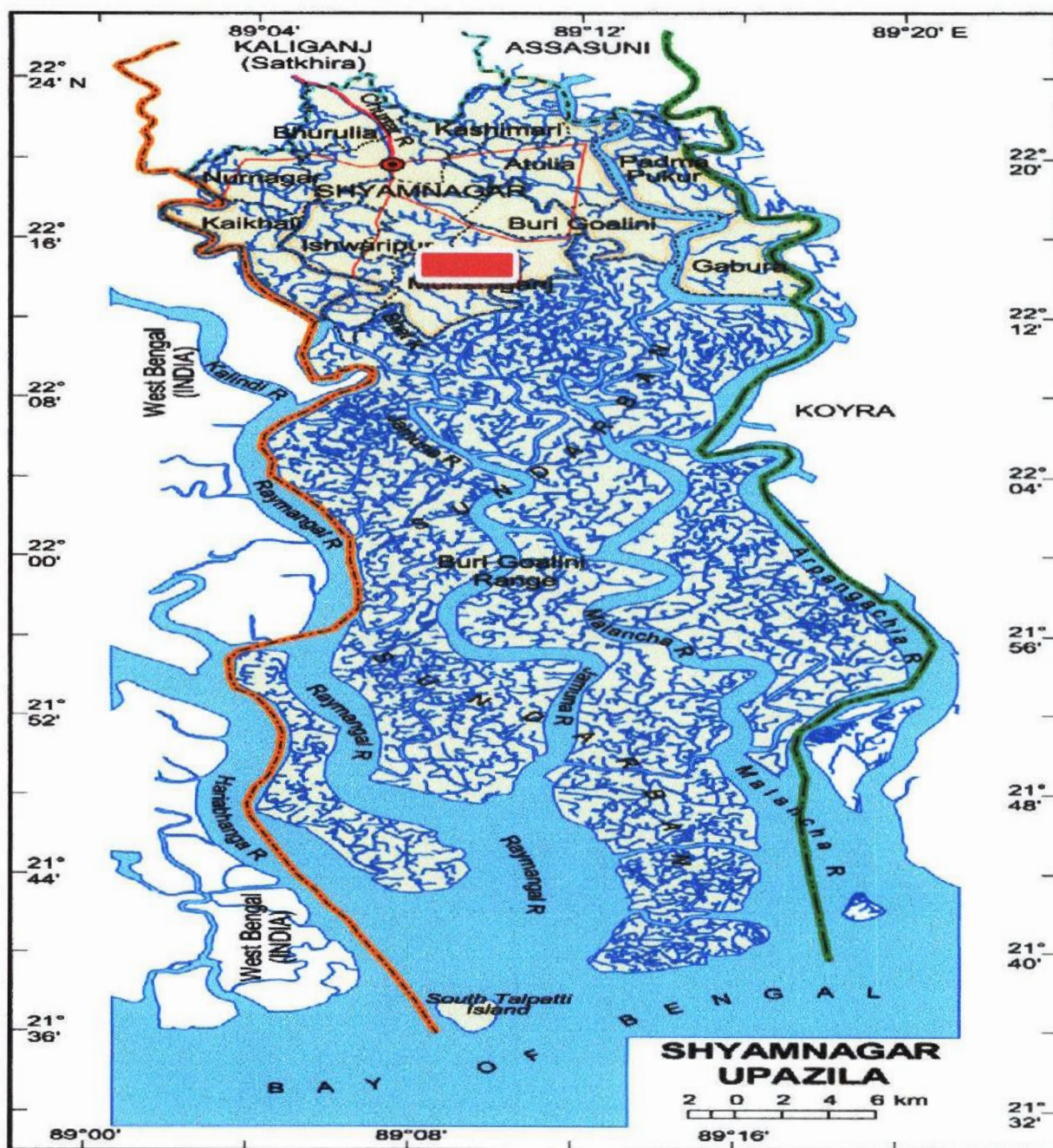
3.3 Data processing and analysis

Data collected from various sources were coded and entered into a database system using Microsoft Excel software. Numerical data which were collected in local units due to familiarity of the respondents, converted into international units before transferring to computer. Preliminary data sheets were compared with the original coding sheets to ensure the accuracy of the data entered. At each stage of survey, data were checked up, edited and coded at the field-level. SPSS (Statistical Package for Social Science) was used to analyze the data. Data were summarized using descriptive statistics. The analytical process was used to identify the importance of the different factors on prawn diseases and culture management systems as well as medication measures.



Map1: Location of the study area of Paikgachha Upazila, Khulna.





Map2: Location of the study area of Shymnagar Upazila, Satkhira.



Map 3: Location of the study area of Mongla Upazila, Bagerhat

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Bagerhat

Chapter Four

RESULTS AND DISCUSSION

Results and Discussion

4.1. Human Capital

4.1.1. Age Structure

In Satkhira (Shymnagar) district, the average age of the crab collectors was 34 years whereas most of them were in the age group of 25-35 years. In Khulna (Paikgacha) district, the average age of the crab collectors was 40 years whereas most of them were in the age group of 30-45 years. In Bagerhat (Mongla) district, the average age of the crab collectors was 45 years whereas most of them were in the age group of 40-50 years.

In the study area, it was found that the average age of the crab collectors who collected crabs from Sundarban Reserve Forest was 39 years.

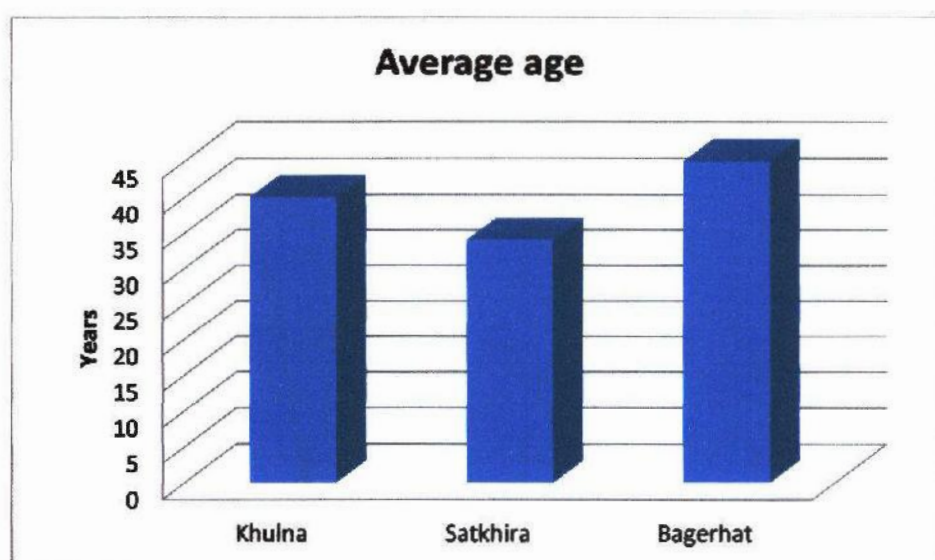


Figure1: Age structure of the crab collectors

4.1.2. Religious Status

In Khulna (Paikgacha) district, it was observed that 87% of the collectors were Hindus, whereas only 13% were Muslims. In Satkhira (Shymnagar) district, 80% of the collectors were Hindus, while 20% were Muslims. In Bagerhat (Mongla) district, 83% of the collectors were Hindus and remaining 17% were Muslims.

The result shows that in the study area about 84% of the collectors were Hindus, whereas only 16% were Muslims. The main cause may be the religious restriction of Muslims to eat and catch crabs. On the other hand, Hindus are involving to this occupation from the prehistoric time.

According to the reports of the fishermen's socio-economic survey (Ahmed, 1996), the majority of the fishermen engaged in their profession in different parts of the country of Hindus. The result of the present study is nearly similar to the above study.

Hannan (1994) stated that an ethnic community used to catch fish from natural waters in Bangladesh and fishermen came from low caste of Hindu society. Before partition of India in 1947, the fishermen were predominantly Hindus.

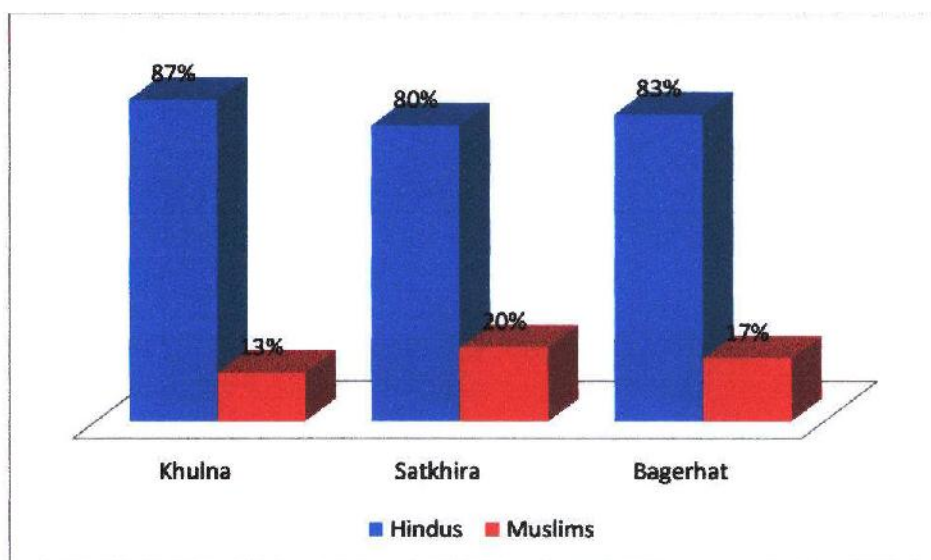


Figure 2: Religious status of the crab collectors

4.1.3. Sex Ratio

In Khulna (Paikgacha) district, 81% of the crab collectors were male and the rest 19% were female, whereas in Satkhira (Shymnagar) district, 82% of the crab collectors were male and the rest 18% were female and in Bagerhat (Mongla) district, 85% of the crab collectors were male and the rest 15% were female. In the study area, the survey revealed that 82% of the total crab collectors were male and the rest 18% were female. The main sources of crab were the Sunderbans and the river far from the locality. Therefore, the crab collectors had to stay there for 7 to 15 days that was usually impossible for the female crab collectors. Female mainly involved in collecting of crab from *gher* and bank of the river. Another reason of less involvement of female in crab collecting activities was social restriction.

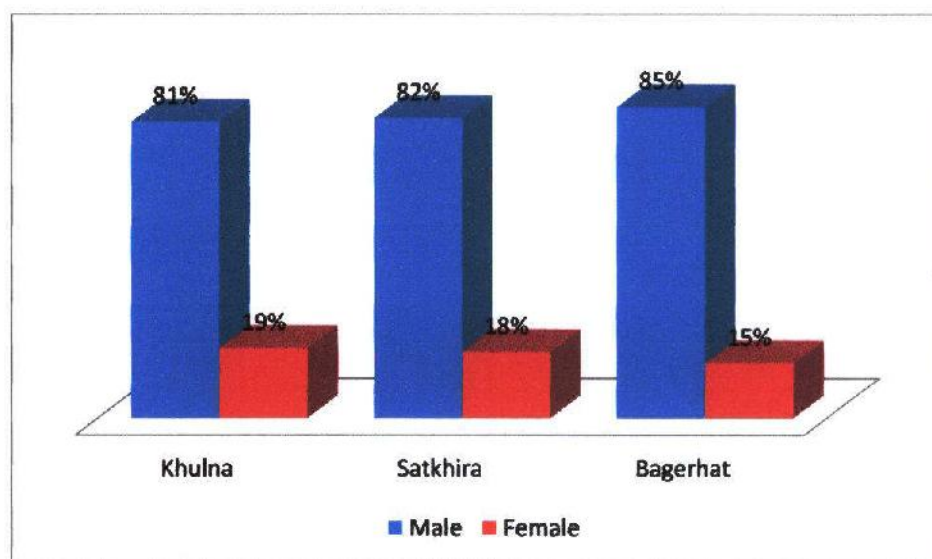


Figure 3: Sex ratio of the respondents of the crab collectors

4.1.4. Marital status and Family structure

In the study area 90% crab collectors were married and remaining 10% were unmarried. 95% crab collectors have single family and remaining 5% have joint family. In Khulna (Paikgacha) district, it was observed that 35% of the collectors had 6-7 members in their family, whereas 45%, 12% and 8% of them had 4-5, above 7 and 2-3 members in their family,

respectively. In Satkhira (Shymnagar) district, 28% of the collectors had 6-7 members in their family, whereas 53%, 11% and 8 % of them had 4-5, above 7 and 2-3 members in their family, respectively. In Bagerhat (Mongla) district, 32% of the collectors had 6-7 members in their family, whereas 43%, 15% and 10% of them had 4-5, above 7 and 2-3 members in their family, respectively.

In the study area, the highest 31% of the collectors had 6-7 members in their family, whereas 47%, 13% and 9% of them had 4-5, above 7 and 2-3 members in their family, respectively. Most of the crab collectors were illiterate. They have no idea about family planning. So they are not intended to minimize their family size.

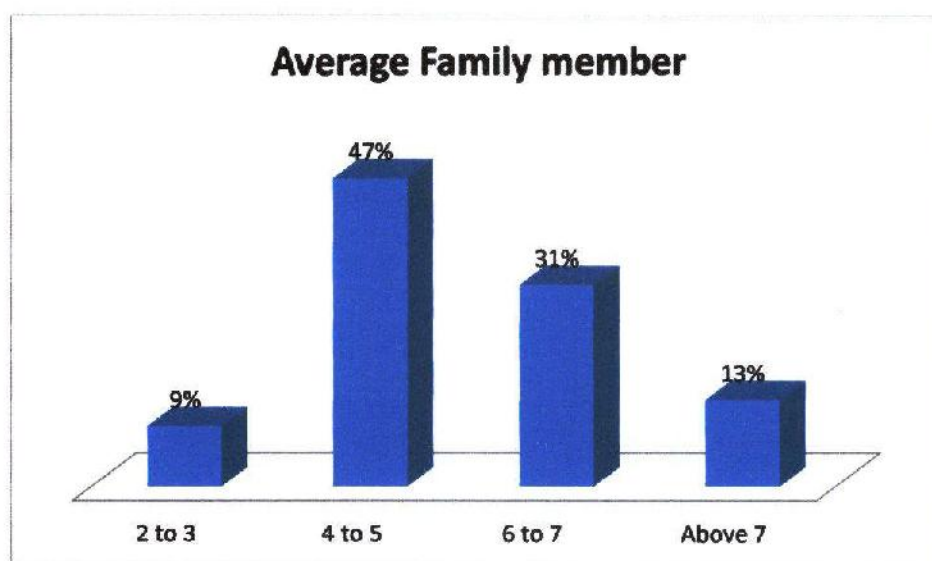


Figure 4: Family size of the crab collectors

4.1.5. Educational Status

In the Khulna (Paikgacha) district, it was found that most of the collectors (30%) were illiterate and 57% of them were class one or two passed, whereas 10%, 3% and 0% of them were class three or five, six or eight and above nine passed, respectively. In Satkhira (Shymnagar) district, illiterate collectors were 34% and 57% class one or two passed, whereas 8%, 3% and 2% of them were class three or five, six or eight and above nine passed, respectively. In Bagerhat (Mongla) district,

20% collectors were illiterate, 52% class one or two passed and remaining 16%, 7% and 5% of them were class three or five, six or eight and above nine passed, respectively.

Result shows that in the study area, 55% of the collectors were found to be class one or two passed and 11%, 4% and 2 % of them were class three or five, six or eight and above nine passed, respectively, while rest (28%) were completely illiterates.

Bailey and Doulman (1994) studied on employment, labor, productivity and income of small-scale fisheries where they found that the coastal fishermen in Bangladesh had the lowest level of education. The result of the present study is similar to the above study.

Most of the crab collectors were illiterate because in the early stage of life they bounded to enter into different activities due to their poor economic condition.

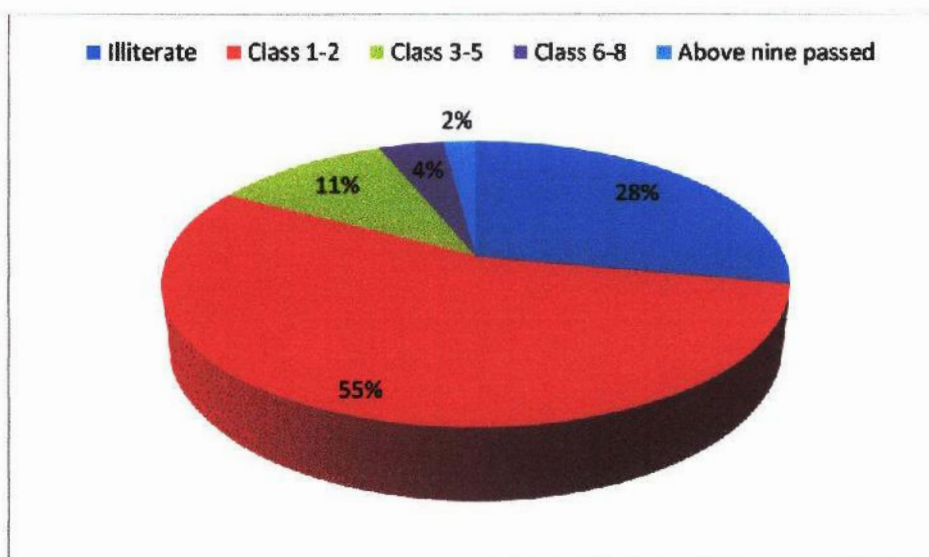


Figure 5: Educational status of the crab collectors

4.1.6. Years of involvement in Crab Collection

In Khulna (Paikgacha) district, the crab collectors involved in crab collection at the average years of 22. Both in Satkhira (Shymnagar) and Bagerhat (Mongla) district they involved in

crab collection at the average years of 25. Result shows that in the study area, the crab collectors involved in crab collection at about 24 years.

4.1.7. Formal knowledge in crab harvesting

In the study area, there was no crab collectors found who had any formal knowledge in crab harvesting.

4.1.8. Help of family member in crab harvesting

In Satkhira (Shymnagar) district, all the fishermen (100%) got help from their family members in crab harvesting. In Khulna (Paikgacha) district, 62% crab collectors got help and remaining 38% didn't get any help from their family members in crab harvesting. In Bagerhat (Mongla) district, only 10% crab collectors got help and another 90% didn't get any help.

Result shows that in the study area, 57% crab collectors got help and 43% didn't get any help from their family members in crab harvesting. In Bagerhat and Khulna District, a large number of crab collectors went to Sundarban Reserve Forest for crab collection that was remote from their home. For this reason, they got poor help from their family members.

Table1: Help of family members in crab harvesting

District	Get help from family members	Didn't get help from family members
Satkhira	100%	0
Khulna	62%	38%
Bagerhat	10%	90%

4.1.9. Occupation

4.1.9.1. Primary Occupation

The main occupation of crab collectors was crab collection for uphold their livelihood.

4.1.9.2. Secondary Occupation

It was observed that the rainy season (June-August) was the peak season of crab collection. In winter (November-January) also found a frequent amount of crab. In offpeak season (rest 6

months) the crab collectors engaged in various income generating occupations (other than crab collection).

In Khulna (Paikgacha) district, secondary occupation of the most crab collectors (67%) were labor, whereas the rest collectors engaged in fishing (15%), craft and gear making (5%), wood collection from the Sundarbans (4)% and van pulling (9%). In Satkhira (Shymnagar) district, secondary occupation of the most crab collectors (64%) were labor, whereas the rest collectors engaged in fishing (19%), craft and gear making (3%), wood collection from the Sundarbans (4)% and van pulling (10%). In Bagerhat (Mongla) district, secondary occupation of the most crab collectors (52%) were labor, whereas the rest collectors engaged in fishing (35%), craft and gear making (6%), wood collection from the Sundarbans (3%) and van pulling (4%).

In the study area, the crab collectors engaged in various occupations other than crab collection such as fishing (24%), craft and gear making (4%), labor (61%), wood collection from Sundarbans (3%) and van pulling (8%).

Table 2: Secondary Occupation of crab collectors

Occupation	Khulna District	Satkhira District	Bagerhat District
Fishing	15%	19%	35%
Craft and gear making	5%	3%	6%
Labor	67%	64%	52%
Wood collection from Sundarbans	4%	4%	3%
Van pulling	9%	10%	4%

4.2. Social Capital

4.2.1. People involved in crab collection

There was no actual estimation of people involved in crab collection in Sunderban Reserve Forest. According to the crab collectors, there were about 5000-6000 people involved in crab collection in Sunderban Reserve Forest.



4.2.2. Business relation of crab collectors with crab traders

In the study area, it was observed that no crab collectors had any sort of business relation with the crab traders.

4.2.3. Member of cooperation

In Khulna (Paikgacha) district, 67% crab collectors were member of some cooperations like BRAC and other NGOs whereas 33% crab collectors were not member of any cooperation. In Satkhira (Shymnagar) and Bagerhat (Mongla) district 50% and 60% crab collectors were member of some cooperations like BRAC and other NGOs, respectively whereas 50% and 40% crab collectors were not member of any cooperation, respectively.

Result shows that, in the study area 59% crab collectors were member of some cooperations like BRAC and other NGOs and 41% crab collectors were not member of any cooperation.

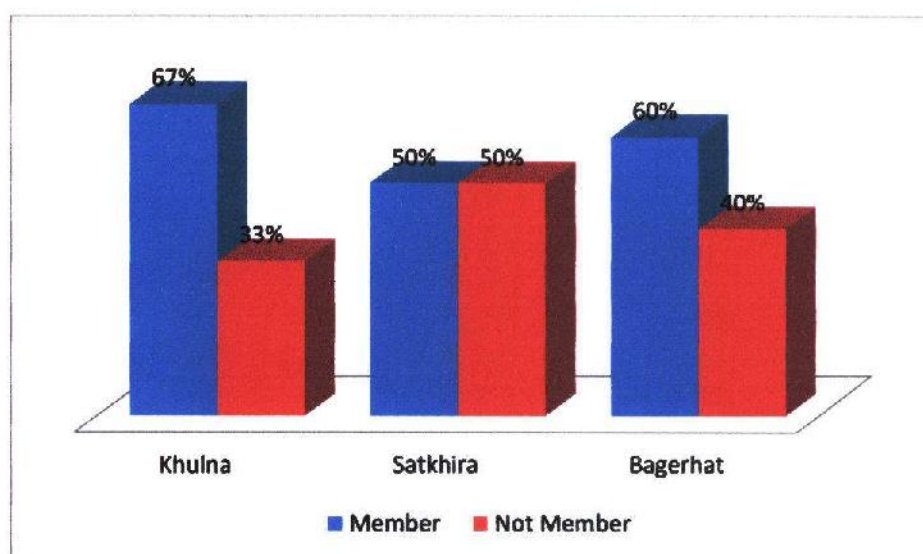


Figure 6: Member of cooperation of crab collectors

4.3. Natural Capital**4.3.1 Ownership of Land**

In Khulna (Paikgacha) district, most of the crab collectors (37%) had a very few amount of land 0-5 decimal, while 19%, 32%, 9% and 3% of them had no land, 6-10, 11-15 and above 15 decimal lands, respectively. In Satkhira (Shymnagar) district, most of the crab collectors (45%) had a very few

amount of land 0-5 decimal, while 38%, 9%, 5% and 3% of them had no land, 6-10, 11-15 and above 15 decimal lands, respectively. In Bagerhat (Mongla) district, most of the crab collectors (42%) had a very few amount of land 0-5 decimal, while 32%, 13%, 7% and 6% of them had no land, 6-10, 11-15 and above 15 decimal lands, respectively.

In the study area, 30% of the crab collectors had no own land, while 41%, 18%, 7% and 4% of them had 0-5, 6-10, 11-15 and above 15 decimal lands, respectively. The landless collectors lived in khas land.

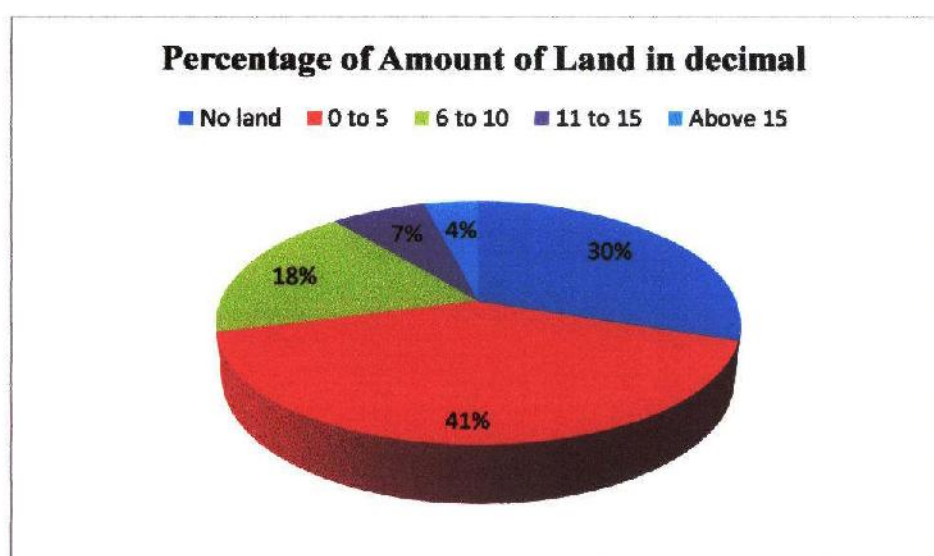


Figure 7: Ownership of land of the crab collectors

4.3.2. Ownership of Livestock

In Khulna (Paikgacha) district, 69% and 31% crab collectors had 2-3 and 4-5 chickens, respectively. 47%, 28% and 25% crab collectors had 2-3, 4-5 and above 6 ducks, respectively. 72% and 28% crab collectors had 2-3 and above 4 goats, respectively and 89% and 11% of them had 1-2 and above 2 cattle, respectively. In Satkhira (Shymnagar) district, 75% and 25% crab collectors had 2-3 and 4-5 chickens, respectively. 43%, 31% and 26% of them had 2-3, 4-5, and above 6 ducks, respectively. In Bagerhat (Mongla) district, 76%, 15% and 9% crab collectors had 2-3, 4-5 and above 6 chickens, respectively. 12%, 23% and 65% of them had 2-3, 4-5 and above 6 ducks, respectively. 55% and 45% of them had 1-2 and above 2 cattle, respectively.

In the study area, it was observed that in Satkhira and Bagerhat district, no crab collectors had goat and they preferred to had duck to chicken.

4.3.3. Season wise crab Collection

In the Sundarbans a person harvested 20-30 Kg in summer, 140-180 Kg in rainy season and 60-100 Kg in winter within 7 days. It is clear that the amount of collection in rainy season is very high and in the summer very low.

4.4. Physical Capital

4.4.1. Housing Condition

It was observed that the crab collectors lived in four types of houses - (i) Wooden wall with tin shed (ii) Mud wall with tin/asbestos shed (iii) Mud wall with golpata shed and (iv) Mud/bamboo/wooden wall with straw shed.

It was observed that most of the crab collectors (60%) in Khulna (Paikgacha) district lived in mud walled with golpata shed, whereas 32%, 6% and 2% lived in mud walled with straw, mud walled with tin/asbestos and wood walled with tin shed house, respectively. In Satkhira (Shymnagar) district, majority of the collectors (65%) lived in mud walled with golpata shed, whereas 27%, 5% and 3% lived in mud walled with straw, mud walled with tin/asbestos and wood walled with tin shed house, respectively. In Bagerhat (Mongla) district, majority of the collectors (62%) lived in mud walled with golpata shed, whereas 28%, 8% and 2% lived in mud walled with straw, mud walled with tin/asbestos and wood walled with tin shed house, respectively.

In the study area, 62% of the crab collectors lived in mud walled with golpata shed, whereas 31%, 6% and 2% lived in mud walled with straw, mud walled with tin/asbestos and wood walled with tin shed house, respectively.

Ahamed (1999) found that the housing conditions of most of the fishermen are poor; their houses were made of mud and one kind of weed leaves. The result of the present study is similar to the above study.

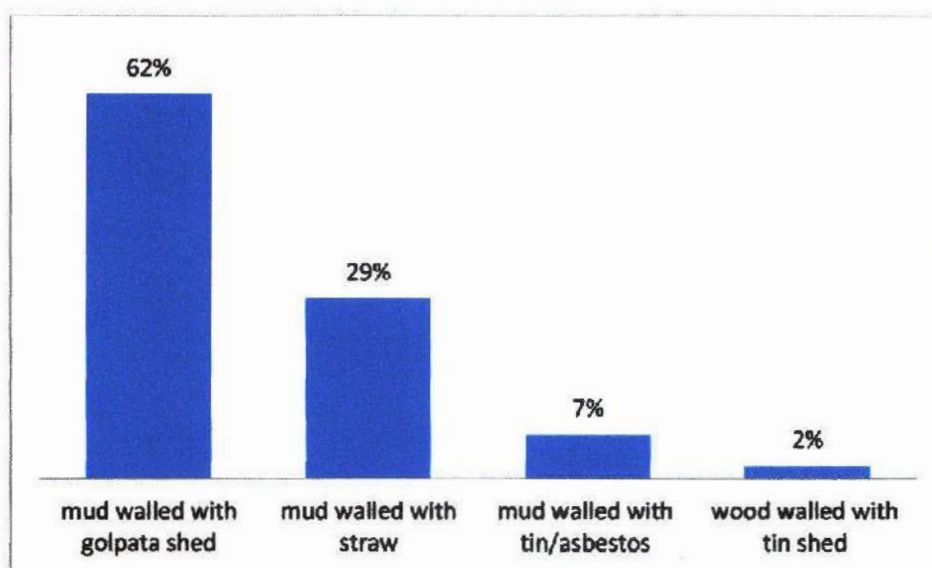


Figure 8: House type used by the crab collectors

4.4.2. Type of Cooker

In the study area, it was observed that all the crab collectors (100%) had the cooker made of mud.

4.4.3. Cooking and Drinking water Facilities

In Khulna (Paikgacha) district, it was found that majority (51%) of the crab collectors used filtered pond water, whereas 39%, 5% and 5% used tube well, pond's water directly and rain water, respectively. In Satkhira (Shymnagar) district, most of the collectors (48%) of the crab collectors used filtered pond water, whereas 41%, 5% and 6% used tube well, pond's water directly and from rain water, respectively. In Bagerhat (Mongla) district, it was found that majority (47%) of the crab collectors used filtered pond water, whereas 39%, 8% and 6% used tube well, pond's water directly and rain water, respectively.

In the study area, it was found that 49% of the crab collectors used filtered pond water, 40% used tube well water, 6% used pond's water directly and 5% used rainwater for drinking purpose. 100% of the total collectors have no own tube well. 23% collectors used tube-well water using Governmental tube-well or those belonging to schools or neighbors.

Ahamed (1999) studied on socio-economic aspects of coastal fishermen in Bangladesh where he found that most fishermen used pond water due to the lack of tube-well water. The result of the present study is similar to the above study.

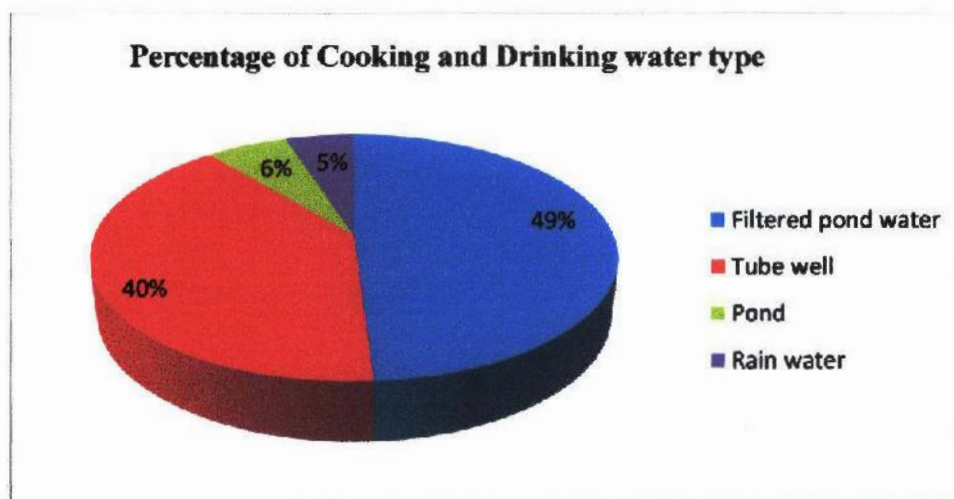


Figure 9: Cooking and Drinking water facilities of the crab collector

4.4.4. Sanitation facilities

In the study area the collectors used two types of toilet such as 1) Katcha toilet-made of bamboo with leaf shelter and inadequate drainage system and 2) Sanitary toilet- made of bamboo walled, ring slave with good drainage system.

In Khulna (Paikgacha) district, 45% of the collectors used safety toilet, whereas the rest (55%) used *Katcha* toilet. In Satkhira (Shymnagar) district, 42% of the collectors used safety toilet, whereas the rest (58%) used *Katcha* toilet. In Bagerhat (Mongla) district, 41% of the collectors used safety toilet, whereas the rest (59%) used *Katcha* toilet.

It was observed in the study area that 57% of the crab collectors did not use sanitary toilet while only 43% used sanitary toilet. The crab collectors were so poor that it was beyond of their ability to buy the constituent materials for making a sanitary latrine. Because of being illiterate they had lack of awareness about sanitation facilities.

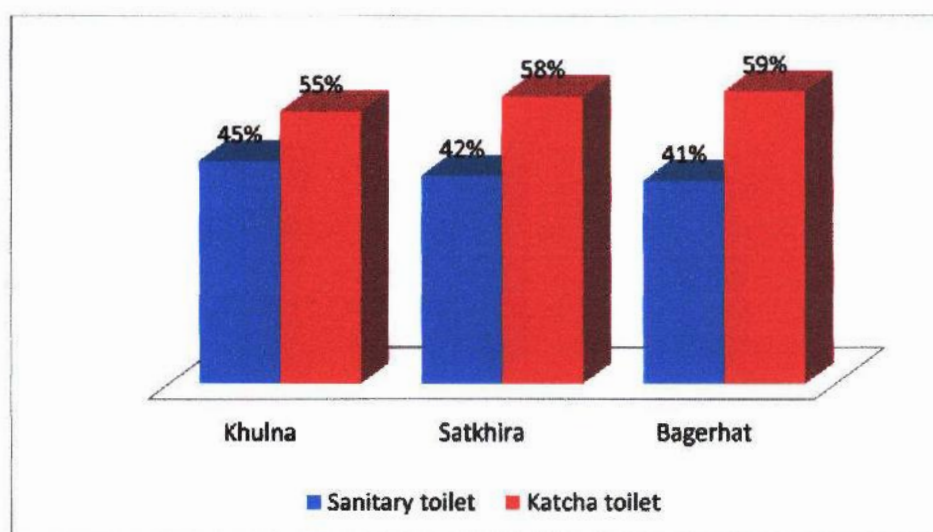


Figure 10: Sanitation facilities of the crab collectors

4.4.5. Use of Electricity

In Khulna (Paikgacha) district, it was found that majority of the crab collectors (81%) did not use electricity, whereas only 19% used electricity. In Satkhira (Shymnagar) district, all the crab collectors (100%) did not use electricity. In Bagerhat (Mongla) district, the majority of the crab collectors (87%) did not use electricity, whereas only 13% used electricity. The crab collectors who hadn't electricity, used kerosene lamp.

It was observed in the study area that 89% of the crab collectors did not use electricity, while only 11% used electricity.

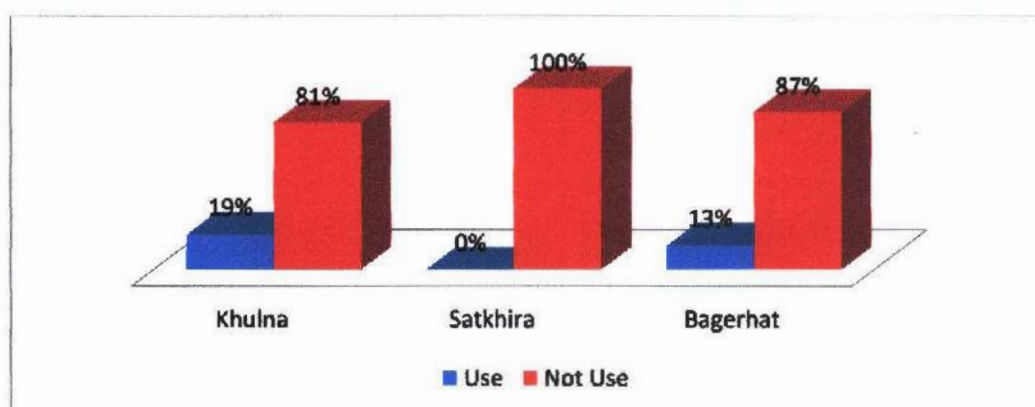


Figure 11: Facility of electricity for the crab collectors

4.4.6. Healthcare facilities

It was observed from the Khulna (Paikgacha) district that most of the crab collectors (76%) availed themselves of treatment facilities like services from village doctor, whereas 9%, 4%, 7% and 4% depended on *kobiraj*, qualified doctor, homeopathic treatment and hospital, respectively. In Satkhira (Shymnagar) district, most of the crab collectors (79%) availed themselves of treatment facilities like services from village doctor, whereas 7%, 3%, 8% and 3% depended on *kobiraj*, qualified doctor, homeopathic treatment and hospital, respectively. In Bagerhat (Mongla) district, most of the crab collectors (73%) availed themselves of treatment facilities like services from village doctor, whereas 10%, 5%, 7% and 5% depended on *kobiraj*, qualified doctor, homeopathic treatment and hospital, respectively.

The study shows that 92% of the crab collectors in the study area was dependent on village doctors (unqualified practitioners, homeopathy, *kobiraj*, etc) for their treatment, while only 8% got medical facilities from qualified doctors from thana health complex and MBBS doctors.

Table 3: Healthcare facilities of crab collectors

Type of Healthcare facilities	Khulna (Paikgacha) district in percentage	Satkhira (Symnagar) district in percentage	Bagerhat (Mongla) district in percentage
Village doctor	76	79	73
Kobiraj	9	7	10
Qualified doctor	4	3	5
Homeopathic	7	8	7
Hospital	4	3	5

4.4.7. Transporting System

In the study area, the crab collectors went to the Sundarban Reserve Forest by dinghi boat. This dinghi boat were widely used by the collectors during harvesting of crab. They went to the market by dinghi boat or van.

4.4.8. Transporting materials

Mainly bamboo made baskets were used as transporting materials. After harvesting the crab, it was gathered in the baskets and transported to the selling place by van or boat. Crab collectors also used bags, buckets, small nets, etc.

4.4.9. Types of Gear

The collectors used various types of gear to harvest the crabs such as rope line/don, scoop nets, hook, bamboo made boom, thopa etc. In the study area, it was observed that 90-95% of the collectors used scoop nets. 75%, 20% and 5% of the collectors used don/rope line, boom and other gears.

Azam, et al. (1998) studied on status and potential of mud crab in Bangladesh where they found that the common gears were- bamboo trap or "boom/ chaff/ tonga"; rope line or "don"(rope with stick, angling with hook); long metal hook and nets. The result of present study is similar to the above study.

4.4.10. Types of Bait

Different types of baits were used for crab harvesting purpose. These were eel, shark, frog, tilapia, etc. It was observed that in Khulna (Paikgacha) district, most of the crab collectors (90%) used eel as bait, whereas 5% and 5% used tilapia and others as bait, respectively. In Satkhira (Shymnagar) district, 88% of the crab collectors used eel as bait, whereas 7% and 5% used tilapia and others as bait, respectively. In Bagerhat (Mongla) district, 86% of the crab collectors used eel as bait, whereas 6% and 8% used tilapia and others as bait, respectively.

In the study area, 88% of the collectors used eel as baits, whereas 6% and 6% used tilapia and others as bait, respectively.

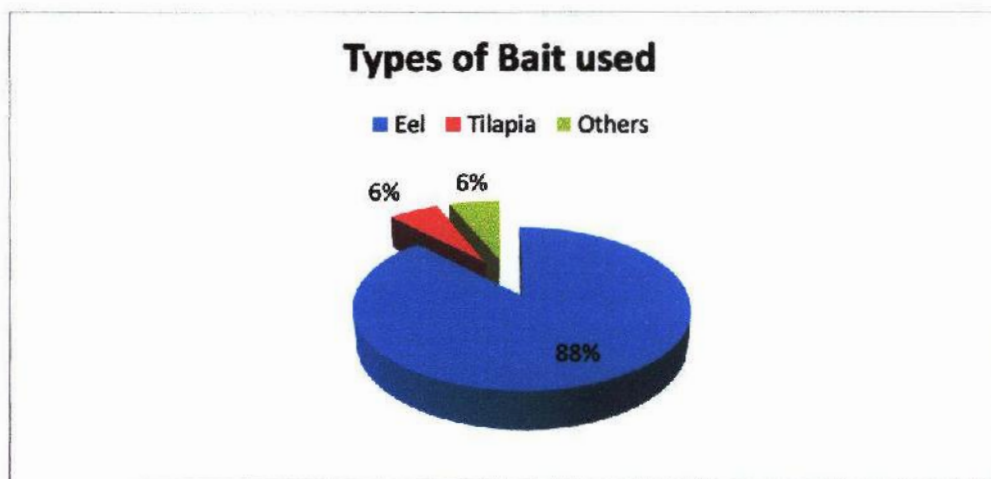


Figure 12: Types of bait used for crab collection

4.4.11. Number of traps per boat

In the study area the crab collectors kept about 45-50 traps per boat as they used dinghi boat. This number varied according to the size of boat. The collectors who used large boat kept 100-200 traps per boat. Generally the crab collectors used dinghi boat during harvesting of crab. They normally operated all traps that they kept in the boat.

4.5. Financial Capital

4.5.1. Credit Facilities

In the study area, it was observed that no crab collectors had any savings. Most of the crab collectors were needy, they had no aptitude to purchase their own concerned crab fishing elements. So, they had to rely upon credit facilities, which were not available from various sources. Generally they got loan from middlemen or aratders which is called dadon.

In Khulna (Paikgacha) district, most (66%) of the crab collectors took dadon and rest (34%) did not take *dadon*, whereas in Satkhira (Shymnagar) and Bagerhat (Mongla) district 62% and 60% of the crab collectors took dadon, respectively and rest 38% and 40% did not take dadon, respectively.

In the study area, 63% of the crab collectors took dadon, whereas only 37% did not take dadon.

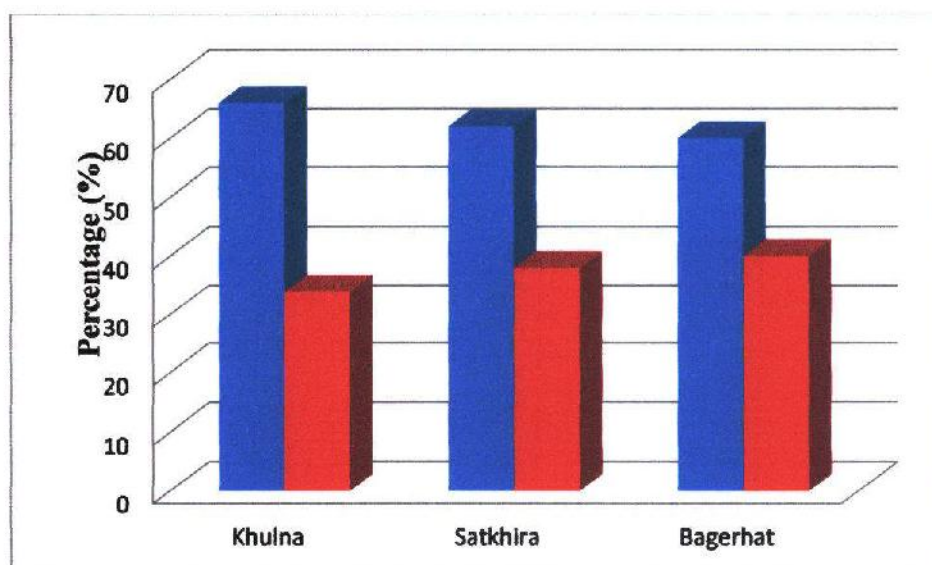


Figure 13: Percentage of respondents took dadon

4.5.2. Selling System

In Khulna (Paikgacha) district, 71 % of the crab collectors sold their catches to the depot, 12% to the Foriah and rest (17%) sold to the local market. In Satkhira (Shymnagar) district, 60% of the crab collectors sold their catches to the depot, 14% to the Foriah and rest (26%) sold to the local market. In Bagerhat (Mongla) district, 68% of the crab collectors sold their catches to the depot, 11% to the Foriah and rest (21%) sold to the local market. Foriah collected crab from the collector at the place of harvesting.

In the study area, most of the crab collectors (66%) sold their catches to the depot, whereas 12% and 22% of them sold crabs to the Foriah and local market, respectively.

Table 4: Selling system of collecting crabs

District	Depot	Foriah	Local market
Khulna	71%	12%	17%
Satkhira	60%	14%	26%
Bagerhat	68%	11%	21%

4.5.3. Selling Price of Crabs

Table 5: Average selling price of crabs in different places

Type	Grade	Weight(gm)	Price(Tk/kg)
Male	XXL	>500	750-900
	XL	>400	650-700
	L	>300	350-400
	SM	>200	200-300
	Water/PD		150-200
Female	F1	>180	650-700
	F2	>160	500-650
	F3	>130	300-450
	KS1	>180	200-250

4.6. Livelihood Strategies

All the crab collectors collected crabs as their livelihood. They started crab harvesting from night by setting gear and collected crabs at morning. Sometimes they ate a very few crabs and most crabs were sold in market. All of them had the idea about crab fattening but they didn't start fattening if they had given the incentives.

4.7. Vulnerability

4.7.1. Daily Income from Crab Collection

Survey was made to estimate the daily income of crab collectors at those days they collected crabs. In Khulna (Paikgacha) district, most of the crab collectors (51%) earned Tk. 100-150/day by selling their collected crabs, whereas 28%, 12% and 9% of them earned Tk. 150-200, 200-250 and 300-400, respectively. In Satkhira (Shymnagar) district, most of the crab collectors (48%) earned Tk. 100-150/day by selling their collected crabs, whereas 26%, 15% and 11% of them earned Tk. 150-200, 200-250 and 300-400, respectively. In Bagerhat (Mongla) district, most of the crab collectors (47%) earned Tk. 100-150/day by selling their collected crabs, whereas 24%, 16% and 13% of them earned Tk. 150-200, 200-250 and 300-400, respectively.

In the study area, 49% of the crab collectors earned Tk. 100-150/day by selling their collected crabs, whereas 26%, 14% and 11% of them earned Tk. 150-200, 200-250 and 300-400, respectively.

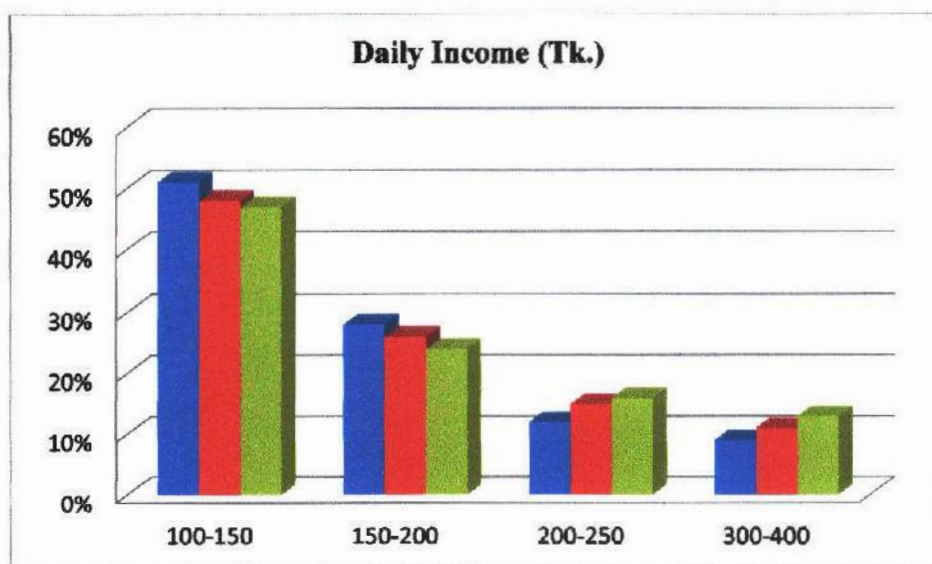


Figure 14: Daily income from crab collection

4.7.2. Daily Expenditure

In Khulna (Paikgacha) district, most of the crab collectors (51%) spent Tk. 80-130/day, whereas 28%, 12% and 9% of them spent Tk. 130-180, 190-240 and 250-350, respectively. In Satkhira (Shymnagar) district, most of the crab collectors (48%) spent Tk. 80-130/day, whereas 26%, 15% and 11% of them spent Tk. 130-180, 190-240 and 250-350, respectively. In Bagerhat (Mongla) district, most of the crab collectors (47%) spent Tk. 80-130/day, whereas 24%, 16% and 13% of them spent Tk. 130-180, 190-240 and 250-350, respectively.

In the study area, 49% of the crab collectors spent Tk. 80-130/day, whereas 26%, 14% and 11% of them spent Tk. 130-180, 190-240 and 250-350, respectively.

Expenditure in crab collection mainly dependent on the amount of baits. Baits were collected from different bazar and market. The collectors needed Tk. 20-80 for per Kg of bait. Each collector needed 1 Kg bait per day.

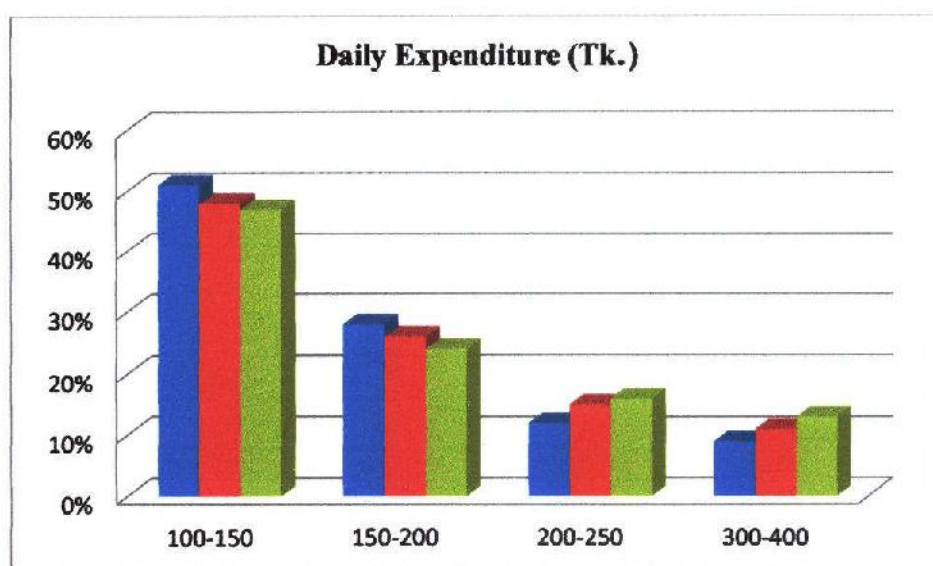


Figure 15: Daily expenditure of crab collectors

According to the crab collectors, their expenditure was increased over the time because of rising prices of all things.

Table 6: Different costs for a 7 days trip for mud crab harvesting inside the SRF

Item	Quality(made of)	Quantity	Unit cost(taka)	Shelf life(year)
New boat	Wood	1	9000-10000	5-7
Boat repairing		1	2000-3000	1
Don	Rope	1	1000-1200	3
Bamboo trap	Bamboo	1	80-100	2-3
Thopa	Bamboo	1	100-150	3
Boat license fee		1	200	1
Royalty of harvest			200	
Food		Per person	1200-1500	7 days
Piracy		Per boat	2000-3000	

4.7.3. Shocks

Economic shocks	Health shocks	Natural shocks
➤ Didn't get actual price of crab because of middlemen or foriah. ➤ In January-February, crab collection was banned from SRF. ➤ Piracy was occurred during crab collection. ➤ Illegal monetary payment was paid to the official of SRF. ➤ Crabs were damaged by fishermen.	➤ During crab harvesting trip, sometimes suffered from fever, diarrhoea, dysentery and some other cold diseases. ➤ These diseases also broke out for dwelling coastal regions.	➤ About 5-7 kg crabs died or damaged within 40 kg of crabs during harvesting. ➤ Due to climate change the amount of crabs were depleted. ➤ House of crab collectors was destroyed by natural disaster.

4.7.4. Seasonality

Seasonality	Month
Better season	December - February
Good season	October – November & March
Bad season	April - June
Worse season	July - September

Chapter Five

PROBLEMS

Problems

When the study was carried out the following problems were found in different levels that the crab collectors faced in their daily life:

Problem in Social Condition

- ❖ Most of the crab collectors are illiterate and leave school just before class two. The environment of education in the study area is not good. Most of the crab collectors are forced to enter into the profession in their early stage due to poor economic status of their parents and lack of awareness about education.
- ❖ The family size of the most crab collectors is large. Most of them have no idea about family planning. Their income is so poor comprising to their family size.
- ❖ Most of the crab collectors do not get tube-well water for drinking and cooking purposes. Sanitation facilities are so poor, that most of them use *katcha* toilet. They depend on unqualified village doctor (quack) and *kabiraj* for their medical treatment. For the above causes health condition of the collectors are poor. Monthly income is so little to buy nutritious foods so they suffered from malnutrition.
- ❖ Housing condition of most of the collectors is very terrible. Most of them live in mud made, golpata/straw shed houses.
- ❖ In the study area, the electric facilities are not available.

Problem in Economic Status

- ❖ The crab collectors have no money to invest in their occupation. However, there is no source from where they can get money with low interest. Therefore, they are found to take dadon from local money lender with high interest.
- ❖ The main occupation of the collectors is crab collection. But crabs are not available all year round. Therefore they have to depend on secondary occupation. But income from both primary and secondary occupation is too poor to lead their live properly. If they had any alternative option they can live in a better way.

Problems

- ❖ There are no proper training facilities for the collectors. Most of them collect crab in traditional way.
- ❖ Transportation system is not good. Some crab die during transportation. They sell their catches to depot, *foriah* and local market. *Foriah* collect crab from harvesting place then the collectors do not get appropriate price.
- ❖ Pirates are one of the major problems for the wild collectors. They are bound to give money/tax to the pirates during crab collection. Often the pirates hijack boat, food and collectors.
- ❖ Many forest officers take extra money beside the license fees from the collectors.

Chapter Six

RECOMMENDATION



Recommendation

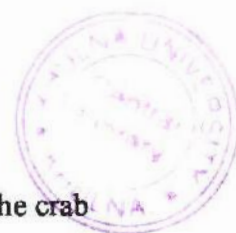
A lot of problems were found in the crab collector's community. The following recommendation should be taken to overcome their problems:

Recommendation for Improving Social Condition

- ❖ It was found that a few of crab collectors were child. So, child labor should be banned.
- ❖ It was observed that very lowest number of Muslims were engaged in this occupation because of the religious restriction. Muslims should be encouraged to this sector.
- ❖ Educational facilities for the children and also the crab collectors have to be ensured. Because only educational knowledge can help them to improve their present socio-economic condition.
- ❖ Medical, drinking water and sanitation facilities have to be ensured for improving the health condition of the crab collectors.
- ❖ It was found that most of crab collectors had large family. Their incomes are so poor comprising to their family size. So, programs have to be taken to aware the crab collectors about family planning.

Recommendation for Improving Economic Status

- ❖ Most of the crab collectors are collecting crabs in a traditional way. So, the crab collectors should be trained up on crab collection.
- ❖ The study shows that most of the crab collectors have no own land or a very few amount of land. Rehabilitation program have to be taken for allotting the *khas* land permanently among the crab collectors.
- ❖ Pirates were one of the major problems for the wild collectors. They were bound to give money/tax to the pirates during crab collection. Often the pirates hijacked boat, food and collectors, which was economically harmful for the collectors. So, security has to be ensured for them from the pirates.



Recommendation

- ❖ It was found that the economic condition of the collectors was very poor. They had no minimum capital to invest in their occupation. They took money from local money lenders with high interest. So, micro credit facilities have to be given from Government and NGO's sectors with low interest.
- ❖ Crabs were not available all the year round. So, they had to depend on secondary occupation. Poultry farming, goat farming, aquaculture, handicrafts, small trade and van pulling, etc. may be the better option of alternative livelihood for them when the crabs are not available.

Chapter Seven

CONCLUSION

Conclusion

Bangladesh is a developing country. She earns a lot of foreign currency by exporting crab in every year. Crabs become a popular food item in our country also. Crabs are a great source of animal protein and can meet the problem of malnutrition of the nation. Like other fisheries products, crabs can create employment opportunities for many jobless people and make sure to use the waste water bodies for rearing or fattening purpose. But it is very unfortunate that the crab collectors are very poor. The socio-economic status and livelihood conditions of the collectors are immeasurable. If we want to improve the crab sector as a foreign exchange earning sector and to fulfill the local and international demand, we must have to take necessary steps in order to improve the present conditions of the crab collectors. We should remember this that crab collectors are the brick of crab marketing channel. So, without improving the status, we never achieve our goal.

Chapter Eight

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