

GSJ: Volume 13, Issue 2, February 2025, Online: ISSN 2320-9186
www.globalscientificjournal.com

Title

Livelihood Situation of the Fishers in Coastal Area of Bangladesh

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March 2010

Acknowledgement

The research work completed through a joint contribution of Feroj Foysal Ahummed and Md Mowar Hossain to capture the “livelihood Situation of the Fishers in Coastal Area of Bangladesh”.

First and foremost, we’re deeply thankful to our advisor, Dr. Khandaker Anisul Haque; Professor, Fisheries and Marine Resource Technology Discipline, University of Khulna, Bangladesh, for his guidance and insightful feedback, and continuous encouragement throughout the course of this study.

Secondly, we would like to share our sincere thanks and gratitude to all those involved personnel and institutions including Department of Fisheries (DoF), Bangladesh and its affiliates for extending their cooperation and support during this research work.

Finally, we would like to acknowledge our families and friends for their sacrifice and support throughout the research work.



Abstract

Livelihood status of the fishermen of Kutubdiapara village, located in Cox's Bazar Sadar Upazila of Cox's Bazar district were studied during the period from June 2009 to March 2010 (10 months). This is an expressive type of study. Conventional survey techniques applied to collect information from randomly selected 50 families. Among the respondents 94 % Muslim, 4% Hindus & 2% found Buddhist. The fishermen were found to use 8 types of gear of which nets (five), fishing traps (two) & wounding gear (one) for their catches. Snake head fishes are the highest catch. Three types of mechanical & two types of non mechanical crafts used for this purposes. Three types of fisher identified such as professional fishermen occupying 58% of community people & earn annually BDT 30000, occasional or seasonal fishermen 32% earning 32600 & 10% representing as subsistence fishermen with having income BDT 38000. Among the respondents 66 % found fishing, 18% agriculture & 16% fishers found daily labor, small trade etc as their main income source. 52% fishers living in Katcha house, 42% availing tinshed housing, 8% fishers having half building & only 2% fishers are living in building. 62% fishers receive health services from village doctor. Only 4% fishers having own tube well for drinking water , 82% use community tube well & 14% using neighbor tube well for drinking water. Almost 60% fishers don't have proper sanitary latrine. 66% fishers have access to use electricity. 16% fishers have TV. 20% using electric fan, 94% fishermen family using chair, 36% fishermen family using table & 64% fishermen family are using khat. Among the respondents 64% have chicken, 22% have cow & 14% fishers have bullock. Professional fishers life becoming more insecure day by day. Crisis credit dadon business made up fishers as slaves to their business lord.

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CHAPTER-I

1. INTRODUCTION:

Bangladesh is a 'Gangetic Delta' with numerous rivers, canals, tributaries and vast Bay of Bengal at the south. It is one of the densely populated country and peoples residing along 810 km long coastal belt of Bangladesh are mostly dependant on natural resources like fisheries and forest. However, the coastal fishing communities are poor and most of them lives below poverty level and depends on fishing and fight against the adverse condition and calamity of the Bay of Bengal. Multispecies and multigear fisheries exist here (Source: Bangladesh POUSH). Most of the fishermen are engaged in small-scale fishing with traditional gears, like set-bag nets as well as, with some other small meshed monofilament gillnets. Hilsa fishery, a semi-industrial fishery is a major contributor to our marine fish landing. Some fishermen are engaged in this fishery as laborer. Most of them are landless and having a little alternate job options other than fishing and fishery related works like fish drying, gear repairing and fish marketing in local level. Women and children are also contributing in family earnings through fishery and non fishery activities. A remarkable number of fishers and family members died every year due to cyclone and disaster. Fishers usually struggle against natural calamity to survive as well as passes most of the time with water and boat to collect ingredients to live on. Although, the situation is better now due to awareness raising and preparedness management by GO/NGOs bodies. The livelihood scenario of coastal communities is something like that. A good number of studies have been conducted by GO/NGO/Academy (Department of Fisheries, Some NGOs, Chittagong University etc.) level on their lives and livelihood. The present study is proposed to know the present position of fisher communities of a coastal village in the south-eastern part of Bangladesh.

This situation may be improved by creating 'alternative income generating activities' (AIGAs), attenuation of disaster hammerings, mechanization of fishing practices, improvement of meteorological warning signs etc.

1.1 Importance of Fisheries Sector in Bangladesh:

Bangladesh is one of the densely populated countries of the world having 910 people /km²; per capita land is 0.11 ha and the population growth rate is 1.54%(BBS,2003). the rapid increase in population in Bangladesh creates tremendous demand for fish. To fulfill these increasing demands heavy fishing pressure on wild stock has resulted in over exploitation, thus causing decline of wild catch. Economy of Bangladesh is based mainly on agriculture, but recently industrialization is increasing day by day. Annual growth of Gross Domestic Product (GDP) on the fiscal year 2006-2007 was 6.51% . Bangladesh is one of the poorest countries in the world, with average per capita income of US\$ 520 in 2007. About a half (44%) of the population is living under the property line (BBS, 2004; BER, 2006).

The fisheries sector plays an important role in the socio-economic development, nutrition, employment generation and poverty alleviation of large number of people and foreign exchange earning of Bangladesh. It also contributes greatly to the improvement of the socio-economic status of poor fishermen. Fish supplies about 63% of animal protein .It has been estimated that 1.28 million peoples are directly related with fisheries activities and fish farmer in Bangladesh are about 3.08 million. Another 12 million indirectly earn their livelihood from fisheries related activities. Frozen shrimp, fish and fishery products occupy the second position in the country's exports. The share of agriculture to GDP is 27.99% and industrial sector contribute 16.-58% to GDP. Economic contribution of fisheries in Gross National Product (GNP) at current market price in TK. 142,588 million (DoF, 2005).

The total fish productions in Bangladesh were estimated at 2400,000 mt in 2005-2006. The major group wise contribution of fish product in 2000-2006 were capture fisheries 874,000 mt (36.42%), culture fisheries 999,000 mt (41.63%), and marine fisheries 527.000 mt(21.95%), (DoF.2006).

1.2 Fisheries Resources of Bangladesh :

Bangladesh has the widest spectrum of inland water resources comprising of rivers, natural depressions, floodplains, reservoirs, oxbow lakes, ponds coastal water and marine water bodies. The major categories of fisheries resources are (i) inland open water 4.92 million ha (ii) inland closed water (including shrimp farms) 0.5 million ha. (iii) Brackish water 0.41 million ha and (IV) marine water 16.61 million ha. Besides, the country has a coastal belt of 480 km. the continental shelf, not deeper than 50 m, extends over an area of 69,900 sq. km. Most of the fishing grounds are located in this region. An economic zone of 320 km from the coast line covers an area of about 4,320 sq. km. (Islam, 2000) There were about 260 fresh water fish species and 475 marine fish species, 12 exotic fish species, 24 fresh water prawn species and 36 marine shrimp species in Bangladesh (DoF, 2005). From them a total of 50 commercially important fish species have been identified in the fresh water of Bangladesh. As for marine 40 commercially important fish species have so far been recorded, but there were about 10 economically important shrimp and

prawn species available in Bangladesh. Besides, Bangladesh has also imported 8 High Yielding Variety (HYV) of fish from abroad (Islam, 2000)

1.3 Employment in Fisheries Sector

A large number of peoples were associated with fish production, fishing, marketing, processing and other related activities. About 1.28 million peoples were directly related with fisheries activities and fish farmers in Bangladesh were about 3.08 million (Table 1.1). Another 12 million people indirectly earn their livelihoods from fisheries related activities.

Table 1.1 Number of peoples Engaged in Fisheries Activities:

People involved in fisheries activities	Number
a)Fishermen	1,280,000
Inland fishermen	770,000
ii) Marine fishermen	510,000
b)fish farmers	3.08 million
i)Fish farms	193 million
ii) Shrimp farmers	1.15 million

Source :DoF,2005.

House hold surveys conducted by Fourth Fisheries Project have indicated that around 85% of the people living on the floodplain carry out some fishing during a year either for their livelihoods or for own consumption. The open water resources are estimated at 4.047 million ha of which 2.83.3 millions ha are flood plains. The average rate of production from floodplain is at 600-700 kg/ha which can be increased manifold (DoF, 2001).

Bangladesh has a vast area of water bodies in the form of rivers canals, haors and beels, reservoir, Kapti Lake, oxbow lakes (boars), ponds, and tanks seasonally flooded area and the Bay of Bengal. Inland fisheries resources cover an area of 4.43 million ha of which 91% comprises of natural fisheries and 9% of closed water culture fisheries. An estimated 1.03 million ha of rivers and estuaries. 2.83 million Ha of floodplains, 1, 14.161 ha of heels and 69,000 ha of Kaptai reservoir offer tremendous scope and potential for fish production (DoF,2006)

For sustainable rural development and; poverty alleviation, different approaches have been adopted and implemented in different context and the periods of time. Among the different approaches, the “Sustainable Livelihood Approach” has been gradually expanded with its own core ideas and principles for poverty focused development activities (DFID, 2000). The approach basically based on the fundamental principle of analysis capital assets (i.e, human capital, physical capital, financial capital, social capital, natural capital) in the external environment. A sustainable livelihood approach is a way to thinking about the objectives, scope and priorities for development, in poverty elimination.

It is well recognized that five key indicators are important for assessing the achievement of sustainable livelihoods 1. Poverty reduction, 2. Well being and capabilities 3. Livelihoods adaptation 4. Vulnerability and resilience and 5. Adequate natural resources base. There fore, it is important to address the above issues while undertaking any social development project and research initiatives.

Fishermen are one of the most vulnerable communities in capture water fisheries. They are poor by any standard and over the years economic condition of the fishermen had further deteriorated. Alam and Bashar (1995) estimated the average per capita annual income of the fishermen families to be TK. 2,442 which is about 70% lower than the per capita income of the country as a whole. Being an isolated community fishermen are deprived of many amenities of life. Actual condition of the fishermen community in general must be assessed to know the real potential of capture water fishing as a source of income. Despite the destruction of aquatic ecosystem, a number of wild sources still exist in Bangladesh.

However, fishers in coastal area mostly depend on daily catches for their livelihood. The catches usually unable to mitigate their family demand, solvency & nutritional requirement. Often natural calamities flash out their resources & dream. So, livelihood of fishers in coastal southern part of Bangladesh is apparently insecure & vulnerable. Difficult

to comment clearly about fishers livelihood in coastal area of Bangladesh. In this regard a study measures taken in village Kutubdiapara, Union Jhilonza of Cox's bazaar Sadar Upazilla of Cox's Bazar district. The study project will help to assess livelihood status of coastal fishers with their professional challenges & suitability.

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CHAPTER-II

REVIEW OF LITERATURE

There found a very few literature in the field of coastal fishers livelihood & open water fisheries resources. Fisher's livelihood depends mostly on nature from many years. However following are the literature, research and surveys conducted to reflect fishers livelihood & open water management.

Hye (1988) studied the socio- economic condition of Kaptai lake fisherman. It was found that 400-500 fishing units were engaged each year of which 75% are floating gill nets and other are net(Tengra jal), dip net (Dharma jal), long line (chara borshi) etc.

Rahman (1989) identified and recorded 260 species of freshwater fish belonging to 55 families in Bangladesh. Among them around 100 species are commercially important.

Pathak (1990) studied comparative energy dynamics of open and closed beel in Ganges and Brahmaputra basins. Eco – energetic studies revealed that experimental beels can produce 1.3 to 2.1 tons of fish/ ha / yr but at present 18 to 37% of the potential has been exploited. Studies also showed that maculated removal in beel enhanced fish production by many folds. He concluded that the stocking of detritivores in the beel would increase their fish production

Biscayan (1990) studied the problem and potentialities of beel fisheries in Assam, India. He stated that the beel fisheries are usually connected with main rivers through canals, over flooded during monsoon months allowing young fish to enter the main beel from the river. The construction of flood control embankments and dykes and the siltation of the bed the connecting channel have adversely affected the production of fish in the beels. Remedies to overcome the various problems include weed eradication, channel deeding, limiting on paddy cultivation in beel, proper design of sluice gates and embankments of fishing regulations.

Anon[1991] mentioned that capture fisheries were seriously affected by the impact of the PIRDP embankment in Pabna. This has obstructed fish migration and reduced areas of open water habitats for fishes, such as beels, canals and floodplains. It was estimated that the floodplain areas has been reduced by 47%[from 11,707 to 6,208 ha] and fish production of 75% [from 11,082 to 2,811 tons] over the period of 1984-1999. It also stated that there are 138 villages of fishing communities in the project area. Because of the decline in open water capture fisheries, the number of full time fishermen has fallen while the number of part times has increased.

Ali [1991] stated that reduction of habit is the cause of freshwater fisheries resources degradation. Reduction and modification of aquatic habitats were reported to be caused by the implementation of water resource development projects in the open waters. Embankments for flood control, drainage and irrigation reduce floodplains and obstruct fish movement and migration from rivers and beels to the remaining floodplain for breeding and feeding. These also alter growth patterns and species composition.

Gupta et.al. [1991] stated that water bodies fewer than 5 ha as pond and more than 10 ha as lakes in the case of close water bodies and production of fishes were 800200 kg/ha in floodplain, lakes under natural condition. They also considered the conceptual frame of the database [sampling concepts, collection of catch and fishing efforts details, population and choice of sampling unit, collection of catch data] for the estimation of fish from rivers and streams. According to BCAS [1991] approximately 30 different types of fishing gears have been identified to be in use in Haldi beel. The major species of fish caught in this beel are Koi, Shing, Magur, Raikh, Boal, Shoal, Air, Punt, Baim, Tengra, Gazar, Taki and various species of prawn. During the water recession period a number of “Fixed engine “ [locally known as Shutijai] are operated in the old Atrai River and Panullal khal. Similarly, in their study at Chandra beel, they reported on fishing gears used including fishing nets made of nylon or cotton twine, bamboo traps, hook and spears, while the fish species caught include major carps as well as others such as, Koi, Punt etc.

Rahuman (1992) stated that fish production in any water body is governed by different factors, which influence the lives of fish fauna. The same way aquatic environment varied by different factors, such as, physical, chemical, biological and meteorological conditions. All of those were generally influenced and determined by the general environment of that geographical region.

Rahman et al . (1992) recorded 20 species in the catches of Punt jai (mesh 2.5-3.18 cm) in Chanda beel. The composition of dominant species was punt (24.22%) kholisha (19.68%), Shing (16.21%), Tengra (8.24%), Taki (8.2%), Koi (8.07%), and Baila (6.12%), But in the catches of koi jai (3.18-3.8 cm, mesh) 15 species were recorded and dominant species were punt (25.25%), kholisha (17.42%), shing (17.01%) and koi (15.46%).

Rahman et al (1993) reported that fishing gear operating in the three floodplain (Chandra, BKSB and Haldi beel) comprised of four groups: Fist net (seven types, 20 dub –types), fish trap (five types, 14 dub types), hook and live (five types) and spear/ harpoon (four types). The fishing operation procedures, fishing season, time of daily fishing operation and target species of the types of gear that caught carps were identified and target species of the types of gear that caught carps were identified. Sixty species of fish belonging to 18 families were identified in the catches in those three floodplains.

Rahman et al (1993) recorded 18 species of fishes in Haldi beel in the catches of seine net. The contribution of dominant species in the catches of this gear were tengra (31.17%), richor (22.60%), punti (14.4%) chanda (9.86%) and stocked fishes i.e., major (8.235) But they recorded 28 species of fishes in the catches of cast net. The percent composition of dominant recorded by them in the same beel was 13.17-49% tengra, 20.28-40.72% punti and 3.4-24.5% baila from August to March. The recorded 27 species of fishes in the catches of lift net in the chanda beel. The recorded punti (30.18%) as the most dominant species in their study. The next dominant species collected by jhaki jal were kholisa(8.8%), tengra (6.4%) and chanda (5.7%). Paul et al (1993) seven species of large size (10-15 cm) gill net (fash jal) in chanda beel and nine species of fish in the catches of gillnet (mesh 9-12 cm) in Haldi beel. The dominant species recorded by them in the catches of this gear (large mesh size gill net) were common carp (55.1%), catla (17.1%), Mrigal (12.7%) and (7.7%) in chanda beel and common carp (35.6%), catla (25.8%) Kalibaush (16.5%) Thai punti (7.4%) in Haldi beel. However, this catch composition was the result of mass scale stocking of water bodies under the third fisheries project.

BCAS (1994) recorded 19 species of fish than shrimp and small size fishes in chanda in the catches of seine net. Whereas, they recorded 20 species of fishes other small fishes in that beel in the catches of cast net.

FAP (1994) reported that the annual catch per unit area (CPUA) from rivers inside the PIRDP ranged from 191 to 1631 kg/ha. Annual CPUA from unregulated river in the north-west (485 kg/ha) and central regions (74568 kg/ha) were generally lower than those from regulated rivers inside the PIRDP (168 kg/ha) was 65 and 64% and lower catches from unregulated canals in the north-west (529 kg/ha) and central (511 kg/ha) regions. Within the PIRDP, values of CPUA varied between sites with the lowest value observed at Gngbhanga (144 kg/ha) and the highest at Ainar (155 kg/ha). The CPUA at Ganadahasti (144 kg/ha) was slightly lower than at Ainar floodplain/beel. A total number of fish species recorded from low elevation floodplains inside scheme (64) was 30% lower than outside it (91).

According to Dewan and Mazid (1994) the fishing techniques that are currently in use amongst the fishermen of Bangladesh can broadly be categorized into netting, angling, spearing, de-watering and hand picking. They also reported that at present a total of 90 gears under broad categories have been found to be used amongst the fishermen in different types of water bodies of the country. Among the gears, they found 28 gill nets, 21 seine, eight drag and nets, eight lift nets, five clasp, six cast and push nets, six hooks and lines, five traps and five spears/harpoons. They also recorded seven new gears during their study, which are phoo jal, paia jal, patpati jal, dool – chot jal, sruti jal, bhuri jal and gorja jal. Among the newly recorded jals, three are being used in beels and other four jals in rivers.

Bhaumik and Saha (1994) carried out a study to assess the socioeconomic conditions of the fishermen engaged in fishing in some estuaries of Sunderbans. The age group of the sample population varied between 20 and 70 years. Most of them belonged to scheduled caste community, 30.6% had 21-30 years of experience in fishing. They operated dinghy type of boat, size range of which varied between 7.92 and 9.14 m. Majority of them (41.5%) operated bag net. About 24% of them undertook fishing operation for 241-260 days and 39.6% spend 12 hrs / day for fishing. On an average, 29.0% of them caught fish about 131-150 kg / month. During off-season, 23.4% of them undertook the job of net marketing or mending or repairing and 50.4% earned about Rs. 501 to 600/ man whereas during on season income of 36.4% of them varied between Rs. 801 and 900.

Chakroborty et al (1995) described the fishing methods used in inland waters of Bangladesh along with the structural design of various types of fishing gears have been classified into nine major categories according to their mode of operation and the capabilities. These gears have been reviewed in terms of harvesting fish from inland water bodies of Bangladesh.

Haque (1995) reported a production statistics of fishes in different water resources in Bangladesh in which he reported that in beel area (11,161 ha) total fish production was 0.53 lakh MT in 1992-93, i.e. 464 kg/ ha / yr. Whereas, in baor (ox-bow lake) area (5488 ha), total fish production in the same year was only 0.021 lakhs, i.e. 634 kg/ ha/ yr.

FAO (1995) reported that total global inland capture fisheries yields increased steadily from 1984 to peak in 1990 about 6.5 million tons. On a global basis, the annual per catch is a little over 1.0 kg. Aquaculture has been responsible for maintaining the total supply of freshwater fish, furnishing a steady increasing proportion of the catch 60% by 1992. DoF (1995) stated that the fish production during July, 1995 to June, 1996 in floodplains was on average on average 130 kg/ ha. In beels it was 511 kg/ ha and that the floodplains covers an area of 2,832,792 ha and beel covers an area of 114,161 ha.

Rahman (1996) recorded and identified a total of species of fish in the catches of different gears by the fishermen in BSKB beel. The most of the species were found important commercially.

Siddique (1996) examined various aspects like major casts among fishermen community, their language, age-distribution of workers engaged in various fishery related activities, marital status, household size, literacy rate, livelihood, marketing facilities, expenditure and indebtedness. Finally, the author made few suggestions to improve the socioeconomic status of the traditional fishermen in the area.

Hossain (1998) found that the Muslims were as the absolute majority (77.78%) fishermen whereas Hindus were very much negligible (22.22%) in the old Brahmaputra River. The largest family size (6.67 persons) belonged to the berjal fishermen with the highest income and the lowest family size (5.50 persons) was found among the push netters. Regarding education level, 11.12% had only secondary level and majority fishermen were illiterate. However, average monthly income of borshi fishermen was the lowest in his work.

Roy and Dorairaj (1998) conducted a socio-economic survey on the fishermen community of 10 localities in south Andaman, four localities in middle Andaman and three localities in north Andaman were covered. The average family size ranged between 4 and 6 in all localities. In south Andaman, the literacy rate varied from 19.85% to 66.07% with an average of 45.3%. Andaman literacy in case of male in RRO camp Rangat bay was 28.92 and 27.81%, respectively. The fishing season varied from locality to locality. During peak season fish landings in south Andaman, middle Andaman and north Andaman arrived from 8 to 66 kg/day, 23 to 40 kg/day and 25 to 300 kg/day, respectively. The estimated income fluctuated from the lowest range of Rs. 816-1,225/ month at Choudari to Rs. 7,866-10,200/ month at Panighat in south Andaman. The average monthly expenditure per family in different localities ranged between Rs 845 and 2,800.

Rahman et al. (1999) conducted a study in three floodplain/beels within the Bangshi-Dhaleswari flood plain in north-central Bangladesh during April-October 1996 demonstrated by a depth-based floodplain fisheries assessment methodology. Fish species, number and length data were sampled from five flood depth classes. Presence of fish species, fish concentration (no/100 m³) and biomass (g/100 m³) were analyzed by depth classes. The highest fish concentration and biomass occurred in the shallowest depth class and gradually declined through the deeper depth classes. A total of 96 species were sampled and categorized into 16 similar groups. Ranking of concentration by guild resulted in prawn 44%, perch and gourami 17%, glass fish 12%, barb 11%, cyprinid 7%, snakehead 4%, Gobi 3% and eel 2%. More species were found in deeper waters (depth > 90 cm) than in shallower depth classes. Depth classes where concentrated were mapped throughout the flood cycles. The number of indigenous species found in the catch survey is considered as an indicator of biodiversity.

Islam (2000) reported that fish production is low in Bangladesh. As far as the nutritional standard is concerned, Bangladesh should produce 4.5 million tons, which is much higher than the present level of 2.1 million tons. Lacks of public policies along with the weaknesses in implementing the existing ones are the main reasons for not getting desired production in fisheries sector.

Shahjahan (2000) studied the socio-economic condition of riverine fishermen in terms of religion, family size and composition, education status and income. He found that the Muslims were featuring as the absolute majority (66.67%) and the Hindus were in minority group (33.37%). The largest family size (7.87 persons) belonged to the ber jal fishermen and the lowest family size (5.25 persons) was found among the current jal. Regarding the educational level, 66.33% of riverine fishermen were illiterate, 31.67% were up to primary level and 5% had only secondary level. In general, majority of the fishermen were illiterate. The highest average monthly income was found among the ber jal fishermen. He concluded that ber jal fishermen were more efficient than those having other gears.

Shah et. al. (2001) conducted an experiment on “Fisheries resources and livelihood of the villagers of Chitrapar”. The objective of the study was to identify potential areas for fisheries development in general and fish culture particularly in small water bodies. This report explained the availability of fishery resources use in the study area, livelihood pattern developed by experience and also the kind of gears, traps and nets adopted by the fishermen.

Alam and Thomson (2001) examined the current status of fisheries in Bangladesh. They explained that production has been increased for all types of fisheries. A host of factors are responsible for the under utilization of fishing areas, including resources limitation, poor implementations of fisheries laws, the limited spread of fish farming technology, low financial capacities and ineffective production practices.

Robbani (2002) assessed the fisheries resources in Mymensingh, Jessore, Laxmipur region. Fish production of carps was found to be 1-2 tons/acre/year. Majority of farmers showed their preference for culturing major carps. Inbreeding problems, lack of quality seed, inadequate technical knowledge on scientific fish culture, incidence of fish disease; poor credit facilities, security, making, multiple ownership and feed were identified as the constraints to fish culture.

Qkkkuddus et. al. (2004) observed that multiple ownership was a problem for fish culture in Demea, Dhaka because the shareholders were usually unable to arrive at a unified decision in respects of fish farming. They suggested that utilization of joint ownership ponds could be done by (a) co-operatives (b) leasing to interested persons and (c) village organization

Under which all ponds might be put into productive use. They also suggested that the necessary steps should be taken by the government to provide a minimum level of education and training facilities to the fishermen on the scientific methods of ponds fish cultivation.

Karim (2004) reported that three types of fishermen were engaged in fishing in Dhamharail beel. They are professional fishermen (ethnic and neo-fisher), seasonal professional fishermen and subsistent fishermen. Various types of fishing gear were found to be operated by the fishermen, who are broadly classified into three groups such as, net, trap and wounding gear. A total of 37 species of fish were identified in the catches of different gears. Among the different types of net, the highest number of species caught was recorded in jhaki jal (29), and the lowest in borshi (10). The highest and the lowest fishing duration were recorded in bair and thela jal, which was 12:15 hrs/day and 2:45 hrs/day, respectively.

Azad (2005) determined the impacts of Mymensingh Aquaculture Extension Project (MAEP) in relation to farmers' gain in knowledge, skill development and change of attitude and management of fish ponds in Melandaha and Islampur upazila under Jamalpur district. The personal characteristics of the fish farmers such as, education, farming experience, training and organizational contact were positively co-related with farmers' acceptance of aquaculture technology. The aquaculture training provided by MAEP was effective in enhancement and development of farmers' knowledge, skill and attitude on fish production under semi- intensive system of culture and management. After receipt of training, fish production of trained farmers increased by 84% over their initial production of 6.83 kg/dec/yr. fish production of the trained farmers increased to a level of 10.00-1800 kg/dec/yr averaging 12.55 kg/dec/yr/ The selected farmers had favorable attitude towards semi-intensive aquaculture practices.

Alam (2006) determined the aquaculture knowledge of fish farmers on different aspect of pond fish culture practices such as, pond biology, pond preparation, species selection and stocking density, water color monitoring, pond management and marketing which revealed that most of the fish farmers belonged to low knowledge category. A few portions of the farmers had high knowledge. Most of the fish farmers had relatively better score on two levels (remembering and understanding) of knowledge. The farmers had low score on the analyzing, synthesizing, evaluating and creating component of knowledge. Among the personal characteristics of the farmers' extension media contact and aquaculture training experience were observed to be significant and positively related with their fisheries knowledge. But age, total income, religious occupation and family size of the respondents had no relation with aquaculture knowledge.

Guha (2006) studied the retention capacity of knowledge of the fish farming in Gazipur district. He reported that 35% farmers were found to have medium fisheries knowledge on 10 components of pond fish farming and 65% farmers were in high knowledge category but none of them were found to be low category of knowledge. After one year in March 2006 when second survey was conducted then 57.5%farmers fell in medium knowledge farmers were limited to only 2.5% among the male and female farmers, there was a remarkable difference in knowledge score on 10 components of pound fish farmers. The average knowledge score of male and female farmable, at the time of initial study were 169.53 and 140.40 as opposed to 124.06 and 103.20 respectively at the final stage. Farmer's aquaculture knowledge was not correlated with their age, family size and religious affiliation but farmers training experience organizational participation media contact were positively co-related with farmer's knowledge on pond aquaculture.

CHAPTER- III

MATERIALS & METHODS:

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3. Introduction:

Methodology is an obvious and pertinent section of successful completion of any research. Research data collection method depends on topics as well as objectives & nature of study. There are a lot of ways of collection information. Among those methods, selection of a particular method depends on many considerations such as, the nature of the research problems, time constraints, fund availability etc. For the present study, the survey method was followed. The word survey refers to a method of study in which an overall picture is obtained by a systematic collection of all available data on the subject. The major advantage of this method is that the investigation has to depend solely upon the memory of the people as per interview. This was, however, verified by asking cross-questions and making frequent visits.

3.1 Research questions:

In a workshop of the Ministry of Water Resources of the Government of the People's Republic of Bangladesh, Water Resources Planning Organization (WARPO) held at Dhaka on August 2002, commented about the coastal resources and livelihood of fishers as *“For sustainable development of the Marine fisheries, a need for control and conservation is needed. The coastal water of Bangladesh has been over fished. There is practically no control on the fishing effort. The fishing effort is increasing day by day and the catches are decreasing. The impact of the phenomenon is being felt, as the fishermen are increasingly moving downward below the poverty line. If this excessive fishing pressure is not decreased, we may see a complete depletion of the stock in near future (www.iczmpbangladesh.com).*

As a result of overexploitation of marine aquatic resources, the yield decreasing over the years and it is a general observation that some of the members of fishing communities (fishers) have changed professions in some area. But a large portion of the community still engaged themselves in this profession. Some landless and jobless peoples are also involving themselves in fishing profession. It is the proper time to identify their spot of vulnerabilities and find out the way to improve their livelihoods.

Eventually, following are the answers of the questions tried to bring out from the fishermen experience & reality.

01. Is fishing a sustainable livelihood for coastal fishers?
02. What are the risks of coastal fishing?
03. Has fishing improved socio-economic condition of coastal fishers?
04. What are the recommendations to improve livelihoods of coastal fishers?

3.2 Research Objectives:

The objectives of the project are:

- To determine the livelihood status of fishers in coastal area of southern part of Bangladesh.
- To determine socio economic condition of fishers of Kutubdiapara village.
- To determine socio economic constrains of fishers in respective area.
- To identify possible area of alternative income generating of fishers livelihood.
- To make possible recommendation for policy guidelines & further development of fishermen livelihood.

3.3 Research Hypothesis:

This study is carried out with the following hypothesis:

“Decrease of fish catch due to overexploitation and environmental degradation (related to *catch per unit of fishing effort- CPUE*) increases the vulnerability of southeast coastal fishers in Bangladesh”.

3.4 Type of study:

This study is an expressive type of study; data and relevant information is collected through primary and secondary sources. Primarily collected information is verified from possible informants. Eventually primary & secondary sources information compared for better consensus.

3.5 Selection of the study area:

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Study site selection is a too important to achieve the objectives of research. Suitable site accelerate to be sanguine of research objective achieve. Realizing the study title requirements one village was selected for sources of information required for the study. The village location & selection logic are described below.

Village: Kutubdiapara,

Union: Jhilonza,

Upazila: Cox's Bazar Sadar,

District: Cox's Bazar,

Bangladesh.

The village **Kutubdiapara** is situated very near to Cox's Bazar sea beach and Moheskhali Channel estuary which falls to Bay of Bengal. The village is bordered by the Bay of Bengal on the West and Moheskhali Channel in southwest, on the north there are Cox's Bazar Paurashava (Municipality). Most of the peoples residing here are migrated from different district of Bangladesh. Some '*Rohinga refugees*' migrated from Myanmar are also inhabiting here illegally. Most of the community members are fisher and businessmen. Fish drying and marketing are major business of the inhabitants. Vegetable gardening and paddy crop production are seasonal occupation of some people. Tiger shrimp fry collection from the natural sources is also seasonal job options for men, women and children. Some are working in small/cottage industries. Some are rickshaw/auto rickshaw puller. The literacy rate is very poor. Diversity in culture and occupation is very interested part of livelihood studies which exists in this village.

The village is within the Government declared Teknaf Peninsular ECA (Ecologically Critical Area). Department of Environment (DoE) of Government of Bangladesh (GoB) launched a project on biodiversity conservation through community participation in the ECAs within Cox's Bazar District. Department of Fisheries (DoF) completed a project for coastal fishers' livelihood security with assistance from FAO-UNDP. The village Kutubdiapara was within the project area. So, the village is selected for the present study.

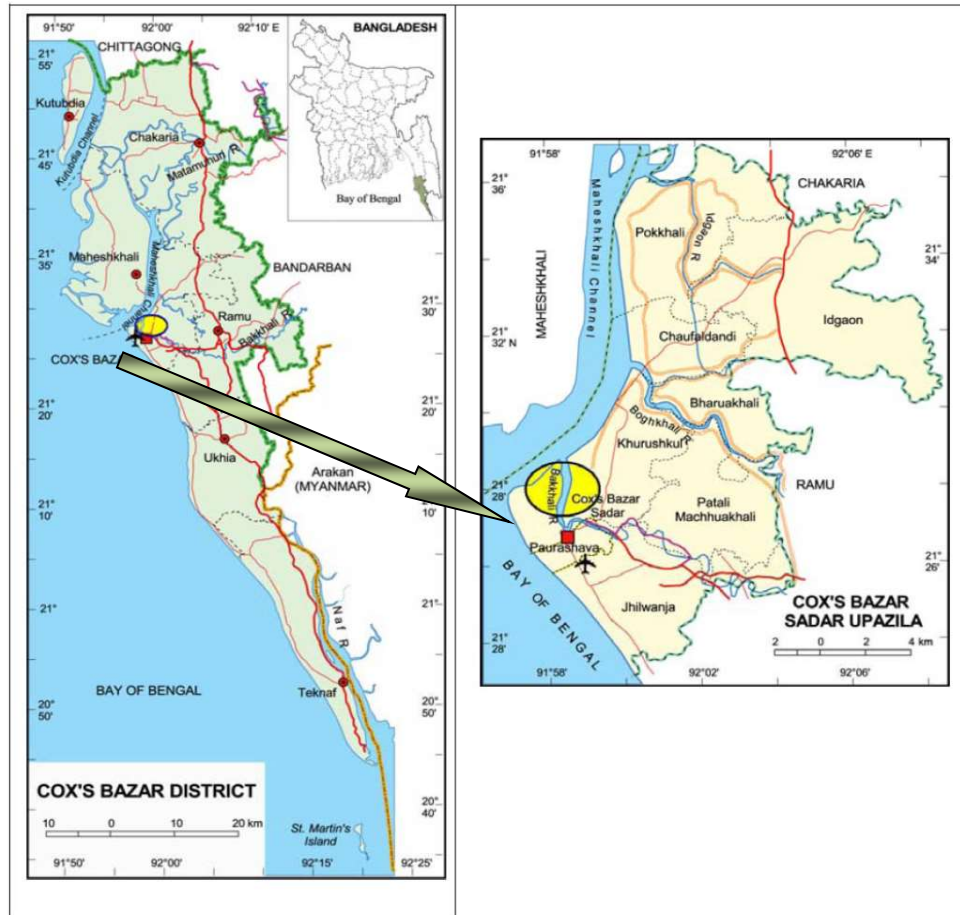


Fig1: Location of Kutubdiapara Village (study Village) (Source: Banglapedia)

3.6 Target Group: Fishermen

People living in Kutubdiapara village comprised of diversity in their occupation. Most of the villagers are fishermen with other professions such as small business, net making, fish dryer, fish trader, carpenter, daily labor etc. In context of religion most are from Muslim families. Including Bangladeshi nationals, a few number of migrated Rohingya refugees also living in the village. Most of the villagers of Kutubdiapara village are somehow involved with fishing & relevant business. So, fishermen were selected randomly for study of the project.

3.7 Study Schedule:

The study will be carried out for 7 months (June-December) and the collected data analysis will take another 3 months (total 10 months).

Table 3.1: Study Schedule

Activity	2009							2010		
	J	J	A	S	O	N	D	J	F	M
<i>Preparation</i>	■	■								
<i>Staff Recruitment & training</i>		■								
<i>Data Collection</i>			■	■	■	■	■			
<i>Supervision, Monitoring</i>			■	■	■	■	■	■		
<i>Data Analysis</i>						■	■	■	■	
<i>Preparation of Report</i>							■	■	■	■

3.8 Methodology:

There are a variety of socio-economic study methods for assessing livelihood of particular community. Selection of specific method depends on many considerations, includes study nature, source of information, availability of relevant documents, fund and time schedule etc. Detail descriptions of methodologies consideration are mentioned below.

3.8.1 Design & Test of Questionnaire:

Realizing the study objectives a draft questionnaire was developed & tested by 10 inhabitants’ fishermen of the village. In the pilot survey, much attention was given to any new information which was not designed to be asked but was changed, modified and rearranged according to the experience gathered in pre-testing of Questionnaire. The final interview schedule was developed in logical sequence so that fishermen could answer systematically to focus their livelihood status, constrains & possible recommendation.

3.8.2 Data Collection:

Information was collected primarily from fishermen by using pre designed questionnaire. Collected information was compared by crosscheck interview with key informants.

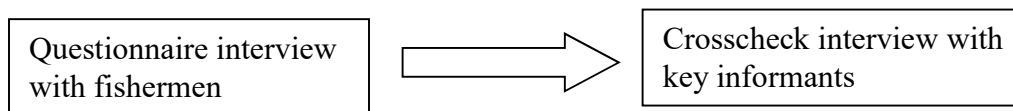


Figure: 2 Steps for data collection method from fishermen

Questionnaire interview:

The data collection procedure was carried out in Kutubdiapara village among **50 randomly selected** fisher families (target group) through a pre-prepared questionnaire. A set of questionnaire was developed based on the project objectives including the key features enlisted on “**Annexure I**”. The alleged questionnaire was tested for identifying confusing and immaterial questions and after that a final set of questionnaire was developed. Collected information was cross checked with key informants.

Crosscheck interview:

Collected information by using questionnaire interview and PRA was necessary to check the information for justification of collected data. If there were such items which had been contradictory then crosschecked interview conducted with possible key informants such as local UP member, mosque Imam, UP Chairman, UFO, AFO & NGOs working in the village.

Other methods for data collection:

- Some of the **Participatory Rural Appraisal (PRA)** tools were used such as Transact Walk, Social Mapping, Wealth Ranking, Venn Diagram, Mobility Chart, Focus Group Discussion (FGD). PRA methods are used to get an overview of require information.
- **Key informants** such as local head of the village, school teachers, union Parishod member, mosque Imam, etc were interviewed by a semi-structured questionnaire.
- **Secondary Source data** was collected from NGO workers, local NGO offices, District and Upazila (Sub-district) level government offices of Department of Fisheries (DoF), Department of Agriculture Extension (DAE), Department of Livestock Services (DLS), Bangladesh Bureau of statistics (BBS) and development projects working at that area.

3.9 Data processing and analysis:

The collected data was checked for reliability; graphic and statistical methods used to analyze the data.

Collected information verified, edited and coded. All the collected data were summarized and scrutinized carefully and recorded. Finally relevant Tables were prepared in accordance with the objectives of the study. Data present mostly in the tabular forms and graphs for its simplicity of calculation & easiest way of understanding.

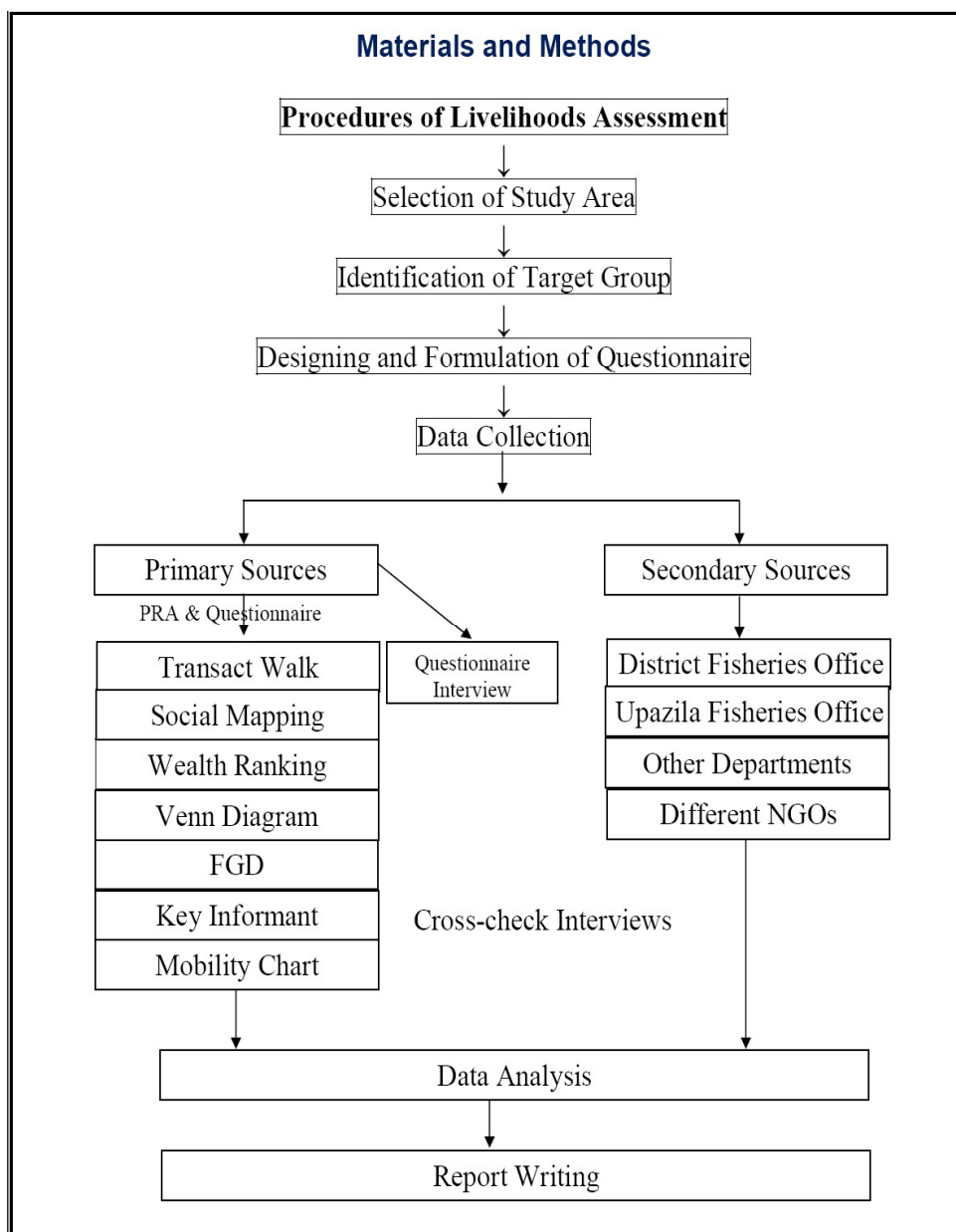


Fig: 3 Work Breakdown Structure of Livelihoods Study

3.10 Problems & justification:

During information collection few difficulties encountered data collection process. Constrains relevant to data collection are as follows

- Unavailability of selected fishers during hours of daylight;
- A small sample size (50 fisher families) may not represent the whole scenario;
- Some findings may be imaginary/ made-up by the participants;
- Budgetary allocation and manpower etc.
- Fishermen hesitated to provide information on few questions especially income, assets, gender sensitivity, credit etc.
- Respondents didn't preserved their furnish income record.



CHAPTER- IV

RESULTS

Study results & socioeconomic status of fishers of Kutubdiapara are described in this chapter. Results come from analytical assessment of collected information.

4.1 Fisher types

There are a big number of fishers along with other occupation inhabitants live in Kutubdiapara village. UP keep necessary primary information about living people in their commanding area. Records kept by UP, there are 185 fishermen family living in the village. Some of them are engaged in fishing all the year round & others are seasonal fisher or labor in fishing boats.

Fishing standard practice by fishermen is categorized into three groups. They are:

- 1) Professional fishermen, who depend on fishing almost year round for their livelihood,
 - 2) Seasonal professional fishermen who only catch fish during a part of the year as income earning and
 - 3) Subsistence fishermen who mostly catch fish for their own consumption and/or work in other person fishing boat as a labor occasionally.
- The distributions of fishermen by category over the seasons in the study area are shown in (table 4.1).

Table 4.1: Distribution of fishermen in Kutubdiapara village

Types of fishermen	Number of fishermen	% of fishermen
Professional fishermen	29	58
Seasonal fishermen	16	32
Subsistence fishermen	5	10

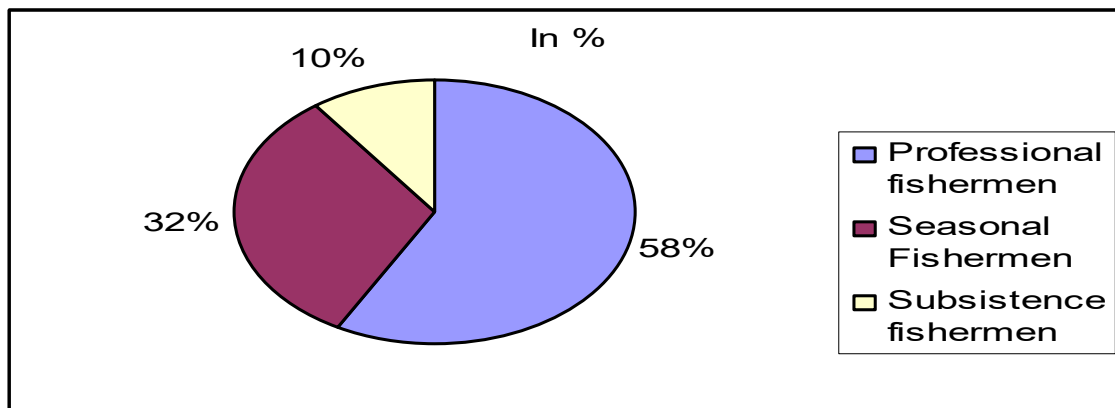


Figure:4 Types of Fishermen in Kutubdiapara village

4.2 Fishing gears used in Kutubdiapara

Most of the gears by Kutubdiapara fishers are rented or borrowed from local businessmen on credit. So, fishers usually lose a big portion of his catches. From the survey it was found that only nine types of fishing gears were operated by the fishermen in Kutubdiapara (Table 4.2.) These gears were mostly of traditional types and some of them were unique for the particular locality and might be classified into three groups, such as, net, trap wounding gear.

Table 4.2: Types of fishing gear used by Kutubdiapara fishers

Types of fishing gear	Name of gears
Nets	Ber jal (Seine net)
	Set bag net
	Shine net (Gill net)
	Current jal (Gill net)
	Jhaki jal (Cast net)
	Thela jal (Push net)
Traps	Bair
	Gora (pen trap)
Wounding gear	Borshi (Hook)

Gears are usually used for catching fish in Bay of Bengal coast side & deep sea in all the year round. Most of fishers catch fish in the deep sea; usually use rented net & boat even work as labor to their business lord. Traps usually used in adjacent canals and coast side water body.

4.3 Description of gears

A brief description and mode of operation of net, trap and wounding gear which were recorded in the study areas are given bellow:

Description of Nets:

i. Ber jal (Seine net)

Mostly used gear in this region for catching large variety of fishes. The net is rectangular in shape having large wall of netting and has two border lines. The upper border line contains floats at suitable interval. Floats may be made of plastic drum, plastic market float, bamboo, sola, light wood etc. The ground rope may (for large size net) or not (for large size net) have sinkers and lower border lines are united to a rope. These are widely used for encircling by stretching the net in the water body for catching fish, manipulating the head and ground floor. The nets are prepared in small pieces, which are joined together at the time of operation according to the necessity; some times it is as long as 250 m and locally called ``ber jal'' This net is commonly used in sea coast, rivers and adjacent canal. Usually large varieties fishes are caught by this gear.

ii. Set bag net

This net is widely used in the region for catching all sorts of fishes in the river or coast side.

iii. Current jal

The net is a single wall made of synthetic or cotton twine with a head rope but with or without foot rope. The head rope floats are attached while the ground ropes may or may not have sinkers. During the operation, it is fixed by poles in all depth of water. The fishes trying to force their way through the nets are caught in the mesh and secured by their gills. The size of mesh varies from place to place depending on the size of fish to be caught. It is also known as ``Fash jal`` when it is made of cotton twine.

iv. Jhaki jal

The net is conical shaped circular net made of nylon or cotton twine. The mesh size of the net varies with the types of water body and the target fishes. A long string about 5-7 m is attached to the apex of the cone. Iron weight in cylindrical form are attached at a regular interval around the peripheral end with the help of strong string. The string with weight is attached to some upper meshes directly about 10-20 cm above the bottom forming pocket all along the circular end inside the net. When the net is castled it spreads out over the water surface circularly and when lifted it comes out in conical form. It is locally known as ``Jhaki jal or Khepa jal``

v. Thella jal

It is a triangular net. Two bamboo poles, one longer than the other, are fixed at an angle of about 30 degrees to a third front pole. The longer pole is used as a handle. To the triangular frame the net is fastened. During the operation triangular portion is lowered and is pushed forward over the bottom of water to a certain distance and lifted on small fishes are caught by this net.

Description of traps

i. Bair

It is a tubular shaped basket like trap. The bamboo sticks are arranged in parallel one after another and tied them with cane materials to make the structure of this gear. There is an unidirectional valve at the mouth and single opening at the upper side. It is mainly operated in shallow running water and set against the water current. Fish once entered through the

valve can not escape. Trapped fish are gathered at the back side. After certain period of time fish are collected through opening.

ii. Gora

Nets are hanged with bamboo or wooden poles set in low tide at any suitable part of water body. Fishes entered into the trap can't escape out from it. These types of trap are used for catching all shallow travel fishes.

Description of wounding gears:

i. Borshi

One end of this gear is round which attached with a twine. The other end which is bent and barbed with pointed edge. On the basis of mode of operation in the water bodies, borshi can be classified into three types, such as, daon borshi, noll borshi and chip borshi. In case of daon borshi, borshi is hung on at a suitable interval from a large rope. The two end of the main line are fixed to stakes on the opposite banks in case of river on two buoys. The lines are shot at night and hauled in the morning. At a time 15-25 borshi are hung on the line. In case of noll borshi, borshi is hung on from the bamboo stick or sola with the help of fishing twine. In case of chip borshi, borshi is hung from the fishing rod with help of fishing twine. Here a float is nothing but pieces of sola or reed, while a piece of lead or iron form a sinker. The most commonly used baits are earthworm, insect larva, small fishes, and semi fermented small fish, live frogs, flour paste etc. It is used round the year.

4.4 Fishing crafts use in Kutubdiapara

Fishing crafts are water vehicles propelled by oars or engine, sails or any other means, used for harvesting and handling all aquatic animals and plants (except whales⁰ in marine, brackish & fresh water. Crafts using in Kutubdiapara village can be classified in the following ways.

1. Mechanized crafts
 - i. Balam ii. Cox's Bazar type Balam iii. Trawler
2. Non-mechanized crafts
 - i. Balam, Chandhi

Mechanized crafts:

i. Balam

Constructed by timber and Ferro cement and powered by 10-25 HP engine. Mainly used for gill net fish catching. Fishing trips is usually made for 4-10 days. Gears are operated by hands.

ii. Cox's Bazar type Balam

Fully decked & constructed by fine wood and Ferro cement. Generally 8 crews engaged for fishing for 7 days at stress.

iii. Trawler

The vessel which operates trawl net for harvesting demarsal fish is called trawler. According to harvesting of spp. Trawler are of two types a) shrimp trawler b) fish trawler

Non mechanized craft

Non mechanized boats are those which are powered by sail, oars or by other means but not motivated by engine. The draw backs of existing non mechanized crafts in Kutubdiapara are low mobility, poor worthiness, poor and endurable construction, daily landing facility.

i. Balam boat

Wooden boat generally used for gill net fishing and propelled by oar & sail. This type of boat was used earlier but rate is decreased recent years drastically.

ii. Chandi

Wooden boat mainly used for gill net fishing in the estuaries, channel etc. This type of boat not being using in Kutubdiapara village but very often it found adjacent areas.

4.5 Livelihood Assets

The livelihood approach is reveals first and foremost with people's strengths (assets or capital endowments) understanding of people's strengths and how they endeavor to convert these into positive livelihood outcomes. The approach is founded on a belief that people require a range of assets to achieve positive livelihood outcomes; no single category of assets on its own is sufficient to yield all the many and varied livelihood outcomes that people seek. This is particularly true for poor people whose access to any given category of assets tends to be very limited. As a result, they have to seek ways of upbringing and combining what assets they do have in innovative ways to ensure survival.

According to **DFID (2000)** there are five livelihood assets which are.

4.5.1. Human Capital

Human capital represents the skills, knowledge, ability to labor and good health that together enable people to pursue their livelihood strategies

i. Age structure

Knowledge of the age structure of farmers is important in estimating potential productive human resources. Planning of education, health and employment generation requires sufficient has an important influence on labor and also on their perceptions of the future. The age of fishermen and the size of cultivated land holdings are key influences on adoption of new fishing practices.

According to study information sources, it was found that 28% of fishermen were 19-29 years of age, 38% of fishermen were 30-40 years of age 20% of fishermen were 41-50 years of age and 14% above were 51 years of age (Table 4.5.1.1)

Table 4.5.1.1: Age distribution of fishermen in the study area

Age category	Number of fishermen (n=50)	% of total
19-29 years	14	28
30-40 years	19	38
41-50 years	10	20
Above 51 years	07	14
Total	50	100

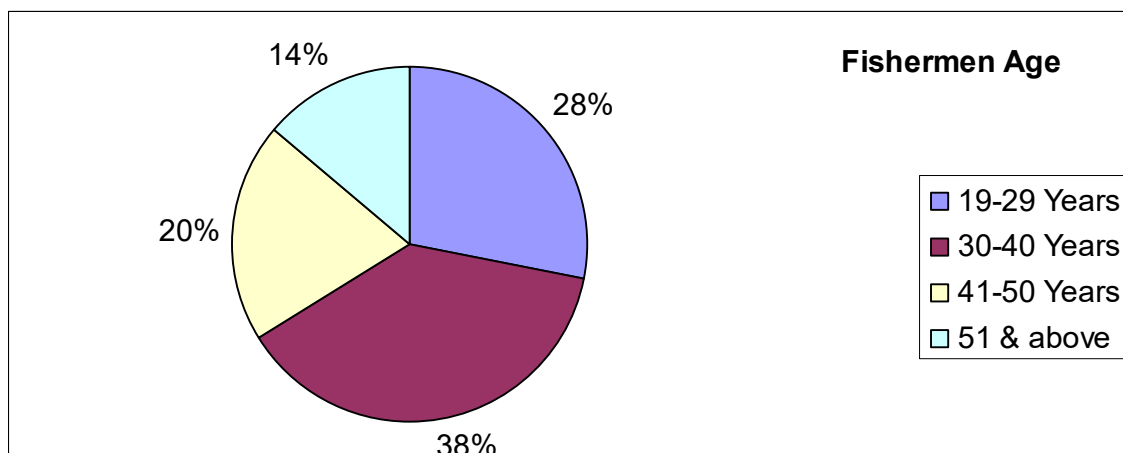


Figure 5: Fishermen Age status

ii. Family size

The word family size reflects number of person live, earn and eat cooked food from same oven. The family size and its composition were related to occupation, income and were likely to have an important influence of fishing practice. The family members include husband, wife, son, daughter, brother, sister, parents and servant. Data on family members of fishermen in the **Kutubdiapara** were presented in (Table 4.5.1.2) the study reveals that 56% of the fishermen had five family members, 38% had six to ten family members and 06% having more than 11 family members in their families

Table: 4.5.1.2 Fishers Family Size

Family size (member)	Number of fishermen (n=50)	% of total
1 to 5	28	56
6 to 10	19	38
11 to above	03	06
Total	50	100

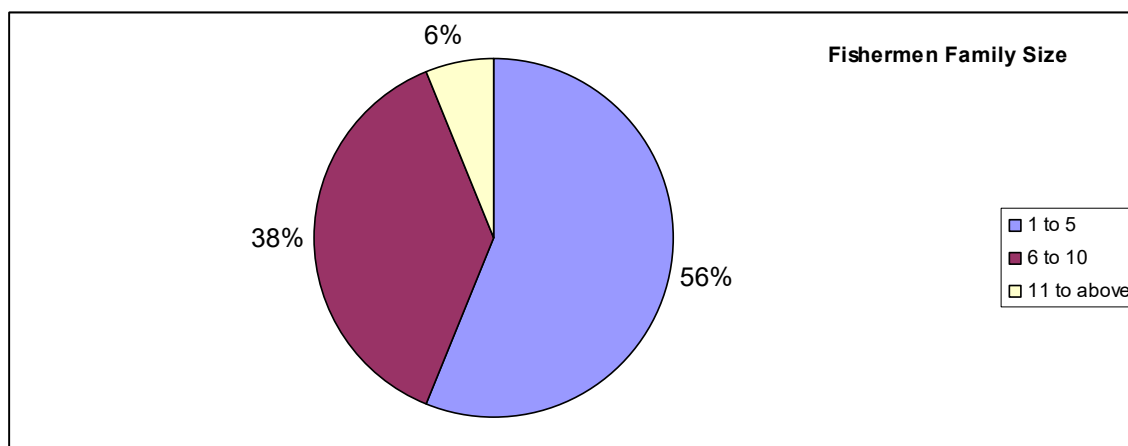


Figure 6: Fishermen Family Size

iii. Family Types

According to our heritage families are classified into two types: 1) Nuclear family: married couple with children and ii) Joint family: group of people related by blood and/or law. In the fishermen community of the study area

it was found that 28% fishermen lived with joint families and 72% lived with nuclear families (Table 4.5.1.3)

Table 4.5.1.3: Family type of fishermen in the study area

Family	Number of fishermen	% of total
Joint family	14	28%
Nuclear family	36	72%

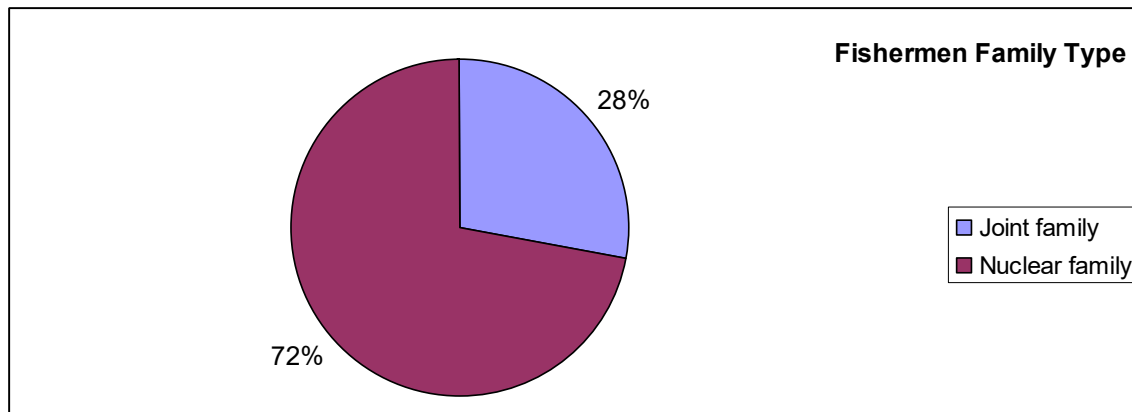


Figure 6: Fishermen Family Type

iv. Educational status

Education has a great importance on socio-economic empowerment in the rural community. There is a strong relationship between society and education. Human resource development is largely a function of literacy and educational attainment. Amongst fishermen, education attainments help develop conceptual skill and also facilitate the acquisition of technical skill, which can have direct reflection on income generation, expenditure and saving activities. Education has a role in influencing yields through production decisions.

Educational status in the study area fishermen were shown in table 4.5.1.4 which reveals that 12% were illiterate 44% were capable of to sign only, 38% fishermen had education upto primary leves, 6% had bellow SSC lebel. The highest members of fishermen (38%) with primary level education were a remarkable future of the Kutubdiapara village.

Table 4.5.1.4: Education status of fishermen in the study area

Level of education	Number of fishermen (n=50)	% of total
No education (illiterate)	6	12
Capable to sign only	22	44
Primary	19	38
Secondary	3	6

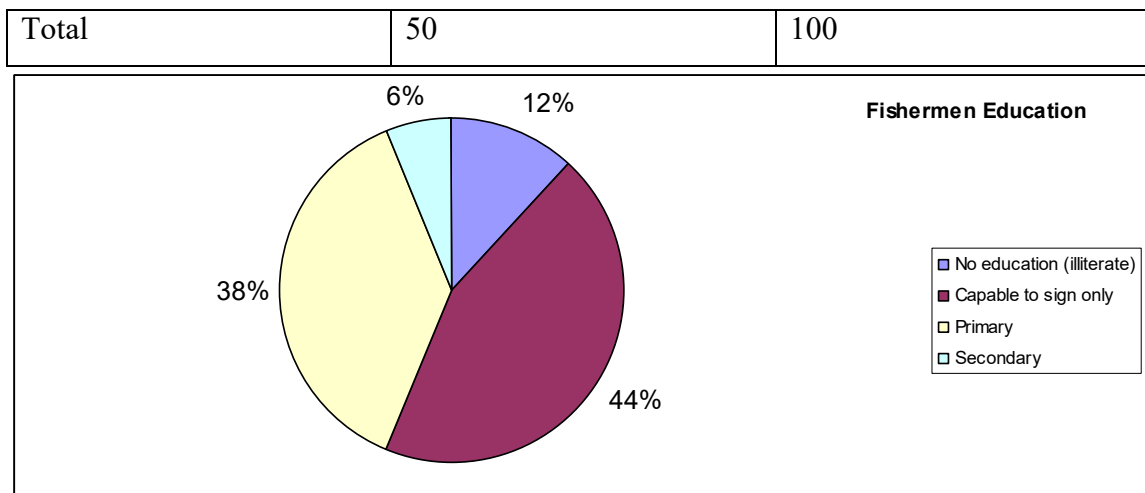


Figure 7: Education of Fishermen

v. Religion

Religion plays an important role on socio-economic condition of a particular area people, and can act as a notable constraint or modifies in social change. In the study area, 94% of interviewed farmers were Muslims and the remaining, 4% informants found as Hindus and 2% were Buddhists. (Table 4.5.1.5)

Table: 4.5.1.5 Religion of Fishermen

Religion	Number of fishermen	% of total
Muslims	47	94
Hindus	02	04
Buddhist	01	02
total	50	100

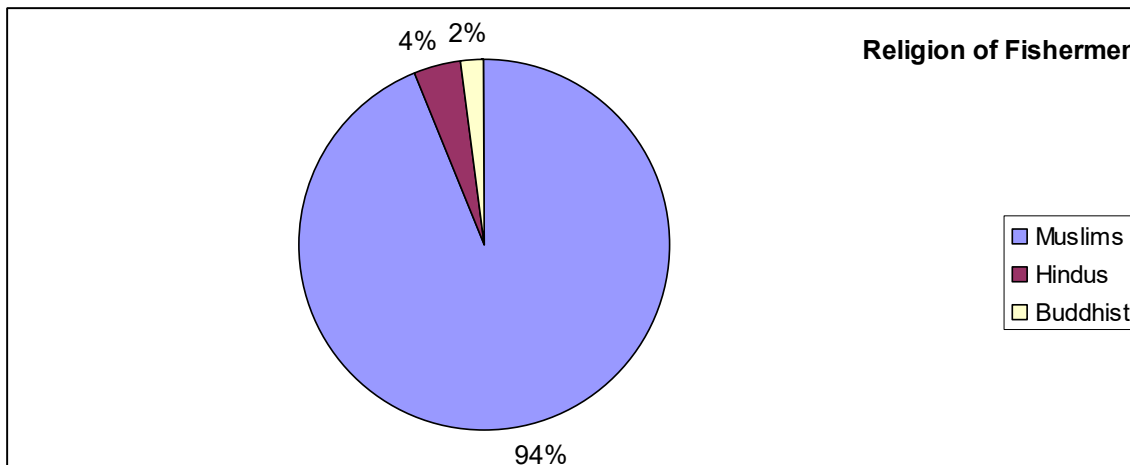


Figure 8: Religion of Fishermen

vi. Child education

Schooling of children is an important indicator to assess the livelihood status of farmer. In the study area 68% children were going to school. But in the PL catching period most of the school going student left school for family earning sources and 32% children did not go to school (Table 4.5.1.6).

Table 4.5.1.6: Child education status in fishermen family in the study area

Schooling status	Number of children	% of total
Going to school	34	68
Not going to School	16	32
Total	50	100

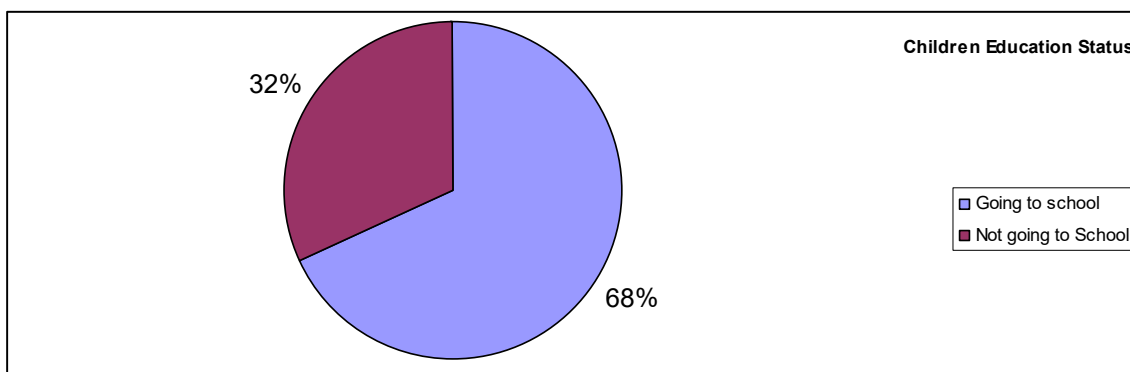


Figure 9: Children Schooling Status in Fishermen Family

5.5.2. Natural capital

From many years fishers believe, nature is being feeding them. In other word fishers livelihood depends many ways on nature and it’s tranquility. Natural capital of fishermen represents the natural resources such as, land, water, timber and wider environmental goods that are critical for farmers and associated groups, to support production (New and Singholka, 1995). None of the fishermen would survive without help of key environmental services and food produced from natural capital depletion that has affected their income in the study area (Sarker 2007).

4.5.3. Financial Capital

Financial capital deserves the ability of expenditure and savings. Financial capital of fishers represents their Savings, credit, liability and resources etc. The fishing sector has the potential to generate considerable amounts of financial capital relative to the resources of associated groups. However, the study shows that fishermen are often disadvantaged due to poor financial resources.

i. Income of fishermen

There are three types of fishermen identified on basis of their fishing involvement. The average annual income of professional fishermen was found to be Tk 30,000 and average income from fishing was Tk. 24000. Occasional fishers earn annually TK.32600 among that TK.18000 contributes from fishing profession. On the other hand subsistence fishers earn TK. 38000 in total & among this fishing profession contributes TK.7500. Occasional & subsistence fishers usually catch fish during peak harvest season or the tenure when fishing labor cost is high.

Table 4.5.3.1. Fishers Yearly Income & Sources

	Source of income
--	------------------

Types of fishermen	Fishing (Tk.)	Agriculture (Tk.)	Day-labor (Tk.)	Fish drying	Small Trader (Tk.)	Fish sale (Tk.)	Total (Tk.)
Professional	24,000	-	-	500	-	5500	30,000
Occasional	18,000	5000	9,000	600	-	-	32,600
Subsistence	7,500	19,000	-		11,500	-	38,000

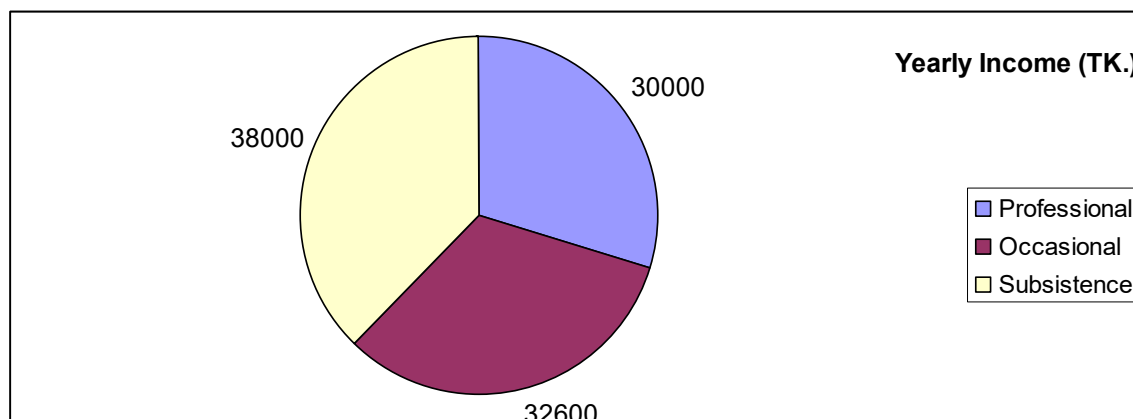


Figure 10: Yearly Income of Fishermen

ii. Occupation

People living in Kutubdiapara village are mostly fishermen along with agriculture and day labor on their main profession. Family members of all means involved in PL catching in the season. Study says that 66% of fishermen were engaged in fishing as their main occupation. While 18 and 16% of fishermen were involved in agriculture and day labor activities, respectively as their main occupation (Table 4.5.3.2)

Table 4.5.3.2: Occupation of fishermen in the study area

Main occupation	Number of fishermen	% of total
Fishing	33	66
Agriculture	09	18
Day labour	8	16

Total	50	100
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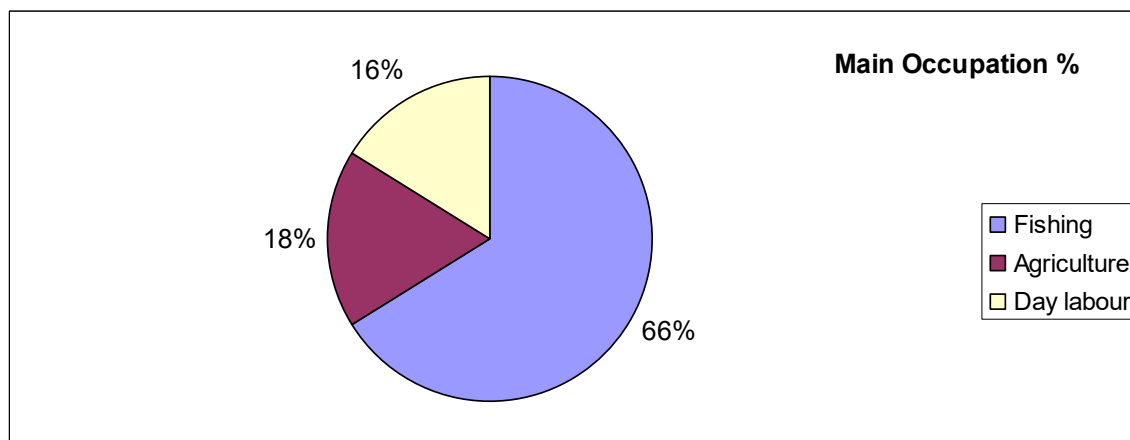


Figure 11: Main Occupation of Fishermen

5.5.4 Physical Capital

Treatment facilities, transport, shelter, road, market, electricity, drinking water supply health and sanitary facilities etc. are the physical capital of fishers that enable people to pursue their livelihood strategies. However, poor physical capital affected people to pursue their livelihood improvement strategies in the study area.

i. Housing conditions

Table 4.5.4.1 shows the housing facilities enjoyed by the selected fish farmers. The study result reflects among the respondents 52% fishers owned Kacha housing condition. Another 42% owned tinshed housing facility. Half building facility owned by 4% respondents and remaining 2% owned building facility.

Table 4.5.4.1: Housing starts of fishermen in the study area

Housing status	Number of fishermen	% of total
Katch	26	52
Tinshed	21	42
Half-building	2	4

Building	1	2
Total	50	100

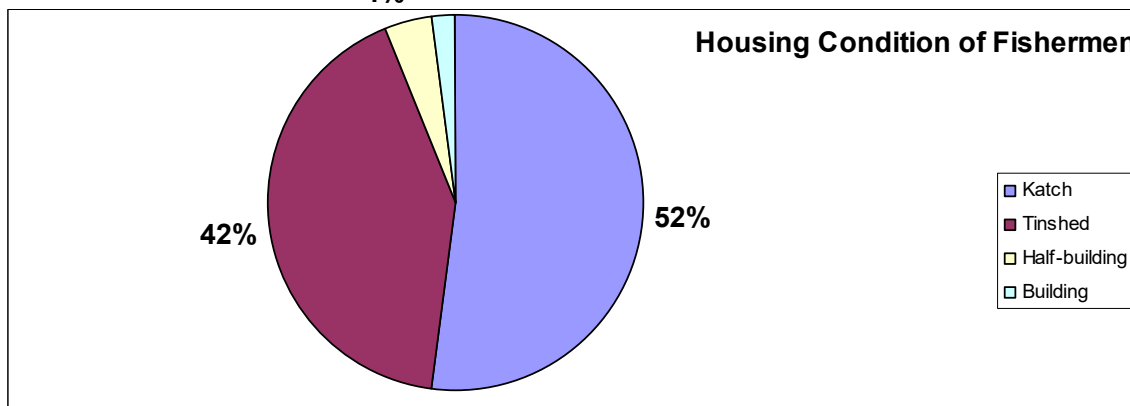


Figure 12: Housing Condition of Fishermen

ii. Health facilities

Fishers usually receiving poor health facilities due to inadequate public health facilities present in that area & their awareness scarcity. Usually fishers are procuring poor medical facilities from village doctor. In the study area it was found that 62% of fishermen households were dependent on ‘village doctors’ for their treatment and health facilities during last one year while 32% and 6% fishers received health services from Upazilla Health Complex or from MBBS doctor (Table 4.5.4.2).

Table 4.5.4.2: Fishers receiving health facilities

Health facilities	Number of fishermen	% of total
Village doctor	31	62
Upazila health Complex	16	32
MBBS doctor	3	06
Total	50	100

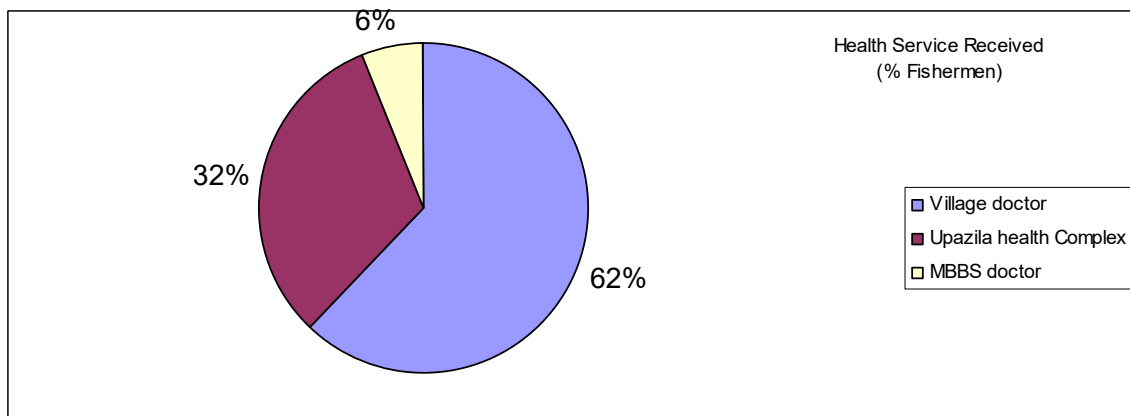


Figure 14: Health Service Received by Fishermen

iii. Drinking water facilities

The provision of clean and safe drinking water is considered to be the most valued elements in society. Lack of drinking water hinders the development of a local economy and the removal of social marginality. The study showed that 4% of the fishermen using own tube-well, 82% fishers are using community tube-well and 14% respondents are collecting drinking water only. (Table 4.5.4.3).

Table 4.5.4.3: Kutubdiapara fisher’s drinking water facility

Drinking water facilities	Number of fishermen	% of total
Own tube-well	02	04
Community tube-well	41	82
Collected from neighbors tube-well	07	14
Total	50	100

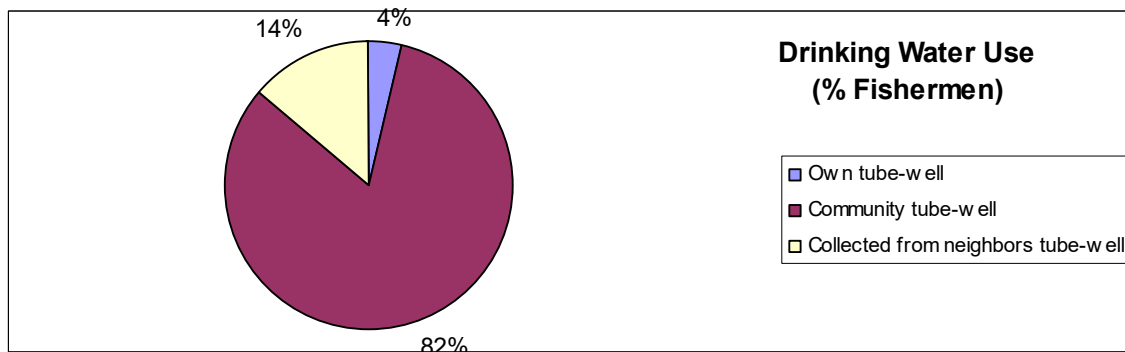


Figure 15: Drinking Water Source of Fishermen

iv. Sanitary facilities

It was observed that fishermen sanitary conditions were very poor. Three types of toilets were found to be used by fishermen; i) Katcha made of bamboo with leaf shelter and inadequate drainage disposal & without any ring slub. ii) Katcha ring slub both are present but there is no water seal to protect insects & disease carrier iii) Semi-pucca made of brick with leaf or tin shelter ring slub both are present iv) pucca-made of brick with good drainage disposal.

More over there are found in the study area, 60% respondent not using proper sanitary latrine while another 40% fishers are availing hygienic latrine condition (Table 4.5.4.4).

Table 4.5.4.4: Latrine Condition of Fishermen

Sanitary facilities	Number of fishermen	% of total
Katcha (without ring slub)	07	14
Katcha (without water seal)	23	46
Semi-pucca (with ring slub)	18	36
Pucca (Hygenic)	02	04
Total	50	100

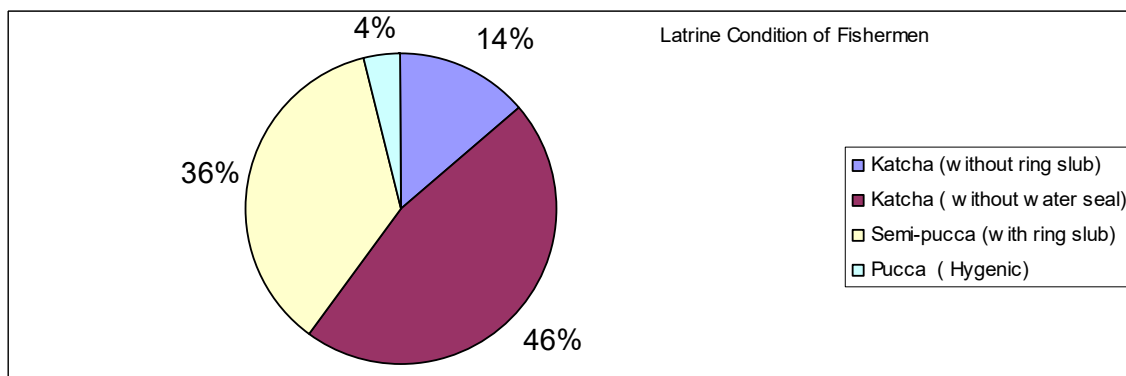


Figure 16: Latrine Condition of Fishermen

v. Electricity facilities

Among the respondents 66% availing electricity facility & remaining 34% don't having it.

Table 4.5.4.5: Electricity facilities enjoyed by the fishermen in the study area

Electricity facilities	Number of fishermen	%of total
Yes	33	66
No	17	34
Total	50	100

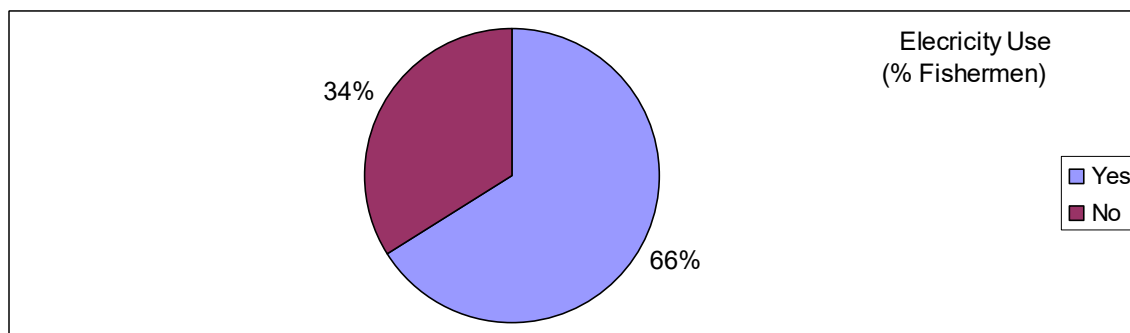


Figure 17: Electricity Use by Fishermen

vi. House hold assets

It is Evident that majority 64% of the respondent’s using khat, 32% availing tables, 94% have at least one chair & 20% having fan and only 16% watching their own TV (Table 4.5.4.6).

Table 5.5.4.6: House holds assets enjoyed by the fishermen in the study area

Name of the assets	Have it (# fishers)	Don’t have (# fishers)	Total (# fishers)	% of total
Khat	32	18	50	64
Table	16	34	50	32
Chair	47	03	50	94
Fan	10	40	50	20
TV	8	42	50	16

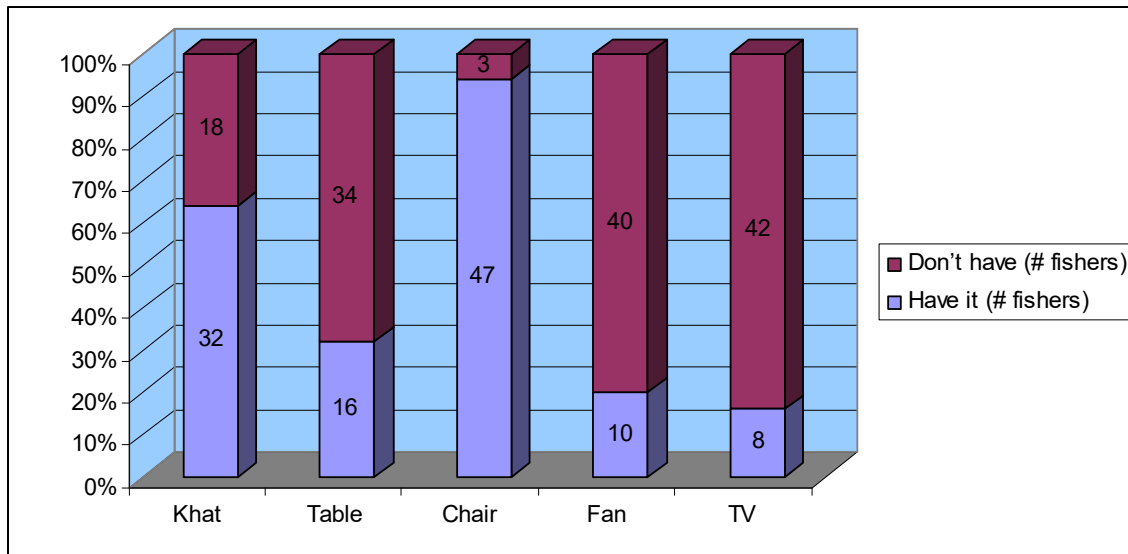


Figure 18: Asset Enjoyed by the Fishermen

vii. Live stock and poultry

In the study area of the total (50) interview stated that 64% fishermen were rearing chicken at house hold level, 22% were rearing cows and 14% had bullock (Table 4.5.4.7).

Table 4.5.4.7: Live stock and poultry Resources of Fishermen

Live stock and poultry	Number of fishermen	% of Total
Chicken	32	64
Cows	11	22
Bullock	07	14

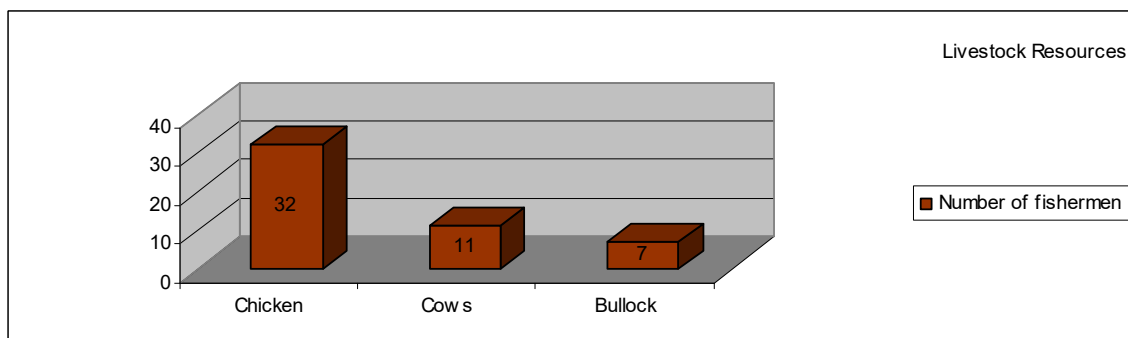


Figure 19: Poultry & Livestock Resources by Fishermen

viii. Coking fuel

In the study area, three main types of cooking fuel are used: 1) cow-dung 2) paddy-straw, and 3) wood including tree branches and dry leaves. Cow-dung can be mixed with straw and dried until hard to provide an odor-less cooking fuel. In general, children go out to collect cow-dung and women are involved in processing this in their own premises. In the study, majority of fuel use rate for cooking found are as, 42% of respondents stated that they mainly used cow dung, while 34% and 24% used paddy straw and wood, respectively (Table 4.5.4.8).

Table 4.5.4.8.: Cooking fuel used by the fishermen of the study area

Cooking fuel	Number of fishermen	% of total
Cow-dung	21	42
Paddy-straw	17	34
Wood	12	24
Total	50	100

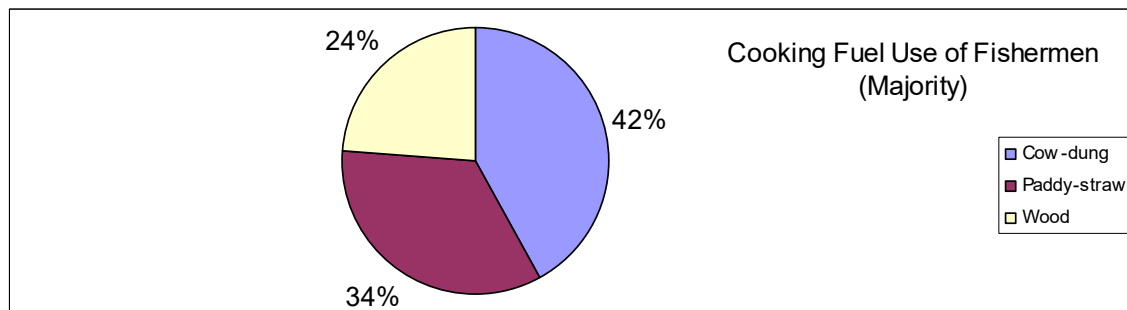


Figure 20: Cooking Fuel Use of Fishermen

4.6 Socio-economic constraints of the fishermen:

Fishers are facing plenty of problems. Mostly they receive credit for boat, net even for daily expenses in the off fishing and/or band season. So, fishers repay most of his catches to

dadon provider. Eventually, day long fishing end they receive only labor cost. The business lords have greater linkage from grass root level to central person. Others problems were identified as extortion by the local extortionist, other problems were inadequate credit facility, presence of aquatic vegetation lack of skill fishermen lack of appropriate gears and disturbances by dacoits thieves etc. most of the fishermen are very poor and they have to resort to credit for buying nets and other fishing equipments. They are neglected in the society. Most of them are illiterate and live from hand to mouth being very poor their children often go for fishing rather than to school. As a result, generation after generation thy remain illiterate and not being able to contribute for the betterment of their community Another socioeconomic constraint is the onset of flood that has to be faced by the fishermen almost every year as depicted in Table 5.6.

Table 4.6. Extent of problems faced by the fishermen of the study area.

Name of problem	Extent of the problem faceb by the respondent		
	Very high	Medium	Low
Dadon (Crisis & kind credit)	50 (100%)	-	-
Lock of Technical Support	2 (4%)	7 (14%)	41 (82%)
Decreasing catch due to over fishing	50 (100%)	-	-
Joint Partnership	48 (96%)	2 (4%)	-
Flooding	12 (24%)	38 (76%)	-
Inadequate loan facilities	3 (6%)	8 (16%)	39 (78%)
Aquaticvegetation coverage	10 (20)	40 (80%)	-

Note: Figure in the parameters indicates the percentage of fishers

4.7 Catch composition & price list

Most of the catches are marine species including brackish water species also. Generally fishers get too lower price in comparison to other stakeholders involved in marketing

system. Because fishers received credit in kinds, locally the process called Dadon. So, fishers are bound to sell their catches at a fixed cost if the price of it satisfactory or not. On an average fisher sell at least half price of original market value. Sometime this ration varies up to 3-4 times. A comparative study related to catch composition & price in different level are described below.

Table: 4.7 Catch composition & price list in different level

Local and seientific name of fish	Catch %	Price received by fishermen	Price (Tk/kg) at different levels		
			Arottdar	Wholesaler	Retailer
Sea catfish	3.00	90	150	170	200
Lottia	18.00	10	30	50	80
Suri	52.00	40	70	90	120
Chingri	2.00	45	70	90	120
Shark	1.00	100	200	250	Export
Shaplapata	1.00	15-25	40	60	100
Chanda (Marine)	1.00	150-180	300	350	450
Mackerel	4.00	50	80	100	140
Fatfish	3.70	40	80	110	140
Poa / Mullet	4.00	70	130	170	220
Falsha	1.00	45-60	100	130	150
Zatka	4.00	30	60-100	80-120	110-150
Surma	1.00	50	90	130	160
Others	4.30	-	-	-	-
Total	100%				

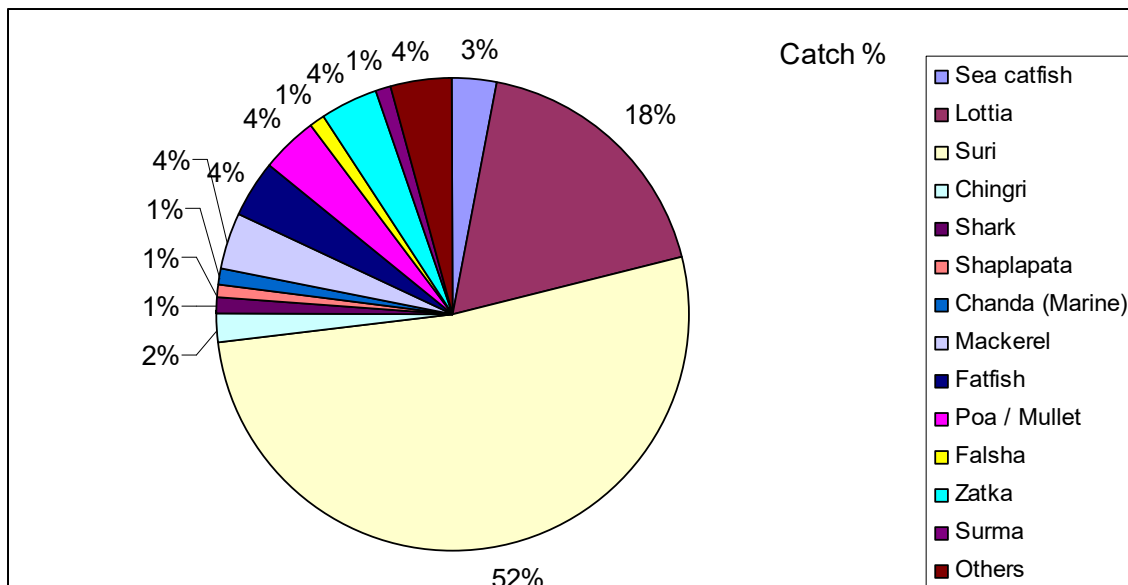


Figure 21: Catch Composition

4.8 Fish marketing channel

It was observed that three types of fish marketing channel exist in the surveyed area (figure 4). These were

Channel 1: Fishermen to Consumers:

In this process fishermen directly sell his catches to consumer or retailer. Only a few small fishers get the opportunity to sell by this channel. Usually those who don't have any liabilities to arothdar or any small trader can follow this process. Usually fishers receive higher price by this channel selling. There are found only 8% fishers are using this channel.

Channel 2: Fishermen to Retailers then Consumers:

Fisher sells their catches to retailer. In this process fishers receive medium price than original value. Receiving catches from fishers, retailer tries to sell quickly to consumer comparatively higher price. Only 16% fishers found in the study area, who sell their catches by using this channel,.

Channel 3: Fishermen – Arothdar-Wholesalers-Retailers-Consumers:

Fishers usually loose closer to equivalent price for selling of catches by using this channel. They had nothing to do any other alternative according to agreement condition of receiving credit at band period, off season, boat and net repairing before initiation of full harvesting season. There are found 66% of fishers are bound to sell their catches by this way.

CHAPTER-V

DISCUSSION

This section illustrated about the findings, discussion & comparison of the study.

5.1 Fisher types

In the present study generally 3 types of fishermen were found in the Kutubdiapara village and on average 185 nos of fishermen were involved in daily fishing in Kutubdiapara. As a total, 58% fishermen are professional, 32% are seasonal and the rest 10% were the subsistence fishermen. During peak season, fishing activities were increased simultaneously for the increasing number of fish. This finding indicates that number of fishermen has increased due to poor economic condition, over growth of population, lack of employment opportunity, lack of awareness and poor education.

5.2 Fishing gears used in Kutubdiapara village

There are a variety of fishing gears were found to be operated in the study area. These gears were classified into 3 groups; such as nets, traps and wounding gears. In this present study, it was found the gears like ber jal, current jal, jhaki jal, thela jal, set bag net, seine, shine

net, gora traps and borshi were operated in Kutubdiapara Village. The fishing activities that are currently being used among the fishermen of Bangladesh have been broadly categorized into netting, angling, trapping, spearing, development watering and hand picking by Dewan and Mozif (1994). For fishing they use local type of crafts. In most cases they are not owner of this gear and crafts.

5.3 Species Composition & marketing

Most of the catches are marine species with few brackish water species also. Among them Suri fish catches at the highest amount 52% of total catch, Others considerable catches are Lottia 18%, Mackerel 4%, Zatkan, Hilsha 4%, fat fishes 3.7%, sea cat fishes 3%, Chingr 2%, Shark & Shaplapata also catches a considerable amount. Generally fishers get too lower price in comparison to other stakeholders involved in marketing system. Because fishers received credit in kinds, locally the process called Dadon. So, fishers are bound to sell their catches at a fixed cost if the price of it satisfactory or not. On an average fisher sell at least half price of original market value. Sometime this ration varies up to 3-4 times. Three types of marketing channel exist there to sell their catches. Such as

Channel 1: Fishermen to Consumers:

In this process fishermen directly sell his catches to consumer or retailer. Only a few small fishers get the opportunity to sell by this channel. Usually those who don't have any liabilities to arothdar or any small trader can follow this process. Only 8% fishers from respondent community are involved with this marketing channel.

Channel 2: Fishermen to Retailers then Consumers:

Fisher sells their catches to retailer. In this process fishers receive medium price than original value. Receiving catches from fishers, retailer tries to sell quickly to consumer comparatively higher price. Only 16% fishers found in the study area, who sell their catches by using this channel,.

Channel 3: Fishermen – Arothdar-Wholesalers-Retailers-Consumers:

Fishers usually loose closer to equivalent price for selling of catches by using this channel. They had nothing to do any other alternative according to agreement condition of receiving

credit at band period, off season, boat and net repairing before initiation of full harvesting season. There are found 66% of fishers are bound to sell their catches by this way.

5.4 Livelihood conditions of fishermen

The study reveals that 28% of fishermen were 19-29 years of age, 38% of fishermen were 30-40 years of age 20% of fishermen were 41-50 years of age and 14% were above 51 years of age group. Among all respondents 56% of the fishermen had five family members, 38% had six to ten family members and 06% having more than 11 family members in their families.

Educational status in the study area found 12% were illiterate 44% were capable of to sign only, 38% fishermen had education up to primary school, 6% had below SSC level. The highest members of fishermen (38%) with primary level education were a remarkable future of the Kutubdiapara village.

Among the respondents 52% fishers owned Kacha housing condition. Another 42% owned tinshed housing facility. Half building facility owned by 4% respondents and remaining 2% owned building facility.

More over there are found in the study area, 60% respondent not using proper sanitary latrine while another 40% fishers are availing hygienic latrine condition.

Study information illustrated that fishers involved with other agricultural activity earning more than only fishing focus family.

5.4.1. Livelihood Assets

i. Human Capital

Human capital represents the skills, knowledge, education ability of labor and good health that together enable people to pursue their livelihood strategies. It is therefore necessary, through no on its own sufficient, for the achievement of positive livelihood outcomes. From the present study, it was found that only 6% of the fishermen got health service from the MBBS doctors, while 62% and 32% farmer's households were dependent on village quack

doctors and Upazilla Health Complex, respectively. The Poor health and inadequate nutrition of the children, women and old aged members of farming communities also inhibits their development. During the period of investigation, it was found the 12% of the fishermen were illiterate, 44% were capable to sign only, 38% went primary school and only 6% were found to have secondary level of education, Adult education evening teaching program, increasing the farmer's literacy.

ii Natural capital

Natural capital of fishermen represents the natural resources such as, land, water, timber and winder environmental goods that are critical for farmers and associated groups, to support production (New and Singhola, 1995). None of the fishermen would survive without help of key environmental services and food produced from natural capital. Rapid populating growth has led to accelerate natural capital depletion that has affected their income in the study area (Sarker, 2007).

iii. Financial Capital

Financial capital is probably the most versatile of the five categories of assets. It can be converted with varying degrees of ease, depending upon transforming structures and processes into other types of capital. It can be used for direct achievement of livelihood outcomes for example when food is purchased to reduce food insecurity. Sarker (2007) stated that the major constraints of carp farming were lack of money and high production costs. However the study showed that poor fishermen often disadvantaged due to poor financial resources such as cash, savings, credits etc. for procurement of fishing gear, craft etc. The present findings are in agreement with the observation of Sultana (2005) and Sarker (2007).

iv. Physical capital

The physical capital of the fishermen includes transport, drinking water supply, sanitary facilities, shelter, roads, market, electricity etc. Among them, 4% have their own tube-well & 82 % respondent use community tube-well water. Drinking water facilities is one of the most important physical capitals. More over there are found in the study area, 60%

respondent not using proper sanitary latrine while another 40% fishers are availing hygienic latrine condition. Poor physical capital in turn affected the well being of the fishers, which is in conformity with the observations of Shahjahan (2000) and Sultana (2005).

v. Social capital

Mutual trust and reciprocity lower the cost of works together. This means that social capital has a direct impact upon other types of capital;

1. By improving the efficiency of relations, social capital can help increase peoples incomes and rates of saving (financial capital),
2. Social capital help in improving the management of common resources (natural capital) and the maintenance of shared infrastructure (physical capital),
3. Social networks facilities innovation, the development of knowledge and sharing of that knowledge.

There is a close relationship between social and human capital (DFID, 2000). Present study revealed the poor existence of social organizations of the fishers in the study area. The lack of social capital has affected livelihood of poor fishing communities. Similar results were found for other fish farming systems in rural Bangladesh (Rahman, 2005; Sultana, 2005 and Podder, 2005).

vi. Vulnerability context

The vulnerability context is the group of factors operating in the external environment, in which people exist, that may affect their susceptibility to poverty (DFID, 2000). The livelihoods which people adopt, and their livelihood outcomes they aspire to, are greatly affected by the vulnerability context (Goldman, 2000). There are three key areas that contribute to the context of catching fish, these are: a) Shocks, b) trends, c) seasonality. Insufficient water in the dry season, multiple ownership and inundation by flood during monsoon caused difficulties. In the present study, illness, natural disasters (i.e., flood heavy rain, drought etc.), social conflicts and political crisis are found to be the stressor or suppressing factor to the fishing communities. Such types of adverse situations were also noted by Shahjahan (2000), Sultana (2005) and Sarker (2007).

Vii. Transforming, structures and process

Transforming, structures and processes are the institution, organizations, policies and legislation that shape livelihoods (DFID, 2000). Understanding institutional processes allows for the identification of barriers and opportunities to sustainable livelihoods. Poor Institutional and administrative help, poor infrastructures and extension services all have affected livelihoods of poor fishers in the study area. Similar results were also found for other fish farming systems in rural Bangladesh (Rahman, 2004; Ara, 2005; and Parobitra, 2005).

5.5.2 Improvement of livelihood:

Most of the fishermen have improved their livelihood conditions to some extent through fishing. These could include food consumption, increased health condition, purchasing power, choice and ability and improvement of their livelihood approach. The most significant change was in food consumption. However, poor infrastructure facilities such as transport, electricity, bank, market etc. are the main problems for household of fishermen. Rahman et al. (1999) also found that 71% prawn farmers improved their socio-economic condition through prawn production. On the other hand, Sarker (2007) concluded that the trained fish farmer in Trishal Upazila in Mymensingh district had the opportunity of improving their livelihood to a very high extent.

CHAPTER-VI

SUMMARY & CONCLUSION

This is an expressive type of study, conducted to determine livelihood status, socioeconomic condition & constrains, identification of possible alternative area of income generating and area of future recommendation for further development of fishers in southern coastal area of Bangladesh. In this regards a village named Kutubdiapara of Cox's Bazar Sadar Upazilla was selected on basis of study demand. The study conducted from June 2009 to March 2010 (10 month) including strategic development of research methodology, collection of information, verification, processing, and analysis of collected information for report writing.

Information collected from primary & secondary sources. Primarily collected information was verified with secondary sources for better accuracy. A set of questionnaire developed with field justification & test for collection of information. PRA techniques including focus group discussion, questionnaire interview applied to collect information. Collected information was verified with secondary source of information such as local government institutions, local key informants, NGOs, Upazilla Fisheries Office & other amenable sources.

In the investigation there found three types of fishermen in Kutubdiapara village on basis of their involvement in fishing are categorized into professional fishermen 58%, seasonal fishermen 32% & subsistence fishermen 10%.

Fishermen are using 9 types of gears including nets (6 types), traps (02 types) & wounding gear (01 type) to catch fishes from mostly wild sources such as river and sea. Four types of mechanized & two types of non-mechanized crafts for catching fishes.

Most of the fishers are of young ages. The study result implies that 38% fishers age were between 30 to 40 years. 28% fisher's age were between 19 to 29 years. 20% fishers found between 40 to 50 years & remaining 14% of fishers found ages above 51 years.

Family size ranges from 1 to 5 person was found 56%. 38% fisher's family found members ranges between 6 to 10 people. Remaining 6 % fisher's family holds more than 11 members. Only 28% of fishers are living with joint family & remaining 72% living in nuclear family.

12% fishers were found illiterate, 44% can do sign only, 38% had primary level education & remaining 6% fishers owned secondary level education. The figure shows almost 56 % fishers have no education.

Among the fishers of Kutubdiapara village 94% were Muslim, 4% were Hindu & only 2% found Buddhist in their religion. 68% children from fisher's family are going to school.

Professional fishers are earning annually BDT 30000, seasonal or occasional fishers are earning BDT 32600 where as subsistence fishers are earning BDT 38000. In their total income fish drying contributes a small amount. Subsistence fishers are earning more because he involves more with other activity such as agriculture & small trade rather than fishing. Seasonal fishermen also earning more than professional fishers because he involves fishing only when catches generally high or fishing labor cost is higher than other sector. On the other hand he also involves with agriculture & daily labor profession.

Professional fishers are completely involved with fishing profession. Only a little amount he earn from fish drying other than fishing. In the band period he is mostly jobless and depends on crisis credit and government aid.

Family members of all means involved in PL catching in the season. Study says that 66% of fishermen were engaged in fishing as their main occupation. While 18 and 16% of fishermen were involved in agriculture and day labor activities, respectively as their main occupation

The study result reflects among the respondants 52% fishers owned Kacha housing condition. Another 42% owned tinshed housing facility. Half building facility owned by 4% respondents and remaining 2% owned building facility

it was found that 62% of fishermen households were dependent on 'village doctors' for their treatment and health facilities during last one year while 32% and 6% fishers received health services from Upazilla Health Complex or from MBBS doctor.

The study showed that 4% of the fishermen using own tube-well, 82% fishers are using community tube-well and 14% respondents are collecting drinking water only.

More over there are found in the study area, 60% respondent not using proper sanitary latrine while another 40% fishers are availing hygienic latrine condition.

Among the respondents 66% availing electricity facility & remaining 34% don't having it.

It is Evident that majority 64% of the respondent's using khat, 32% availing tables, 94% have at least one chair & 20% having fan and only 16% watching their own TV. In the study area of the total (50) interview stated that 64% fishermen were rearing chicken at house hold level, 22% were rearing cows and 14% had bullock

In the study, majority of fuel use rate for cooking found are as, 42% of respondents stated that they mainly used cow dung, while 34% and 24% used paddy straw and wood, respectively.

52% of total catch found snake head fishes. Others catches are sea catfish, Lottia, Fat fish, Mackerel, Shaplapata, Chingri, Shark, Mullet etc.

Fishers usually facing plenty troubles for his daily livelihood. In most cases he behave likely slaves for receiving crisis credit from business lord for making, repairing gear and crafts or feeding family members in prohibited fishing period. So, fishers usually don't have freedom to sell their catches.

According to the study, following are the recommendation can be made to improve the socio-economic condition of the coastal fishers especially fishermen of Kutubdiapara village

- Professional fishers need to be involved with other alternative income generating activities.
- All fishers need to be involving alternative income generating activity to live for better livelihood especially in fishing band period.
- IGA involvement & skill training needed by GO & NGO joint collaboration for further socio-economic development of fisher's livelihood.
- Institutional credit could be offered to support fishers with easiest condition especially at their crisis period.
- Crisis credit process to be brought under regulatory control.
- Marketing access of fishers need to be developed for benefiting them by their catches.
- Public and private support needed to adopt crisis especially in fishing band period.

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APPENDICES

APPENDIX-1

ASSESSMENT OF THE LIVELIHOOD STATUS OF THE FISHERS OF KUTUBDIAPARA VILLAGE OF COX'S BAZAR SADAR UPAZILLA

1. Personal details of fishermen/Fish farmers:

- (a) Name:
- (b) Address:Village:.....Post:... Upazilla:
..... District:
- (c) Religion:
- (d) Age:
- (e) Educational level (No education/primary /SSC/HSC/Bachelor) :
- (f) Family size: Male:
Female:.....Earning members:
- (g) Main Occupation:.....
- (h) Secondary Occupation:.....
- (i) Total income:
- (j) Income from fishing:
- (k) Income from other sources:.....

2. Fishing Information:

- (a) Name of the fishing gear used:
- (b) Total number of gears:
- (c) Owner of gear:.....
- (d) Total catch:
- (e) Used Craft name:.....Owner (self/others):.....
- (f) Comments on annual catch:.....

3. Fishing Time:

- (a) Peak season (month) : From To
- (b) Fishing daily/Weekly/ monthly/ seasonal:
- (c) Fishing time: (Day/Night/Both):.....
- (d) Duration of fishing time: hrs/day/month

4. Fishing area:
5. Housing condition:
 - Kacha
 - Tinshed
 - Half building
 - Building
6. Source of drinking water:
 - Own tube well
 - Neighbors tube well
 - Others
7. Health facilities:
 - Village doctor
 - Upazilla Health Complex
 - District Hospital
 - MBBS Doctor
 - Do not get any treatment
8. Sanitary facilities:
 - Kacha
 - Semi Pucca
 - Pucca
9. Electric Facilities:
 - Yes
 - No
10. Family education:
 - Self (Husband) read up to
 - Wife
 - Son
 - Daughter
 - Brother
 - Others
11. House Hold Assets:
 - TV
 - Freeze
 - Khat

- Chair
- Table
- Almira
- Fan

12. Livestock and Poultry:

- Cow
- Bullock
- Chicken

13. Fuel used in Cooking:

- Cow dung
- Paddy straw
- Wood
- Leaves
- Electricity
- Gas
- Others

14. Schooling of Children:

- (a) Number of School going students:
- (b) Level of education:
 - Primary
 - High School
 - College
 - University
 - Others

15. Assessment of Fisheries and aquaculture knowledge:

- (a) How to improve fish production in wild sources?
- (b) Knowledge on prohibited, band fishing period?
- (c) Initiatives taken to adopt crisis
- (d) Where will you dispose of your fish?

- To Paiker
- Aratdar of the Market
- Directly to the Customer

(g) What would be the mesh size of fishing net?

15. Catch composition:

Sl. No.	Species	Number	Weight
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

16. (a) Organizational involvement
- (b) Type of membership
17. Number of people/fishermen engaged in the fishing activities
18. Marketing of fish:
- a) Name of the markets:
- b) Place of marketing: i) Harvesting site
 ii) Local market
- c) To whom sold: i) Local customer
 ii) Stockiest (Aratdar)
 iii) Fish trader
- d) Mode of marketing: i) Whole sale
 ii) Retail
 iii) Iced
 iv) Fresh
- e) Transportation of fish

- f) Species wise price of fish.....
- g) Average price (Tk.)

19. Problem faced by the fishermen/benching:

Name of the Problem	<i>Extant of the problem</i>		
	<i>Very high</i>	<i>Medium</i>	<i>Low</i>

20. Training Information:

Did you receive any training on fish culture? If yes tell us the name of the training programme.

Name of the training Programme	Duration of the programme	When (year)	Who offered training

21. Suggestion for improvement of livelihood of the fishermen/beneficiaries:

- 1.
- 2.
- 3.
- 4.

22. Constraints of fishing

- i) Fishing Problem:
- ii) Single most important problem for fishing

iii) Possible remedial measure

Signature of interviewer

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