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Livelihood Status of Hilsa (*Tenualosa ilisha*) Fishermen of Greater Noakhali Regions of Bangladesh

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Abstract

The present study aimed to elucidate the livelihood status of Hilsa (*Tenualosa ilisha*) fishermen at Lakshmipur and Noahkali Districts in Bangladesh during August, 2014 to January, 2015 through questionnaire survey method. During Hilsa fishing, Pangas (*Pangasius pangasius*), Koral (*Lates calcarifer*) and Poa (*Johnius coitor*) were also found to capture as by catch using *Chandi jal* (set gill net). 85% fishermen were observed to use mechanized (5-40 HP; Horse Power) boats in the study areas. Hilsa fishing was noticed mostly during October-November while such activities was almost absent during February-May (off period) which made fishermen to start migrating temporarily to the nearest urban areas for their livelihood. Although the Government of Bangladesh formulates an act to have fishing license yet 20% of the fishermen were found having valid fishing license in the study areas. Average daily net income of the fishermen during fishing period was 600 BDT whereas their real field daily income through fishing supposed to be 1695 BDT if they are supported by nets, boats, fuels etc., which means almost 64% of their daily income is taken by the aratdars. Therefore, subsidy as a means of nets, boats, fuels, engines etc., might be recommended for the better livelihood of the fishermen in greater Noakhali region.

Keywords: Hilsa; *Tenualosa ilisha*; Livelihood; Lakshmipur; Noakhali; Bangladesh

Introduction

Fisheries sector plays an immensely important role on the socio-economic development of Bangladesh from time immemorial as it is the part of the cultural heritage of the country. Fisheries sector contributes about 3.00% of the total export earning, 4.37% to GDP and 23.37% to agricultural sector [1]. Annual fish production was 34,10,254 MT in 2012-2013 fiscal year and the production of Hilsa fish is 3.51 MT which contributes 11% to the total fish production and 1% to the national GDP of the country.

Fish is one of the principal dietary ingredients to the people of Bangladesh providing about 60% of their animal protein intake. Hilsa contributes a major part to this. There is a proverb in Bengali is "*Macher raja Ilish*" meaning "Hilsa is the king of fish." It is the national fish of Bangladesh because of its importance. The Hilsa fishery of the country is characterized by the usual common property conditions where the available resources are exploited by a large number of fishermen.

The Indian River shad (*Tenualosa ilisha*, Hamilton, 1822), locally known as 'Ilish' constitutes the largest single species fishery of Bangladesh [2]. There are three Hilsa species found in the Bay of Bengal, *Tenualosa ilisha, Hilsa kelee,* and *Hilsa toli.* The majority of Hilsa fish captured belongs to *Tenualosa ilisha.* Though the Hilsa is generally regarded as an anadromous fish, there is evidence that it is in fact a diadromous fish, which means it migrates both ways between ocean and river. This anadromous fish is mainly found from the Meghna River estuary region through Noakhali, Lakshmipur and Chandpur district to the upper Padma River.

Lakshmipur is one of the southern coastal districts and Noakhali is situated in the central coastal zone of Bangladesh along the northeastern coast of Bay of Bengal. Both of the districts has the presence of large number of ponds, canals, floodplains and also the vicinity of the area to Meghna River estuary ensures the significance of the district in total culture and capture fish of the country. These two districts contribute greatly to the national annual production of Hilsa providing a large number of captured Hilsa to the country. That's why Ramgoti upazila of Lakshmipur district and Subarnachar upazila of Noakhali district are selected as two of the ideal Hilsa fish capture areas for the present research study.

Most of the Hilsa fishers live below the poverty line, and most work in teams as labourers/fishers. The wealthier fishers own the boats and nets. During fishing season, the fishers are dependent on fishing for their livelihood and do not have any alternative sources of income to support their families. Being an isolated community, fishermen are deprived of many amenities of life mostly in off season. Considering the above fact, the present study was carried out to assess the livelihood status of the Hilsa fishermen and the impacts of off season on the socio-economic condition of Hilsa fishermen in Lakshmipur and Noakhali region of Bangladesh.

Materials and Methods

Investigation was carried out in Ramgoti upazila of Lakshmipur district and Subarnachar Upazila of Noakhali district for six months from August, 2014 to January, 2015.

The study was based on the collection of primary and secondary data. Total 400 fishermen were involved in Hilsa fishing (250 in Laksmipur

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district and 150 in Noakhali district). Therefore, primary data (10% of the total population) for this study were collected from randomly selected 40 (forty) Hilsa fishermen (25 fishermen from Ramgoti upazila of Lakshmipur district and 15 fishermen from Subarnachar upazila of Noakhali district) comprising of younger, middle aged and elderly experienced fishers. Pre-evaluated and post evaluated questionnaire were used for the data collection from fishermen in accordance with the objective set for the study.

Primary data were collected through personal interview and Focus Group Discussion (FGD) and secondary data were collected through Crosscheck Interviews (CI) with key informants, from project reports and documents. Necessary relevant information on the socio-economic condition of fishermen was collected from regional offices.

After collection of data, these were edited and coded. All the collected data were summarized and scrutinized carefully and recorded. All the collected information were accumulated and analyzed by MS-Excel and then presented in textual, tabular and graphical forms to understand the present livelihood status of the fishermen in the studied area.

Results and Discussion

Human capital

Age distribution: Knowledge on the age structure of fishermen is very important in estimating the productive potential of human resources. Different categories of age groups are 16-25 years, 26-35 years, 36-45 years and 46-55 years were considered to examine the age distribution. It was appeared that out of 40 fishermen age group of 26-35 years was the highest (57%) and 46-55 years was the lowest (5%) (Table 1). Most of the fishermen from 26-35 years were married and majority of them are head of their family. Besides all of them are full of energy and have more opportunity to earn more. Age group ranged from 46-55 years was the lowest that are considered the oldest fishermen and they are gradually losing their energy after these years. Khatun reported that most of the fish farmers belonged to the age groups of 36 to 50 years (46%) in Charbata union Noakhali district [3]. Minar found that most of the fishermen belonged to the age groups of 31 to 40 years (56.00%) in the Kirtonkhola River nearby to the Barisal town which was different to the present findings [4].

Family size: The family sizes of the fishermen were divided into three classes as small, medium and large. From the study it was found that, about 50% fishermen family were medium sized (5-6 members), about 35% fishermen family were small sized (2-4 members) and 15% family were large sized (>6 members) (Table 1). Ali found that most of the fish farmer (45%) belonged in the 4 to 5 member's family in Mymensingh district which is similar to the present findings [5]. The family size has considerable influence on the income and expenditure of the family.

Educational status: Education has significant impact on the society. In the present study seven categories were used to determine the level of education. Out of 40 interviewed fishermen, 35% had primary (up to class 5), small portion (5%) of them can read only, 10% Illiterate, 10% can only write their name, 10% are literate to SSC level and the most important thing is that secondary education (Up to Class 8) completed fishermen was 30% out of 40 fisherman interviewed (Table 1). Pravakar found that about 10% had no education, 16% had primary (Up to class 5) level, 48% had secondary level, 16% had higher secondary level and 10% had bachelor level of education in Shahrasti Upazila under Chandpur district which is slightly similar to the present findings [6]. According to the fishermen sampled to the present study it is found that fishermen want to change the trends about illiteracy. They want to be educated so that they would not like to be cheated by the others due to lack of their education. Hilsa fishermen were consistently being cheated by the aratdars and loan providers as they were forced to sell their captured Hilsa to them. They revealed that majority of the fishermen were illiterate as most of the fishermen were involved in the fishing activity which was the only way to economically support their family in their early stage of life and also the lack of awareness about education. Another important factor was observed that there is a few numbers of educational institutions in the areas of fishing community. Most of the fishermen families are unable to bear the educational expenses of their school going children during banning period or lean season due to low or zero income.

Religious status: From the present study, it was found that Muslims constituted 85% of the fishermen community with 15% Hindus (Table 1). There was no Buddhists or Christians which was similar to Minar [4]. The dominance of Muslims in the fishing community indicates that Muslims are gradually coming to fishing profession by breaking the previous superstitions of the society. Pravakar found that about 75% and 25% of the pond fish farmers were Muslims and Hindus respectively in Shahrasti Upazila under Chandpur district [6].

Physical capital

Housing condition: The nature of house indicates the social status of the people. Ramgoti Upazila of Lakshmipur and Subarnachar Upazila of Noakhali were not developed as like as the main town of Lakshmipur and Noakhali district respectively. From the survey, it was found that 65% households of the fishermen were tin shed, 25% households were semi-pacca and 10% households were cemented building (Table 1).

Title	Types	Percentage (%)
Age Distribution (Years)	16-25	20
	26-35	57
	36-45	18
	46-55	5
Family Size	Small (2-4 members)	35
	Medium (5-6 members)	50
	Large (>6 members)	15
Educational Status	Illiterate	10
	Can write their name only	10
	Can read only	5
	Primary (Up to Class 5)	35
	Secondary (Up to Class 8)	30
	Secondary School Certificate (SSC)	10
	Higher Secondary School Certificate (HSC)	0
Religious Status	Muslim	85
	Hindus	15
Housing Conditions	Tin Shed	65
	Semi Pacca	25
	Cemented	10
Sanitation	Yes	35
	No	65
Subsidy	Get VGF	25
	Not Get VGF	75

Table 1: Information of fishermen in Lakshmipur and Noakhali districts in Bangladesh.

Khatun observed in their study that most of the house of pond fish farmers (78%) was made of tin-shed, 12% houses were katcha (straw components), 8% half cemented building and 2% cemented building of Charbata, Noakhali [3]. This is because of low income of the fishermen throughout the country.

Sanitary facilities: Fishermen are the poorest group of people in the country. It was observed that sanitary conditions of the fishermen were very poor. Only 35% of fishermen families were found who use sanitized toilets (Table 1). So they are in unhygienic condition which revealed that the sanitary conditions of the fishermen were not satisfactory like fisherman of the Kirtonkhola River nearby to the Barisal town where Minar found that 74% of toilets were kacha while 10% were semi-pacca and 16% of the fishermen had no sanitary facilities [4]. Poor sanitation system reflects poor socio-economic condition and lower income.

Livelihood strategies of Hilsa fishermen: Hilsa fishermen are dependent on fishing as a source of income and nutrition. They are engaged in fishing from generation to generation. The fishermen in the study areas were reported to go for fishing during day, night and even for 24 hours together. In day period fishermen usually prefer for fishing between 5 am to 11 am. In night, they prefer fishing between 7 pm to 4 am. From the present study, both professional and seasonal fishermen were found. Present analysis showed that professional fishermen constituted 65% and seasonal fishermen 35% to the total sample population (Table 2). Paul found that about 70% fishermen in Birulia and 64% fishermen in Boroibari were full-time fishermen respectively on the other hand about 26% fishermen in Birulia and 34% fishermen in Boroibari were part-time fishermen respectively [7].

According to the present study, about 100% of fishermen used *Chandi jal* (set gill net) with mesh size of 5 inches for Hilsa fishing, but width varies from 5.5-9.15 m which depends on the depth of seabed and distance from the sea shore [8]. Sometimes fishermen illegally use *Current jal* (drift gill nets). Sazzad studied on Hilsa fishery in the river Meghna in Chandpur district with sixty sampled boats for three gears motorized *gulti jal, Chandi jal* and *Current jal* [8]. For catching Hilsa, about 57% of fishermen spent 6 hours per day, whereas 30% and 13% of fishermen were involved in fishing for 5 hours and 4 hours respectively (Figure 1) in the present study. Bhaumik and Saha found that about 24.0% of the fishers engaged in fishing operation for 241-260 days, 39.9% spend 12 hours per day and 29.0% of them caught 131-150 kg fish/month [9].

Fishermen normally capture mature Hilsa in the fishing season (August-January). From the survey, it was found that about (55%) of fishermen capture Hilsa that weight (0.750-1.0) kg whereas a few (8%) were found about >0.5 kg of Hilsa (Table 3). According to the Hilsa fishers, the size of Hilsa fish are gradually increasing than the previous years, as Government of Bangladesh has prohibited all types of Hilsa fishing during banning period (11 days, 13 to 23 October, 2014). The fishers also mentioned that Pangas (*Pangasius pangasius*), Koral (*Lates calcarifer*) and Poa (*Johnius coitor)* comprise 10% of the total composition of fish capture while 90% of that is Hilsa.

Sazzad studied on Hilsa fishery in the river Meghna and found that Hilsa fishing was profitable [8]. Considerable differences in price were

Types of fishermen	No. of fishermen (n=40)	Total fishermen (%)
Professional fishermen	26	65
Seasonal fishermen	14	35
Total	40	100

Table 2: Types of fishermen in the study areas.

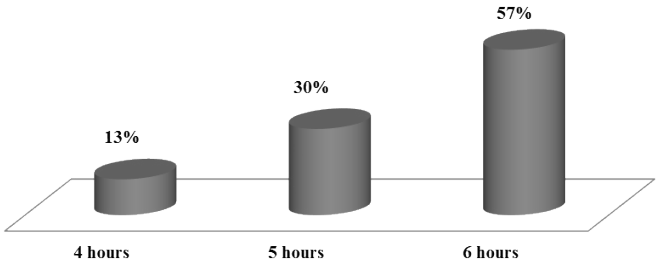

Figure 1: Fishing activities observed in the study areas.

Sizes of Hilsa fish	No of fishermen	Total fishermen (%)
>0.5 kg	3	8
0.5-0.750 kg	8	20
0.750 kg-1.0 kg	22	55
<1.0 kg	7	17

Table 3: Sizes of Hilsa fish during harvesting in the study areas.

noticed between fishermen and consumers and this happened due to the involvement of a number of middlemen in the marketing chain of Hilsa. An important observation in the study area was the dispute between the fishermen and the aratdars regarding price of the fish. Generally boat, net and loan are provided by the aratdar with a number of terms and conditions, among them two most important is, first they have to be paid 10% of the total catch of Hilsa by the fishermen, another one is, rest of the catch have to be sold to those aratdars or the loan providers. These systems reduce the selling price of Hilsa caught by the fishermen as well as reduce the income of them. The marketing chain from fishermen to consumers passes through local aratdar or broker to local market where retailer sells the fish to consumers which is similar to Pravakar in Shahrasti Upazila under Chandpur district [6].

Types of boat: Boat was the main fishing gear for Hilsa fishermen. Two types of boats were found in the study area used in Hilsa fishing; mechanized and non-mechanized boat. It is denoted that 85% of the fishermen use mechanized boat while the rest (15%) used non-mechanized boat (Table 4). These boats have difference in storage as well as in carrying capacity. Mechanized boats have higher storage capacity and carrying capacity than non-mechanized boats. Mechanized boats went to the deep sea areas for 3/5/7 (most of them were gone for 3 days) days according to their storage and carrying capacity while the non-mechanized boats move from dawn to dusk nearby sea shore area. It was found that 75% mechanized boat has storage capacity and 25% of non-mechanized boat has storage capacity (Table 4). They use only ice for two types of storage facilities; on-boat and on-shore. Ice concentration is not same for on-boat and on-shore. Generally they use ice at a concentration of 350-400 kg/MT of Hilsa in on-boat storage. But in on-shore, the ice concentration for storage is 1:1 (i.e., 1 kg ice for 1 kg Hilsa fish).

Engine capacity (Ranges of HP): The capacity of the mechanized boats used in the study area ranged from 10 to 40 HP (Horse Power). The selected fishermen were grouped into three categories based on their use of HP of the engine. The categories are 10 to 20 HP; 20 to 30 HP and 30 to 40 HP. From the study area it is found that 20 to 30 HP had the highest number (45%) of fishermen whereas 30 to 40 HP had the lowest number (10%) (Table 4). It is also noticed that 30 to 40 HP of engine were only used for deep sea fishing when they were gone for 3/5/7 days. Among them, some of the fishermen have some special preference in using the engine according to the made by which country or not. Mainly Japanese and Chinese engines are their

Title	Types	Percentage (%)
Boat types	Mechanized	85
	Non mechanized	15
Storage Facilities	Yes	75
	No	25
Engine Capacity (HP)	10-20	35
	20-30	45
	30-40	10
	>40	10
Engine Preferences	Japanese	30
	Chinese	70
Carrying capacities (Metric Ton)	Less than 0.5	30
	0.5-1.0	25
	1.0-1.5	15
	1.5-2.0	20
	Above 2.0	10
Having License	Yes	20
	No	80

Table 4: Information about the boat used by the fishermen.

special preference. It is found that Chinese engines are used in highest percentage (70%) while Japanese engines are used in lowest percentage (30%) (Table 4).

Carrying capacities: Different sizes of boats have different capacities. Boats are categorized into five classes such as less than 0.5 MT; 0.5-1.0 MT; 1.0-1.5 MT; 1.5-2.0 MT and above 2.0 MT. It is found that in the study area less than 0.5 MT has the highest percentage (30%) while above 2.0 MT has the lowest percentage (10%) (Table 4). For the small trip, generally 6 am to 5 or 6 pm, fishermen need lower storage capacity boat. But for long trip, generally 3 to 7 days, they need higher storage capacity boat as they go to the deep sea for Hilsa fissing.

License availability: Although license is the key element for Hilsa fishing in both riverside and deep sea areas in the developed countries, but there is no essential obligation of license for Hilsa fishing in Bangladesh. As a result large amounts of Hilsa fish including jatka (having 23 cm sizes of Hilsa) are captured by large number of fishermen. Though the Government of Bangladesh took some necessary steps to control the jatka fishing but their thought is that license is not essential for Hilsa fishermen. In the study area it is found that 80% fishermen has no license while the rest 20% has license for Hilsa fishing (Table 4). According to UFO of Cox's Bazar, fishermen must have license for Hilsa fishing in the Cox's Bazar sea shore area or BFDC area.

Fishermen activity observed in the study area: Hilsa fishermen of Bangladesh do not get involved in Hilsa fishing all the year round. The activities of the fishermen are shown in Table 5. Less Hilsa fishing activity was observed during December to January due to the gradual decrease of Hilsa capture rate. All the brood generally migrates seaward after the release of their egg. Almost no fishing activity was observed during February to March due to absence of Hilsa in sea shore or riverside area. In this time, the released eggs turn into hatchling to juvenile (jatka). It is the restricted period for all fishermen announced by the Government of Bangladesh. No fishing activity was observed during April to July because of the protection for juvenile Hilsa (jatka). It is the time when all jatka get time to grow up to mature Hilsa. There was another no fishing activity was observed during banning season (13 to 23 October, 2014 for 11 days). In this period all brood Hilsa move toward river to release their eggs in freshwater. All types of Hilsa fishing are strictly prohibited and this is announced to fishermen's village by respective Upazila Fisheries Officer and also broadcast to the mass media. During August to September, some of matured Hilsa move toward the sea shore or riverside area, so all Hilsa fishermen start their fishing activity. October to November is the high fishing activity period because this is the peak season for Hilsa fishing. All mature Hilsa start to move freshwater river to release their eggs and fishermen capture most of the Hilsa during this time.

Cost benefit analysis of a fisherman

Income of fishermen: Level of income of an individual family determines socio-economic status in a society. Annual income of a fisherman comes from main occupation as well as secondary occupation. There are various sources of income such as fishing, agriculture, service, day labourer, business, cattle rising, poultry and selling its product, rickshaw pulling etc.

It was also found that, the real field income of a fisherman is BDT. 1695.00 per day. Thus a fisherman's deserved annual income is Tk. 440,700.00. But a fisherman only obtain as his wage is BDT. 600.00 from aratdar which means his obtained annual income is BDT. 156,000.00. So he is deceived at BDT. 1095.00 per day and Tk. 284,700.00 per year from his aratdar (Table 6). Therefore a fisherman's income is Tk. 156,000.00 per year and his cost is Tk. 78,840.00 per year (Table 7), thus his net annual income (Obtained Annual income-Total cost) is BDT. 77,160.00. A fisherman could manage his family maintenance at

Month	Activity
December-January	Less Hilsa fishing activity
February-March	Almost no Hilsa fishing activity.
April-July	No Hilsa fishing activity
August-September	Start fishing activity
October-November	High fishing activity (It is a peak season)
13 October, 2014 to 23 October, 2014 (28 Ashwin to 10 Kartik, 11 days)	No fishing activity (The banning period for Hilsa fishing)

Table 5: Fishermen activities observed in the study areas.

Gross income (BDT)					
Real field income				Obtained income	
Per day average catch	Amount (BDT)	Total income (BDT)	Annual income (BDT)	Per day (BDT)	Annual income (BDT)
Hilsa (3.5 kg@BDT 400.00)	1400.00	**1695.00**	440,700.00	**600.00**	156,000.00
Koral (500 gm@BDT 300.00/kg)	150.00				
Pangas (500 mg@BDT 150.00/kg)	75.00				
Poa (200 gm@BDT 350.00/kg)	70.00				

Table 6: Calculated income of a fisherman (group comprising 10 members during fishing; each item is divided by 10) observed in the study area excluding banning period (260 working days).

Cost (BDT)		
Item of cost	**Cost (BDT)**	**Total cost (BDT)**
Fuel and oil (2 liter@72 BDT/ day/man)	37,440.00	**78,840.00**
Food (80 BDT/day/man)	20,800.00	
Ice (60 BDT/day/man)	15,600.00	
Subscription to the Pirates	5,000.00	

Table 7: Calculated operational cost (BDT) of a fishermen (group comprising 10 members during fishing; each item is divided by 10) observed in the study area excluding banning period (260 working days).

Tk. 297.00 per day of his total fishing year (260 working days) by this earning. This is mostly the lowest income for a fisherman to maintain his family like foods, clothes, medicine or disease treatment, education, homestead maintenance, etc., according to the present life style for a family.

The selected fishermen were grouped into four categories based on the level of their net annual income. The 1st category described the fishermen having net annual income less than Tk. 50,000. The 2nd, 3rd and 4th categories had income levels of Tk. 50,001-Tk. 75,000; Tk. 75,001-Tk. 100,000; and above Tk. 100,000 respectively (Table 8). It denoted that the annual income less than Tk. 50,000 categories had the highest number (45%) of fishermen while above Tk. 100,000 categories had the lowest number (10%). The net annual income of 25% fishermen had Tk. 50,001-Tk. 75,000 and 20% fishermen had Tk. 75,001-Tk. 100,000. This indicates that the fisherman who cannot manage his family having his net annual income less than Tk. 50,000 are the most in number.

Impacts of off-season on the fishermen

Fishers do not have opportunities for alternative income generating activities by the government during off-season and they suffer much during those periods. They find themselves their own alternative income generating sources. Present studies have identified several alternative livelihood strategies already adopted by the Hilsa fishermen. During off-season, 15% of fishermen had no off-season income, some of them (25%) were engaged in rickshaw pulling, some of them (20%) were engaged in construction work and most of the fishermen (40%) were engaged in day labor (Table 9) which was more or less similar with the findings of Ali. It is also mentioned that boat and net making categorized fishermen were very poor in percentage but they were involved during off-season [5].

In reduction of poverty and to improve livelihood in this area a very limited effort was found from the side of the Government organizations (GOs). In the present days, the Government had distributed some VGF (Vulnerable Group Feeding) card to the poor fishermen in time of off-season. From the present study, it was found that 25% of fishermen got subsidy (VGF card) from government and 75% of fishermen had no VGF card (Table 1) though they were actual fishermen. Through VGF card they got rice 40 kg rice per month for four month only but

Net Annual Income/Year		
Categories (BDT)	**Number of fishermen (n=40)**	**% of total fishermen**
Less than 50,000	18	45
50,001-75,000	10	25
75,001-100,000	8	20
Above 100,000	4	10
Total	**40**	**100**

Table 8: Fishing income/year (BDT) of the fishermen in the study area.

Types of work	No of fishermen (n=40)	% of fishermen	Wage per day (BDT)	Income per year (BDT)
Day labor	16	40	350.00	36,750.00
Rickshaw puller	10	25	350.00	36,750.00
Construction worker	8	20	400.00	42,000.00
No work	6	15	0.00	0.00

Table 9: Fishermen involvement in other activities during off-season (considering 105 days).

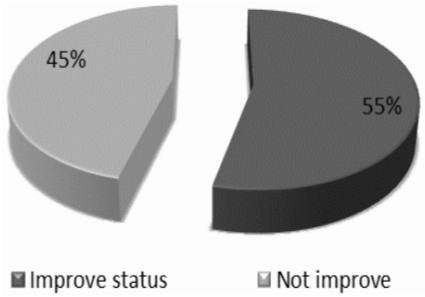

Figure 2: Fishermen improvement status through fishing.

they claim that they don't get full benefit of VGF card provided by the Government. They only get 30-35 kg rice per month and the remaining 5-10 kg rice did not distributed at all.

Livelihood constraints: Day by day increasing price and unavailability of fishing materials like boat, net, ice were main fishing constraints for fishermen whereas most of the fishermen do not get boat during their prime need and a small number of fishermen do not get net, ice, etc.

During off-season, the poor fishermen household suffered food storage and try to consume less expensive foods items, they mostly depended on vegetables and their fish consumption reduce to 1-2 day/week from 4-5 days/week. Fishermen also suffered from various problems such as, inadequate credit facility, lack of marketing facilities, lack of knowledge of fishing, lack of appropriate gears etc., which were similar with the findings of Alam and Hossain [10,11].

Livelihood outcomes: Livelihood outcomes can be thought of as the inverse of poverty. Contributing to the eradication of poverty and food insecurity depends on equitable access to resources, access of disadvantaged groups to sufficient, safe and nutritionally adequate food [12]. In spite of poor resources livelihood outcomes of fish farming are positive and most of them increased their income, food security and basic needs. The survey found that 55% of fishermen had improved their socio-economic condition through fishing. They had better food, clothes, housing conditions and children education. But 45% farmers had not yet been improved their status (Figure 2). Similar results also reported by Halder [13].

Livelihood outcome factors are food security, nutrition, health, income, education, housing facilities, environment, safety etc. The fishermen community goes under food insecurity for 4-5 months in every year. Reason for the food insecurity was off-season of fish catches. Food crisis become severe in the months of April to July. Only a few fishermen those who had agricultural land had food security for the whole year. Educational status of the fishermen in the study area was not good and most of the people were illiterate. But the primary education percentage of the children of fishermen was increasing gradually.

Conclusion

The study was focussed on the livelihood of the Hilsa fishermen of Ramgoti upazila under Lakshmipur district and Subarnachar upazila under Noakhali district, Bangladesh.

Fishers were found to be mostly poor and neglected in the society and are exploited by the rich people/Mohajan/Aratdar in different ways. Many fishers do not have fishing equipment (boat and net) and as such they undertake fishing in Mohajan's boat as labourers or on

catch share basis (paying Mohajan's at 10% according to their catch). About 100% of fishermen used *Chandi jal* (set gill net) of which 85% fishers were used mechanized boat. Among of all fishermen 20 to 30 HP of engine of mechanized boat had the highest number (45%). There is no essential obligation of using license for Hilsa fishing. October to November is the peak season for fishing activity. According to the present study, a fisherman is deceived at Tk. 1095.00 per day by his aratdar. It indicates that this is too hard for a fisherman to maintain his family like food, cloth, medicine or disease treatment, education, homestead maintenance, etc., according to the present life style for a family

The socio-economic condition of the fishermen in the adjacent area was not satisfactory. The fishermen were deprived of many amenities. Thus surviving is the most important thing for fishermen; they find themselves their own alternative income generating sources during off-season.

As fishermen play an important role in catching Hilsa fish under severe stressful conditions, so Government should take some important steps by providing some extra providence (VGF card, providing soft loan, fishing gears and nets, etc.,) during off-season to improve their socio-economic conditions. Government of Bangladesh should ensure that license holders are getting more incentives in all cases like boat making, net weaving, fuel, diesel and engine purchasing and providing VGF than others. Government should implement an act to settle a fixed wage per day for Hilsa fishers and should ensure punishment to those aratdars who are violating the act. Government should check that superscription to the pirates by frequent patrolling by coast guard.

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