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STATUS AND IMPACT OF JATKA CATCHING ON HILSA FISHERY IN THE MEGHNA RIVER AT HIZLA-MEHENDIGANJ REGION OF BANGLADESH

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Abstract: To contemplate the *Jatka* (juvenile *Hilsa*) catching and its ultimate effects on *Hilsa* fishery, twelve landing centers of Hizla-Mehendigonj segment of Meghna river were surveyed from January to May for successive years (2004 and 2005). Both mechanized and non-mechanized boats were used to catch *Jatka* using mainly Trammel net (45% catch) and Purse seine net (35% catch). The number of boats used in *Jatka* catching was increasing every year in the study area. The maximum catch of *Jatka* was observed in the month of April at 32.63 mt in 2004 and 23.52 mt in 2005. The daily catch of *Jatka* by twenty boats ranged from 203.3 to 481.6 kg in April 2004. Considering the *Jatka* production (51,750 kg) in 2004, the probable production of *Hilsa* after one year would be 388.14 mt.

Key words: *Jatka*, *Tenualosa ilisha*, overfishing, landing center, trammel net

Introduction

Tenualosa ilisha is the most important and largest single fishery in the open water of Bangladesh both in inland and marine sectors. The total production of *Hilsa* in the fiscal year 2000-2001 was 2.30 *lac* mt contributing 13.0% of the total fish production (Ahmed and Rahman, 2002). This amount costs about Tk. 23000 millions (Tk. 100 kg^{-1}). In this respect, *Hilsa* contributes near by 21.11% to gross national product (Basak, 2004). A study under Fourth Fisheries Project shows that 447,451 fishermen of 1419 union of 143,333 *Upazila* are directly involved in *Hilsa* fishing and of these fishermen, 65% are from Barishal Division (Anon, 2002). *Hilsa* migrates upstream for the breeding purpose into rivers. Immature young *Hilsa* grow in rivers at first and then descend to the sea for growth and maturity and back to fresh water for breeding to complete the life cycle (Basak, 2004). Fingerlings of size ranging from 4-15 cm of *Hilsa* are called *Jatka*. *Jatka* is available in the Padma, Meghna, Jamuna and in almost all other main rivers and estuaries of the country. The deltaic Meghna is their main nursery area. More than 50% of total *Jatka* are caught from the Meghna river. About 50,000 fishermen are engaged to catch *Jatka* from Padma, Meghna and Meghna estuarine region (Islam, 1998). *Jatka* are the recruiting phase of *Hilsa*. In Bangladesh, juvenile *Hilsa* (*Jatka*) are found in almost all the main rivers, esruaries and even in the floodplains. The largest riverine nursery ground is the Meghna river extending from Shatnol in the upstream to Nilkomol in the downstream. In these areas *Jatka* are caught during January to April with peak in March-April. Thus considering the biological and economical aspect of *Jatka*, Meghna is the most important river for *Jatka* fishery.

From the studies of Fourth Fisheries Project (Anon, 2002), shows that 3,707 and 6,380 tons of *Jatka* were caught in the lower Meghna region and coastal belt in 1993 and 1999 respectively. Overfishing of huge amount of *Jatka* every year may drastically reduce the total production of *Hilsa*. However, in Bangladesh, *Hilsa* fishery is very important and plays a significant role for the national economy as well as in the socio-economics of the fishing community and consumers.

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The present study attempted to finds out the present status and impact of *Jatka* fishing with the effect of this over fishing on the total *Hilsa* fishery as well as its marketing channel from the study area to commercial markets.

Materials and Methods

The survey was conducted at the Meghna river near Hijla-Mehendiganj region, Barishal district. Hijla and Mehendiganj were selected as the nursery ground of *Jatka* from January 4 to May 5 in 2004 and 2005. All the landing centers of the region (12) were selected to collect the information on *Jatka* catching. Ten boat owners, twenty crews and ten fishermen were randomly selected and interviewed through questionnaire from all the landing centers to collect necessary information. The secondary data were collected from twelve *aratdars,* Bangladesh Fisheries Research Institute, Chandpur Riverine Station and *Upazila* Fisheries Officer of Hizla and Mehendiganj *Upazila* to compare the primary data collected from the actual fishermen.

The yearly, monthly, and daily catches of *Jatka* were collected from the previous records of the particular landing centers. Twenty boats were randomly selected and the crews on board were personally interviewed to know the daily catch of *Jatka* during April 2004. Effect of *Jatka* catching on *Hilsa* fishery was determined by the following equation:

$$Pp = (En \times S \times IWG)/100.$$

Where, Pp= Probable production; En= Number of exploited Jatka /year; S= Survival rate (15%, obtained from L-F analysis, BFRI); and, IWG = Individual Weight Gain per year (0. 5 to 0. 6 kg/year obtained from L-F analysis; Anon, 2003).

Results

***Fishing crafts and gears*:** In the study area, small-motorized boats and wooden hull motorboats with gill nets locally called *Tempo* were found as the most important crafts used for *Jatka* fishing. The *Chandi, Khosha and Dingi* (local boats) were usually operated in the study area for harvesting. The boats were found to carry *Gulti jal*, *Kona jal, Chandi jal, Jagot ber-jal* (purse seine), *Behundi jal* (set bag net) and *current jal* (trammel net) from January to May. However, most of the boats were found to operate with Trammel net. The present study found that Trammel net were the main gear used to catch about 45% *Jatka* while 35% by *Jagot ber-jal* and the remaining 20% by other types of gears. According to the investigation it was found that the number of boats used for *Jatka* catching was being increased each year. The number of boats used for *Jatka* catching in the study area in 2002, 2003, 2004 and 2005 were 99, 122, 147 and 125 respectively (Table 1). Minimum six fishermen were involved with each fishing craft or boat. In every boat, fishermen were found in debt with the local *Mohajons* (the whole sellers and money lenders) in terms of cash, boats, engines or fishing gears. Consequently they had to pay by landing their catch to the particular *Mohajon's* landing center.

Table 1. Fishing crafts and gears used in the Meghna river at Hizla-Mehendigonj between 2002 and 2005.

Year	Types of gear	% of *Jatka* capture	Number of boat
2002	*Current jal*	-	99
	Jagat ber jal	-	
	Others	-	
2003	*Current jal*	-	122
	Jagat berjal	-	
	Others	-	
2004	*Current jal*	45	147
	Jagat berjal	35	
	Others	20	
2005	*Current jal*	40	125
	Jagat berjal	45	
	Others	15	

Jatka catching trend: Data of consecutive two years on *Jatka* catching were compared with those of the previous three years recorded by the local stakeholders. Table 2 shows the amount of capture of *Jatka* in peak season from 2001 to 2005 in the study area. In the peak season of the *Jatka* catching, April was found as the month of highest catch. The total quantity of *Jatka* caught was highest in 2001 and 2003 but it was found to decrease gradually in the following years (Fig. 1). The catch in 2005 was lower than that in 2004 due to

destruction of some landing center by breaking of riverbank. There were eight-landing center and the rest were broken down into the river. Fig. 1 shows *Jatka* catch from the river near Hizla-Mehendiganj during the study period. Here the maximum catches were found at 32.633 and 23.52 mt in April of 2004 and 2005 respectively while the catches were the minimum in May at 2.561 and 3.142 mt of 2004 and 2005 respectively.

Table 2. Volume of harvested *Jatka* from January to May during 2001 to 2005 in the Meghna river near Hizla-Mehendiganj area.

Month	2001	2002	2003	2004	2005	Month Mean	Month SD
Jan	7.52	6.21	5.64	7.52	4.13	6.21	1.420
Feb	9.67	7.63	7.24	9.16	6.02	7.95	1.479
March	11.21	9.12	8.92	10.22	8.42	9.58	1.124
April	33.45	28.56	26.52	32.63	23.5	28.94	4.163
May	2.57	3.56	3.41	2.56	3.14	3.05	0.466
Total	64.43	55.10	62.09	51.75	45.23	55.72	7.789
Year Mean	12.88	11.02	10.35	12.42	9.04		
Year SD	11.95	10.02	9.27	11.68	8.33		

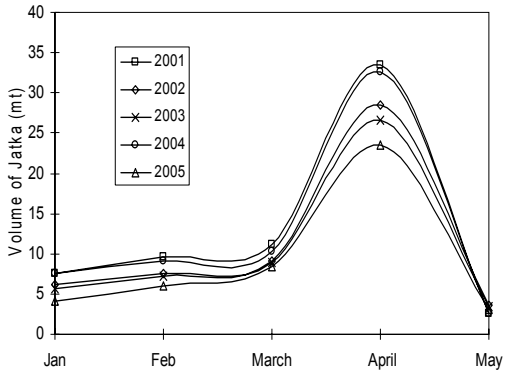

Fig. 1. Monthly variation in *Jatka* catches from the Meghna river at Hizla-Mendigonj in different months from 2001 to 2005.

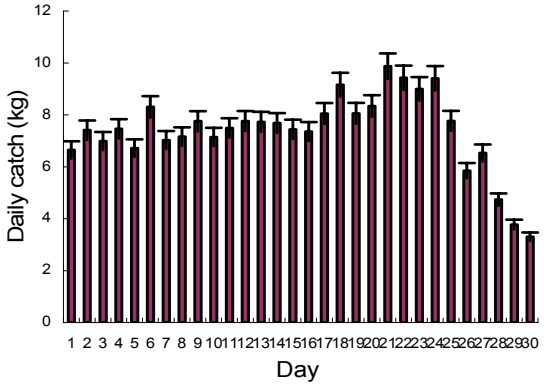

Fig. 2. Daily average catch of *Jatka* of 20 boats from the Meghna river at Hizla- Mendiganj in April 2004.

Quantity of Jatka landed in different landing centers in 2004 and 2005: In the study area (Meghna river) the total catch was landed in 12 different centers. Various types of fishes were landed in those landing centers. Each *aratdar* had own landing center. Sometimes two or more landing centers were found at the same place. *Aratdars* lend money (*Dadon*) and other necessary support to the fishermen to catch fish. Thus the fishermen were bound to land their catch to the particular landing centers (Table 3). In 2005, there were eight landing centers were present. The amount of *Jatka* landed at Latif fish, and Ratan Bapary, Aliganj ghat was maximum (> 6 mt) whereas the landing almost was half of them at Masud fish center and Babul Majhi fish center in 2004. The amount of *Jatka* landed at other landing center was more or less same.

Table 3. Estimated landed volume (mt) of *Jatka* at selected landing centers at Hizla-Mendigonj between 2004 and 2005.

Sl. No.	*Jatka* landing centers	Landed volume in 2004 (mt)	Landed volume in 2005* (mt)
1	Kaliganj Ghat, Kaliganj.	5.54	5.33
2	Pinto fish, Kaliganj	5.16	-
3	Mirermoshzid Ghat fish center, Mirermoshzid Ghat	4.96	5.65
4	Mashud fish center, Mirermoshzid Ghat	3.23	-
5	Babul Majhi, Mollikpur	3.57	-
6	Alauddin Majhi, Mollikpur	5.29	4.86
7	Mollikpur Fish Center, Mollikpur	4.79	6.03
8	Latif Fish, Aliganj Ghat	6.91	-
9	Ratan Bapary, Aliganj Ghat	6.22	6.93
10	Tapuchowdhury Fish Center, Puberchar	5.21	5.12
11	Mokbul Daptory, Puberchar	5.7	3.9
12	Puberchar Fish Center, Puberchar	5.48	5.5

* Value is for five months

Daily catch: In the year 2004, maximum *Jatka* was caught during the month of April. The total amount of *Jatka* caught by twenty boats in April 2004 was observed estimated to be 5844 kg. The daily catch of *Jatka*

by twenty boats ranged from 203.3 kg to 481.6 kg, among these catching by 6 boats were more than 400 kg and by others around 200 kg.

Preservation: In the study area the fishermen did not preserve *Jatka* during harvest, they only landed their catch to the particular landing center and then the capture was preserved by the *aratdar* using only ice as there was no processing industry.

Marketing system: The fishermen sell the *Jatka* landed on the landing center to the middlemen through the auction systems and *aratdar* got 5% of the sale money. The price of *Jatka* depended upon the season, size of the *Jatka* and market demand. During the study period it ranged from Tk. 35 to 55 kg^{-1}. The consecutive trading of *Jatka* involved a series of intermediaries between the first middleman and consumer (Fig. 2). The middleman then carried those *Jatka* to different parts of the country; mainly to Dhaka, Chandpur and Barishal. Among the local markets the *Jatka* was carried mainly to the Hizla main Bazar, Ulania Bazar, Kaliganj Bazar, Kalikhuola Bazar, Mollikpur Bazar, Hajir hat, Lalganj Bazar, Aliganj Bazar etc. During transportation they carry the *Jatka* through launch, trawler and for the purpose of preservation they use *Hogla Chach* (mat) and large bamboo basket (*Jhuri*) using ice inside the pack. For transporting to the local market they carry *Jatka* through van, rickshaw, small boat and even on foot, and they use ice according to the distance of the market and transporting time (Fig. 3).

***Effect of Jatka catch on Hilsa fishery*:** The *Jatka* production in 2004 was 51750 kg (Table 2). The average weight of *Jatka* was 10 g in the study area having 51, 75,000 individuals of *Jatka* were landed. The probable production after one year would be 388.14 mt considering mortality rate 85% and average weight gain would be 0.5 kg yr^{-1} (Anon, 2003). From the above calculation it is revealed that if the captured *Jatka* (51.752 mt) will not be harvested; the production would be attained 388.14 mt *Hilsa* in the next year. The average price of *Jatka* was Tk. 35 kg^{-1}. Thus the total price of *Jatka* was Tk. 1,811,320 where the total price of *Hilsa* would be Tk. 31,051,200 yr^{-1} (Tk. 80 kg^{-1}). Therefore, the average loss is Tk. 29,239,880 yr^{-1}.

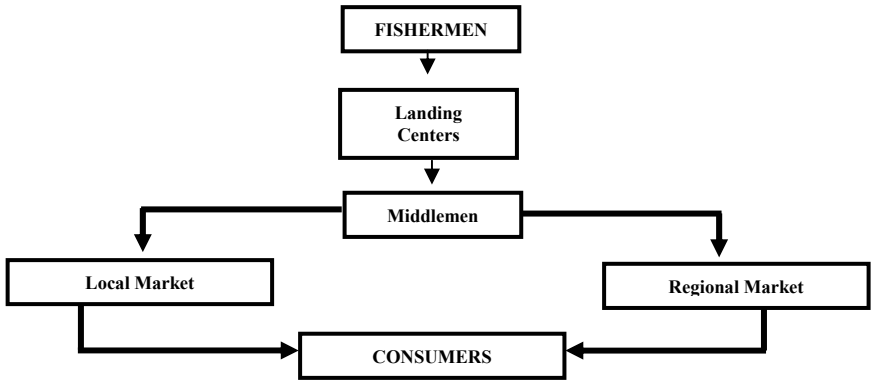

Fig. 3. Marketing channel of *Jatka* fishery in the *Meghna* river.

Discussion

Fishing crafts and gears*:** Bangladesh Fisheries Research Institute (BFRI) conducted a survey in 1992-94 and estimated that every year in a fishing season from January to April, about 3,500-4,000 mt of *Jatka* are caught by using different types of gears such as *Jagot ber jal*, *Current jal* and *Behundi jal*. According to Halder *et al*. (2004), 50% *Jatka* were caught by *Jagot ber-jal,** 40% by *Current jal* and the rest 10% by *Behundi jal* and other gears in Bangladesh. About 80% of the total *Jatka* was caught from the Chandpur area of Meghna river with the Purse seine (Mazid, 1998). Others important gears used to catch juvenile *Hilsa* were *Current jal*, *Poa jal* and *moshary jal* (One kind of local net).

Jatka catching trend: In the riverine nursery ground, the abundance of *Jatka* was found from November to April and peak in March in the year (Rahman *et al*., 1995) which supports the present findings. January to May of the year is considered as the peak season of *Jatka* catching (Mazid, 1998). *T. ilisha* is capable of withstanding a wide range of salinity (Mazid and Blaber, 1998). It feeds and grows mainly in the sea, but migrates to fresh water for spawning (Haroon, 1998). Juveniles *T. ilisha* develop and grow in the fresh water, but soon migrate to the ocean, where they spend most of their lives (Amin *et al*., 2004). In some years, they

occurred during mid May to the end of May. The catch of *Jatka* would start in Meghna river and around Chandpur in November and continued up to June with peak in March and in coastal area comparatively large sized (11-15 cm) *Jatka* were caught during December-January (Mazid, 1998). The increasing catch of *Hilsa* in marine resources indicated the change of migratory routes of *Hilsa* from up stream to downward (Miah *et al*., 1997). Though the amount of total capture fishery in the country has been increasing, the *Hilsa* fishery has been decreasing day by day. It may be due to overfishing of *Jatka* using *current jal* and *jagot ber jal*, destruction of breeding, nursery and feeding grounds, decrease of water areas due to irrigation and flood control schemes, indiscriminate use of pesticides and discharge of toxic wastes in the water bodies (Halder *et al*., 1992; Talukder, 1997).

Amount of Jatka landed in different landing centres in 2004 and 2005: Ahmed *et al.* (2002) reports that in 2000 the estimated annual *Jatka* catching for Chandpur (Meghna- Shatnol, Hajimara, Nilkomol and Hizla area), Rajbari, Barishal (Tetulia, Kirtankhola) and Khulna (Rupsha, Shipsa and Poshur) were 18403, 466.2, 43.2, and 202 mt respectively having total catch to be estimated at 19,258.32 mt caught from the major rivers of Bangladesh.

Daily catch: The amount of *Jatka* caught in March and April was at 3,000 and 11,000 mt respectively having 50-60% of total *Jatka* harvested in 1992-1994 from which it was calculated that *Jatka* was caught daily at 366.6 mt in April throughout the country (Halder *et al*., 2004).

Preservation: Basak (2004) reported that in respect of *Hilsa* fish, quick marketing is practised. About 87.78% *Hilsa* fish is reached as immediately as possible to the *arats* and then preserved with ice, while 12.22% *Hilsa* caught from the estuarine and marine waters were preserved on boats as a temporary basis.

Marketing system: The trading pattern of *Hilsa* production involved a series of intermediaries between fishermen and consumer in two distinct phases; firstly *Hilsa* from the harvesters would directly go to the consumer through a series of intermediaries. Secondly, *aratders* would supply fish to the National market or processing industries which would ultimately be exported to foreign countries (Basak, 2004).

***Effect of Jatka catch on Hilsa fishery*:** The production will increase by over Tk. 6,000 crore a year if *Hilsa* fry catching are stopped all over the country (Anon, 2005). In 2000, the total catch of *Jatka* was estimated to be about 19200 tons throughout the country. It is considered that, if 10 to 15 % of *Jatka* could be protected, additional amount of 150,000-200,000 mt of *Hilsa* would be available for capture the next year (Mazid, 2001). In Meghna river around the Chandpur covering Shatnol to Nilkomol, the catch was estimated at 3,456 mt, which equals to 442.37 million individuals during January to April with a peak in March –April every year, reflecting the damage of the *Hilsa* production every year.

Conclusion

Production of *Jatka* will reset brood *Hilsa* and more recruitment of *Hilsa*. Therefore, it is important to regulate indiscriminate killing of *Jatka* by increasing people's awareness through mass media, training, and demonstration not to catch and by prohibiting the use of *Jagot ber jal* and *current jal* with mesh size smaller than 10 cm to enhance the production and export of the *Hilsa* fish.

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