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Indiscriminate killing of *Pangasius pangasius* (Hamilton, 1822) in Openwater Habitat of Bangladesh

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Abstract

A study was conducted to assess the degree of indiscriminate killing of *Pangasius pangasius* (Hamilton, 1822) [6] in upper and lower Meghna and Padma river of Bangladesh. A total of 08 study areas were pre-selected in the rivers during peak killing season from November 2012 to May 2013. Three types of fishing net such as gill net (Current jal), set bagnet (Behundi jal) and barrier net (Charghera jal), and two types of fishing trap pangas chai and hook line (Borshi) were found to be involved in arbitrary killing of pangas fry in open water habitat. Among the arbitrary gears pangas chai has shown the highest efficiency in catching juvenile pangas in different sampling locations. In Barisal, Monpura and Hatia the highest CPUE of pangas chai were 81, 101 and 100 kg/haul, respectively in the month of May and the lowest CPUE was 25, 23 and 19 kg/haul, respectively in the month of January. The maximum average CPUE of pangas chai was found 48.14 kg/haul in Monpura and lowest average CPUE was 22.67 kg/haul in Haimchar. More intense use of pangas chai was found in Barisal, Monpura and Hatia. The highest average length and weight of juvenile pangas was 22.22 cm and 77.51 g, respectively while the lowest average length and weight of juvenile pangas was 15.71 cm and 43.1 g, respectively. The highest CPUE of pangas chai was found 101 kg/haul in May in Monpura by 100 kg in Hatia.

Keywords: Pangas chai, indiscriminate killing, native pangas, CPUE, fishing trap

Introduction

Bangladesh is endowed with its vast freshwater areas, which include the great Meghna, Padma and the Jamuna rivers and their innumerable tributaries, and one of the richest areas in this sub-continent in respect of freshwater fishery. Rivers and canals cover about 5.8% of the total area of the country. Other than cyprinidae, the catfishes are the most prominent freshwater fish fauna. At least 55 species of catfishes belonging to 30 genera have been recorded so far in Bangladesh (Rahman, 1989) [5]. *Pangasius pangasius* (Hamilton) is one of the largest catfishes abundant in the rivers and estuaries of Bangladesh. *P. pangasius* is a euryhaline fish species occurring in high estuary (freshwater tidal zone) as juveniles, moving to brackish water as sub-adults, and finally as adults to river mouths and inshore areas. It is a tasty fish having high demand and market price all over the country. Flesh of mature and older *P. pangasius* contains thick layer of fat (Rahman, 2005) [16]. The liver of this fish contains vitamin 'A' (Seshan, 1940) [23]. It is a voracious omnivore but non-predacious in feeding habit (David 1963) [3]. It takes crustaceans, insects, small fish, shrimps, molluscs, snails, offal's, putrefying animal flesh, blood, crabs, rice bran, wheat bran, mustard oilcake, sesame oilcake, fruits, roots, leaves, pulses, potatoes, stems, chilly, seeds etc. as food (Ramakrishniah 1986, Ali *et al.* 1985, David 1963) [1, 3, 22]. *P. pangasius* is a freshwater monsoon spawner, which breeds in the shallow region of river where water current is sluggish (David 1963) [3]. Systematic, biology, distribution, migration, age and growth, length-weight relationships, food and feeding habits, gastro-somatic index, first maturity, gonado-somatic index, fecundity, egg characteristics, fishery and rearing of *P. pangasius* in ponds have been reported by Hora (1923, 1939, 1952), Job *et al.* (1955) [12], David (1962, 1963) [3], Pantulu (1962) [14], Bardach *et al.* (1972) [2], Ali *et al.* (1985) [1], Hannan *et al.* (1988) [7], Rahman *et al.* (1991, 1992, 1994) [17, 19, 20] and Rahman (1992) [19]. First breeding success of *P. pangasius* occurred in 2004 in Riverine Station, BFRI (Rahman *et al.* 2006) [21].

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Fingerlings of *P. pangasius* averaging 30-50 g corresponding to 10.0-25.0 cm are caught by box traps from the River Meghna near Chandpur during the month between March and April. Large *P. pangasius* is caught by submerged drift gill nets in August to December especially during full moon and new moon (Rahman 1992) [19]. In recent years, catches of adult *P. pangasius* have declined critically due to increasing fishing pressure and habitat degradation (Rahman *et al.* 1994) [20]. Moreover, natural spawning areas of this fish have decreased rapidly, limiting the natural recruitment. *P. pangasius* has disappeared from many northern rivers of Bangladesh including the Kaptai Lake (Rahman *et al.* 1994) [20]. As a result currently the species is surviving under endangered conditions (IUCN 2003) [11] and needs protection from extinction. Therefore the present study was undertaken to assess the degradation of indiscriminate killing of juvenile pangas (*P. pangasius*) in Meghna and Padma rivers in order to take their conservation measures. Identification of gears & traps used for catching juvenile pangas was also a major objective of the study.

Materials and Methods

To assess the indiscriminate killing of *P. pangasius* (Hamilton, 1822) [6] in the major river system of Padma and Meghna of Bangladesh a comprehensive study was conducted during peak killing season from November 2012 to May 2013.

Data were collected through in situ observation on monthly basis from different gears of 8 pre-selected points of upper and lower Meghna and Padma river *viz.* Chandpur Sadar, Haimchar, Char Vairabi, Ramgati (Laxmipur), Hatia, Barishal, Monpura (Bhola) and Sureswar (Shariatpur). Mechanized boat was used for sampling and data collection. Major spawning grounds of native pangas and related areas were taken into consideration for comprehensive study. Length-weight and CPUE (Catch per Unit Effort) data of *P. pangasius* were recorded from captured species collected from the major landing centers and the fisherman in the study areas.

Some of data were collected in local units due to familiarity for respondents. These were converted into international units before data analysis. All the collected data were accumulated and coded for analyzed. Data was analyzed by using Microsoft Excel, statistical packages (SPSS).

Results and Discussion

Indiscriminate killing of juvenile pangas from the Meghna and other rivers of Bangladesh is a burning issue now a day. Therefore, a study was conducted to assess the indiscriminate killing of pangas seed. Monthly data were collected from the 8 study areas. Three types of fishing net such as gill net (current jal), set bagnet (behundi jal) and barrier net (chaghera jal) and two types of fishing trap pangas chai and hookline (borshi) were identified those were used for pangas fry killing in Padma and Meghna rivers (Figs. 1 & 2). Among the gears pangas chai are too much harmful that kills pangas indiscriminately (Fig. 4).

Gill net (current jal) generally small mesh (15-50 mm) monofilament fixed gill net usually used to catch small species (Fig. 6). A number of pieces of net are joined together and set in river. Each piece of net is about 12-26 m long and 0.5-1.0 m wide. Various mesh sizes are used in different river. *Current jals* with a small mesh (15-25 mm) are used for catching fingerlings of *P. pangasius*. The *current jal* is an

extremely effective net and has been banned by the government because of its potential to overexploit juvenile fish species. It is considered to be one of the most harmful nets and is responsible for the decline in fish populations in rivers. Kibria *et al.* (2005) [13] found gill net (*current jals*) with larger mesh sizes (30-50 mm) are used mainly for capturing rohu, catol, common carp, boal and 'air' (*Mystus aor*) while nets with a small mesh (10-20 mm) are used for catching fingerlings of fish species.

The set bagnet is a traditional fishing gear widely used in river especially in the coastal area of Bangladesh. The set bagnet is regarded as one of the most damaging gears in use for juvenile pangas catching. The set bag net (*behundi jal*) operated from boats. These fixed types of gears with very fine mesh net are set across the river. The cod-end of the net is emptied at half to one hourly interval. The strong current brings debris, pieces of wood, mud etc. along with pangas fry inside the net.

The barrier net (*Chor ghera Jal*) is several meters long and about 3-4 meters wide made of netting with very small meshes (Fig. 5). The net operated in shallow areas where the bottom gets partially or fully exposed during low tide. The netting is mounted to a slender rope on the upper side and a stout rope in the lower side. The net is operated especially during spring tide in the winter season. The barrier net was found in the lower part of Meghna river such as Monpura, Hatia. This net was identified as harmful gear for pangas fishing due to indiscriminate killing efficiency of juvenile pangas.

In Hooks or long line fishing hooks or metallic points are used to catch fish by ripping them when they pass near. The fish are attracted by a natural or artificial bait (lures) placed on a hook and line units may be used singly or in several numbers may be used in surface or in bottom. Lines with multiple hooks are operated in the Meghna River of Barisal, Chandpur, Monpura and Hatia region for catching *P. pangasius* fry (Fig. 2).

Pangas chai is made by bamboo sticks and synthetic rope having a mesh size of 0.5-1.0 cm and length 2.3-2.6 m. Fish lure is used inside the gear to trap fish in the chai (Fig. 3). Fish lure is prepared by using several ingredients *viz.*: mustard oil cake/ sesame oil cake, cheap rice, fed rice, sugar/ sweetmeat juice/ molasses and dried fish (Native punti, *Puntius sp.* Chewa, *Pseudapocryptes elongates* etc.). The native pangas fishery is suffering from serious recruitment over-fishing due to indiscriminate catching of juvenile pangas. There are innumerable numbers of fishing traps are also used inland water of Bangladesh.



Fig 1: Pangas chai in Monpura



Fig 2: Hookline (Borshi) in Barisal



Fig 5: Barrier net (*Chor ghera Jal*)



Fig 3: Lure method of pangas chai



Fig 6: Gill net (current jal)



Fig 4: pangasius caught by pangas chai

The results of the study showed that, in Barisal, Monpura and Hatia the highest CPUE of native pangas were 81, 101 and 100 kg/haul, respectively in the month of May and the lowest CPUE was 25, 23 and 19 kg/haul, respectively in the month of January (Table 1).

The study revealed that, in Haimchar the highest CPUE of native pangas was 30 kg/haul in the month of February and the lowest CPUE was 15 kg/haul in the month of January (Table 1). In Charvairabi the highest CPUE was 48 kg/haul in the month of May and the lowest CPUE was 20 kg/haul in the month of December (Table 1).

Table 1: Monthly CPUE (kg/haul) of Pangas Chai from different places

Month	Barisal	Monpura	Hatia	Haimchar	Charvairabi	Sureshwar	Chandpur	Ramgati
November	50	64	48	28	30	38	40	42
December	40	47	42	16	20	29	34	31
January	25	23	19	15	21	24	22	26
February	28	26	30	30	33	28	31	33
March	35	40	36	19	24	18	22	14
April	32	36	37	28	38	36	32	26
May	81	101	100	-	48	58	-	38

The investigation found the highest CPUE in Sureshwar was 58 kg/haul in May and the lowest CPUE was 18 kg/haul in the month of March. In both Chandpur and Ramgati the highest CPUE was found in the month of January and the lowest

CPUE was 14 kg/haul in Ramgati in March (Table 1), which contradicts the findings of Rahman (1992) ^[19] who found in his study that the major portion of pangas fingerling was caught in Chandpur in the month of March and April

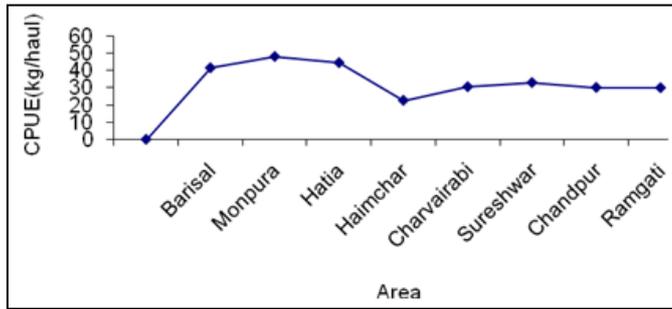


Fig 7: Average CPUE (kg/haul) of Pangas chai according to different area

The present study showed that the highest catch of pangas caught in Chandpur was found in November. The present study also revealed that average highest CPUE of pangas chai was 48.14 kg/haul in Monpura and average lowest CPUE was 22.67 kg/haul in Haimchar. From the results it is also found that massive indiscriminate killing of juvenile pangas occurs in the mouth of the River Meghna at Barisal, Monpura and Hatia (Fig. 7).

Rahman *et al.* (1994) [20] found catches of *P. pangasius* declined critically due to increasing fishing pressure and habitat degradation. Present study is on line with the results of Rahman *et al.* (1994) [20]. The study revealed that the average highest length and weight of juvenile native pangas was 22.22 cm and 77.51 g, respectively and average lowest length and weight of juvenile native pangas was 15.71 cm and 43.1 g, respectively (Fig. 8) but, Rahman (1992) [19] found an average 30-50 g fingerlings of *P. pangasius* corresponding to length of 0.0-25.0 cm in his study. However results of the present study were more or less similar with those of Rahman (1992) [19].

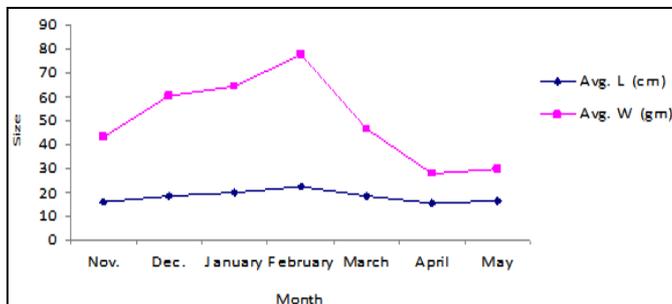


Fig 8: Monthly Average length-weight of pangas caught by pangas chai

Conclusion and Recommendations

Pangasius pangasius is a very tasty and high demandable fish in Bangladesh. Present study indicates that a huge number of juvenile pangas are caught every year in the Meghna and Padma rivers. This information is very much alarming for natural recruitment of *P. pangasius*. Government needs to take proper management measures for the conservation of native pangas like hilsa (*Tenualosa ilisha*) fish.

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