

Fishing Gears used by Riparian Fishers Posing Threat to the Conservation of Rare Fish Fauna in North Bihar

Anand Mohan Verma

*Department of Fisheries
Sitamarhi, Bihar - 843 301*

Riparian fishers, the hunters of wild fish fauna over generations adopted different techniques and gears for capturing fishes in different parts of the world. In this study different fishing gears used by Riparian fishers of north Bihar harvest for harvesting the fishes in the lotic water system are described. Traps of different shapes and sizes are used throughout the year to trap the fishes which account to majority of carnivorous types. The trapping of fishes was maximum during night but low during day. Wanton killing of juveniles and fingerlings of commercially important Indian major carps and low priced fishes can reduce the potentiality of riverine fish yield and also diminish the population of future brood fishes considerably.

Key words : Gears, Riparian fishermen, Bihar

North Bihar is bestowed with the network of ephemeral, intermittent and perennial river systems, which are the most important capture fishery resource. These lotic water systems harbour abundant and diverse types of biotic organisms and the richest freshwater ichthyofauna of Northern India. This bio-resource provides a means of livelihood to the poor fishermen and is an important contributor to the state's total fish production. Riparian fishers of north Bihar adopt different techniques to capture the fishes from these riverine network. Determination of the techniques for the capture of any fish from the wild depends largely on a close understanding of its behavioural pattern, ecological conditions of its living habitat (Verma, 2005) and topography also (George, 1971). The techniques for the operation of gears have come into existence based on the knowledge gathered by traditional fishermen thorough ages. References throwing light on fishing gears and methods include Hornell (1224), CSIR (1962),

Saxena (1966), Krishnamurthy & Rao (1970), George (1971), Algaraja (1977), Bilgrami & Dutta Munshi (1985), Ahmad & Singh (1991), Hassan *et. al.* (1988), Talwar *et. al.* (2005), Verma (2005) and others. In the present communication, fishing appliances and techniques adopted by the local riparian fishers to capture the fishes in the lotic water system and their impact on conservation of fish fauna in north Bihar are discussed.

Material and Methods

Data for the present study was collected during June, 2002 to May, 2003 in Raxi *dhar* (Rivulet) connected to PWD department channel of Darbhanga district. Total 21 stations in a stretch of 5 km. were selected for the study of types of gears operated by the local riparian fishers and period of their operations, total catch, species composition and effort exerted. Total fish catch during the study period was computed throughout using the following formula,

Total Fish Catch = Catch per unit effort x Total number of effort per day x number of days.

Fishermen used different types of traps throughout the year, but exercised other appliances such as screens, *khaur baarhi*, (June, 2002 to August, 2002) and *Chhani baarhi* (September, 2002 to December, 2002), lift net (June, 2002 to August, 2002), gill net (September, 2002 to May, 2003) and drag net (September, 2002 to May, 2003).

Results and Discussion

Traps of different shape and size are used by the riparian fishers in North Bihar region to catch the fishes. These traps are cuboid, cube and conical in shape (Fig.1a) and are made of bamboo sticks. All the traps have one opening on one side to allow the fishes to get in and second opening on another side to collect the trapped fishes. The entrance opening is guarded by re-curved bamboo sticks with their free ends facing towards the inner side. Such fabrication prevents the fishes to escape.



Fig 1(a) : Different Types of Traps

To catch the fishes of different size, the fishers used cuboidal traps of different size locally called *Tehuka* (length -1.5 m, breadth -1.0m, height-0.5m), *Tabhka* (length -1.5m, breadth -1.25m, height -1.0m), *Tabhki* (length - 0.8m, breadth -1.0m, height -0.5m) and *Saraili* (length - 1.0m, breadth - 0.3m, height

-0.3m). In *Tehuka* and *Tabhka*, fishes of more than 250 gms weight were trapped whereas in *Tabhki* and *Saraili* fishes less than 250 gm weight were caught.

Cube traps are small in size and suitable to trap the low priced fishes, *Ghana*, *Ekhari* and *Duhari* having their edges 0.5m, 1.0m and 0.8m respectively were the common cube traps in this region. In *Ghana* and *Duhari*, there is only one opening to enter the fishes, but *Ekhari* is provided with two entrances. Locally called *Anta*, it is a conical trap having the diameter of 0.5 m at one end through which the fishes get in. It is 1.0 m long and the fishes of more than 250 gm weight were found to get trapped in it.

Screens are mattresses made of interwoven slender bamboo sticks. These are used to erect a barrier locally called *Baarhi* to obstruct the flow of running water. Screens are fixed firmly with the help of bamboo poles. In such device there is one or more narrow openings for the fishes to pass through along with the water current. Local fishermen fix traps (*Anta* or *Ghana*) in these opening of *Baarhi* and is called *Anta* or *Ghana Baarhi* (Fig. 1b).



Fig 1(b) : A Fisherman Placing Anta
PS = Pen Screen / AN = Anta

During monsoon period a 21.0m long bag net having 1.0m wide mouth with its mesh size near the mouth and hind end 4.0 cm and 1.0 cm respectively is tied along the

opening space of the screen. Such device is known as *Khaur Baarhi* (Fig. 1c). But in post monsoon period, riparian fishers adopted *Chhani Baarhi* to capture the fishes after replacing bag net with a closely woven mattress made of bamboo slits (measuring 3.0 m x 1.5 m size). This mattress is curved to facilitate the formation of a passage. One end of this passage is closed whereas another end remains open and is connected to the opening of the barrier pen towards the down stream (Fig 2a). This passage acts as filter.



Fig 1(C) : A Khaur baarhi erected
PS = Pen Screen / BN = Bag Net submerged in water



Fig 2(a) : A Chhani baarhi erected
SP = Screen Fabricated As U Shaped Passage / PS = Pen Screen / BP = Bamboo Pole

In north Bihar, three types of nets are used by the fishers to capture the fishes in riverine ecosystem. Fishing with small meshed nets, through, prohibited by the State Fishers Department were also common in several areas. Gill net locally called *Phasa Jal* made up of nylon monofilament is stretched across the river banks and is fixed by bamboo poles. When the fish tries to swim through it, its head gets entangled in

the mesh and the fish is caught. Lift net known as *Bisari* is a large sized triangular nylon made mosquito net framed with two long bamboo poles to make the net 'V' shape. This net is operated from a platform made of bamboo poles fixed in the river bed (Fig. 2b). Fishermen use bamboo poles as a lever to operate the lift net. Drag net is locally known as *Chatti Jal*. It is nylon made mosquito net. One end remains on the bank of the river whereas rest portion of the net is spread in the water and the slowly dragged in semicircular way by the fishermen. In north Bihar, fisher folks use dolphin body oil as fish attractant. A mixture of soil and rice bran is kneaded in water and dolphin oil to make small sized spheres. After sun dry these spheres are plunged into water to attract fishes from neighbouring areas.



Fig 2(b) : A Lift Net with Platform
LN =Lift Net / BP = Bamboo Pole / PF = Platform

Although 34 fishes species were captured in different appliances during the study period (Table -1), results showed that highest fish catch in *Khaur Baarhi* was during June, 2002 to August, 2002 which was due to trapping of higher number of gravid carps and other fishes (Table-2). Mature carps migrated from the aquaculture water bodies to the rivulet along the current of flood water (Verma, 2005). Fast current velocity and high

Table 1. Fish species captured in fishing appliances

Sl No.	Zoological Name	Local Name
1	<i>Agrichthys seenghala</i> sykes	Kanti
2	<i>Amphipnous cuchia</i> Ham	Bami
3	<i>Anabas testudinieus</i> Bloch	Kahai
4	<i>Botia dario</i> Ham	Baghi
5	<i>Catla catla</i> Ham	Catla
6	<i>Channa punctatus</i> Bloch	Garai
7	<i>C. striatus</i> Bloch	Saura
8	<i>C. marulius</i> Ham	Saura
9	<i>C. gachua</i> Ham	Saura
10	<i>Chanda nama</i> Ham	Chanda
11	<i>C. rango</i> Ham	Chanda
12	<i>Cirrhinus mrigala</i> Ham	Naini
13	<i>C. reba</i> Ham	Reba
14	<i>Colisa fasciatus</i> Bl & Sch	Khesara
15	<i>C. latius</i> Ham	Khesara
16	<i>Eutropiichthys vacha</i> Ham	Bachwa
17	<i>Gudusia chapra</i> Ham	Suhia
18	<i>Labeo bata</i> Ham	Bata
19	<i>L. gonius</i> Ham	Kursa
20	<i>L. panguisa</i> Ham	Rewa
21	<i>L. rohita</i> Ham	Rohu
22	<i>Macrognathus aculeatus</i> Bl.	Gaichi
23	<i>Mystus bileekeri</i> Day	Tengara
24	<i>M. menado</i> Ham	Belonda
25	<i>M. tengara</i> Ham	Tengara
26	<i>Nandus nandus</i> Ham	Dhalwa
27	<i>Notopterus chitala</i> Ham	Chittal
28	<i>Oxygaster bacaila</i> Ham	Chehalwa
29	<i>Puntius ticto</i> Ham	Pothi
30	<i>P. sarana</i> Ham	Pothi
31	<i>P. conchoni</i> Ham	Pothi
32	<i>Tetraodon cutcutia</i> Ham	Pokcha
33	<i>Wallago attu</i> Bl & Sch	Boari
34	<i>Xenentodon cancila</i> Ham	Kauwa

water level enhanced the quantum of fish catch. These factors were also responsible for high fish catch through lift net. During September' 2002 to December' 2002, flow of

water from *Chaur* (flood plains) to rivulet carried majority of wild fishes and juveniles of carps. But weakening of current velocity and decrease in water level brought down the fish catch. Fish catch in different traps accounted majority of carnivorous fishes. It is remarkable that trapping of fishes was maximum during night but low during the day. Low fish catch during the day was due to human activities. Low fish catch in gill net was recorded as entangled fishes predominantly belonged to small size groups of carps and catfishes. Talwar *et. al.* (2005) discussed the efficiency of gill net to catch carps, catfishes and other fishes. Exercise of drag net showed high catch because fishes of all size groups are caught. These appliances caused detrimental effect to the sustainance of fish fauna because even the rare forms were not spared. **Table-1** revealed that even vulnerable (*Eutropiichthys vacha* and *Puntius sarana*) and indeterminate (*Gudusia chapra*, *Labeo gonius*, *Mastacembalus armatus*, *Mystus tengara*, *Nandus nandus*, *Notopterus chitala*, *Puntius conchoni* and *Xenentodon cancila*) fishes as categorized by NBFGR (1994) were captured rather more easily under *Channi Baarhi*. Wanton killing of juveniles and fingerlings of commercially important Indian major carps and low priced fishes after the operation of *Channi Baarhi* and mosquito net during post monsoon period could reduce the potentiality of riverine fish yield and also

Table 2. Total Fish Catch in Different Appliances

Name of Fishing Appliances	Period of Operation	Total Fish Catch (Wt. In Kg.)
Traps	June' 02 to May' 03	610
Lift Net	June' 02 to Aug' 02	900
Gill Net	Sept' 02 to May' 03	320
Drag Net	Sept' 02 tp May' 03	1060
Khaur Baarhi	June' 02 to Aug' 03	2350
Chhiani Baarhi	Sept' 02 to Dec' 02	1574

diminish the population of future brood fishes considerably. Bilgrami & Dutta Munshi (1985) reported the collection of 150 to 30,000 fingerlings of carps per day in the river Ganga. Ahmad & Singh (1991) reported that IMC constituted only 21% of total riverine catch. According to Hassan *et. al.* (1998), Devadasan (2005) and Vass (2005), indiscriminate fishing of brooders, juveniles and fingerlings had led to the reduction in fish stocks and disappearance of many rare species in the rivers. Mesh size regulation, banning on catching juveniles, observing closed seasons at least for two months (July-August) and discouraging the use of mosquito nets are some of the management norms suggested for conservation of riverine resources (Nath, 2005). The study emphasises the need for conserving the resources rather than exploitation.

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