

Fishery in Paddy Fields in Purba Medinipur District, West Bengal, India

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Abstract: India, my country is blessed with almost all types of natural resources of water bodies and huge number of fish biodiversity. Paddy field is a natural water resource and fishery in paddy field is one of the most important fisheries in West Bengal. This paper is written on the basis of my own practical experience. During the last two decades of twenty century, a large amount of fish and prawns were caught from paddy fields and marketed in different fish markets in the district of Purba Medinipur. About 26 varieties of fin fishes and shellfishes (prawns) were caught from the paddy field. From the beginning of the twenty-first century, paddy field fishery has been decreasing and now it stands on the bottom level due to malpractices in paddy culture techniques.

Keywords: Fishery, Fishing Traps, Paddy Field, Endangered Fishes, Disease, EUS

1. Introduction

Primitive men were totally dependent on the world life existing around him to fulfill his everyday needs. Since prehistoric times they have been using different methods to catch fishes and the fishing gears have undergone evolution in different parts of the world giving rise to various methods of the present day. The method in use at a particular place depends on the type of fishes caught, nature of the water bodies. The size of the fishing gears are determined by the productivity of the fishing ground, nature of the fishing ground and efficiency of the gears used. The number of the fishing cycles per day depends on the daily pattern of occurrence (density) of fishes, type of fishing methods used, geographical condition of the fishing grounds and the fishermen.

At the age of my schooling, with my father I used to go every day afternoon and next day morning in paddy field (Aman) to catch different freshwater fishes using various kinds of fishing traps. Fishing traps are fixed in embankment water drainage between two paddy plots in evening hours and different fishes are captivated inside the traps at night and in the early morning captivated fishes are removed outside from the traps and collected. The traps which are usually used to catch fishes in their local names are Ghuni, Mugri, Charua, phasi, Bidhajal and Barshi ets.

26 varieties of freshwater fish and prawns were caught from the paddy field during the last two decades (8's and 9's) of twenty century but now it is the matter of concern that this fishing is going to be abolished in Purba Medinipur district.

2. Materials and Methods

Study Area-The district Purba Medinipur is a coastal district of West Bengal. Maritime actions in the Bay of Bengal and seasonal winds influence the tropical wet and dry climate of the region. The rainy season is largely restricted to the months of June to October after a long dry spell of hot humid Summer (Chandra et al, 2008). This district is geographically located between latitude 21° 36'N to 22° 57'N and longitude 86° 33'E to 88° 12'E. The

district is surrounded by its the Bay of Bengal in the East, Paschim Medinipur district in the West, Rupnarayan river and Howrah district in the North and in the South, there is Odisha state. The total area of this district is 4736 km², total population is 51 lakh as per census 2011, total land under cultivation is about 430,140 ha and net cultivation area is 304,800 ha having 58% of total area of lands ¹.



Figure 1: Purba Medinipur District Map



Figure 2: Aman Paddy Fields in Purba Medinipur District

The agro-climatic condition of Purba Medinipur district is very suitable for paddy cultivation. Production is high in comparison to other districts except Bardwan district in West Bengal. In the last decade of the previous century, fish grew very fast with rice. The climatic condition of Purba Medinipur district which is observed throughout the year is shown in the table-1.

Table 1: Climatic Conditions of Purba Medinipur²

Parameters	Limit
Annual rainfall	1000 mm to 1300 mm
Temperature	9 ⁰ C to 40 ⁰ C
Relative humidity	50% in November and 78% in July
Wind flow (average)	30 Km/ hour

The paddy culture in Aman season runs from the month of July to November every year. Seed bed preparation starts in July at the beginning of rainfall and plantation is done in the month of August. Rice is harvested in the month of November. Fishing activities occurred throughout the total culture period of rice. Several types of net, traps and hooks are used to catch fish and prawns. It is difficult to enumerate all the fishing methods in use in various parts of India and there is no uniformity in the names given to various fishing gears used in commercial fisheries. Some of these gears are used for catching fish only, others for fish, prawn and others, while some are used for crustaceans only. The fish which were available in the paddy field are shown in the table-2.

3. Result and Discussion

Table 2: Available Fishes and Prawns in Paddy Field in Purba Medinipur District³.

Sl. No	Local Name	Scientific Name	Order Name
1.	Shal Mach	<i>Channa marulius</i> . (Hamilton, 1822)	Channiformes.
2.	Shol Mach	<i>Channa striatus</i> . (Bloch, 1793)	
3.	Lata Mach	<i>Channa punctatus</i> . (Bloch, 1793)	
4.	Chang Mach	<i>Channa gachua</i> . (Hamilton, 1822)	Channiformes.
5.	Magur Mach	<i>Clarias batrachus</i> . (Linnaeus, 1758)	
6.	Singi Mach	<i>Heteropneustes fossilis</i> . (Bloch, 1794)	Siluriformes
7.	Tangra Mach	<i>Mystus vittatus</i> . (Bloch, 1794)	
8.	Bowal Mach	<i>Wallago attu</i> . (Bloch & Schneider, 1801)	
9.	Koi Mach	<i>Anabas testudineus</i> . (Bloch, 1792)	
10.	Chanda Mach	<i>Chanda nama</i> . (Hamilton, 1822)	Perciformes
11.	Khalisa	<i>Colisa fasciata</i> . (Bloch & Schneider, 1801)	
12.	Mud Perch	<i>Nandus nandus</i> Hamilton, 1822).	
13.	Mourala	<i>Amblypharyngodon mola</i> . (Hamilton, 1822)	Cypriniformes
14.	Danrica	<i>Labuca sp.</i> (F. Hamilton, 1822)	
15.	Punti Mach	<i>Puntius sophore</i> . (Hamilton, 1822)	
16.		<i>Puntius ticto</i> . (Hamilton, 1822)	
17.	Gutum Mach	<i>Lepidocephalichthys guntea</i> . (F. Hamilton, 1822)	
18.	Phalui Mach	<i>Notopterus notopterus</i> (Palas, 1769)	Osteoglossiformes
19.	Pankal Mach	<i>Mastacembalus armatus</i> . (Lacepede, 1800)	Mastacembaliformes
20.	Bele Mach	<i>Glossogobius guiris</i> (J.Richardson, 1846)	Gobiiformes
21.	Rui Mach	<i>Labeo rohita</i> . (Hamilton, 1822)	Cypriniformes
22.	Catla Mach	<i>Catla catla</i> . (Hamilton, 1822)	
23.	Bata Mach	<i>Labeo bata</i> . (Hamilton, 1822)	
24.	Galda Chingri.	<i>Macrobrachium rosenbergii</i> . (De Man, 1879)	
25.	Nadir Chingri.	<i>Macrobrachium rude</i> . (Heller, 1862)	Decapoda
26.	Kucho Chingri.	<i>Macrobrachium idella</i> . (Hilgendorf, 1898)	



Channa marulius.



Channa striatus.



Channa punctatus



Channa gachua



Mystus vittatus.



Wallago attu.



Colisa fasciata



Heteropneustes fossilis



Clarias batrachus



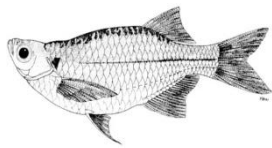
Notopterus notopterus



Puntius sophore



Puntius ticto



Labuca sp.



Chanda nama.



Amblypharyngodon mola



Mastacembalus armatus



Anabas testudineus.



Glossogobius guiris.



Labeo bata



Catla catla



Labeo rohita.



Lepidocephalichthys guntea.



Nandus nandus.



Macrobrachium rosenbergii.



Macrobrachium rude.



Macrobrachium idella.

Figure 3: Photograph of Available Fishes in Paddy Field in Purba Medinipur District

Various types of fishing nets and traps are used to catch fishes from the paddy fields in Purba Medinipur district. Their fabrication is versatile. Few are bamboo made and others are made of thread. The fishing traps are locally called as Charua, Mugri, Dhouri, Ghuni and Phasi and fishing gears are known as gill net, cast net and scoop net (Chakni Jal).

Gill Net (Bindha Jal)-Gill netting is a most common fishing practice in paddy fields. It is wall like nets with floats attached to the head rope and sinkers fixed to the foot rope. Bindha Jals are vertical panels of netting set normally in a straight line. Fishes may be caught by using the gill nets in three ways-i). wedged ii). gilled and iii). tangled. This net is made of nylon rope of various sizes of mesh. The net is set in the transverse direction of the migratory fish, so that when the fishes try to swim through a net wall, the meshes form a noose around its head and the fish is caught. As the fishes try to escape, it gets stuck up behind the operculum of fish body; hence these nets are called 'Gill net'. In order to be efficient, the meshes must be of the right size and shape for the fishes to be caught. A large size of gill net may be 10 to 30 meter long and 1.5 to 2.5 meter in height. The mesh size

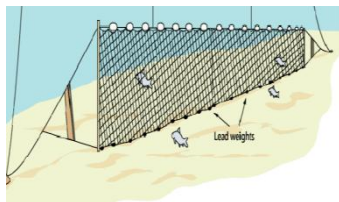
varies from 1.0 to 2.0 cm. There are three types of gill nets used like i) Stationary ii) Floating and iii) Draft. In paddy field fishery, stationary gill nets are used to catch fish.

Cast Net-Cast net is a round shaped net, looks like a large size umbrella, used for fishing of both shellfish and finfish in open places, free of any obstruction where water is passed or stagnated near bridge, culvert etc. It has a long cord (rope) attached to the apex of the net and a number of lead or iron weights are tied with rope all along the margin. The iron weights are called 'sinkers'. The cast net has a radius of about 12 feet. The fisherman throws the net keeping the long rope in his right or left hand and the net fully spreads over the water. This has to be done by fishermen very skillfully so that the net (cast net) falls on the surface of the open water fully expended. Thus the net sinks to the bottom of water body and the circumference closes owing to the weights (sinkers) attached along the margin. All kinds of large and small size fishes are entangled in the net depending upon the mesh size of the net which is then pulled out by means of the cord.

Scoop Net (Chakni Jal)-Scoop Net is a circular shaped bag net which is about 1.0 meter in diameter with a bamboo made handle. Chakni Jal is made by using nylon and used for fishing in paddy fields where water depth is less. It is very useful in fishing in paddy fields.

Fishing Traps-Variety types of fishing traps are used to lure the fish which are allowed to get in but are prevented from the escaping. The traps which are used to catch fish from paddy fields look like baskets, made of fine bamboo sticks. Each trap is provided with an opening at the narrow end.

The opening is guarded by flexible re-curved bamboo sticks with their free ends facing towards the inner side. In some cases tasty baits are kept inside the traps to lure fish which are lowered in water for some time. Fish that enter the traps are unable to get out due to the re-curved nature of the sticks guarding the opening. Earthworms (*Pheretima postuma*), flesh of bivalves and gastropods (*Lamellidens marginalis*, *Pila globosa*) are used as bait. The fishing traps are locally called Charua, Mugri, Dhouri, Ghuni and Phasi. It is also very useful for fishing in paddy field⁴.



Fishing Trap (Bindha Jal).



Cast net



Fishing Trap (Mugri)



Fishing Trap (Charua).



Fishing Trap (Ghuni).



Fishing Trap (Chakni Jal).



Fish angling (Bardhi)

Figure 4: Photograph of Fishing Gears and Traps used for catching fishes

Till the last decade of the twenty century, a huge quantity of different varieties of fishes was found in the agriculture fields but these are now going to be endangered due to malpractice in rice culture. Since the last two decades of the twenty-first century, farmers use fertilizers and spray pesticides and insecticides in paddy fields instead of using organic manures and spraying of herbal products for rapid growth of seedlings and to yield high production of paddy. Owing to use of such chemicals in the field, the physico-chemical parameters of soil and water required for fish survivability is quietly hampered.

Fish disease is the culmination of an interaction among the susceptible fish, the pathogen and the environment. Epizootic Ulcerative Syndrome (EUS) is presently known as Epizootic Ulcerative Disease. This disease attacks fish that live in paddy fields. It is an important Bacterial-Fungal disease responsible for high mortality in paddy field fishes. In the primary stage of this disease, the bacteria responsible for it is *Aspergillus* sp, then the fungal named *Aphonomyces piscicida* has been isolated. Initially, this disease is appeared as the red coloured lesions, haemorrhagic in nature. These red coloured lesions rapidly spread and gradually enlarged becoming deep to deeper and assuming in the form of ulcers. Patches of fish tissues fall off, causing fish mortality. It is studied that the use of huge quality fertilizers and spraying of insecticides and pesticides to control insects and pests in paddy plants are the main basic cause of this disease. A clean environment always helps in the growth of fish whereas a dirty environment favours multiplication of pathogens.

In recent years, our paddy farmers follow the culture techniques that are not suitable for fish survivability and growth in the paddy field. I suggest they study the following advantages of paddy culture with fishes in their paddy field.

- 1) Paddy culture with fishes increases the organic fertilization in soil by fish excreta and remains of the supplementary feed.
- 2) It is tilling better of the rice seedlings due to the grazing and moving activity of the fishes.
- 3) It also reduces the number of the harmful insects like paddy stem borers whose larvae in large number are eaten by fish.
- 4) It increases the aeration of the soil and mineralization of the organic matter resulting from the puddling of mud by benthic feeders.
- 5) It also reduces the rat population for high water levels in the field.
- 6) It controls the algae and aquatic weeds in the paddy field.
- 7) No extra water from outside is required. It is fully cultured in rain water.
- 8) Profit is higher to sell fish and paddy together.

4. Conclusion

India is a rapidly growing country and its population is over 130 crores. Now a huge amount of good sources of protein is needed like carbohydrate foods. Fish is a good source of easily digestible protein food due to the low percentage of connective tissue in it. There are other sources of protein also like pork, beef, mutton, chicken etc but their production is low now due to the high lifestyle of people in rural areas.

If all sources of protein production go downwards, there will be malnutrition diseases among the people in large. So culture and capture of fishes utilizing all kinds of water bodies are to be made strong for supply of protein food in future. Now it is the exact time to increase the supply of fish protein by culture and capture in scientific ways.

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