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Fishing methods in lendi river, district Nanded, Maharashtra, India

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Abstract

Lendi River is one of the tributary of river Manar, originates at Malkapur district Latur and joins to river Manar at Degloor, district Nanded. Water of this Semi-perennial river is used to perform various activities such as industrial, irrigation, fisheries and human activities. Artisanal fishery is the main type of fishing practiced occupationally by the fishermen in Lendi River. Quite a large number of traditional fishing gears are being used by these fishermen. Most of such fishing gears are seasonal and selective and is based on the type of fish species to be catch. The types of fishing gears found in this area include spears of different shapes and sizes, different sizes of traps, hooks and line, cast, drag, gill, scoop and trap are used.

Keywords: Fishing methods, craft, gear, lendi, river, Nanded

Introduction

Fishing method means the manner in which the fishes are captured. Fishing gear is the implement developed for the purpose. The history of fishing began when man had to be content with what food nature could provide. Fishing and hunting can be traced to be of the same origin. The behavioural studies of fishes lead to the development of fishing methods by opening the gear at the depths where different types of fishes are present. Thus the fishing at bottom, mid water and surface has evolved. For commercial fisheries it became desirable to change from catching single fish to bulk. Fishing gear capable of catching small quantity had to be enlarged and their efficiency improved. This required mechanisation of crafts, designing of more effective gears etc. The knowledge of fish behaviour in relation to fishing gear has become one of the most important tools of modern gear development. The choice of material has become very important, since it was found that efficiency of a gear could be increased many fold by using suitable material like the synthetic yarn in place of natural fibres. From all these developments, these developed gear which can be used in many ways such as the gill net, set net, surrounding net, dragnet etc. The fishing technology is an integral part of fishery science. Thus studies in fishing gears and methods provide the essential background for proper exploitation of fishery.

Several investigator collected information on fishing methods reported detailed account of fishing methods of Jammu region of Jammu and Kashmir State ^[3]. Species composition and gear competition for the small-scale fisheries in the Cyclades waters (off Naxos Island, Aegean Sea, Hellas) was studied based on samples collected during 1997–1998 with gill nets of different mesh sizes and long lines with hooks of different sizes ^[14]. Fishing methods in streams of the Kumaon Himalayan region of India ^[13]. The existing scenario of riverine fishing methods with special reference to *Aorichthys* spp ^[11]. Catch analysis in small mesh gill net, seasonality of usage of different mesh sizes and proportion of immature specimens of important species caught in each mesh size ^[15]. Catching methods of the river Padma, in Bangladesh ^[7].

Fishing methods in the rivers of northeast India. They found some of the existing fishing methods in the hill streams such as hooks and line, maze/ barricade, encircling gear, entangling gear, impaling gear, scooping gear, groping, impoundment, indigenous trap and noose fishing. For the large scale fishing destructive practices such as dynamiting and poisoning are employed, Electric fishing is also becoming very popular in some parts ^[6]. Traditional fishing method of Assam for catfishes using duck meat as an attractant ^[5]. The diversity of gears

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employed by the fishermen as well as the contribution of each to the overall fish catch on the Gbedikere Lake. The types of fishing gears found in this area include spears of different shapes and sizes, different sizes of traps, hooks and line, cast, drag, gill, scoop and seine nets are used². Traditional fishing practices followed by fisher folks of Tamil Nadu⁹. Impact of fishing methods and gears used on fish faunal diversity in spring-fed torrential river Relli in Darjeeling hill area of West Bengal ^[1].

Materials & Methods

Selection of stations

For the study of crafts and gears in river Lendi two sampling stations (S-I Mukramabad and S-II Degloor) were selected on the right bank of River Lendi. The first station is in Mukhed taluka and second station is in Degloor taluka, district Nanded.

Sampling stations

A) Station-I: Mukramabad: This station is located at the height of 394 meter above M.S.L. in between the latitude 18° 28' & 44.33"N and longitude 77° 21' & 58.20"E. Depth was 2 to 15 feet and width was 110 meter. Substratum consists of large boulders, bedrock, pebbles and sand. Surrounding area is agricultural land and farmer cultivates Wheat (*Triticum aestivum*), Jowar (*Sorghum* spp.), Cotton (*Gossypium* spp.), Soybeans (*Glycine max*) etc. water was turbid during rainy season & heavy shower and became clear few days after heavy shower and in early winter. In let winter and summer it was green. Villagers use water for irrigation, drinking, washing, bathing, etc. Teru Rivulet joins with Lendi River at this station. This station is a landing and marketing centre of fish.

B) Station-II: Bahegaon road (Degloor): This station is located at the height of 363 meter above M.S.L. in between latitude 18° 32' & 41.32"N and longitude 77° 33' & 28.07"E. The depth ranges from 5 to 20 feet and width is 160 meter. Many pools are located at this region. The substratum consists of coarse sand, rocks, large boulders and bedrock. Water is turbid and is used for washing and bathing. Deep pools were developed due to sand mining. Station is located on the downstream of proposed Lendi irrigation project and it is widest and deepest part of the river. Distance between first and second sampling station i.e. from Mukramabad to Bahegaon road is about 22 km (Fig. 1).

Field & survey method

Information on fishing methods was collected through intensive field survey and interaction with the local fishermen of the Mukramabad and Degloor region during the period of 2010 to 2012. During data collection, the local fishermen were photographed practicing the methods of catching fish. The information collected in the field was compared with the existing information in the literature; for most of the methods no information was existing. Later, the techniques used in these methods were correlated with fish behaviour. The material used during the survey includes; measuring tape, scales, still camera. Fish identification handbook; drawing paper, pencils etc. are some of the materials used. Data are collected from the field directly by measuring, viewing and direct conversation to the fishermen. The information on type of crafts & gears, season and method of operation, river water and river bed conditions and probable catch composition were collected.

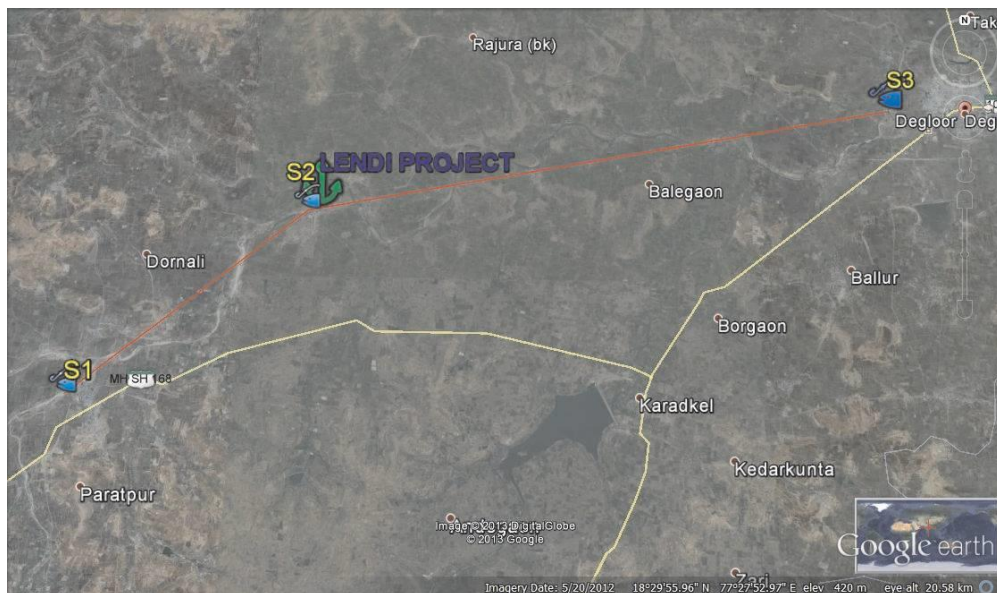


Fig 1: Google earth map of stations

Results

Crafts

The fishing crafts used in the Lendi River are thermocol rafts and motor vehicle tubes.

1. Raft

Thermocol rafts are commonly used in Lendi River at Nanded district. The shape and size of thermocol rafts was variable. It

was made of single piece or two to three pieces tied together. Single piece of thermocol is of 2 to 3 feet in length. Thickness of thermocol raft 10 cm to 70 cm in width. Durability of this rafts is of 1 to 2 year and cost is of Rs. 1000/- to Rs. 2000/-. It is used in all season. Carrying capacity of raft up to one ton. In river water this raft is used up to the depth of 5 to 10 feet. Small sized raft is operated in water with the fisherman legs and large sized raft operated with the help of wooden

propeller. Locally it is called as “Chatu”. It is ‘V’ shaped.

2. Motor vehicle tubes

Inflated truck tubes are also used in Lendi river for fishing. The tube is used for spreading the gill net in stagnant water up to the depth of 5 to 10 feet. The cost of tube is Rs. 200/-. Tube is operated with the help of fisherman legs.

Gears

The fishermen in Lendi river basin use wide varieties of fishing gears which includes gill net, cast net, Drag net, traps, hook & lines and scoop net etc. (Plate No. I & Table No. 1).

1. Gill net

This is the most widely used fishing gear. They are vertical walls of netting normally set out in a straight line. Floats and sinkers are attached to the head ropes and foot ropes. There is various mesh size of gill net used commencing from number 0 to 50 mm. According to requirement extra large mesh sized gill net is also used by the fishermen of Lendi River. Manufacture gill nets are directly purchased from the market or they are fabricated at home by using gauge and needle. The longevity of the gear is around 3 to 4 years. The other materials such as footrope, head rope, float, sinker etc. are also purchased from the market.

Net No. 0: The name indicates this is the smallest mesh size (0 to 10 mm) gill net and used to catch the smallest sized fish.

Net No. 20: It is most commonly used for catching smaller sized fish. It is about 180 metres in length and 4ft in height and about \$14 to \$22. The fixing of the float, foot rope and sinkers are done independently by the fisherman. Sinkers are made of ignited clay with a hole at the centre to pass the foot rope. These sinkers are elongated in shape. The floats are made up of rubber plastic or thermocol material and are purchased in market.

Smaller sized fish such as *Rohtee cotio*, *Chela Sp.*, *Puntius Sp.*, etc. are fished in the river throughout the year except in heavy floods. For operating the gill net mild or stagnant current with clean, turbid sandy river bottom required.

2. Cast net

These nets are commonly known as “Fake Jal”. It is conical or bell shaped, forming a circle when spread out. The lower edge is provided with footrope attaching a series of sinkers to it. The foot rope along the circumference of the net has small iron or lead weights attached all around about 10-15 cm. intervals. This is a falling gear; here the fishing is done by direct quick movement of the gear to cover the fish. It is mainly operate in shallow water. Each weight is cylindrical, 4 cm long and 2 cm in diameter. A string or line passes from the centre and is held in the hand for operating the net. The central line (rope) branches out into several lines and also into sub branches, finally connected to the free edge of the net. The edges of the net in some cases are folded inwardly and fixed by twines to form pockets. The size of the mesh is 1 – 4 cm² and diameter is 5 to 10’ or more. Operation is done by a single fisherman. Fishermen throw the net on the shoal. Due to the sinker it sinks quickly at the bottom in the form of an umbrella. Net is operated round the year in all types of water, except rocky bottom. Coast of net is Rs. 1100/- to Rs. 1250/- depending upon the size of the net.

3. Drag net

Each drag net is a wall like structure and is mostly used for fishing in ponds, lakes, rivers etc. To keep the net in vertical position, head rope is provided with floats and foot rope with sinkers. Floats are attached to the head rope at a distance of about 5-6 feet. Iron sinkers are placed at a distance of 7.5 cm. Length of each iron sinker is 2 cm and diameter is 1.5 cm. Mesh size of the net is 1 Sq. cm. The length and height of the drag net varies according to the size and depth of the water body. The netting operation is carried by keeping the net vertically across the width of the pond. The fisherman holds the foot rope in right foot and raises the head rope above the water with his hands. The net is dragged from one end of the pool to the other end. At a distance of 5-6 feet fishermen hold the net. Number of fishermen required for holding the net is depend upon length of the net. The stretched net restricts the migration of the fish to the other end of the water body. On reaching the corner, net is dragged from both the sides and the fishes are collected.

4. Trap-bundh method

This is one of the indigenous methods commonly used by fishermen in Lendi river at Mukramabad region. It is also called as “Kodom or Gundu”. Kodom is rectangular in shape having a length of 5ft and height of 2.5ft, breadth is about 3ft at the mouth region. Kodom is made by interweaving of bamboo splits with spaces sufficiently to pass the water. One end of the bamboo netting is fold lengthwise in the middle to join into a single vertical line whereas the other end is left freely open. Bamboo frames are provided all around its mouth. Fishermen construct this net himself at home within 12 to 15 days. The cost of the net is around Rs. 1700/- to 1850/-.

The setting of the gear is done along the current. Two bamboo poles are in the water trap is kept within the bamboo poles. Inside the trap branches of trees are kept. It acts as a shelter/hiding place for the fishes. The upper portion of the trap is kept open to attract fishes some lure is kept within the trap in the form of rice bran or bait. Trap is lifted after an interval of 4 to 5 hours to remove the fishes. Trap is operated in the month of September to January. The main species caught by this net are *Labeo sp.*, *Cirrhinus mrigala*, *Channa sp.*, *Wallago attu* and shrimps.

5. Scoop net

It is indigenous gear known as “Jali”, is operated manually in shallow water. Net consist of a bamboo ring of 2 feet diameter. To this bamboo ring net is fixed. It is made up of bamboo splits. Mesh size is very small. It allow only water pass through it. Coast of net is Rs. 150 to 200/-. Small fishes, shrimps are caught by this net.

6. Hook & Line

Indigenous type of hooks and line baited gear is used in this area to catch the fishes. Bait is attached to the hooks to attract fishes. The baits are made from wheat, flour paste, sheep liver & blood, chicken entrails & earthworms. The fishes caught by this gear are the *Chana sp.*, *Mastacembelus armatus*, *Wallago attu* etc. Fishing is done throughout the year.

Discussion

Fishing method means the manner in which the fishes are captured. Fishing gear is the implement developed for the purpose. The history of fishing began when man had to be

content with what food nature could provide. Fishing and hunting can be traced to be of the same origin [9].

The knowledge of fish behaviour by practical observation and experience often results in the development of very specific fishing methods [4]. The carnivorous feeding behaviour of catfishes has been effectively used by the local fishers for catching them with simple implements and little drudgery. Such innovative fishing methods ensured good fish catch from the river, where fishing with conventional fishing nets is difficult and ineffective because of large volume of water, strong water current and uneven bottom topography. In the present fishing method, the strong flavour of cattle meat appears to have acted as a fish attractant. Attraction and concentrating fish into a range of fishing gear using chemical bait for stimulating the senses of smell and taste is part of development of fishing methods by traditional fishers all over the world [3].

Excess unsold fresh fishes are used for making dried fish. Dried fish can be made out of all the species of fish. Fins and tail portion are cut by using knife and fish is slit open. Inner

portion is removed. Fish is washed without removing the scales (while drying the scales will fall off) and lined with knife, which facilitates better salt absorption. Salt is applied over the fleshy portion. It is dried in hot sunlight for a day; next day the fish is washed and again salt is applied. Duration of drying varies from 3-10 days, which depends upon the size of the fish. Women fisher folks are involved in this dried fish making. Dried fish is one of the major ingredients of the poultry feed [9].

Cast net is used almost throughout the year but the catch is maximum (10-12 fishes/effort) during rainy season, when the river

bed is flooded and fishes show horizontal migration to breeding sites. Fishing with small nets in torrential hill-stream is a laborious process with very poor catches. During upward and downward migration and also during monsoon, angling is mostly done by the people as a sport fishery [10]. Traps, like Kodom or Gundu, are used during downward migration of fishes (September to November) thus, most of the juvenile and adult fishes are killed [8].

Table 1: Shows types of fishing gears used in lendi river system

Type of Gear	Local Name	Period of operation	River condition	Probable catch
Gill Net	According to size/No. Of mesh	Round the year, except in heavy floods	Stagnant or Mild current with clean, turbid sandy river bottom	All species are caught, except <i>Mastacembelus armatus</i>
Cast Net	Fake Jal	Round the year	All type of water, except rocky bottom	Small sized mixed catch, occasionally large sized fishes & Prawns
Drag Net	Wadap	Winter & summer Months	Stagnant water with sandy bottom	<i>Rohtee cotio</i> , <i>Chela</i> Sp., <i>Puntius</i> Sp., <i>Channa</i> Sp.
Trap- Bundh method	Kodom or Gundu	Winter Months	Mild current, bottom with Stone & rocks	<i>Labeo</i> Sp., <i>Cirrhinus mrigala</i> , <i>Channa</i> Sp., <i>Wallago attu</i> and river shrimps
Scoop Net (Fishing by mosquito Net)	Jali	Post monsoon & winter months	Shallow clear to turbid with mild current	Small sized mixed catch & Prawns
Hook & Line	Kanta	Round the year, mostly in monsoon months	Fast current with turbid water	<i>Mastacembelus armatus</i> , <i>Channa</i> Sp., <i>Wallago attu</i>

PLATE - I



Line-Hook Fishing



Gill Net Fishing



Siene Net Fishing



Trap Fishing



Cast Net Fishing



Scoop Net Fishing



Gill Net Fishing (Using Tube Raft)



Gill Net Fishing (Using Thermocole Raft)

Conclusion

In the stretch of river Lendi, the efforts done for fishing are generally low due to poor catches. Selection of fishing methods and gear in Lendi river are influenced by various factors such as physiography of the water body, nature of fish capture, characteristics of the raw material from which gear are fabricated and standard of living. Therefore, variations in application of gear are observed. The frequency in the operation of gears and fishing methods varies in different seasons in relation with water level of water, movement of fish and their migration. The prevalent and popular fishing crafts and gears used in this region are also very primitive. Gill net, cast net, Kodom or Gundu trap and hook and line gears are employed. The most prominent among them is the Gill net. For effective use of traditional and modern fishing gears and crafts, training to fishermen is necessary to improve fishing. Financial supports and encouragement from government is needed. Indiscriminate and uncontrolled fishing should be prevented so that there will be a conservation of fish stock. Practice of fishing before breeding should be prevented.

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