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Review Paper

Traditional fishing crafts and gears of Madhya Pradesh, India

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Abstract

Fishing is an age old practice carried out since time immemorial. The crafts and gears in use in different parts of India are mostly primitive, low-cost and non-mechanized. A wide range of fishing crafts and gears to catch fish has been evolved by the fishers of Madhya Pradesh which have contributed a lot to the total fish production and economy of the local population. Information so far available on this field is scattered and very precisely scanty. With this view, the present work was aimed to document the traditional fishing crafts and gears which are in use in Madhya Pradesh. In total eight types of crafts and ten types of gears have been documented during the study period.

Keywords: Crafts, Gears, Madhya Pradesh.

Introduction

Fishing is the art of catching not only the fish but also other aquatic animals[1] and it has been considered as an age old profession with a long history when human beings were mainly involved in food collection from nature; be it fishing from water bodies or hunting animals from the wild. The fishes are one of the main exploitable resources in the aquatic ecosystems that provide the cheap source of protein. The mankind not only derives food through fishing, but it also provides nutritional security and livelihood to a large section of the rural society[2].

The traditional fishing practices by artisanal fishermen play a significant role in the Indian fisheries. In the face of emerging challenges in capture fishery, there would be an immediate need for better understanding on harvesting systems, besides the knowledge on traditional fishing methods for bringing sustainability to the sector. Traditional fishing is more energy efficient, easy to adopt and environment friendly. In addition to these, traditional fishing offers ample scope for equitable distribution of ecosystem benefits as compared to mechanized sector.

Madhya Pradesh is the second largest state in India by area which is bestowed with plentiful water resources including rivers, streams, reservoirs, ponds and lakes. A number of major and minor river systems drain the state by virtue of its geographical location; supporting varied aquatic biodiversity, including that of fish fauna. This state has diverse type of fishing crafts and gear, evolved over the period of times. There might be many reasons for such diversity in crafts and gear, but it may largely be attributed to diverse categories of tribes, who could develop different sets of fishing implements specific to a particular tribe based on its indigenous technical knowledge (ITK). Moreover, as hunting was the way of life for most of the tribes including catching fish from wild waters more and more devices were developed[3]. The availability of forest products in abundance like timber, bamboo, cane, etc., the basic materials for the construction of such devices, might have provided added advantage to design and construct various categories of crafts and gears. The information so far available on fishing technology of Madhya Pradesh is a bit scattered. With this view, an attempt has been made to document the fishing crafts and gears which are in use in this state, which hitherto remain unexplored and under documented.

Materials and methods

Repeated survey was undertaken in open-waters of Madhya Pradesh to document the prevailing fishing tackles, covering different rivers (Narmada, Tawa, Tapti, Chambal, Shipra, Kalisindh, Son, Betwa, Gambhir, Ken, Dhasan, Wainganga, Kanhan, Parbati, Pench), reservoirs (Bargi, Indira Sagar, Omkareshwar, Tawa, Sarni, Gandhi Sagar, Ban Sagar, Halali, Dahod etc.) and wetlands during 2010-11. Focused Group Discussion (FGD) and personal interview with the fishers were followed in this study. A specific questionnaire was prepared to collect information on different points like local name; usual size; materials used; mesh size; method, season and persons involved in operation etc.

Results and discussion

A wide array of traditional fishing crafts and gear have been recorded from inland open-waters of Madhya Pradesh. The present inventory of crafts and gear has indicated as many as eight different types of crafts and ten different types of gears, which are being used for fishing in open-waters. The most

popular crafts are 'Plank-built boat', 'Large boat for group fishing', 'Wooden frame iron/tin/aluminum sheet boat'. Among the gears, the most common types are 'Gill net', 'Cast net', 'Scoop net', 'Hook and Line' and 'Traps'.

Fishing crafts: The floating and movable platform on which the fishermen operate the gear is known as fishing craft. The nature of inland fishing crafts varies from place to place and it mainly depends on the geographical and hydrological features of the region[4].

The floating fishing crafts were used by the fishermen extensively for fishing in different open-waters. The fishing craft so far observed to be used are Dug-out canoe, Plank–built boat, Rubber tube platform, Thermocol raft, Bamboo raft, Boat covered on wooden frame/bamboo frame, Large boat for group fishing and Wooden frame iron/tin/aluminum sheet boat. The wooden canoes used in the Madhya Pradesh are multi-functional type i.e. they are being used for fishing as well as also for transportation of fish catch.

Dug-out canoe: Dug-out canoe is locally known as *'Donga'* which are small wooden canoes dug-out from a single log of wood. Trunks of palm trees are also occasionally used to make smaller canoes. The overall length of 3-4m and width of 0.5-0.6 m are common; which can accommodate only 1 or 2 fishers at a time. These types of crafts are suitable for shallow water to carry and set fish traps, gill nets, cast nets, and lines. This type of canoe was found in most of the rivers, which was mainly used by traditional fishers for small scale fishing (Figure-1).

Plank built boat: It is commonly called as *'Nao'*, *'Lauka'* and *'Nauka'*. It is spindle shaped and constructed by joining good quality wooden planks with iron nails. Periodical coating of coal and kerosene oil is done in the bottom part of the boat to preserve from fouler and borers. The size of the fishing boats varies to a range of 5-7m with a width of 1-1.5m. The smaller sized boats are used in wetlands, lakes and tanks while the large sized fishing boats are used in rivers and reservoirs. This type of boat is usually being operated by 2-4 fishermen with manual paddling (Figure-2).

Wooden Framed iron/tin/aluminum sheet boat: Wooden framed boats with iron /tin/aluminum sheet are locally known as *'Nauka'* or *'Dingi'*. These boats vary in size and shape depending on their use and the types of fishing to be carried out. The length of 3-5m and width of 1.5-2m are common; which can accommodate only 1 or 2 fishers at a time. These are basically used in shallow reservoir for low volume fishing (Figure-3 and 4).

Large boat: Large boats are mainly used in group fishing to capture large scale of fish. More than two fishermen are engaged to operate and to harvest fish by this type of boat. Large boats are also used for transportation of fish catch. It is mainly used in rivers and reservoirs (Figure-5).

Boats covered on wooden frame and bamboo frame: Some boats are made from good quality planks and are covered with wooden or bamboo frames. These boats vary in shape and size. They are basically used in rivers and reservoir for fishing. This type of craft is suitable for operating all types of gear. It can be used for fishing all through the seasons and it also provides protection to the fishers from rain and scorching sun as having shades (Figure-6).

Figure-1: Dug-out canoe.

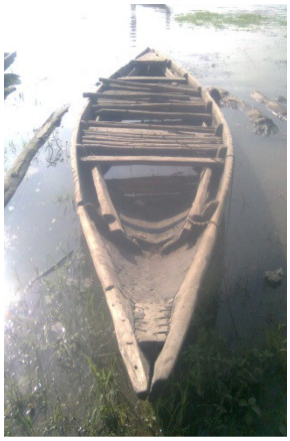

Figure-2: Plank–built boat.

Figure-3: Wooden framed boat.

Figure-4: Wooden framed small boat.

Figure-5: Large boat.

Figure-6: Covered boat.

Rubber tube platform: It is the cheapest among all the crafts encountered so far; used mainly by poor fishers and is single man operated. The old rubber tubes are used for this purpose. A wooden/jute/nylon mat platform is placed over the rubber tube, tied tightly with rope. It is used for setting and hauling of small mesh sized gill net in both stagnant and running waters. It was mostly encountered in Tawa and Tapti River and Dahod reservoir (Figure-7).

Bamboo raft: This is the most primitive type craft used for fishing and transportation. This can be easily made with low investment by the poor fishers since bamboo is abundantly available in this region. About 5-6 bamboos are sufficient to make this types of craft. Light bamboos are cut horizontally in same size of 15-20 pieces and are tied together (keeping all the bigger ends of the trunk towards the stern side) with coir/jute rope for constructing this raft. This type of craft is generally varied in their length and size. Size mainly depends on the water current and number of bamboos used. They are normally used in sluggish rivers and wetlands (Figure-8).

Thermocol craft: It is another easily made craft used mainly by poor fishers; it is also a single man operated craft. A thermocol box (length 0.7-0.8m and width 0.5-0.6m) is fixed under another larger thermocol box and tied with rope. In another type of craft, pieces of thermocol are tied with bamboo frame with the help of rope to make a bundle of length 0.5-0.7m and width 0.4-0.5m. Two such bundles are tied with rope on which fishermen used to sit and go for fishing (Figure-9).

Figure-7: Rubber tube boat.

Figure-8: Bamboo raf.

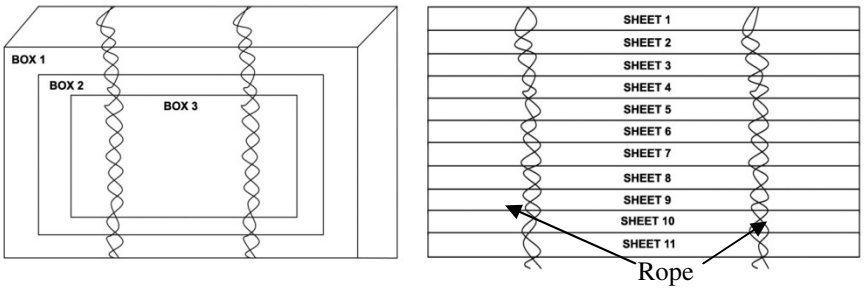

Figure-9: Schematic diagram of Thermocol craft.

Fishing gears: The term "fishing gear" refers to all those implements and devices that are used for quite diverse methods of fishing around the world, which employ gears ranging from simple hook and line to the modern fish pumps. Gears are basically of two types- active and passive[5]. Thus a great variety of gears are used in fishing which differ widely in size, shape, fabricating material, method of operation, area of operation and type of fish to be caught. The gears which are in use in Madhya Pradesh are Gill net, Cast net, Drag net, Scoop net, Hand bag net for jumping fish, Hook and Line and Traps.

Gill net: Locally, the gill nets are known as *'Phansa Jal'* or *'Phanda Jal'*. It is a passive gear (barring floating gill net) where the mesh size varies as per the body depth of the targeted fish. The gill nets are kept erect in water column vertically by means of floats and sinkers. In this type of gear, the actual meshes of the net play the leading role in capturing various fish species. This is one of the most common types of gears used so far in Indian open-waters, including Madhya Pradesh. It is operated in all depths, ranging from shallow to deep waters. Gill nets with different mesh sizes were observed in use in the state. The fishermen set the net across the river using boats; the net is either set using bamboos (for long time operation) or just set free in the water (for short time operation). The net is lifted up after the specific time period to collect the fishes tangled therein. Thermocol, light wooden pieces and plastic floats are normally used as floaters and sinkers are used for the sinking purpose. The gill nets are generally of 2.5-10 m width and 100-200 m in length. Wide use of monofilament gill nets over thicker nylon nets was observed (Figure-10 and 11).

Figure-10: Gill net.

Figure-11: Setting of Gill net.

Cast net: Cast net is locally known as *'Phenka Jal'*. It is conical in shape with a strong rope which is attached to the apex; forming a circle when spread out. A number of lead or iron weights are attached along the margin to sink it during the operation. Cast nets were most common, which are being operated in ponds, streams, rivers, reservoirs and wetlands. The length of the net is usually 2-2.5 m and mesh size is 8-15 mm besides using nets of different mesh and pocket size, targeting to capture a particular species. It is operated by single fisherman. Cast nets are generally used in still waters round the year. It can be operated anywhere either using a craft in shallow or even from shore line (Figure-12).

Figure-12: Cast net.

Drag net: Drag net is locally known as *'Maha Jal'*. This type of net is towed through the water in small or large sheets of waterbodies. It is very large, heavy and with fine meshed net (mesh size 20-50mm); requiring the efforts of a large team of fishermen. The drag net can be used manually or by using a boat to set in water and draw. This net is operated at places where the river bed, lake or wetland is more or less calm or stagnant. In reservoirs, they are being operated in bays especially during summer months when water recedes and fishers normally avoid those places where submerged tree stumps are there (Figure-13).

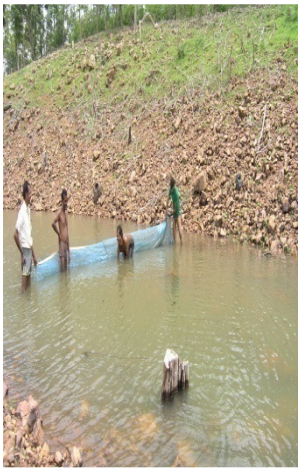

Figure-13: Drag netting.

Scoop net: Scoop net is locally known as *'Penni'*. It is a conical shaped bag net tied on a triangular bamboo frame. One pole of the bamboo frame is extended by about 1 m for operating the net. The frame is dipped into water, pushed forward along the bottom to some distance before being lifted up. This type of gear is mostly operated in shallow waters of 0.5-2m depth. It is being used sporadically round the year in various water bodies of Madhya Pradesh especially to catch small fishes and prawn (Figure-14).

Hand bag net for jumping fish: This type of bag net is locally known as *'Jhalga'*. It is a square/rectangular shaped small hand bag net tied on a frame made of wood/bamboo/cane. It is fixed on a long handle for operating the net. The square/rectangular frame, fitted with a mosquito netting cloth, is used to catch fishes from a long distance when they jump out of the water. The length of the net is 60-90cm while the length of the handle depends on the distance of the fishing ground/area. It is mainly operated individually in turbulent waters like waterfalls or such type of water bodies (Figure-15).

Hook and Line: Various forms of hooks and line are used for angling different kind of fish. The lines can be anchored or left drifting or they can be fixed in any position from the surface to the bottom. Originally, line is used to catch single fish but in the form of long line, it becomes a gear to catch large quantity of fish. The fishes are being lured through real or artificial bait attached to the hook for getting them hooked, ultimately. Use of earthworm as living bait and snail flesh as dead bait are traditionally used as baits in hooks and line. This is usually done by putting the bait along with hooks at the end of the line. This type of gears can further be divided into 'Hand line' (with a small series of hooks) (Figure-16) and 'Long line' (with a larger series of hooks) (Figure-17).

Figure-14: Scoop net.

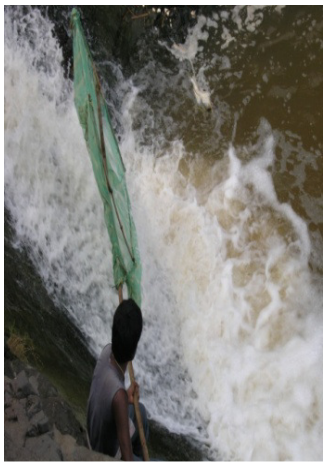

Figure-15: Hand bag net for jumping fish.

Figure-16: Hook and Line.

Figure-17: Long line.

Traps: Traps are fishing devices where fishes enter voluntarily and are being trapped inside. Trap fishing is a passive fishing technique of ancient origin with great variations in the design, materials, fabrication and operation so as to match local condition and behavior of the target organism. A trap may have one or more chambers in, which gets closed after the fish moved inside. Except for the entrance, small traps are completely closed like cages, unlike the large traps which remain open above the water surface. Traps are made up of bamboo splits, generally. In Madhya Pradesh several types of traps are in use for fishing.

V shaped trap: This type of trap is locally known as *'Moude'* and is being operated individually for catching diverse group of fishes. *'Moude'* trap fishing is common during winter to summer months in shallow, stagnant and calm waters. Small fishes and prawn are common catches by this type of trap. It was documented in river Narmada at Khalghat (Figure-18).

Long trap: This type of trap is locally known as *'Dhir'*. *'Dhir'* is a large rectangular shape trap and numbers of pockets are present horizontally. Fishing using this trap is common during winter to summer months in shallow, stagnant and calm waters. It is used to be operated by one or two fishers. Due to long size of this trap, large quantity of fish can be harvested in a single operation. Several types of small fish species and prawn can be harvested by *'Dhir'*. This type of trap was observed in river Weinganga at Balaghat (Figure-19).

Trap fitted with net: This is locally known as *'Chorya'*. This type of trap is cylindrical in shape and is fitted with about 10-15 m long and 5-10m width nylon net. This trap can be used all through the season. It is used to set in middle portion of the river where water current is available. Large quantity of fish can be harvested in a single operation by *'Chorya'*. It was observed in river Weinganga at Balaghat (Figure-20).

Cylindrical trap: This type of trap is locally known as *'Kumman'* and is being operated individually for catching diverse group of fishes. *'Kumman'* trap fishing is common during winter to summer months in shallow, stagnant and calm waters. Small fishes and prawns can be harvested by this type of trap. This trap was also observed in river Weinganga at Balaghat (Figure-21).

Figure-18: V-shaped trap.

Figure-19: Long trap.

Figure-20: Trap fitted with net.

Figure-21: Cylindrical trap.

So far numbers of researches have been conducted in different parts of India to document the available traditional crafts and gears which are in use for fishing[3,6-14]. Maximum of the documentations are from eastern and north-eastern part of India. Except some scattered information[15-17], so far no such comprehensive knowledge was available on the existing crafts and gear of Madhya Pradesh. Srivastava et al.[15] reported three types of gears namely gill net, drag net and long lines in their study on ecology and fisheries of Tawa reservoir while Singh[16] reported five types of gears namely gill net, drag net, scoop net, cast net and hook and line in his study on environment and fisheries of river Narmada. Later Chourey et al.[17] reported the same documentation as that of Singh[16] except the addition of a special type of trap called *'chapar'*.

In the present study, as many as ten kinds of fishing gears have been documented including five new techniques which earlier have not been reported from this state. On the other hand, not much detail documentation on crafts in use in this state was available, which has been reported in the present study.

Conclusion

So in a nut shell, it can be reported that in the present investigation it has been tried to summarize the so far available crafts and gears used in fishing in Madhya Pradesh. These ITKs can be further upgraded with modern technologies to increase the catch and to enhance the durability and life span.

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