Traditional fishing gears used by the fisher folk of Chatla floodplain area, Barak valley, Assam

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Received 17.07.12, revised 10.09.13

A survey was conducted for a period of 18 months (January 2010-September 2011) on 150 fish farmers of Chatla floodplain area to document the traditional fishing gears and fishing practices prevailing among them. It is found that the fishermen of Chatla floodplain area use different types of fishing gears depending upon the species and size of fish. Almost all the gears are hand made with bamboo, cane, cotton and sometimes nylon threads following primitive technologies.

Keywords: Fish farmers, Fishing gears, Livelihood

India is rich in aquatic resources and among various aquatic resources fishes are important and palatable food for mankind. It is significant to note that India is at the threshold of blue revolution\(^ 1\). It has made notable progress in the field of inland fisheries. Most of the Indian water bodies are utilized for fish culture. Fishing is not a new practice in India. Evidence of fishing were found among the pre-historic artefacts\(^ 2,3\), in the artifacts of Harappan pottery, motif and civilization of Indus valley\(^ 2,4\) and ‘Asokan’ epigraphical materials\(^ 5,6\). Human civilization in the last few decades witnessed a heightened interest in knowing and seeking support from the rural people, who are bookmarked as indigenous knowledge holders and practitioners. The traditional fishers are termed as a repository of valuable knowledge about the dynamic nature of fishery resources and ecosystems. Traditional fishing gear, specialized fishing techniques and fishing practices mould the socio-economy of the inhabitants of an area and their livelihood. Human societies of each and every region possess individual types of fishing gears and traditional fishing practices. Chatla wetland (90° 45' N and 24°45' E), situated about 20 km South of Silchar, Barak Valley, Assam, has a number of small inlets and a single outlet which drains into River Barak. The wetland basin has about 32 villages whose economy is highly dependent on fish and agricultural crops produced in the area. Fishermen of the floodplain area use different types of fishing gears as per the physiography of the water bodies. In this paper, an attempt has been made to generate relevant baseline information on the traditional fishing gears used by the fishermen of Chatla floodplain area, Barak Valley, Assam.

Materials and methods
Information on the traditional fishing gears and fishing practices were collected during January 2010-September 2011 from 150 fishermen of Chatla floodplain area (Fig. 1). All data were collected by preparing interview schedule with structured and semi-structured questions extracting data from fisher folk. A multistage sampling technique was applied to select sample respondents\(^ 7\). Multistage sampling is a combination of various techniques such as simple random sampling, where each possible sample has the same probability of being selected; stratified random sampling, where the whole population is divided into sub-populations called strata and a sample is selected using a random design within each stratum; cluster sampling, where the population is partitioned into groups. In multistage sampling, each stage involves a random selection of sampling units, which can be elements or clusters. Finally the statistical analyses were made using MS EXCEL 2007.

Results
At least twelve types of fishing gears are used by the fishermen of Chatla floodplain area (Table 1). Fishing gears along with associated equipments, their
materials of manufacture and market rate are shown in Table 2. Seventeen per cent fishermen of the study area are known to use *Dori* for catching fishes, 15% are known to use *Konch*, *Faron* is used by 17% fishermen, *Runga* is used by 8% fishermen, 4% fishermen are known to use *Borsi* and *Lar*, *Sepa* is used by the 5% fishermen and 34% fishermen are known to use different types of nets such as *Dub Jal*, *Moshari Jal*, *Ural Jal*, *Ber* and *Fas Jal* for catching fishes (Fig. 2). Photographs of fishing gears used by the fishermen of Chatla floodplain area are shown in Figs. 3-10. Condition of water body might have a role in determining the methods of fishing and economy associated with it. Fishermen of Chatla floodplain area use different types of fishing gears depending upon the species and size of fish. These fishing practices are the important capture technology, which had not undergone many changes across the time.

**Discussion**

Fishing gears are generally made with bamboos. However, fishing nets are made by weaving cotton threads and in some cases nylon threads are also used. Bamboo has always played an important role in the lives of the people of Barak Valley as well as Assam. It has been an integral part of the cultural, social and economic traditions of North east India. It is utilized in many ways such as housing, fencing, functional

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<th>Table 1—Fishing gears used by the fishermen of Chatla floodplain area</th>
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<td><strong>Fishing traps</strong></td>
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Fig. 1—Map of the area studied
articles, agricultural implements, fishing gears, basketry, and even fuel and food. People possess traditional skill of making the various articles as well as knowledge of the cultivation and management of bamboo. Rattan is also an important natural material for the manufacture of fishing gears. Rattans are superficially similar to bamboo and are extensively used for making furniture and baskets. People from different villages specially Bhaga, Bhuban Dahar, Aiyna Khal, Baskandi and Dolu of Barak valley are the manufacturer of fishing gears. The gears are hand made and considered as the traditional source of economy for many rural families. The cost of fishing gears ranges according to their shape and size. As for example the rate of a Sepa and Runga ranges from Rs.150-200 and Dori upto Rs. 300. Similarly rates of different nets are comparatively higher than other gears with a range of Rs.500-10000. Different types of accessories associated with fishing are also in high demand. But with decrease in the interest for adopting fishing as an occupation, the demand for fishing gears are gradually decreasing. For that reason the rural industry associated with manufacture of fishing gears is on the decline. Fishing gears most commonly used by fishermen of Chatla floodplain area generally include spear, nets, both manipulated and automatic traps, valved as well as non-valved.

Automatic fishing traps like Sepa (Fig. 3), Runga (Fig. 4), Dori (Fig. 5) and Faron (Fig. 6) do not require any manipulation by hand. Some of these gears have valves at one end. When fitted to gentle water current, fish enters through the valve and get trapped inside the gear. They have to be kept along the water current. They might be with valves or without valves. Valves are nothing but trap doors through which fish can enter easily but can not go out easily.

Fish hooks (Borsi and Lar) Besides these fishing gears, fishermen at household level use hooks and fish gorges locally known as Borsi (Fig. 7) and Lar (Fig. 8) for catching fishes at the household level. The technique is to allure a fish to swallow the curved needle to which, a bait is attached. Tiny creatures like grasshopper, earthworm, etc. are provided as bait. In Borsi, the hook containing bait is attached to a bamboo pole in hanging position via a cotton thread, whereas in Lar it is at the end part of long jute threads and is operated from boat only.

Fishing spear or Konch (Fig. 9) is mainly used by the people of West Bengal and Assam. Fishers can catch fishes simply by throwing this specially designed spear. These are very handy and quite useful in catching fishes.
Nets

Different types of Nets used by the people of Chatla area include Lift net, Gill net and Seine net (including Fine mesh Seine net).

**Lift nets** or **Dub Jal** (Fig. 10a) are the nets, where fish swims or are maneuvered over a flat or bag like piece of netting and are then caught by lifting the net. It is a triangular lift net fixed with bamboo poles operated from a bamboo platform built along the canal that brings in or drains out water from a *Beel* or in a floodplain area with gentle flowing water. During fishing, fishers drop the net into the water against gentle current. The front remains under water while the conical end remains about 2 m above the water surface.

**Fine mesh Seine nets** or **Moshari Jal** (Fig. 10b) are small mesh (25-50 mm) monofilament fixed gill net usually used to catch small freshwater fish species. A number of nets are joined together and set in paddy fields or an open area of floodplain, river or reservoir.
Mesh sizes vary according to water bodies. It is extremely destructive because of its potential to overexploit juvenile carp. It is considered to be one of the most harmful nets and is responsible for the decline in fish population in rivers, flood plains and reservoirs.

**Gill nets** or *Ural Jal* (Fig. 10c) are panels of netting held vertically in the water column by a series of floats attached to their upper edge (the float line or cork line) and weights to their lower edge (the foot rope or lead line). These nets are either staked or anchored in shallow water or set to drift in open water. As passive gear, their catching ability relies on the movement or migration of fish through the area where the nets are set.

**Seine nets** or *Ber and Fas Jal* (Fig. 10d) are designed to be towed in an arc around fish shoals to surround them. Fishes of both small and large size are vulnerable to such gear but the catch depends mostly on the mesh size. Methods of employing seine nets vary. Frequently one end of the net is attached to a pulley or anchored on the shore and a boat is used to pull the net into a large arc back to the shore before hauling in. Seine nets are of two types mainly of *Ber Jal* and *Fas Jal*. *Ber Jal* is a conventional beach seine net. It is commonly used in floodplains, ponds and rivers. This gear catches huge numbers of undersized carp from the stocked flood plains. It is considered very destructive to fish communities for several reasons. During operation, this gear destroys the habitat for wild species thus causing multiple harms to all the species. Fine-mesh *Ber Jal* catch fish irrespective of their size or species. *Fash Jal* is a rectangular net made of monofilament or nylon twine operated in reservoirs, rivers and flood plains. It is a passive gear commonly known as net *jal*. This gear is fixed in the bottom of water body with two bamboo poles to form a large net wall.

All the catches are generally kept in traditional containers like *Kholoi* and *Tukri* or *Chagad* being covered by *Dala*. In order to protect themselves from sun and rain, fishermen use a bamboo made traditional umbrella, locally known as *Chatta*. *Barringtonia acutangula* is used to provide habitat to the fishes that assemble in the fisheries from the rivers. Fishermen of Chatla area use some common plant species for providing shelter to the small fishes after the water recedes during October-November. Use of *B. acutangula* was reported in an earlier work from the same area.

**Traditional significance of study of fishing gears and some constructive recommendations**

Present study recommends the use of locally available biodegradable materials for the manufacture of fishing gears. Use of traditional fishing gears and nets can be a constructive step in replacing newly adopted fine mesh nylon nets (*Moshari Jal*), there by promoting fish catch in a sustainable way. Traditional knowledge is an integral component of any holistic approach and can provide potentially critical information. Traditional fishing gears promote sustainability. Traditional fishermen community of Chatla floodplain area depends upon sustainable management measures for their own long-term survival. They are the people, who are in constant contact with aquatic environment and have access to a wide variety of knowledge, which may not be easily accessible to a visiting researcher. But the main issue is, they lack proper scientific information on each and every fishing gear they used, impact of these devices on the environment, and science behind the traditional way of fishery management they follow. As complete information from fishermen as well as scientific researchers fill up all the loopholes and help in proper development of fishery sector in sustainable way, such communicative researches should be carried out everywhere in each and every community level.

**Conclusion**

Though the fishing gears were traditionally designed to promote sustainable fishing, tremendous use of fine mesh nylon nets (*Moshari Jal*) has become a matter of concern as they catch large number of under size carp. The indiscriminate exploitation of fishes from inland open water, natural depressions (*beels*), floodplains, or canals result in the loss of the entire populations of wild fish species including brood fish and juveniles. It is time to raise awareness among the fishermen about long term ill effect of overfishing with the help of fine mesh nets (mosquito nets or *Moshari Jal*). The construction of the traps itself is an art and remains with the traditional fishers of the region. Synthetic materials for the construction of traps for increasing the durability is an option, but the present material is abundantly available locally and these are biodegradable and would not have any adverse affect on the environment. Traditional fishing gears are also associated with economic life of large number of people. So, the manufacture, use of traditional fishing gears and implementation of traditional fishing practices should be given priority to
promote sustainable fishing and socio economic upliftment of the fishermen as well artisans of the area as well as entire region.

Acknowledgement
Authors are thankful to the University grants commission, New Delhi for financial support through major research project. Authors are also thankful to all the fishermen of Chatla floodplain area who shared all these information and provided their consent regarding publication of the work.

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