



Line Fishing Methods of the Brahmaputra Valley

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ABSTRACT

An investigation was carried on the availability of different types of fish hooks and lining methods in the Brahmaputra valley with an objective to study the respective dimensions, seasonal variation, abundance, catch, cost, the variability of gears with the targeted fish species and their mode of operation. The identified fish hooks and lined by the fishers of Assam can be classified into 10 different types under 2 major categories based on the principle of capture, design, and operational methods. Many of these gears were selective and the hook materials have a significant influence on the gear performance. The fish catch is composed of small fishes viz., *C. punctatus*, *Puntius* spp., *Anabas testudineus*, *Eutropiichthys vacha*; mid-sized fishes viz., *Catla catla*, *Labeo rohita*, *Channa marulius* and bigger sized fishes viz., *Wallago attu*, *Rita rita*, *Bagarius bagarius*, *Chitala chitala* and *Notopterus notopterus*. The fishes are caught on their commercial importance in terms of food, ornamental and sports perspectives. Most of these hooks are fabricated traditionally and except the ones being imported on recreational purposes in the region.

KeyWords: Assam, Brahmaputra valley, fishing, gear, lining.

INTRODUCTION

Knowledge of Indians concerning fishing techniques, fishing gear and their fabrication is quite ancient and a number of studies are conducted in line fishing all over the world as it is one of the most important fishing aids in the fishing industry especially to catch large sized predatory fishes. Most of the studies on long line fishing is restricted to the marine fisheries (Edwin *et al*, 2014; Selva *et al*, 2015; Kumar *et al*, 2017) and scanty information is available for the inland or freshwater fisheries of the Northeastern region of India. Fishing areas in the state Assam are mostly river basins, often associated with extensive areas of floodplains, connecting channels, lakes, reservoirs and an array of smaller rivers, irrigation and drainage canals and a variety of seasonal or permanent small water bodies (Baruah *et al*, 2018). Description of the fishing gears and their mode of operation in these water bodies under Brahmaputra and Barak valley are detailed in different seasons and locations (Dutta and Bhattacharya, 2009; Gurumayum and

Choudhury, 2009; Vass and Moza, 2011; Dutta *et al*, 2012; Dutta and Dutta, 2013; Baruah *et al*, 2013; Saud *et al*, 2015; Ahmed *et al*, 2018; Nath *et al*, 2018. The usage of these gears were found to vary according to water depth, season, water area, type of fish species, availability of raw material for gear fabrication etc (Sandhya *et al*, 2019). Improvement of the materials used on the designing of the different types of pole and lines has made a great influence on their performance with respect to fishing efficiency, selectivity, gear handling and cost and catch quality. Due to limited information available on the applicability of fish hooks and lines used by the fishers of Assam, an effort has been made herewith to understand the techniques of line fishing in the largest river system of the region-the Brahmaputra drainage.

MATERIALS AND METHODS

A survey was conducted in forty river fishing grounds, twenty seven wetlands, eight landing centers and sixty seven fishing villages in the

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entire stretch of river Brahmaputra and floodplain wet lands (*beels*) in the state Assam with reference to study the usage of various hooks and line and their fishing methods. The information was collected following a prescheduled proforma and the technical specifications with design details of the gear and mode of operation were recorded based on classifications of Brandt A Von (1984) and Sreekrishna and Shenoy (2001). Based on the proforma, the details of gear dimensions, construction materials and area of operation, fish catch composition, duration of operation were collected from more than 120 fishermen, 70 lessees, mohaldars and middleman.

RESULTS AND DISCUSSION

As a result of the investigation in the different parts of the river valley and its adjoining floodplain areas, the identified fish hooks and line can be classified into 10 different types belonging to 2 major categories based on the principle of capture, design, and operational methods. These devices consist of baited hooks attached to a single line or multiple lines, whereas the principle of capture is based on the feeding and hunting behaviour of target species.

Simple hand lines: These types of lines are operated with few hooks and the operator needs constant attention to catch the fish. These are locally known as '*Boroxi*' in general, '*Duruk boroxi*' in Kamrup district, '*Puthi boroxi*' and '*Jhul boroxi*' in Dhubri district. Generally used to catch *Channa marulius*, *C. punctatus*, *Puntius* spp., *Anabas testudineus*, *Wallago attu*, etc.

Hand lines

Hand line is a single vertical line carrying one barbed hook which is dropped into the water and waited for a fish to bite. It is the simplest form of line fishing. It consists of a line made of nylon of a certain length with or without sinkers and with an iron hook. These hand lines may be of a very shorter length of about 0.5 m and operated in marginal water bodies of ponds, tanks, wetlands and river

banks to attract the fish with a baited hook. Baits such as flour balls, earthworms, insect larvae and cooked rice are used. The longer version of the hand lines may be provided with or without sinkers and floats. The baited hook is thrown to a certain distance and the line is continuously watched. Any catch at the hooks is felt by the jerks exerted by the fish on the line held by the fisher. The line is very cheap ranging from Rs. 20.00-30.00

Pole lines

These are hand lines attached to a pole or poles and used with acceptable baits of all kinds (Fig. 1). This is a simple fishing rod made of bamboo of suitable length (2-10 m) and girth (2-3 cm) with a line made of cotton or nylon (Baruah, 2014). The hooks are barbed and every line is fixed with one of them. The float may be a piece of lightwood, sandal/rubber while a piece of lead or iron forms a sinker. Expensive rods provided with revolving reels are not in use commercially but are actively used for angling/sports fisheries as a popular hobby in this wing of India. The prized catches are *Tor* species (mahseers, locally *pithia*) and *Labeo dyocheilus* (*shilgoria*). Pole line can be a hand pole line and a set pole line. The former is operated by hand and inserting the butt of the pole to the ground sets the later. Live form of a frog, small *Channa punctata* is given as baits. Predatory fishes like *Wallago attu*, *Sperata seenghala*, *Sperata aor*, *Channa marulius* are attracted to the moving baits and are caught in the process of swallowing the bait along with the hooks. These gears are fabricated within a cost of Rs. 100.00-200.00.

Long lines

Long lines are devices anchored with a large series of baited hooks, either set or drifting and requiring only periodical attention at more or less fixed intervals of time.

Set long lines

These are long lines anchored to the ground on shore or bottom so that they are not free to move with the current. A long line of this kind has the

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main line of several hundred or thousand meters in length. This main line is attached with snoods or secondary lines/branch lines at suitable intervals with baited hooks. The two ends of the line are fixed to stakes on the opposite banks of a river. Some variations may have only one end fixed to a stake and the opposite end allowed to sink by using bricks as sinkers. The lines are generally shot at night and hauled in the morning. Fishes targeted are *Wallago attu*, *Rita rita*, *Bagarius bagarius*, *Chitala chitala* and *Notopterus notopterus*. The cost of the gear is approximately Rs. 300.00-500.00.

Dham boroxi

It is also known as '*Lar boroxi*' in the Barak valley region and '*Lesera boroxi*' in North Lakhimpur district. These types of lines are operated round the year. It is operated in both river and beels. The main line is tied to bamboo poles fixed on either side of the river and, in case of beels a particular spot is selected. The hooks on the branch line are hanged from the main line at regular intervals (Fig. 2). Sometime one end of the main line is tied to a bamboo pole fixed on the riverbank and the other end is set free. The hooks are placed both day and night and the catch is periodically removed. Bigger sized fishessuch as *Wallago attu*, *Rita rita*, *Bagarius bagarius*, *Channa punctatus*, *Chitala chitala*, *Notopterus notopterus*, *Clarias batrachus*, *Mastacembelus armatus*, *Catla catla* and *Sperata aor* are targeted. Other catch includes *Mystus* spp, *Xenentodon cancila*, *Eutropiichthys vacha* etc are targeted. The cost of the hooks is approximately Rs.400.00.

Hazar boroxi

These types of hooks are operated round the year, especially during winter months. This type of fishing is mostly practised in river Brahmaputra and in some beels of Dhubri and Barpeta districts in particular. The hooks are hanged from the main line at regular intervals and are installed at the bottom of the river- bed or beel (Fig.3). This '*hazar boroxi*' is specially targeted to catch the tortoise. Other catch

includes *Wallago attu*, *Aorichthys aor*, *Notopterus notopterus* etc. The cost of the hook ranges from Rs.700.00-4000.00 depending on the length and number of hooks being used.

Toponi boroxi

It is a long line with one hook at the end, which is provided with bait (Fig.4). It is operated in the rivers of Jorhat district. The line with the bait is thrown in the middle of the river and the other end is tied to a bamboo pole fixed at the bank of the river. It is especially used for catching *Bagarius bagarius* and *Wallago attu*. The total cost of the hook and line is Rs.60.00. Such type of gear usually lasts for around 4 years, which may vary depending upon its usage.

Shal boroxi

It is similar to '*Toponi boroxi*'. The name is given on the target fish, *Channa marulius*. It is operated in beels and rivers of district Jorhat mostly during the daytime.

Garua dhora boroxi

This is similar in operation to that of '*Toponi boroxi*' (Fig.5) and the name is given on the targeted species, *Bagarius bagarius*. Apart from it, the other catch includes *Sperata aor*, *Wallago attu* and *Rita rita*. This long line is mostly operated in the district Sonitpur.

Puthi boroxi

This hand line is mostly operated in the district of Kamrup and is targeted to catch *Puntius* spp.

Drift long lines

Drift long lines are long lines without a fixed attachment to the ground on shore or bottom that are free to drift with the current or tide. These are locally known as '*nol boroxi*' or '*ponga boroxi*' more specifically in the Dhemaji district (Fig.6). This is a single vertical line suspended from a short bamboo float of 30-35 cm length, carrying a barbed hook and operated by simply dropping it into the water and waiting for a fish to bite. The length of

the vertical line is facilitated based on the water depth. This long line is mostly suitable for weed choked stagnant water bodies to catch specially murels. The acceptable baits to catch these fishes are earthworms, small fish, eggs of honeybee and ants and wheat balls.

In line fishing, the fishes are lured to a bait which is presented in such a manner that it is neither able to take away the bait or can it escape once it is taken. Line fishing is prevalent in most parts of the state due to its simplicity of construction, cost effectiveness and ease of operation. Line fishing is considered by the local fishers to be an efficient technique of fishing in weed choked beels and high terrain streams where other fishing gears are difficult to be employed due to submerged obstructions. The hand line is the simplest form of fishing line. However, with the development of set lines, it is possible to use more lines that have several hooks and extend to considerable length. Lines are species and size specific and are used for sport fisheries (Fig. 7) in the upper reaches of the Brahmaputra and its tributaries viz., Jia Bhorelli, Lohit, Siang, Subansiri and Dibang. In spite of lower landing in these forms of fishing gears, the catch structure is of high quality with prized value.

CONCLUSION

The present study observes that the small differences in the hook sizes do not influence the size distribution of the fish catch. Larger hooks demand a stronger force to penetrate the mouth tissue. These hooks are more resistant to breaking or straightening and therefore prevent the largest fish from escaping. Nowadays, the high quality hook manufacturers ensure a high breaking strength also for hooks of small dimensions. In certain hooks, the numbers of fish caught are affected by the size of the bait used. Some fish species have a habit of taking the entire bait in the mouth, while others nibble the bait piece by piece thereby allowing the consumption of larger bait. Thus the selectivity of the hook size can be affected by the size of the bait.

The hooks used in line fishing are made of steel and wrought iron and are marketed in different shapes and sizes. The Norwegian method of numbering hooks is followed in India (Sreekrishna and Shenoy, 2001). In this method, the size of hook becomes smaller as the number increases. Improvement of the materials used on the designing of the different types of lines will have their influence on gear performance with respect to fishing efficiency, selectivity, gear handling and cost and catch quality.

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Fig. 1 - A hand pole line (*boroxi*)



Fig. 2 - A set long line (*dham boroxi*)



Fig. 5 - A set long line (*Garua dham boroxi*)

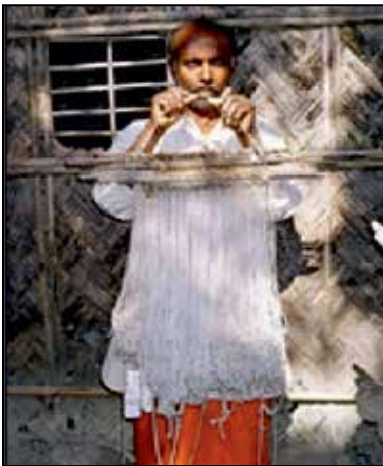


Fig. 3 - A set long line (*hazarboroxi*)

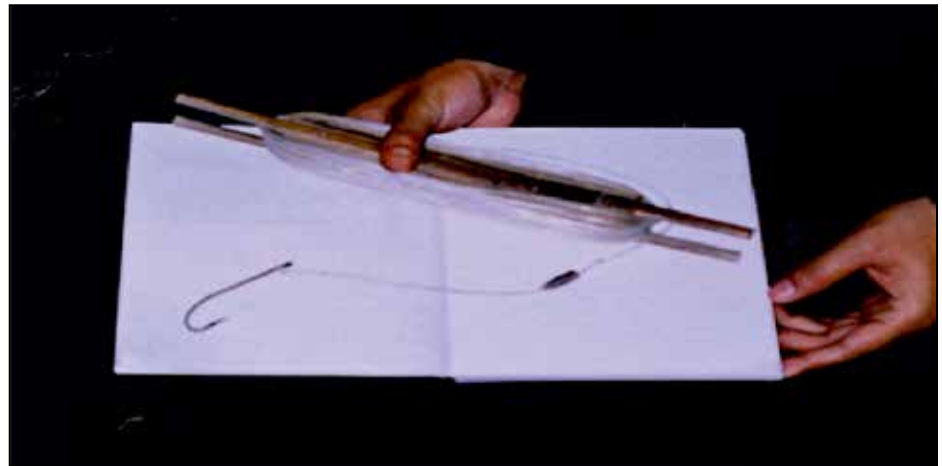


Fig. 4 - A set long line (*toponiboroxi*)



Fig. 6 - A drift line (*pongaboroxi*)



Fig. 7 - A modern pole and line used in sport fisheries

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