

## DIFFERENT TYPES OF FISHING GEARS USED BY THE FISHERMEN IN NALBARI DISTRICT OF ASSAM

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### ABSTRACT

Nalbari District is situated in between 26°N and 27° N latitude and 91° E and 97° E longitude in the state of Assam. The entire area of the District is situated at the plains of the Brahmaputra Valley. The tributaries of the Brahmaputra, Nona, Burhadia, Pagaldia, Borolia and Tihu which are originated from the foothills of the Himalayan Range are wild in nature and have enormous contribution towards the fishery economy of the district. A diverse range of fishing gears and methods have been evolved over a long period of time by the fishermen of Nalbari district to capture a wide range of fish species. An attempt has been made to focus on certain indigenous methods, which were recorded during the present work. The survey of the fishing gears and their method of operation in Nalbari district has revealed that 36 types of fishing gears are in vogue in commercial use which belongs to several categories. As obtained from the study, it is evident that Mushari jal, Langi jal and Phansi jal are the most extensively used implements in commercial fishing. Among all indigenous fishing devices “Katal fishing” is the unique and assured method of capturing big sized fishes.

**KEYWORDS:** Fishing gears, Indigenous method, Katal fishing, Mushari jal, Nalbari district.

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### INTRODUCTION:

Fishes are important resources worldwide, especially as food. Commercial and subsistence fishers hunt fish in wild fisheries or farm them in ponds or in cages in the ocean. They are also caught by recreational fishers, kept as pets, raised by fish keepers, and exhibited in public aquaria. Fish have had a role in culture through the ages, serving as deities, religious symbols, and as the subjects of art, books and movies.

Assam is gifted with many extensive water bodies commonly known as Beels that are the only source of fish for the poor people in the surrounding villages. Beels are major fishery resources contributing to about 25 % of the fish production in Assam. Assam is bestowed with enormous Water resources covering as much as 3.65 lakh hectares of water spread areas. This constitutes about one twelfth of the Country's Inland Water resources. However, the rich biodiversity of the freshwater fish of Assam has been rapidly dwindling because of increasing degradation of inland water.

Assam being a predominantly fish consuming State, the demand for fish is very high in the State. Assam produced 2.06 lacs metric ton fish against a requirement of 2.26 lakh metric ton in 2008-09. Around 20,000 metric ton fish come from outside the State to fulfil the demand. Thus, there exist a gap between demand and production of fish.

### ABOUT THE STUDY AREA:

Our study site, “Nalbari District” is situated in the state of Assam, India in between 26°n and 27° n latitude and 91° e and 97° e longitude.

The entire area of the district is situated at the plains of the Brahmaputra valley. The tributaries of the Brahmaputra, Nona, Burhadia, Pagaldia, Borolia and Tihu which are originated from the foothills of the Himalayan range are wild in nature and have enormous contribution towards the agrarian economy of the District. The district has a sub-tropical climate with semi – dry hot summer and cold winter. During summer, generally during the months from May to August, heavy rainfall occurs for which the district experiences flood. The district experiences annual (average) rainfall and humidity @ 1500 mm and @ 80 % respectively.

### THE BOUNDARY OF NALBARI DISTRICT: -

East: Kamrup and Darrang districts.

West: Barpeta district.

North: Indo-Bhutan International boundary.

South: Brahmaputra River.



Fig- 1: MAP OF NALBARI DISTRICT

## **AIM & OBJECTIVE OF THE WORK**

Nalbari District harbours a wide variety of commercial and non-commercial fishes which form the principal economic source for the fishermen of the concerned area. The people of the district much depend on the fisheries for their livelihood. But, now a day, the production of the fish species is in declined and the fishermen communities are of the opinion that this is because of the degradation of the water bodies.

Various fishing gears are applied for the catching of fish in the Kapla Beel. The fishermen select the fishing gears according to the situation. But most of the fishing gears are of primitive type. The total potentiality of the Beel can be enhanced by applying the proper fishing gears. Use of improper gear for fishing can hamper the fish population and potentiality of the Beel cannot be utilized properly.

Keeping all these in mind, we have decided to do a detailed survey about different type of fishing gears and instruments used in fishing. The impact of these fishing gears in the fish population will be determined at the same time.

## **MATERIALS AND METHOD OF COLLECTION:**

### **COLLECTION OF THE DATA:**

All the relevant data about the fishing gear and fishing method were collected through the field survey with the help of the local fishermen. A large number of fishermen were personally interviewed.

### **STUDY PERIOD:**

The data were collected during the study period of July, 2011 to June, 2012.

## **PROCEDURE OF THE STUDY:**

All the description of the gear and methods and other relevant statistics provided by the fishermen were recorded in the relevant section of the questionnaire. The gear and methods were - types of gears, seasonal variation of gears, types of indigenous fishing devices and fish composition. The fishing gears are classified into several groups for the better study of the same.

## **RESULT OF THE STUDY**

A diverse range of fishing gears and methods have been evolved over a long period of time by the fishermen of the Nalbari District to capture a wide range of fish species. Hence there is a need to classify them for their discussion in a systematic way. Several systems of classification of fishing gears have been developed based on the principle of capture, design and operational method. Based on the mechanism in the capture process, fishing gears whether primitive or modern can be classified into following five categories-

1. Gilling or Tangling (Gill nets)
2. Trapping (Traps)

3. Filtering (trawls, seines and other net fishing system)
4. Hook and Spearing (Hook and Lines)
5. Dewatering (fish ditches)

The principle laid down by the joint committee of ICNAF, ICES and FAO (1956), Brandt (1968) grouped the fishing gears into 13 categories.

However, it has been observed that classification of fishing gears into 5 categories mentioned earlier is grossly inadequate to describe the gears and methods of Assam. Hence, the study followed the minute classification suggested by Brandt (1994). Seines, namely Musari jal, and Gully jal, surrounding jal namely Ber jal, Pam jal, Cheela jal, Katalmara jal, Polo jal, Juluki and Jhupri and falling nets namely Khewali jal and Angtha jal share common characteristics i.e., encircling type nets (There is no stupefying method).

#### **(A) FISHING WITHOUT GEARS (DECEMBER - FEBRUARY):**

This is probably the simplest method of catching the fishes, which are caught by hand in shallow water. In the beel, water flows out through narrow channels. The fishes that come out in the shallow channels are picked up by hand.

Mollusca and Murrels are also caught by this method.

#### **(B) IMPALLING GEAR:**

This method uses sharp implements for catching of fish by wounding, grappling and killing. The different types of impaling gear found in Nalbari district have been described below.

**(i) JONGAR:** The jongar or joar consist of a tapering bundle of 10 or more split bamboo spears, shod with sharp conical iron points. It is heavy and hurled with considerable force at the fish, which is pointed to the ground. It is also known as a "Pocha".

**(ii) TIARA:** It is a light bamboo spear, ending in a detachable fork of three barbed points. The fork is attached to the shaft by a fine string. The points are made of steel wire tied in a bunch with a piece of thinner wire.

**(iii) POKORA:** The pokora is a thin bamboo spear with a single barbed point, which is detachable and is fastened with the shaft by a fine string. It is generally used for spearing large fish and for tortoise also.

**(iv) KOL OR KATI:** It is same as that of Pokora but is a small spear with single point, which is not barbed.

#### **(C) TRAPS:**

Traps are fishing devices where fishes or shellfishes are enticed by bait or shelter spaces or enclosures where they are guided to enter, because of an obstacle placed in their normal migration path and from which their escape is made difficult by constriction by retarding valves or labyrinths.

The trap is a passive fishing process of ancient origin.

(i) **GHANI:** The Ghani is a cylindrical fixed trap slightly flattened at the bottom to enable it to lie stable on the floor of the Beel. On the other end of the cylinder has a concave surface, going into the cylinder and ending up into a narrow orifice. The meshes are of generally 50-70 mm square. It is used for catfishes and large fishes. It is fixed by tied to shakes driven in the bed. It has a door at the top of the neck which is emptied once after 6-8 hours.

(ii) **CHEPA:** It is most commonly used. It is a drum shaped sieved bamboo trap, tapering at both ends. One opening is closed by a piece of wood while the opening on the other side is half closed by another piece of wood. There is also an opening at the side of the trap with bamboo stripes extended inwards so that fishes get an easy entry to the trap while extended gill like bamboo stripes prevent them from escaping. The trap is facing the opening against the current. The diameter of the opening is 20-40 cm and total length varies from 90 to 150 cm.

It is generally used to catch minor group of fishes during the time of April to June.

(iii) **DINGORA:** It is made up of of bamboo stripes, rectangular in shape having a mouth at one side with the sieve directed inwards, like spines. It is set between two guard walls, made of screw of vertical split bamboo, inclined to each other at an obtuse angle. The length varies from 0.5 to 1.3 m.

Generally it catches all kinds of minor group fishes in monsoon (May to July).

(iv) **CHERHA:** It is funnel shaped fishing trap which is also known as "Choroha". The height of the trap measures 77 cm and width is about 10.1 cm (diameter). Funnel shaped fishing basket is made up of several stripes. A ring of bamboo supports the circular wide mouth. The whole body is woven by a spirally travel bamboo or cane slip. This trap is set in the shallow water.

(v) **POLO JAL:** The polo jal is a bell shaped slit bamboo trap with a small opening on the top (15 - 25 cm) and bottom (60 - 90 cm). It usually 0.6 - 0.9 m in height and is used in shallow water for catching all kinds of fishes. The fishermen walk into the water press down the polo in front of him and the stopping down plunges his hand through the opening at the top and gropes in the mud for fish that are trapped.

(vi) **JULUKI:** The design detail of Juluki is very much similar to that of polo with few exceptions like the circumference of both the top and bottom opening are almost equal (in mouth 20-30 cm, bottom 28-30 cm). Rice bran bails are used to lure the fishes which facilitated easy trapping.

(vii) **JHUPRI:** The design detail is similar to polo but in this trap the mesh size is much smaller which can trap fish fry also. The spaces between the reeds are interwoven with sting. All types of fishes are trapped with Jhupri.

## (D) HOOKING AND LINE FISHING:

Lines are widely used in both traditional and modern fisheries. The principle of capture is based on the feeding and hunting behaviour of target species. Unlike the net fishing method here the fishes are individually caught and retained by hooks, which are tethered to lines.

(i) **RODS AND LINES:** Fishing rods are made up of bamboo. The lines are usually of twisted cotton or hemp threads. The floats are commonly made up of “Ulu grass”, “Jute stick” or “Sola pith”.

Bottom feeders and predaceous fishes are caught by the lines. Baits usually small fishes “Cheng”, “Lati”, “Prawn”, “frogs”, etc.

It can be categorized into two types depending on the materials used in the preparation of the pole.

(a) **NAL BARASI:** This type of “Barasi” bear a Nal instead of bamboo, which is of about 1.5 m long and is tied centrally with a central rope with a hook, which can float freely at right angle to the Nal. Generally earthworm is used as bait in this Barasi. About 100 - 150 Nal Barasi are found floating in the beel at a time and are checked three times a day to catch the hooked fishes.

The catch composition comprises mainly Goroi fish, Cheng, Kawoi, Singara and Singi.

(b) **SIP BARASI:** It is made up of Bijuli bamboo, which measures about 20-24 feet in length. At the top of the bamboo, a nylon rope with a hook is tied with a grasshopper taking as bait. The nylon rope measures about 4 to 4.5 feet length.

This is generally used to capture Singi and Clarias species.

(c) **DHAN BARASI :** It is a ground line consist of a short and stout line, one end of which is tied to a bait, while a number of finer lines, carrying baited hooks are tied at intervals to the last yard or two of the other end. It resembles like an ear of paddy, so known as “Dhan Barasi”. It is also known as “Khuti Barasi”.

(d) **DAN BARASI:** It is a multi-hooked barasi comprising of a number of hooks in a single barasi. A main nylon rope of the required length is tied with two bamboos pests at the other end of a particular area where where chances of catch is more. The main nylon rope measuring 1 - 1.5 m in length and are spread at an interval of 3 - 3.5 feet so that the hooks entangled each other. This type of barasi is used to capture mainly sol fishes.

## (E) ENTANGLING GEARS:

These gears such as gill nets are passive fishing gears. These are vertical wall of netting kept erect in water column by means of floats and sinkers and set perpendicular to the direction of movement of the target fishes. The simplicity of its design construction, operation and low investment has made this fishing gear very popular among small scale fishermen. In the Beel, they are operated in surface layer of water column and are known as “Drift nets”.

**(1) LANGI JAL (GILL NET):** Langi jals are rectangular nets which are provided with head and foot ropes. The foot and head ropes are provided respectively with sinkers and floats. Langi jals are often fabricated coarse, but stronger material like sun hemp. These nets are very much in size and meshes and operated bottom set, encircling or dragged gill net depending upon the behaviour of the species sought. The net is set by fastening to anchor. Sometimes the net is simply allowed to stretch the float. Fishes are often driven toward the net by beating kerosene tins or by disturbing the water with bamboo poles. Sometimes the net is tied against the current and allowed to remain a night. Fishes get entangled in the net by their operculum. Langi jals are of different types. Those are as follows -

**(i) PUTHI LANGI:** It is operated in sound the year. The design is similar as mentioned above and the mesh size is only 8-10 mm. The total length varies from 10-50m. The catch composition comprises of *Puntius* species, *Heteropneustes* species, *Catla* species, *Labeo* species, *Nandus* species, etc.

**(ii) KAWOI LANGI:** The design detail is same as mentioned earlier about langi jal and mesh size is around 17 mm. The major catch composition is *Anabas* species, *Nandas* species, *Heteropneustes* species and *Clarias* species.

**(iii) GOROI LANGI:** The mesh size is little more (20 mm) than Kawoi langi jal and Puthi langi jal but design detail is similar. The net is usually set near weed infested shore area. Fishes are driven into the net with Polo and Juluki. To operate the net 3 - 5 persons are needed for about 1 - 2 hours. The catch composition comprises of *Channa* species, carp fingerlings and small sizes *Wallago* species.

**(iv) ARI LANGI:** It is also large sized langi jal but as dragged gill net. It is made of sunn-hemp (4 ply) 55-60 mm meshes. The height of the net is about 1.15 m. It is used to fish Ari fishes (*Mystus* species).

**(2) PHANSI JAL:** Phansi jal are gill net of which the design detail is similar with that of langi jal with few exceptions. It is also a rectangular net provided with head and footrops. Unlike langi jals, the footrops is generally devoid of sinkers but is much thicker. Phansi jals are made of light materials, i.e., nylon or cotton.

The method of operation involves several indigenous devices to drive the fish into the net and is operated as surface set or drift net for Hilsa species, carps and cat fishes. Like langijal these are also variously named depending upon the fish species sought. These are as follows -

**(i) ROU FANSI JAL:** It is extensively used as surface set gill net in Nalbari district. It is made of sunn-hemp (3 ply) with 107.5 mm meshes. The other design detail and modes of operation is same as mentioned under the head phansi jal. As name indicates it is used to capture *Labeo rohita* but other carp of similar size could also be captured.

**(ii) KARAL FANSI JAL:** It is made of nylon or cotton with 120 - 135 mm meshes and 1.3 m height. It is used as surface set or drift gill net to capture *Catla catla* and other fish species of similar size. The structural detail and method of operation is described under Phansi jal.

**(iii) ARI PHANSI JAL:** It is mostly used as surface set or drift net and is made of cotton with 150 - 165 mm meshes 2.5 m height. The name indicates it is used to capture Ari (*M. Seenghala*) species. The structural detail and method of operation is mentioned under Phansi jal.

#### **(F) ENCIRCLING GEAR:**

The task of this net is to encircle a certain area where supposed to be presence or detected fish school and capture them by dragging or same time scooped out with other nets. This type of net is also known as surrounding nets. In operation of certain encircling gear one end of the net is shot from a fixed point, after which the gear is then hauled. The starting point is generally the shore of the Beel. It is found to be operated in shallow water and the net sinks from the surface to the bottom. Different types of cast nets are also fall in this category. Different types of encircling gears have been recorded during the study are describe before.

##### **(1) SURROUNDING NETS -**

**MUSHARI JAL:** It is also known as “Mohori Jal” in Nalbari District. It is used extensively all through the year except monsoon season. The net is made up of 2 - 5 pieces of rectangular nylon nets of mesh size 1 - 1.2 mm. Each piece of net varies 20 - 30 mm in length and 6 - 8 in breadth, tied together by nylon threads. The upper margin of the net is attached with a stout jute rope that is known as head rope likewise the lower margin with another jute rope, the ground rope or the foot rope. The net is also provided with the floats of soft wood or banana shoot and sinker of lead or breaks in the head rope and foot rope respectively. Other long ropes are tied on either side of the net.

The net is taken into the deep portion of the beel, stretched and the bottom rope is allowed to settle. The two nets are dragged towards the shore and brought together. As the central portion of the net comes to the shore, the net is lifted to form an effective bag. Generally 8 - 14 persons are required depending upon the size of the net for a single operation with the help of 2 - 3 boats. A single operation needs about 5 - 7 hours.

The catch composition comprises mainly the surface and column feeders but this net captures almost all types of fishes.

##### **(2) CAST NET:**

**KHEWALI JAL:** It is a circular net having the shape of a large umbrella. A strong cord is attached to the apex of the umbrella and a number of lead or iron weights are fixed all along the margin. The fishermen throw the net fully spread over the water, keeping the long rope in his left hand. This has to be done skillfully so that the net falls on the surface of the water fully expanded. The net sinks to the bottom and the circumference closes due to the weights attached to it. All kinds of small sized fish are entangled in the net, which is then pulled out by means of the cord.

##### **(G) SCOOPING GEAR:**

It is very simple and common and has been described as dip lift nets. This method is to submerge a hanging net, then pull it rapidly out of the water so as to capture any fish which



happen to be over it. The smaller net of this type hand operated but bigger one needs mechanism on land or a boat. The netting is supported on a round or rectangular frame.

**(i) PAH JAL:** It is also a Thela jal. The structure of the gear is same as mentioned under thela jal. But mesh size about 70.0 mm and is made of sunn-hemp instead of cotton. A man standing at a bow end of a boat while it is drifting operates it. It is said to be a special gear of hilsa and migratory carps.

**(ii) JAKOI:** It is a pouch of bamboo matting, which is triangular in shape with a wide mouth (2 m circumference). It is made of bamboo sieves even at intervals of 0.3 - 0.7 cm. A bamboo rod is fixed across the mouth from the middle of the base of the triangle to the vertex and is prolonged to a short handle. The fisherman plunges it into the bed of shallow water with the mouth facing him and dances on the ground driving the fish at the bottom into the pouch. Then he suddenly lifts it up in standing position. It is also pushed along the ground. The catch composition comprises mainly small fishes with surface and bottom feeders.

**(iii) DHEKI JAL:** It is a large triangular net stretch across two bamboos tied near the thick ends. The net is balanced in front of bamboo platform raised in the bed of the beel about 6 feet above the level of water. The fisherman standing on the platform release the cross piece from it fastening to the platform, when the net drops down in the water. After 30-45 min the fisherman put his weight on the cross piece when the net slowly swings up in the air. The fishes caught slide down to the apex of the frame, where the fisherman gathers them. Almost all kinds of fishes are caught by this fishing method.

#### **(H) TRAWLING GEARS:**

Trawling gears are also called as drag nets and are used for dragging the beds of beel. They are generally used in shallow water. Drag nets are large and exist in various form and dimensions. These nets have been divided into the following types -

(i) With Pockets.

(ii) Without Pockets.

Drag nets without pockets are worn prevalent as used through the year except monsoon season.

Different types of trawlers used in the Beels of Nalbari district are mentioned as follows -

**(i) MOI JAL.**

**(ii) HORHORI JAL.**

**(iii) SHANGLA JAL.**

#### **(I) INDIGENOUS FISHING METHODS:**

On account of highly diverse nature of beel habitat, the method ranging from catching with hands to the operation of large and indigenous designed nets and diverse methods of fish capturing devices are adopted for fishing in the beel fisheries of Assam. This method employed is varied and no doubt, the tradition and possibly the result of long years of trial for perfection have made them most suitable for that particular environment. Assam and other North-Eastern states as much such have no dearth of indigenous fishing methods and many of them are

unreported till date. Therefore an attempt has been made to focus on certain indigenous methods, which were recorded during the present work that are described here under.

### **KATAL FISHING:**

Katal fishing or “Katal Mara” (Yadav 1981) is a method which is extensively used in the beel fisheries of Assam. The method was probably brought to this region by the migratory fishermen from Bangladesh and has now come to stay as a profitable method of fishing in beels. It is also known as “Jeng” in lower Assam. Though the method is very simple and low investment but requires a long time between installation and harvesting. “Katal”s are lures and the motive is to entice fishes in accumulated mass of bushes, weeds and tree branches for a period of 2 - 3 months, where they form their abode and are finally caught by enclosing the area. The circumstances of the inner periphery water hyacinth, bushes and tree branches are dumped together and a circle made by fixing tree stumps around these vegetation mass to avoid scattering. The outer periphery about 4 - 6 m all around denotes the territorial right of the Katal and is treated as “No disturbance area”, where no boats are allowed to move.

The installation period of Katal is mostly monsoon (September-October) when the beel water starts receding. In suitable places with water depth varying from 1.5 - 3.0 m the Katals are arranged and lie dispersed all over the beel. These are then left as such up to 2 - 3 months. When the beel water recedes and fishing starts. A few days, prior to the harvest the Katals are encircled by “Katal mara jal”. and “Banas” closely woven bamboo matting. When the actual fishing starts, a group of 20 - 30 fishermen depending upon the size of Katal enter the encirclement. The circle is gradually reduced, vegetation set aside and with the help of cast nets, encircling gears, Thella jal the fishes are caught. The operation is carried out boat and it lasts for 8 - 12 hours where by harvesting the complete Katal at a stretch. In certain beels, after complete harvesting again the Katal is arranged with the help of same bushes, tree stumps and bamboos, which are the harvested after 1-2 months

### **DISCUSSION:**

The survey of the fishing gears and their method of operation have revealed that 36 types of fishing gears are in vogue in commercial use which belongs to several categories as described already. The topography of the water body and behaviour of fishes play a dominant role on the types of fishing gear used in fishing process (George, 1971).

As obtained from the study, it is evident that Mushari jal, Langi jal and Phansi jal are the most extensively used implements in commercial fishing. The fishing with these gear is banned during 1st May to July 15th vide Assam Fishing Rule 1953 (Phukan, 2001). Another type of encircling net is the “Berjal” or “Borjal” the design details of which are same as “Mushari jal” except the mesh size (25-30mm). These gears are generally operated in deep areas of the main Beel.

The seines used in the Beel fisheries of Assam show certain peculiarities when compared with the conventional shore seines of the East Coast. The most important differences of these, is the absence of a bag or bunt at the mid length of the net from end to end, while other is the presence of peripheral pockets in some of the seines.

The gill nets of the set type are the principal fishing gear in the Beels of the district because of the many underwater obstructions (George, 1971). In the Beel fisheries of Assam, the

gill nets come next to seine in its importance. The line of demarcation between seine and gill nets (Langi jal) seems to be intermediate as gill nets are some times operated in the fashion of seines. De (1910) has classified it as a Drag net but Hornell (1924) has treated it as “Gilling seines”. During the present survey it is observed that fishes are caught in these nets by gilling or enmeshing. Langijal are sometimes used to drag or encircle an area. But such practices are only the mean to scare and drive the fishes into the net. The main difference between “Langi jal” and “Phansi jal” lies in the method of operation and rigging. The foot rope the “Langi jal” touches the bottom during operation whereas the later does not. The foot rope of “Phansi jal” is devoid of sinker.

The present study reveals that “Khewali jal”, i.e., Cast net is used all through the year unlike other gears which shown a distinct seasonal pattern. This gear is generally found in operation in the shallow depth areas of the beel and can be placed third in order of importance. The remarkable features of cast net are the presence of peripheral pockets as described by Von Brandt (1968), Von Brandt (1968) considered that the cast net originated in India.

The scooping gears such as “Dharma jal” and “Dheki jal” are also used all through the year except stormy weather. “Dheki jal resemble with “Khoraka jal” (Joseph, 1965) in shape and operation and are mostly used in flood season. “Dharma jal”, on the other hand is used all through the year.

Contrivances for trapping fish may be presumed to antedate the invention of nets (Hornell, 1938). In the Beel, different types of fish traps have been found in operation. They are found to have economic and energy related advantages over active search and capture method (Mohan Rajan, 1993). But the used of perch traps has been criticized because of their low catching power (Stall, 1970). The present survey has shown that there is a marked seasonal variation in the catching power of traps, which to a large extent can be attributed to the behaviour of fish. In general, trap is a highly versatile gear whose dexterous operation enables several scattered areas to be worked out simultaneously.

Fishing methods in the Beels are diversified and some of them are unique. Common gears such as cast nets, gill nets, dip nets and traps are in vogue. But the District also offer ample scope to certain indigenous fishing devices like “Katal fishing” (Yadava et al, 1981).

Among the all indigenous fishing devices “Katal fishing” is the unique and assured method of capturing big sized fishes. This method has some resemblances with the “Byana” fishing of West Bengal (Dey, 1877). In lower Assam it is known as “Jeng fishing” this special fishing device needs “Khewali jal”, “Ghurni jal”, “Katalmara jal” and “Berjal” and certain other gears such as “Athua jal” and “Thela jal”. The catch composition includes mainly the major carps.

Like wise, Banas are fixed barriers, erected across the channels to prevent return of fishes from the Beel to river along with receding waters. It is considered one of the major fishing methods where the Beel has a connection with the river. It act as an obstruction for the commercially important varieties like *Labeo rohita*, *L. gonius*, *L. calbasu*, *Catla. catta*, *Cirrhinus cirrhosa* and Feather backs migrating back to the river.

The study on seasonal variation of the use of fishing gears support the statement provided by Changeux , et al, 1993 that fishing activities follow seasonal pattern. The Pre-monsoon, Post-monsoon and winter are the main fishing seasons in the Beel and almost all gears are used in these seasons. More over, in winter Katal are harvested which yield a substantial catches of the Beels.

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FIG: A Khaloi



FIG: A Chepa



FIG: A Polo



FIG: A Juluki



FIG: A Darki



FIG: A Mushari Jal



FIG: A Small sized Dheki Jal



FIG: A Large sized Dheki Jal





FIG: A type of indigenous fishing



FIG: Katal Fishing

FIG: A Khewali Jal

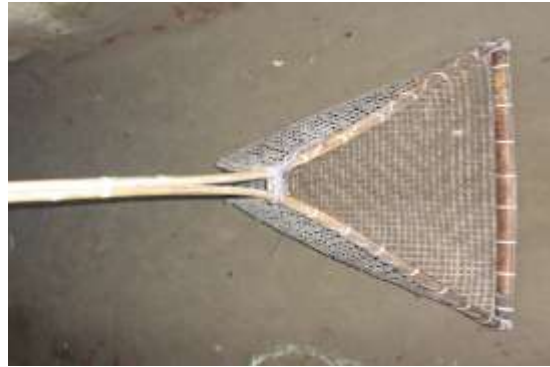


FIG: A Jakoi