

## Indigenous fishing knowledge of Sundarban

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### **Abstract**

Sundarban is the largest mangrove reserve forest in the world. It is a home of Royal Bengal Tiger. No one lives or is allowed to live inside the forest. The forest resources dependent local people live in the Sundarban Impact Zone (SIZ). A large number of people of Sundarban Impact Zone have depended on fishing and related occupations. They have separate identity and traditional cultural or folklore. They are depended on the fishes of Sundarban for their livelihood. Every day or seasonally they go to Sundarban for catching fish and crab. One of the key targets of the study is to trace out how the fishermen people of Sundarban use their traditional knowledge and technique for fishing. Generally they use most wonderful indigenous method and indigenous technique for fishing. They use different type of nets and different kind of traps for fishing. Therefore it can easily be inferred that there is a vast body of indigenous knowledge on fishing among the fishermen communities in Sundarban. This knowledge includes the indigenous technology of fishing and indigenous understanding of environment.

**Key words:** Indigenous fishing knowledge, Fishing technique, Sundarban

### **INTRODUCTION**

Sundarban is the largest mangrove reserve forest in the world. It is a home of Royal Bengal Tiger. The Indian part of the Sundarban covers an area of 9630 sq. kms and is designated as a Biosphere Reserve forest. The area comprises about 102 islands of which 54 islands are inhabited. It consists of 6 blocks of North It 24-Parganas district and 13 blocks of South 24-Parganas district of West Bengal. The local people involve in various resource collections from the Sundarban. They have separate identity and traditional cultural or folklore. The fishermen community is the largest segment of the local community of Sundarban area. A large number of fishermen are depended on the fishes of Sundarban for their livelihood. Every day or seasonally they go to Sundarban for catching fish and crab. Generally they go to fishing on the August to March. When they go for fishing then have to paid permission fee and received BLC permit.

Naturally they go to journey with local country boat (*Nouka*) that must be permitted by the forest department. They use various type of fishing nets. When they go to fish collection then must be carried a sharp cutting weapon as *da* or *katari*. At first the fishermen collect permission letter from the forest office by the deposit of some fixed money. After that they start journey for fishing from forest river or creek area. They use most wonderful indigenous traditional knowledge and technique for fishing. Not only they use nets but also use different kind of equipments for fishing. Generally they catch different type of fishes whose local name is *vetki*, *parshe*, *kaine*, *bagda*, *bele*, *kakra*, *tangra*, etc. They do not catch some kind of fishes which has marked by forest department; these are *kamat*, *chakol*, *kata bol*, *koibol*, *timi*, *jon kede*, *tepa* etc. Total twelve type of fishes are restricted for fishing in Sundarban.

## METHODOLOGY

Kalitala and Jogeshganj Gram panchayets of Hingalganj block were selected purposively from the fishing area adjacent in the Sundarban forest in west Bengal. Two villages of Kalitala and two villages of Jogeshganj were selected randomly. Finally the sample consisted of two panchayets, four villages and 24 samples fishermen (see table-1). The data were collected from the month of July to October, 2011, which were analyzed and presented into suitable tables and picture to draw meaningful conclusions.

**Table-1 Study area and sample size**

Sl.No.	Block	Panchayet	Village	Sample size(No.)		
				M	F	Total
1.	Hingalganj	Kalitala	Kalitala	6	0	6
			Samshernagar	6	0	6
2.	Hingalganj	Jogeshganj	Hemnagar	6	0	6
			Madhabkathi	6	0	6
	1	2	4	24	0	24

M = Male; F = Female,

## RESULT AND DISCURSION

I studied 24 samples fishermen in two panchayets of Hingalganj block for find out their accrual condition of socio-economical background and fishing knowledge. The result comes; overall family member in each family is 4.95., whereas the average number of earning family member is only 1.29. I found that fishing is the main occupation of all 24 samples fishermen which are selected from two panchayets. But they engage in some subsidiary occupation like honey collection, agricultural land and other works. Overall 45.83% fishermen are engaged in fishing and honey collection, 37.5% in fishing and agriculture, 4.16% in fishing and other job. Overall 33.33% people are completely landless and 4.16% people have only homestead and remaining 62.5% do have agriculture land and homestead. Majority numbers of fishermen in the study area are Hindus while some are *Muslims*. In this study I found that majority number of Hindus belongs to SC caste their sub-caste are *Pandokhatrio* and *Rajbangshi*. In this investigation I found that overall 67.08% fishermen are literate and remain 32.75% are completely illiterate. The literate fishermen are more in Jogeshganj (69.49%) panchayet than in Kalitala (65%). The educational background of sample households indicates the literacy and education level is very poor among selected fishermen population. Overall 40.14% fishermen have primary education (I to IV class), 46.30% secondary studied (V to X class), 11.09% have higher secondary (XI to XII class) and only 2.43% have studies above higher secondary. So educationally fishermen are at the bottom of their stair. Fishing is the main source of income of local fishermen. The secondary source of income is agriculture, honey collection and day labour. The average household's income of 24 samples is Rs 1899.99 per month. I found that variations in income from different areas of Sundarban like Kalitala (1591.66) and Jogeshganj (2208.33). The variations in income from fishing activity depend upon various factors like forest fishing or without forest fishing and BLC permit holder or without BLC permit holder.

**Table-2: Socio-economic characteristic of fishermen at two panchayets of Hingalganj block, West Bengal**

Particulars		Kalitala	Jogeshganj	Overall
No. of Fishermen		12	12	24
Average Size of family (no.)		5	4.91	4.95
Average age of Fishermen (ye)		49.08	51.16	50.12
Education of Fishermen Family (no.)				
Literate		65	69.49	67.08
	Primary	46.15	34.14	40.14
	Secondary	48.71	43.90	46.30
	Higher Secondary	5.12	17.07	11.09
	Graduate	0	4.87	2.43
Illiterate		35	30.50	32.75
Occupation (no.)				
Only Fishing		16.66	8.33	12.49
Fishing with Honey Collection		50	41.66	45.83
Fishing with Agriculture		25	50	37.5
Fishing with other		8.33	0	4.16
Property (no)				
Landless		41.66	25	33.33
Homestead		8.33	0	4.16
Homestead & Agriculture		50	75	62.5
No. of earning members		1.33	1.25	1.29
Monthly income		1591.66	2208.33	1899.99
Last 5 years credit		4333.33	4833.33	4583.33
Job Satisfaction (No.)		33.33	41.66	37.49
Desire for other job (No.)		66.66	58.33	62.49

*Figures in parentheses are percentage values.*

## **FISHING TECHNIQUE**

Fishing techniques are based on using fishing gears (nets) and crafts or by practicing any other ways, has been developed in Sundarban area (See table- 3). Gears and crafts used in open water bodies are different from that used in closed water bodies. The reason behind developing particular fishing methods in open as well as closed water bodies are due to geographical differences, landscapes and fish population abundance. Most of the fishing methods have been developed on open water bodies mainly rivers and creeks. The fishermen use different type of nets for inside or outside fishing in open water bodies in Sundarban. In the Sundarban area, maximum fishes are mainly captured from open water bodies; but not regularly from the cultured water bodies. Various types of fishing gears and crafts are found not only in the fishermen colony but also in every villager's house. Some exceptional fishing methods and well known gears are described in the follows:

## **INDIGENOUS FISHING KNOWLEDGE**

At first the fishermen search a fishing zone before the fish's collection. They search where the turbid water is because their observance turbid water is a store house of fishes. Another traditional knowledge has found that when the water colour is made green then the *illisha* fish come in to the water bodies. The *arh* fish founds more when the water is made in seized with eager greed. According to fishermen, *Vhangan* (local word) is a rich fishing area rather than free water bodies. The may be understood where is fish or not for the observation on volume and movement of water current. All the assessment of fishermen is possible for the common practical sense. That is their indigenous knowledge and long experience of life.

## **USE OF FISHING NETS**

### ***Khepla jal (cast net)***

Khepla jal is a kind of cast net, which is the most



familiar fishing gear used in all types of water bodies. It is a conical shaped net; this net occurs in different sizes. A standard khepla jal measures about 4m in length and the bottom is a circle of 6-9 m diameter. The loop size of the net is 0.6 to 7.5 cm<sup>1</sup>. It may be weaved by natural or artificial twines. It is a hand operating net<sup>2</sup>, which can be thrown and operated by a fisherman alone (see Fig 1).

Fig -1 Khepla jal

### ***Behundi jal (bag net)***

The bag portion of behundi jal measures 20 m long, mouth 6 m wide and wings 9 m long. Loop size near the mouth is 4.0 cm narrowing to 0.5 cm at the cod end. It has six step of loop size<sup>3</sup>. The lower end of the extremity of the wing is tied either to a pair of heavy wooden anchors or to two wooden spikes driven into the mud, while on the upper side a large drum is attached to serve as a float. The mouth is kept open with the help of two bamboo poles each about 5 m long. There is also a buoy at the cod end<sup>4</sup>.

### ***Charpata jal (stakenet)***

The charpata jal (stake nets) is used in the creeks and tidal inshore areas of the Sundarban. It is made of artificial twines. A standard charpata jal measures about 100m in length and the 4 m in wide. The loop size of the net is 1.6 to 1 cm<sup>5</sup>. The net consists of number of rectangular pieces of artificial twines netting attached to bamboo/ wood poles and is operated where wide stretches of mud flats are exposed at low tide. A team of about 5/6 men are required for its operation. It is kept stationary with the help of stakes placed at regular intervals. No floats or sinkers are used. At ebb tide the net is laid pleated and concealed in the inertial regions<sup>4</sup>. With the two ends tied to some mangrove trees or poles specially fixed on the land. When the tide is almost full, the fishermen wade through waist deep water, lift the net part by part and fix it on bamboo or mangrove stakes which are carried in their arms. At the turn of the tide all the *bagda* (tiger shrimp/prawns) and other fishes which had entered with the flood tide get caught in the net.

***Khalpata jal (stakenet)***

This is similar to charpata jal. It is used only in the *khari* (creek) of Sundarban. A standard khalpata jal measures about 60m in length and the 6m in wide. The loop size of the net is 1.6 to 1 cm. It is also used to capture large and small fish species like *vetki*, *chingri*, *kain*, *datne*, *paira*, etc<sup>6</sup>.

***Ber jal (seine nets)***

Ber jal is a conventional beach seine net. It is commonly used in ponds and rivers. It is also used in marsh and rivers during the dry season when water flow is minimal. This net is usually hauled by a team of fishers, the number depending on the size and weight of the net. It is a rectangular net with floats on the head rope and weights on the ground rope. The ground rope is made of thick twisted jute fibers and the head rope is thin nylon or polyethylene<sup>7</sup>. It is very large in size, usually 50-200 m long and 5-6 m wide. Mesh size ranges between 0.5-2 cm<sup>8</sup>. Length, depth and mesh size vary with the size of the water body and the species to be caught. After surrounding part of a water body with this net, the two ends of the net are drawn together and the ground rope is hauled up from the center of the water body to catch the fish<sup>7</sup>. A large mesh size is used for harvesting *vetki*, *kain*, *arh*, *datne* and other large fish, while small mesh net captures *tengra*, *chingri*, *fasha*, etc.

***Fash jal (seine nets)***

This 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. It is 20-200 m long and 1-6 m wide with mesh of 0.1-0.5cm<sup>9</sup>. Floats are used at the headline, earthen weights for the ground line. This gear is fixed in the water with two bamboo poles to form a large net wall<sup>7</sup>. It is used to catch fishes like *tangra*, *parshe*, *fasha*, *chingri*. Fash Jal with a mesh size greater than 90 mm is not at all harmful to stocked carp.

**Table-3** A detail list of selective fishing nets used on the Sundarban area

Type of Fishing gears	Local Name	Target species	Size( M)	Mesh size (cm)	Technique	Operation period	Habitat	Cost
Fish nets								
Cast Net	Khepla Jal	All kind of fish	L-4m W- 6-9	0.6-7.5 cm	It is round-shaped when thrown to fully open and it is operate manually.	Day+night	P,R	1200.00-1300.00
Bag Net	Behundi Jal	mainly chingri	L-20m MO-6m W-9m	4-0.5 cm	Kept vertically open by a frame and held horizontally stretched by the water current.	Day+night	C	15000.00
Stake net	Charpata Jal	vetki, chingri, datne , kain, paira	L-100m W-4m	1.6-1 cm	Charpata jal a serene barrier made of netting small loops.	Day+night	R	8000.00
	Khalpata Jal	vetki, chingri, datne , kain, paira	L-60m W-6m	1.6-1 cm	Khalpata jal a serene barrier made of netting small loops.	Day+night	C	6000.00



Seine net	Ber jal	vetki , kain, arh, datne	L-50- 200m W-5- 6m	0.5-2 cm	After surrounding part of a water body with this net, the two ends of the net are drawn together and the ground rope is hauled up from the center of the water body to catch the fish.	Day+nig ht	R, M	10000. 00
	Fash jal	tangra, parshe, fasha chingri	L-20- 200m W-1- 6m	0.1- 0.5 cm	Floats are used at the headline, earthen weights for the ground line. This gear is fixed in the water with two bamboo poles to form a large net wall.	Day+nig ht	R, MA	3000.0 0

\*Jal: Local name for fishing net.

R = River; P = Pond , MA = marsh; C= Creeks CM = Centimeter; M = Miter; L = Length, W= Wide, MO= Mouth

## CONCLUSION

The study concludes that the aquatic resources of the Sundarban Mangrove Forest (SMF) are an important component of its biodiversity and are an important source of food and income for fishermen communities. The fishermen in Sundarban are usually ranked very low in the hierarchy. They are indigenous traditional knowledge holder because they use very indigenous traditional method and technique for fishing. Fishermen also have their own folklore. In harmony with their natural environment and social context, the fishermen of Sundarban have developed their folklore. During their fishing activities they derive mental pleasure by singing folksongs such as *Bhatiyali* and *Shari* song<sup>2</sup>. But they are leading a very miserable life. They work hard for only foods and clothes. Their only capital is their strength. The community life of fishermen of Sundarban has changed gradually. Due to the decrease of fishing grounds, fishing resources, some social and environmental pressure, traditional knowledge holder of the fishing communities have tended to leave their traditional occupation in search of other job. Moreover, there is no guarantee of daily income. Hence, the new generation feels discouraged to opt for their traditional occupation.

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**Glossary**

BLC	Boat Loading Certificate	Bagda	Tiger Shrimp
Da	A heavy knife	Katari	A heavy knife
Khari	Creeks	Vetki	Local Fish

Parshe	Local Fish	Kaine	Local Fish
Bagda	Shrimp	Bele	Local Fish
Kakra	Crab	Tangra	Local Fish
Chingri	Local Fish	Kain	Local Fish
Datne	Local Fish	Paira	Local Fish
Telapiya	Local Fish	Gule	Local Fish
Fasha	Local Fish	Kamat	Local Fish
Chakol	Local Fish	Kata bol	Local Fish
Koibol	Local Fish	Med	Local Fish
Chhele	Local Fish	Jaoya	Local Fish
Timi	Local Fish	Jon	Local Fish
Kede	Local Fish	Tepa	Local Fish
Ilisha	Local Fish	Arh	Local Fish
Vhangan	Bank of river where mangrove tree live		
Khepla jal	A local Cast Net	Behundi Jal	A local Bag Net
Charpata Jal	A local Stake net	Khalpata jal	A local Stake net
Ber Jal	A local Seine nets	Fash Jal	A local Seine nets
Jal	Fishing net	Karent jal	Small loop size net
Pandokhatrio	S.C Caste	Rajbangshi	S.C Caste
Bhatiyali	Traditional folksong	Shari	Traditional folksong