



## Indigenous Fishing Method and its impact on rural livelihood among Galo Tribe of West Siang District, Arunachal Pradesh, India

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### Abstract

Indigenous fishing is a kind of small scale, commercial and subsistence fishing practices done by using traditional techniques such as trapping, nets, local poisoning, rods/line and various other traditional methods. Various plants and their product are used as poisons by the practitioners to catch fishes from the rivers and streams. The methods of using plants as fish poison transmitted from one generation to another informally and verbally. In fact, Arunachal Pradesh is well endowed with numerous rivers with good number of ponds, lakes and streams suitable for fishing. These practices have become source of livelihood and an important part of the ways of life of the Galo people since time immemorial. In the past, the Galo's lived as hunter-gatherer and due to necessity, constantly on the move. They were mostly associated with fishing as major sources of food and livelihood for survival. But with the passages of time and advent of modernization traditional fishing practices among the Galo tribe has been diminishing slowly as such the dependency on fishes by rural people also diminishes. As a result, for those who depend on fishing as means of livelihood and in addition to this, the non-availability of proper documentation and preservation of their indigenous fishing practices posed major challenges.

**Keywords:** Galo tribe, fishing methods, indigenous fishing, rural livelihood, west siang

### Introduction

The West Siang District is a mountainous tract lying roughly between the longitude 94° to 00' E to 95° to 00' E and Latitude 28° 15' 00' N and 29° 15' 00' N. Comprising roughly of 7643 Sq.km the District is bounded by Upper Siang and East Siang District at the East, People Republic of China at the North, Upper Subansiri District on the West and Lower Siang District on the South. The Galo tribe is the main tribe inhabited in the District followed by Adi, Ramo, Pailibo, Bori, Bokar, Membas and Khambas. All these tribes inhabiting in the District are fish eater. The fish is the main source of protein and livelihood for the Galo's living in West Siang district.

### Riverine Fisheries

Nature has bestowed West Siang District with huge bio-resources. Due to typical topography, the rivers are undulated. There are numerous streams and rivers that are drained by principal rivers like the Siang, Siyom, Sipu, Hirik, Hiru, Hiri. Sie, Kidi, Mebu and Gadi, etc. These principal rivers of the district are drained by the westerly flowing mighty Brahmaputra. Hence, these rivers constitute the riverine system of the district. There are many small streams that are the tributaries of rivers Siang and Siyom and have huge significance on fisheries development.

These Riverine systems are situated at an altitude ranging from 430m to 1200m above the mean sea level. The Fishery resources are spread over with 30% in high altitude zone and the rest being evenly distributed in the middle and lower zone. In recent years number of studies on fishery resources of the state has increased. For example, Nath and Dey (2000) [5] published their pioneering works on a systematic account of fish resources of Arunachal Pradesh revealing 131 species from the state. Moreover, 43 new species have been identified by Bagra, Kadu, Nebeswahwar, Laskar,

Sarkar, and Das (2009) [1] which was published in their joint work namely, Ichthyological survey and review of the checklist of fish fauna of Arunachal Pradesh, India. The checklist in their work described 43 species in addition to the previous record of 170 fish species. In most rivers and streams of the study area, a few species of the same variety of fish are found. The names of some fishes found in this River system are Labeo species Mahseers, (Golden and Chocolate Mahseer), Local trout (Schyzothorax sp.), garra sp. Bacillus sp., different species of catfishes, etc.

### Indigenous Fishing Methods

Most of the population or rural communities of the West Siang District depend on wild/natural resources such as wild animals, fishes, birds, and plants to meet their protein demands as well as additional food supplements. The majority of the Galo population in the district are living in remote or rural areas and they are dependent on shifting and terrace cultivations. So fishing is one of the important means of livelihood and also an important part of the life of these rural societies. The fishing methods they generally practiced were trapping, using nets, local poisoning, rods and lines, and various other traditional methods. They used various plants and their products as fish poison for easy catch. These methods of using plants as fish poison transmitted from one generation to another informally and verbally.

In fact, the traditional fishing methods used in the district are simple and less expensive as compared to the modern method of fishing. The methods ranging from catching with hands to the operation of indigenous nets are adopted for fishing and still a number of the age-old traditional methods are used. The methods used in this area are the results of experiences gained over a period of time and are related to the topography of the fishing ground and the behaviour of

the fish. Thus to a countable extent, the style of living and nature of consumption have also influenced fishing practices. Many people in this region like to eat the fry stage of medium-sized fishes and accordingly, catching methods also vary. Some specific fishing methods are very effective in catching a particular fish even though the method practiced is primitive. To catch the slippery and sneaky hills strum fishes; the people of this region used locally available materials and applied indigenous ideas and skills. Since no new and reliable fishing technology is available to the fishermen but due to developmental effects, like the construction of dam, roads, bridges, and infrastructures the indigenous fishing practices is being replaced by

destructive/illegal method of fishing such as using dynamites, etc. (Gurumayum & Choudhury 2009, 237-241)<sup>[3]</sup>. Some of the indigenous fishing methods used by the Galos in the rivers of the district are as under:

**1. Hibok Penam**

Hibok Penam<sup>1</sup> is a method of catching fish in the river bed. In this method, one side of the stream is diverted to another side from a particular point by constructing a dam of sand, boulders, leaves, logs, etc. As a result, the volume of water becomes less or dry, and poisoning of fish is done using plant parts in water-scanty areas and fish are collected (Fig. No. 1, 2 & 3).



Fig 1: Hibok Penam



Fig 2: Hibok Penam



Fig 3: Fishes, Craps, Prawns and other small fishes Collected from Hibok Penam

**2. Tasum Kunam**

Tasum Kunam<sup>2</sup> is a traditional fishing carried out by using equipment known as Raaju, to catch fish, such as crabs, small fishes and small prawns, etc. This method is exclusively performed by women in small streams and tributaries throughout the year as and when they want to do (Fig. No. 4).



Fig 4: Tasum/Tahum Kunam

**3. Kompi Ganam**

In this method called Kompi Ganam<sup>3</sup> a conical-shaped, roughly woven basket called Takom which is made from bamboo is used to catch fish. This fish trap is fixed in the small stream course, particularly at the point where the stream falls and fish that falls under it get trapped.

**4. Rapak Pagnam**

Rapak Pagnam<sup>4</sup> is a traditional fishing method in which a conical-shaped, roughly woven basket called Takom which is made from bamboo is used for catching fish. This fish

trap is fixed in the big stream/river course, particularly at the point where the stream/river falls, and fish that fall under it get trapped (Fig. No. 5).

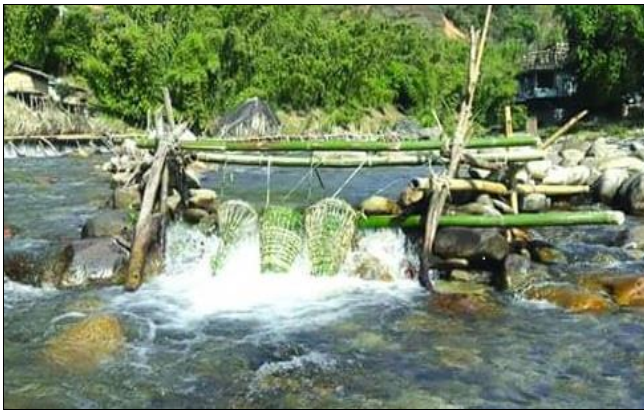


Fig 5: Rapak Pagnam

**5. Idir Ganam**

Idir Ganam<sup>5</sup> is also a type of Takom Ganam method in which Takom which is made from barbed/hooked creepers in conical shape is used. After the diversion of water from one side of the stream to another side during Hibok Penam day the Idir (conical fish trap made from Bamboo) is put on the lowermost part of the diverted stream enabling fishes to get trapped in the Idir (Fig. No. 6).



Fig 6: Idir Ganam

**6. Tam Lignam**

'Tam' means poison obtained from plants and trees and 'Lignam' means application. Thus, the two terms literally 'Tam Lignam'<sup>6</sup> means the application of poison. It is one of the oldest and most practiced methods of fishing prevalent in the West Siang district. In this method, a variety of plants and their parts are used as poison to catch fish in the stream. Galos use leaves, fruits, bark, and roots to poison fish. Some of these locally available plants that are used for fish poisoning are – Taniir, Ramjir, Taruk, Tam, Dik Tamo, and Ripik-Risap, etc. The bark, roots, fruits, and leaves are crushed and accumulated. After crushing, it is directly thrown into the running river. Fishes cannot bear the poison and float on the surface of water and are easily caught. These half-dead fishes caught through this method are said to be fit for human consumption. During Tam Lignam, moribund fishes which are not caught get fresh water and survive again, which show little effect on the riverine ecosystem, unlike chemical poisoning like bleaching which destroy all aquatic ecosystem. This traditional fishing

practice is gradually diminishing day by day due to development in society as well as the adoption of various modern fishing implements and techniques. Instead of using naturally obtained fish poisons, various synthetic and chemical poisons are used which are easily available in the market. If certain measure is not taken, this age-old traditional practice of fishing will vanish from the district soon.

**7. Eshap Ernem**

In this method, the net (Eshap<sup>7</sup>) made of nylon is used for fishing in the river. This fishing method is the most common one and it is specifically performed by the male (Fig. No.7). But Eshap Ernem<sup>7</sup> is not an indigenous fishing technique of the Galo tribe since it is mostly practiced by all fishermen.



Fig 7: Eshap Ernem

**8. Kegum Rinam**

Kegum Rinam<sup>8</sup> is standing gear to catch fish from the river. In this method of fishing, many baited hooks are tied at a particular distance to the main thick nylon twine and towed into the river and left overnight. In the morning, they pull out the main twine, and allured fishes are caught in the baited hook. The bait used consists of frog, small fish and insects, etc.

**9. Lipum**

Lipum<sup>9</sup> as shown in Fig. No. 8 is a specific kind of traditional fishing method practised by the Galos of West Siang district under study as well as Galos living in other districts of Arunachal Pradesh. It is an eco-friendly fishing method that involves minimum destruction of aquatic life and doesn't pollute the water equally. During the time of fish harvesting from Lipum, the whole circular structure of stones is surrounded or encircled with 'Ishir' (A circular open basket made of bamboo) with openings in the top and bottom. Idir is fixed with Ishir in the bottom in such a way that there is no any hole or path from which the fish could escape outside the Ishir. Having fixed the Ishir and Idir, the stones are removed gradually from the Lipum, and fish are caught and collected alive. Fishes caught through this technique are generally of one or two varieties only. Moreover, the size of these fishes is small since only a smaller and specific variety of fish stay in such artificially created Lipum.



Fig 8: Lipum

**10. Hiire**

It is one of the traditional methods of catching fish adopted by the Galos. In fact, the other Tani tribes especially the Nyishi tribe also practice Hiire<sup>10</sup> as one of their fishing methods (Fig. No. 9, 10 & 11). In this method, large bridge-

like fish traps are constructed in the flowing river using bamboo and wood. It is constructed downstream of the river with the idea of catching the fish that flow downwards. Since it is a community fishing all people of the village participate with different assignments being given by village elders. Thus, some people procure wood and logs as scaffolds, some help in procuring raw bamboo and canes, while women folks also participate and prepare local drinks and food for all village folks. The trap is built by barricading the flow of the river/stream with the help of bamboo and wood, and one water passage is made in the bridge-like structure built for trapping the fish which flows with water. Thus, when there is heavy rainfall and the water level of the river increases then the fish passing through the opening are deposited in the bridge-like structured trap. It allows the water to seep through the gap but fish are trapped in it which are collected by all (Dr. Eli Doye and Jimmy Camdir Tok, Personal Communication with author, September 24, 2023).



Fig 9: Hiire



Fig 10: Hiire



Fig 11: Fishes trapped in Hiire

**Impact of Indigenous fishing methods on livelihood of Galo people in in rural areas of West Siang.**

The indigenous fishing method has an important impact on the rural economy. In India, about 12 million people are directly engaged in fishing and about 60 million are exclusively dependent on fish farming as an exclusive income source (Manasi *et al.* 2009) <sup>[4]</sup>. Most of the population or rural communities of the West Siang District depend on fish to meet their protein demands as well as additional food supplements. So fishing plays an important part in the life of these rural societies. The fishing method they generally practiced was trapping, using nets, local poisoning, rods and lines, and various other traditional methods. They used various plants and their products as fish poison for easy catch. These methods of using plants as fish poison transmitted from one generation to another informally and verbally. The traditional fishing methods used in the district are simple and less expensive as compared to the modern method of fishing. These fishing methods and practices create self-employment opportunities, generate incomes, and satisfy fish requirements for consumption at home for the rural people of the West Siang district. In this way, the fish caught by indigenous fishing methods provide a substantial opportunity for the rural local people to improve for a supplementary and alternative income source and thereby also improving their livelihood and economic security. The sustainable utilization of the diversified indigenous fishing methods which are low-input operating systems free from expensive and advanced-technology machinery in available

water resources with financial support can bring development in the traditional fishery-based rural livelihood among the Galo people of the district.

Apart from the routine household activities, the Galo women of the district inhabiting rural areas are also found to be actively involved in indigenous fishing practices like "Tasum kunam". Thus, their involvement in indigenous fishing practices also provides scope for improving their livelihood and economic security. The involvement of rural women folk in these indigenous fishing methods also led to the production of fish-based pickles, dried fish, fermented fish products, etc. So, this activity can raise the employment of rural women to earn a significant supplementary income (Baruah 2015) <sup>[2]</sup>. As a result, this activity will highly boost the women's economic security and will pave the way for empowering them in terms of occupation and food security.

**Conclusion**

The Galo tribe of West Siang District has rich ethno-botanical knowledge of using plant derivatives in fishing. The plant used for fish poisoning during 'Tam Lignam' does not harm human beings as it consumes the poisoned fish. These could be due to the safe Phyto-chemical nature of the plants. These Plants may also have the potential to be used in medicine, agriculture and industries, etc.

The practice of age-old fishing techniques is being gradually replaced by destructive methods of fishing due to developmental effects, like the construction of dams, roads, bridges, and other infrastructures as a result the aquatic ecology or ecosystem of the pristine river has been

disturbed. All quarry materials used for the development of the district have largely affected the fish population, its habitat and supplementary fish-based rural livelihood of the Galo tribe of the west Siang district. Unless certain conservative measures are not taken, the fish population of the river of the West Siang which is one of the important supplementary sources of rural livelihood will diminish gradually so as the age-old traditional fishing method is not preserved.

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### Notes

1. Mr. Iken Ete, interviewed by Mr. Gumbin Noshi, 10<sup>th</sup> June 2023.
2. Smt. Osam Pado Noshi, interviewed by Mr. Gumbin Noshi, 15<sup>th</sup> June 2023.
3. Mr. Geli Gamoh, interviewed by Mr. Gumbin Noshi, 30<sup>th</sup> June 2023.
4. Mr. Hogli Noshi, interviewed by Mr. Gumbin Noshi, 8<sup>th</sup> July 2023.
5. Mr. Gumto Noshi, interviewed by Mr. Gumbin Noshi, 10<sup>th</sup> July 2023.
6. 'Tam Lignam' means application of locally available leaves, fruits, barks and roots to poison fishes in the ponds and small stream for fishing purposes.
7. Interview with Mr. Hogli Noshi, as note 4.
8. Interview with Mr. Iken Ete, as note 1.
9. Mr. Gumge Noshi, interviewed by Mr. Gumbin Noshi, 5<sup>th</sup> July 2023.
10. Lipum is an artificial and temporary dwelling place of the fishes constructed during winter season specifically in the month of November and December by the Galo people and the harvesting of fish is done in January and February. Etymologically, the term 'Lipum' originated from the Galo word 'Ili' this means stone or small boulder. Thus, genealogically, from Ili, it is Lipum. It is built by placing stones in circular shape with diameter ranging about 2 to 3 meters and its height depends upon the depth of the water in the stream and river. Utmost care is taken so that Lipum remains submerged in water throughout the winter season.
11. Mrs. Osam Pado Noshi, interviewed by Mr. Gumbin Noshi, 20<sup>th</sup> July 2023.

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