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Indigenous fishing nets, fishing gears and fishing methods of Kamrup and Bongaigaon district of Assam, India

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Indigenous fishing gears and methods are an important part of traditional ecological knowledge and inland fisheries in Assam, Northeast India. This study documents indigenous fishing nets, gears and practices in Kamrup and Bongaigaon districts, focusing on design, operation, habitat and reported catch. Field investigations were conducted from April 2024 to August 2025 in 20 villages among 110 active fisher households selected through a multi-stage approach. Data came from semi-structured interviews, direct observations and photographs. The study recorded 23 fishing tools, comprising 14 gears and 9 nets, adapted to rivers, beels, floodplains and inundated paddy fields. Use patterns showed that gill nets were most common (76.36%), followed by Toni jal (56.36%) and Dowari traps (51.82%). Fishers reported gradual substitution of natural materials with synthetic alternatives and declining use of some labour-intensive gears. The findings provide baseline documentation of locally adapted fishing practices and their potential relevance to fisheries management and livelihood security.

Keywords: Bamboo traps, Indigenous fishing, Inland fisheries, Sustainability, Traditional knowledge

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Assam has diverse inland fisheries resources, including rivers, beels, ponds, wetlands, reservoirs and floodplains[1-3]. Fish is important to the diet, culture and economy of the state, and fishing remains a traditional occupation in Kamrup and Bongaigaon districts[4]. The districts contain varied aquatic habitats that have supported locally adapted fishing gears and methods. Bongaigaon has 41 beel fisheries (2,619.00 ha), 10,941 ponds/tanks (2,419.61 ha) and 193 swamps/derelict water bodies (3,332.40 ha)[5]. Kamrup has 195 beel fisheries (9,644.27 ha), 27,139 ponds/tanks (5137.87 ha) and 230 swamps/derelict/low-lying areas (1,324.26 ha)[5]. Bamboo and cane are common traditional construction materials, reflecting knowledge of local resources and aquatic conditions[6]. Gears range from nets and traps to hooks and lift devices, each associated with particular habitats and fishing practices[6]. Previous work has documented indigenous technical knowledge in inland fisheries[7]. This study documents traditional fishing gears and nets used by fishers in the two districts.

The gears vary widely in design and function-ranging from nets, traps and hooks to lift devices-each suited to specific habitats and ecological contexts[6]. They are eco-friendly, cost-effective and culturally significant, supporting rural food security while minimizing ecological disruption. Several researchers have documented Indigenous Technical Knowledge (ITK) associated with fish harvesting practices in inland fisheries[7]. In the present study, an attempt has been made to generate baseline information on different traditional fishing gears used by the fishermen in Kamrup and Bongaigaon district of Assam.

Materials and Methods

Study area

The study was conducted in Kamrup and Bongaigaon districts of Assam, Northeast India, where inland fishing is closely associated with rural livelihoods. The districts lie between 25°43′N–26°54′N latitude and 89°00′E–92°12′E longitude (Fig. 1). The region comprises rivers, floodplains, wetlands (beels), ponds and seasonally inundated agricultural fields. Its humid subtropical climate, with

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annual rainfall of 2,000–2,500 mm, supports diverse fish habitats and traditional fishing practices.

Selection of blocks and villages

Study sites were identified using local fisheries records, reconnaissance visits and discussions with fishers, village elders and extension personnel. Areas where indigenous fishing gears remained in active use were prioritised. Two blocks in Kamrup (Bezera and Hajo) and four in Bongaigaon (Boitamari, Srijangram, Tapattary and Manikpur) were selected to represent diverse aquatic habitats and fishing practices. Twenty villages were included (Table 1).

Selection of respondents and sample size

A total of 110 active fisher households were surveyed, comprising 65 from Kamrup and 45 from Bongaigaon. The sample size was determined by field conditions and the availability of actively fishing households. Within each village, households were randomly selected from lists prepared with assistance from village elders and local fishers' groups. Only households actively engaged in fishing during the study period were included.

Data collection

Fieldwork was conducted from April 2024 to August 2025 to capture seasonal variations in fishing practices. Data were collected through semi-structured interviews, direct observations and photographic documentation using a pre-tested interview schedule. Information recorded included local gear names, construction materials, operating methods, seasonal use and associated aquatic habitats. Discussions with experienced and elderly fishers provided insights into the cultural significance of fishing gears and changes in materials and practices. Observations of fishing operations were used to verify interview responses wherever possible.

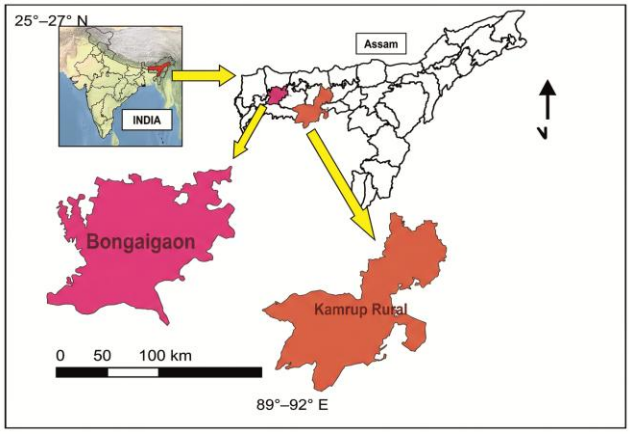


Fig. 1 — Map showing study areas (Kamrup and Bongaigaon district of Assam, India)

Data analysis

Data were analysed through qualitative description and simple quantitative summaries. Gears were grouped by structure, operation and habitat, and fishers' knowledge of construction, operation and fish behaviour was recorded.

Use of each gear was summarised as household frequency and percentage of the 110 surveyed households. Where appropriate, district-level differences were examined descriptively.

Ethical considerations

Prior informed consent was obtained before interviews and photography. The study purpose was explained in the local language, participation was voluntary, and participants were informed that the information would be used for academic documentation and conservation-related purposes. Local customs and community ownership of traditional knowledge were respected.

Results

The survey documented a wide range of indigenous fishing gears and nets used by the surveyed households, reflecting diversified fishing practices in the study area. The study documented a total of 23 indigenous fishing tools, comprising 14 fishing gears and 9 fishing nets. Among the different categories, fishing nets showed the highest level of adoption, with *Gill nets* being the most widely used (76.36%). Other commonly used nets include *Toni jal* (56.36%),

Table 1 — Villages and blocks of Kamrup and Bongaigain district selected for the study

District	Block	Village name
Kamrup	Bezera	Rajkhowapara, Manikpur, Bhumulahati, Borhazara, Barpalaha, Kheneipara, Sahan, Bezera
	Hajo	Dihina, Japia, Gandheli Tari, No. 1 Bagta, Khalihamari
Bongaigaon	Boitamari	Ghilaguri, Ekrabari
	Srijangram	Borghola, Kirtanpara
	Tapattary	Lotibari, Amguri
	Manikpur	Goraimari

Cast net or *Khewalijal* (46.36%), *Pahijal* (43.63%), *Dhekijal* (41.82%) and *Khali jal* (40.00%), indicating their effectiveness under varying fishing conditions. In contrast, *Musharijal* (19.09%) and *Porongijal* (24.54%) were used by relatively fewer households (Table 2).

Among automatic fishing gears, *Dowari* (51.82%) and *Juluki* (44.55%) were the most commonly used traps, followed by *Seppa* (37.27%) and *Dingori* (31.82%). Other gears such as *Polah*, *Khoka* and *Darki* showed moderate levels of use, while *Choroha* (17.27%) was limited to specific fishing situations (Table 2).

Overall, the overlap in gear use suggests that most households employed multiple fishing gears and nets, selecting them according to season, water depth and target fish species. The description of the traditional fishing gears and nets documented during the survey is presented below:

Traditional fishing gears

***Jakoi Dolonga* (*Fish aggregating and trapping device*)**

Structure and design

Jakoi Dolonga is a triangular bamboo-woven fish-aggregating device with a broad mouth and an interior packed loosely with weeds, twigs and branches (Fig. 2 a). It is secured in flowing water or connected beels and left for one to two days before the plant material is removed and fish are collected.

Operational protocol

The device is usually operated by one or two fishers and installed in small rivers, streams and beels connected waters, facing the inflow current (Table 3). It is anchored using bamboo poles or ropes and left undisturbed for one to two days. Fish are harvested by manually removing the plant material and collecting the fish sheltering inside. In some cases, ant nests or decomposing organic matter are used as auxiliary attractants.

Catch composition

The gear primarily targets air-breathing and predatory fishes such as snakeheads (*Channa punctatus*, *Channa striata*, *Channa marulius*), walking catfish (*Clarias batrachus*), freshwater shark (*Wallago attu*) and climbing perch (*Anabas testudineus*) (Table 3). Occasional captures of carps such as *Labeo rohita* have also been reported.

***Seppa* (*Tubular bamboo trap*)**

Structure and design

Seppa is a spindle-shaped, dorso-ventrally flattened tubular trap fitted with one to four inwardly directed trap doors acting as non-return valves. A removable opening at the posterior end allows fish retrieval (Fig. 2 b-d).

Table 2 — Types of fishing gears/nets and accessories, frequency of gear used and per cent household use fishing gear

Types	Local name	Frequency of gear used (No./household) N= 110	Per cent household use fishing gear
Automatic fishing traps	*Sepa*	41	37.27
	Dowari	57	51.82
	Dingori	35	31.82
	Darki	26	23.64
	Polah / Polo (Bell-shaped trap)	31	28.18
	Juluki (Trap with equal mouth and base)	49	44.55
	Choroha (Cherha)	19	17.27
	Khoka	30	27.27
	Bheta fishing/barriers	26	23.64
Wonding gear	*Tiar* and *Pocha* (Multi-pronged wounding spears)	24	21.82
	Cuchiajathi (Single-prong spear)	12	10.91
Nets	*Toni jal* (Drag net / encircling net)	62	56.36
	Pahijal (Encircling net)	48	43.63
	Chip jal	38	34.54
	Porongijal (*Dharma jal*)	27	24.54
	Musharijal (*Mohorijal*)	21	19.09
	Cast nets/ Khewalijal	51	46.36
	Khali jal	44	40.00
	Dhekijal	46	41.82
	Gill nets	84	76.36
Accessories	*Khaloi*	44	40.00
Other bamboo made gear	*Jakoidolonga*	29	26.36
	Jakoi	36	32.72



Fig. 2 — Different fishing gears used by fishermen in Kamrup and Bongaigaon district of Assam

Operational protocol

Small *Seppa* traps are operated by one person in inundated paddy fields, while larger traps used in rivers and streams require two operators (Table 3). The gear is frequently used in combination with bamboo barriers (Banas) arranged in a V-shape to guide fish towards the trap mouth. Traps are checked periodically, especially during the monsoon season.

Catch composition

Commonly captured species include spiny eels (*Mastacembelus aculeatus*, *Mastacembelus armatus*), catfishes (*Mystus tengra*, *Mystus vittatus*, *Aorichthys aor*), snakeheads (*Channa punctatus*, *Channa marulius*), freshwater eel (*Monopterus cuchia*), featherback (*Chitala chitala*) and small barbs (*Puntius* spp.) (Table 3). Small prawns (*Macrobrachium* spp.) are also frequently encountered in smaller traps.

***Bheta fishing* (*Bamboo barrier method*)**

Structure and design

Bheta fishing involves the installation of bamboo barriers (Banas) arranged either straight or in a V-shaped formation across narrow channels and small rivers (Fig. 2 e-f). These barriers do not completely block water flow but redirect fish movement.

Operational protocol

Installation typically requires two to four fishers. The barriers are positioned facing the inflow current, often in combination with seppa traps placed downstream of the streams, beels and waterlogged fields (Table 3). Fish attempting to jump over the barrier are intercepted by overhead nets or scaffolds. The method is most effective during periods of seasonal fish migration.

Catch composition

The method primarily captures air-breathing fishes, notably snakeheads (*Channa punctatus*, *Channa striata*, *Channa marulius*), walking catfish (*Clarias batrachus*), stinging catfish (*Heteropneustes fossilis*), freshwater eel (*Monopterus cuchia*) and large predatory catfish (*Wallago attu*). Small indigenous fishes such as barbs (*Puntius* spp.) and rasboras (*Rasbora* spp.) are also recorded.

***Dowari* (*Box-shaped bamboo trap*)**

Structure and design

Dowari is a tall, box-shaped bamboo trap with an inward-opening side entrance and a top opening for removing the catch (Fig. 2 g). Closely arranged bamboo strips allow water to pass while retaining fish.

Table 3 — Types of traditional fishing gears, fishing nets and waterbody where they are used

Name of gears/nets	Waterbody where gears/nets are used
Fishing gears	
Jakoi Dolonga	River, streams, beels
Seppa	River, streams, water logged fields
Bheta Fishing / Barriers	Streams, beels, water logged fields
Dowari	Streams, beels, water logged fields
Dingori	Streams, beels, water logged fields
Darki	Streams, beels, water logged fields
Choroha (*Cherha*)	Mainly rice field bundhs
Khoka	Mainly rice field bundhs
Tiar and *Pocha* (Multi-Pronged Wounding Spears)	Shallow water, flooded paddy fields
Cuchiajathi (Single-Prong Spear)	Shallow water
Jakoi (Hand-Operated Scoop Net)	Beels, water logged areas
Khaloi (Fish Keeper)	All types of water bodies, used to store fishes
Polah / *Polo* (Bell-shaped Trap)	Shallow beels, waterlogged fields, flooded paddy lands
Juluki (Trap with Equal Mouth and Base)	Beels, paddy fields
Fishing nets	
Chip jal	Rivers, streams
Porongijal (*Dharma jal*)	Rivers, floodplains
Toni jal (Drag net / Encircling net)	Streams, water logged fields, small river
Khali jal (Baralia Fishing net)	River, wetlands
Pahijal (Encircling net)	Ponds and confined waters
Musharijal (*Mohorijal*)	Beels, large ponds
Gill nets	Streams, beels, water logged areas, inundated paddy fields
Cast nets/ Khewalijal	Streams, wetlands, water logged fields
Dhekijal	Streams, rivers, wetlands

Operational protocol

The *Dowari* is usually operated by a single fisher. It is placed in shallow waters, such as beels, slow-flowing streams and waterlogged paddy fields, particularly during the monsoon and post-monsoon seasons, when fish movement is high (Table 3). The trap is positioned upright on the bottom of the water body and left undisturbed for several hours or overnight. Fish entering the trap remain confined inside and the fisher later lifts the trap and removes the catch through the top opening.

Catch composition

The *Dowari* mainly captures small to medium-sized fishes that inhabit shallow and slow-moving waters. Commonly recorded species include small barbs (*Puntius* spp.), climbing perch (*Anabas testudineus*), striped snakehead (*Channa striata*), spiny eel (*Mastacembelus armatus*), walking catfish (*Clarias batrachus*) and minor carps such as *Labeo bata* and *Cirrhinus reba*.

***Dingori* (*Rectangular bamboo trap*)**

Structure and design

Dingori is a rectangular bamboo trap with an inward-facing sieve that acts as a non-return entrance (Fig. 2 h). It is often placed between guiding bamboo screens (*banas*) in shallow streams, beels and inundated fields.

Operational protocol

The *Dingori* is usually operated by one fisher, although two fishers may be involved when installing guiding screens or handling larger traps. It is set in shallow beels, waterlogged fields and slow-flowing river margins, particularly during the flood and monsoon seasons when fish movement is high. The trap is placed firmly on the substrate, aligned with the direction of water flow and left for several hours or overnight. Fish are harvested by lifting the trap and manually removing the catch.

Catch composition

The *Dingori* mainly captures small to medium-sized fishes commonly found in shallow floodplain habitats. Representative species include spotted snakehead (*Channa punctatus*), climbing perch (*Anabas testudineus*), striped catfish (*Mystus vittatus*), small barbs (*Puntius* spp.) and juvenile catfishes such as walking catfish (*Clarias batrachus*).

***Darki* (*Box-shaped bamboo trap with trap doors*)**

Structure and design

Darki is a rectangular bamboo trap fitted with one or two inward-opening doors along its lower side and a rear opening for removing fish (Fig. 2 i). Narrow gaps between strips help retain fish.

Operational protocol

The *Darki* is usually operated by one fisher, although two fishers may be involved when several traps are set together. It is placed in shallow waters of beels, waterlogged fields or slow-moving streams, often during the monsoon and post-monsoon seasons when fish movement is high (Table 3). To improve efficiency, bamboo screens or guiding barriers (*banas*) are sometimes installed near the trap mouth to direct fish toward the entrance. The trap is checked periodically and fish are removed manually through the rear opening.

Catch composition

The *Darki* mainly captures medium-sized fishes that move close to the bottom or along shallow margins. Common species include striped snakehead (*Channa striata*), catfishes such as *Mystus* spp. and walking catfish (*Clarias batrachus*), climbing perch (*Anabas testudineus*) and small barbs (*Puntius* spp.).

***Choroha* (*Cherha*)**

Structure and design

Choroha is a funnel-shaped bamboo trap, approximately 75–80 cm high, with a circular mouth about 10–12 cm in diameter (Fig. 2 j). Its narrowing internal passage makes escape difficult after fish enter.

Operational protocol

Choroha is typically operated by a single fisher as a set trap. It is placed in shallow water bodies, including waterlogged paddy fields, small channels and marginal areas of beels (Table 3). The trap is positioned with the mouth facing the direction of water movement or suspected fish pathways. Once set, it is left undisturbed for several hours or overnight. Fish entering the funnel are unable to escape due to the narrowing internal passage. The trap is periodically lifted and fish are removed manually.

Catch composition

The trap mainly captures small indigenous fishes, including snakeheads (*Channa punctatus*), climbing perch (*Anabas testudineus*), small barbs (*Puntius* spp.) and juvenile catfishes such as *Mystus* spp. Occasional catches of air-breathing fishes are also reported.

Khoka

Structure and design

Khoka is made from a mature bamboo culm whose split end is bent outward to form a circular mouth.

It is approximately 0.9–1.1 m long, with a mouth 0.5–0.6 m across (Fig. 2 k).

Operational protocol

Khoka is operated by a single fisher and is commonly used in weed-infested shallow waters, waterlogged areas and along the earthen bunds of inundated paddy fields, especially during the monsoon season (Table 3). The trap is placed horizontally with the open mouth facing areas of fish movement. It is checked periodically by lifting the trap and manually collecting the fish.

Catch composition

The trap mainly captures air-breathing and small indigenous fishes, including snakeheads (*Channa punctatus*), walking catfish (*Clarias batrachus*) and small barbs (*Puntius* spp.).

***Tiar and Pocha* (*Multi-pronged wounding spears*)**

Structure and design

Tiar is a bamboo-shafted spear with a detachable iron fork carrying 5–7 barbed prongs; *Pocha* is a similar, unbarbed variant (Fig. 2 l-m). The total length is about 1.8–2.5 m.

Operational protocol

These spears are operated by individual fishers, mainly during the monsoon season at night in flooded paddy fields and shallow waters (Table 3). Fishing is often carried out using a flaming torch as a light attractant, a traditional practice locally known as *Jora Kota*. Fishers walk slowly through shallow water and strike fish that approach the illuminated areas.

Catch composition

Commonly captured species include snakeheads (*Channa* spp.), walking catfish (*Clarias batrachus*), freshwater eel (*Monopterus cuchia*) and freshwater shark (*Wallago attu*).

***Jakoi* (*Hand-Operated Scoop Net*)**

Structural design

Jakoi is a triangular, pouch-shaped hand-operated gear supported by closely spaced bamboo splints. Its mouth has a circumference of about 2 m and a bamboo rod provides the handle (Fig. 2 n-o).

Operational protocol

During operation, the fisher plunges the *Jakoi* into shallow water with the mouth facing towards the operator (Table 3). The substrate is disturbed by stamping or "dancing" on the ground to drive fish hiding in the bottom sediments into the pouch. The gear is then lifted quickly in an upright position to trap the fish. In some instances, the *Jakoi* is also pushed along the bottom to scoop fish directly.

Catch composition

Jakoi is mainly used in paddy fields, beels and other shallow water bodies. The catch predominantly consists of small-sized fishes, including both surface- and bottom-dwelling species. Owing to its simplicity and ease of operation, it is commonly used as a household fishing gear, often operated by women and children in rural areas.

***Khaloi* (*Fish keeper*)**

Structure and design

Khaloi is a bottle-shaped bamboo fish keeper, about 50–70 cm long and 25–35 cm wide, with a narrow opening and inward-pointing bamboo spines (Fig. 2 p). Water circulation helps keep captured fish alive until fishing ends or the catch is transported.

Operational protocol

The device is used by individual fishers and is usually tied around the waist or kept submerged in water during fishing. Captured fish are inserted through the mouth opening and remain alive inside until fishing is completed or the catch is transported.

Function

Khaloi is used for storing all types of small live fish such as snakeheads (*Channa* spp.), small barbs (*Puntius* spp.) and various catfishes, thereby serving as an essential accessory in traditional fishing systems.

***Polah / Polo* (*Bell-shaped trap*)**

Structure and design

Polah (*Polo*) is a bell-shaped bamboo trap, 0.5–1.5 m high, with a base diameter of 0.6–1.2 m and a small top opening for retrieving fish (Fig. 2 q).

Operational protocol

Polah is operated by one fisher, usually in shallow beels, waterlogged fields and flooded paddy lands (Table 3). The fisher plunges the trap suddenly over suspected fish habitats and presses it firmly onto the substrate. Fish trapped inside are collected by inserting a hand through the top opening. The gear is commonly used during community fishing events.

Catch composition

The trap captures small to medium-sized fishes such as barbs (*Puntius* spp.), minnows, climbing perch (*Anabas testudineus*) and snakehead (*Channa punctatus*).

Juluki

Structure and design

Juluki resembles *Polah* but has nearly equal openings at the top and bottom (Fig. 2 r). It is about 50–70 cm high and is used in shallow beels and paddy fields; rice bran may be used as bait.

Operational protocol

Juluki is operated by individual fishers in shallow water bodies such as beels and paddy fields (Table 3). To increase catch efficiency, rice bran or similar bait is sometimes placed near or inside the trap. The device is periodically lifted to harvest the trapped fish.

Catch composition

The trap mainly captures small indigenous fishes, including barbs (*Puntius* spp.), danios (*Danio* spp.) and rasboras (*Rasbora* spp.).

Cuchia Jathi

Structure and design

Cuchia Jathi is a single-pronged iron spear mounted on a 1.5–2.0 m bamboo handle. The iron



Fig. 3 — Different fishing nets used by fishermen in Kamrup and Bongaigaon district of Assam

prong is approximately 70–100 cm long and may be barbed to retain the fish (Fig. 2 s-t).

Operational protocol

The gear is operated by one fisher, mainly during the post-monsoon season, when water levels recede and muddy substrates are exposed. The fisher locates burrows of freshwater eel and strikes into the mud until contact is felt.

Catch composition

This gear is highly selective and exclusively targets freshwater eel (*Monopterus cuchia*).

Fishing nets

Chip jal

Structure and design

Chip jal is a lift net supported by two crossing bamboo poles, each about 3.0–4.5 m long, and a central vertical lever. It is lowered horizontally and lifted at intervals to collect fish (Fig. 3 a-b).

Operational protocol

Chip jal is operated by one to two fishers. The net is submerged horizontally in the water and lifted vertically at regular intervals using the bamboo lever. Fish trapped on the net surface are collected by hand or with a scoop net. The gear is used throughout the year in rivers, beels and channels with moderate water depth.

Catch composition

The catch commonly includes all kinds of fishes available in the waterbody particularly Indian major carps such as rohu (*Labeo rohita*), catla (*Catla catla*) and mrigal (*Cirrhinus mrigala*), along with small indigenous fishes such as barbs (*Puntius* spp.), glassfishes (*Chanda nama*, *Chanda ranga*), flying barb (*Esomus danricus*) and air-breathing fishes including *Channa* spp.

***Porongijal* (*Dharma jal*)**

Structure and design

Porongijal is a square lift net supported by crossed bamboo poles about 2.2–2.5 m long and attached to a long handle (Fig. 3 c). A single fisher repeatedly dips and lifts it from the bank or shallow water.

Operational protocol

The net is operated by a single person, often from the bank or shallow area. It is repeatedly dipped and lifted vertically. Women frequently operate this net, especially during flood periods. It is used year-round in rivers, floodplains and inundated paddy fields (Table 3).

Catch composition

All types of fishes available in the water body including danios (*Danio* spp.), barbs (*Puntius* spp.), rasboras (*Rasbora* spp.), garua catfish (*Clupisoma garua*), *Eutropiichthys vacha*, Indian river shad (*Gudusia chapra*) and anchovies (*Setipinna phasa*).

Toni jal (Drag Net / Encircling Net)

Structure and design

Toni jal is a rectangular drag net, 2.5–4.5 m long and 1.5–2.5 m deep, held open by bamboo poles (Fig. 3 d). Two fishers drag it through shallow water and collect the fish manually. The net is locally known as *Tana jal* or *Muglaijal* in some areas (Table 3).

Operational protocol

The net is operated by two fishers, usually women. Each fisher holds one bamboo pole and the net is dragged through shallow water to encircle fishes. After dragging, the net is lifted and fish are collected manually. It is mainly used during the lean season.

Catch composition

The catch mainly includes small indigenous fishes such as barbs (*Puntius* spp.), banded gourami (*Colisa fasciatus*) and small catfishes (*Mystus* spp.).

***Khali jal* (*Baralia fishing net*)**

Structure and design

Khali jal is a bag-shaped net held open by a short bamboo stick across its mouth (Fig. 3 e). Two fishers tow it slowly along shallow river margins or floodplain areas, mainly during monsoon and post-monsoon periods.

Operational protocol

Operated by two fishers, the net is towed slowly along the shallow margins of rivers or floodplain areas, either from the bank or a boat (Table 3). It is mainly used during the monsoon and post-monsoon seasons.

Catch composition

The net is highly selective for *Baralia* fish (*Barilius* spp.), though small quantities of other small indigenous fishes may also be caught.

Pahijal

Structure and design

Pahijal is an encircling net with floats on the head rope, sinkers on the foot rope and hauling ropes at

both ends (Fig. 3 f). Two to four fishers use it to encircle fish, including brooders in ponds and confined waters.

Operational protocol

The net is operated by two to four fishers. It is spread in water and gradually pulled to encircle fishes, particularly brooders in ponds and confined waters (Table 3). The net is used throughout the year.

Catch composition

It mainly captures medium to large fishes such as carps (*Labeo* spp., *Cirrhinus* spp.) and large catfishes.

***Musharijal* (*Mohorijal*)**

Structure and design

Musharijal is a long, deep encircling net designed to form a central bag when hauled (Fig. 3 g-h). It generally requires 6–8 people and is used in beels and large ponds, including during community fishing events.

Operational protocol

The net requires 6-8 people for operation. It is stretched across shallow water and gradually pulled towards the shore from both ends. This gear is commonly used during community fishing events in beels and large ponds (Table 3).

Catch composition

It captures a wide variety of fishes, including small indigenous fishes, carps, catfishes and air-breathing fishes such as *Channa* spp.

Gill nets

Structure and design

Gill nets are vertical rectangular nets fitted with floats above and sinkers below (Fig. 3 i-j). They may be fixed or drift with the current and are used across streams, beels, waterlogged areas and inundated paddy fields.

Operational protocol

Gill nets are operated by one to two fishers and are either fixed (*Fasijal, Langi jal*) or allowed to drift with current (*Current jal*, *Bagarjal*). They are used throughout the year in streams, beels, waterlogged areas and inundated paddy fields (Table 3).

Catch composition

A wide range of fishes are captured, including carps (*Labeo* spp.), catfishes (*Sperata aor*), snakeheads (*Channa* spp.) and featherback (*Chitala chitala*).

Cast nets

Structure and design

Cast nets are conical nets with weighted edges that form pockets as the net sinks (Fig. 3 k-l). A single fisher throws the net over water and retrieves it using the central hauling rope.

Operational protocol

Operated by a single fisher, the net is thrown over water so that it spreads circularly and sinks rapidly. Fish are trapped in the pockets and retrieved by pulling the rope.

Catch composition

All types of species including rohu (*Labeo rohita*), bata (*Labeo bata*), reba carp (*Cirrhinus reba*), snakeheads (*Channa marulius*, *Channa striatus*), featherback (*Chitala chitala*) and catfishes (*Bagarius bagarius*).

Dhekijal

Structure and design

Dhekijal is a large V-shaped lift net formed by two bamboo poles, each about 13–15 m long, with a mouth width of approximately 15–16 m (Fig. 3 m-n). It is mounted on a riverbank platform and lifted against the current.

Operational protocol

Operated by two or more fishers, the net is fixed on a bamboo platform along riverbanks and lifted against the current (Table 3). It is mainly used during flood and receding water periods.

Catch composition

The net captures Indian major carps (*Catla catla*, *Labeo rohita*, *Cirrhinus mrigala*), clupeids and large predators such as *Wallago attu*.

Discussion

The present study highlights the continued importance of indigenous fishing gears and nets in sustaining household-level fisheries in the study area. The wide range of gears recorded reflects the rich traditional knowledge of local fishing communities and their ability to adapt fishing practices to changing environmental and seasonal conditions. The dominance of fishing nets, particularly *gill nets*, indicates their efficiency, versatility and suitability across different water depths and habitats. Similar observations have been reported from other floodplain and riverine fisheries of northeastern India[8-10], where

nets remain the primary fishing tools due to their higher catch efficiency and ease of operation.

The widespread use of nets such as *Toni jal*, *Khewalijal* further suggests that households rely on multiple net types to target different fish species and life stages. In contrast, the relatively lower use of *Musharijal* and *Porongijal* may be attributed to their specialized application in specific habitats or seasons.

Automatic fishing gears, especially bamboo-based traps like *Dowari* and *Juluki*, continue to play a significant role in household fishing activities. Their popularity can be linked to their low cost, ease of construction from locally available materials and ability to operate without continuous human effort. Moderate use of other traps such as *Sepa*, *Dingori*, *Polah* and *Khoka* indicates that these gears complement net fishing, particularly in shallow waters, vegetated areas or during receding water levels[7,10,11].

In the present study, it was observed that wounding gears were used by a comparatively smaller proportion of households, reflecting their limited and situational application. Gears such as *Tiar* and *Pocha* and *Cuchiajathi* are typically employed in shallow waters or for targeting specific species, which may explain their lower adoption. Additionally, growing awareness about sustainable fishing practices and regulatory restrictions in certain water bodies may have influenced the reduced use of such gears.

The observed overlap in the use of fishing gears and nets indicates that most households adopt a diversified fishing strategies rather than depending on a single device.

The predominance of bamboo and other biodegradable materials in the construction of fishing gears further indicates their environmentally benign nature[12]. However, the increasing incorporation of nylon twine and plastic rope observed in some geras suggests a gradual shift in material use, which may have long-term ecological implications[7,10]. Documenting these transitions is important for designing management strategies that balance technological adaptation with environmental sustainability.

Limitations of the study

Some seasonal fishing gears may have been missed during field visits, and information on these gears was partly based on fishers' recollections. The study also did not assess catch per unit effort (CPUE) and covered only selected villages in two districts, which may limit the wider applicability of the findings. Despite these limitations, the study provides useful insights into indigenous fishing practices and their importance for sustainable inland fisheries.

Conclusion

The study documents traditional fishing knowledge in Kamrup and Bongaigaon districts and shows that gears are adapted to local habitats, seasons and fish behaviour. The recorded technologies include bamboo traps, hand-operated devices, spears and nets, used in rivers, beels, wetlands and flooded fields. Changes in materials and the reduced use of some labour-intensive gears suggest that these practices continue to evolve. The inventory provides a baseline for recognising local knowledge and considering its role in sustainable inland fisheries management. Further work should measure catch per unit effort, size selectivity and seasonal impacts before making strong claims about ecological sustainability.

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Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

PS: Conceptualization, supervision, review and editing. DP: Methodology, investigation, data curation and original draft. KDN: Investigation, validation of gears and fish species, review and editing. RS: Investigation, resources, review and editing. All authors approved the final manuscript.

Ethics Statement

The study involved non-invasive interviews and field observations. No animals were experimentally treated, and no fish were sacrificed specifically for this study; therefore, institutional animal ethics approval was not required.

Informed Consent

Prior informed consent was obtained from respondents and village heads after explaining the study in the local language. Individuals shown in (Fig. 2 & Fig. 3) consented to publication of their photographs.

Consent for Publication

All participants shown in the manuscript provided consent for publication of their photographs.

Use of Artificial Intelligence (AI)

ChatGPT was used for language editing to improve sentence flow and grammar. The authors take full responsibility for the manuscript's content and accuracy.

Data Availability

Data are presented in (Table 1-3) and figures. Additional data, including interview schedules and field notes, are available from the corresponding author upon reasonable request. Identifying details are withheld to protect respondents' privacy and traditional knowledge.

References

1 Bhuyan P C, Goswami C, Kakati B K & Bhagawati K, Constraints in adoption of composite carp culture in central Brahmaputra valley zone of Assam - a perceptual framework, *J Applnat Sci*, 9 (2) (2017) 730-735. DOI: 10.31018/jans.v9i2.1265

2 Saikia P, Sarma D K, Saikia R, Saharia P K, Dutta P, *et al*., Constraints in adoption of recommended technologies of composite carp culture in Assam among the beneficiary fish farmers under Assam Agribusiness and rural transformation project (APART) -A perceptual framework, *J Comm Mob Sus Dev*, 18 (3) (2023) 759-766. DOI: 10.5958/2231-6736.2023.00007.8

3 Saikia P, Sarma D K, Saikia R, Saharia P K, Kalita D N, *et al*., Factors associated with adoption level and adoption behaviour of fish farmers on Best Management Practices (BMPs) for fish culture in Assam, India, *J Inl Fish Soc India*, 56 (3) (2024) 286-299. https://doi.org/10.56093/jifsi.v56i3.2024.166381

4 Chakravarty B, Tamuli A K, Borah S & Nath K D, Economic analysis of fish farmers and fishers in Kamrup District, Assam, India, *Asian J Agri Ext Econ Soc*, 20 (1) (2017) 1-7. DOI: 10.9734/AJAEES/2017/36258

5 Directorate of Economics and Statistics, Assam, Statistical Handbook, Assam-2024, Government of Assam, Guwahati, Assam, 2024

6 Saha B, Devi R, Kashyap D & Baruah D J, Perceived effectiveness of indigenous traditional fishing methods including gears and traps in Nagaon district of Assam, *Indian J Tradit Know*, 1 (1) (2015) 103-111.

7 Das A, Debnath B, Choudhury T G, Roy D, Saha B, *et al*., Indigenous Technical Knowledge for pond maintenance, fish health management and fish seed in Tripura, India, *Indian J Tradit Know*, 12 (1) (2013) 66-71.

8 Nath K D, Borah S, Chetia B R, Saikia N, Saud B J, *et al*., Indigenous fishing techniques and their effectiveness as perceived by fishers in Cachar district, Assam, India, *Indian J Fish*, 65 (1) (2018) 110-115. DOI: 10.21077/ijf.2018.65.1.65095-18

9 Baruah D, Traditional community fishing practices of rural Kamrup of Assam, Aquaculture, Vol. XXI No. 1 (January-March) (2017) 7-16.

10 Kalita K D, Das B K & Kalita S, Fishing communities and traditional fishing gears in South-West Assam, *IOSR J Agri Vet Sci* (*IOSR-JAVS*), 12 (5) (2019) 01-07.

11 Devi R, Shaha B, Pandit A & Kashyap D, Assessment of applicability of Indigenous Technical Knowledge (ITK) in aquaculture as perceived by fish farmers in Assam, *Indian J Fish*, 61 (3) (2014) 104-110.

12 Baruah D, Dutta A & Pravin P, Traditional fish trapping devices and methods in the Brahmaputra valley of Assam, *Indian J Tradit Know*, 12 (1) (2013) 123-129.