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STUDY ON THE LOCALLY AVAILABLE FISH SPECIES AND FISHING GEAR USED IN THE GAINADI RIVER, DHEMAJI DISTRICT OF ASSAM, INDIA

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Abstract

The present study was conducted in the Gainadi River of Dhemaji district in Assam. The study was carried out from the month of January to May 2024 in two selected sampling sites. Through this investigation, the economic importance of locally available fish and fishing gear used in Gainadi River was analysed. A total of 42 fish species were recorded belonging to 9 orders and 12 families. Among the 12 families, the family Cyprinidae was dominant with 24 species followed by Siluridae with 3 species and Ambassidae, Channidae, Cobitidae, Bagridae and Mastacembelidae with 2 species each and Belonidae, Gobiidae, Clariidae, Schilbeidae and Tetraodontidae with one species each. Based on the conservation status, 36 species are least concern, 3 species is recorded as vulnerable and 3 species as near threatened. However, on the basis of economic value, 36 species were found to be of commercially importance, 27 species have food value and 13 species are of ornamental value. Out of the 42 species recorded, 8 species are herbivorous, 11 species are omnivorous and 23 species carnivorous. In the present study, a variety of 17 types of fishing gear, including 5 fishing nets, 8 fishing traps, 2 hooks and lines, were used for catching live fishes. The primary concern for the declining diversity, both in the study area and across the country, is the decreasing availability of fish. So, fish species requires a multifaceted management practice, habitat protection and community engagement.

Key words: Fish diversity, Conservation status, Economic value, Feeding habit, Gainadi River

Introduction

Rivers are freshwater aquatic ecosystems where water current is a major controlling factor, oxygen and nutrients in the water are more uniform and land-water exchange is more extensive. The most diverse and richest ecosystem is found to the freshwater ecosystem on earth. More than 10% of animal species, including 25% of vertebrates, and 6% of all species occur in freshwater (McAllister, *et. al.*, 1997).

In Assam there are two major river systems namely the Brahmaputra and the Barak River system. The Brahmaputra River is a large international river flowing through Tibet (China), India and Bangladesh (Pradhan, *et. al.*, 2021). The Brahmaputra River flows through the states of Arunachal Pradesh and Assam in India. The Brahmaputra traverses a total distance of 2880 km, which comprises an easterly course of 1625 km in Tibet, a southerly and westerly course of 918 km in India and a southerly course of 337 km in Bangladesh (Bhattacharjya *et. al.*, 2017). The fish fauna of the North-East is primarily shared with that of the Indo-Gangetic region, as well as with Burma and South China. Unique ecological diversity may be found in North East India, which is made up of eight states: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. This region, which is a portion of the Himalayas and Indo-Burma, has extremely diverse freshwater ecosystems that are significant regionally (Chatterjee *et. al.*, 2006).

Fish occupy a very important place in the life and culture of the diverse ethnic communities inhabiting the North Eastern region of India since very long time (Singh *et. al.*, 2023). Fishing gear plays a crucial role in supporting livelihoods for many people around the world, particularly those who rely on fishing as their primary source of income. Assam is enriched with a variety of water bodies including rivers and beels or wetlands. The various types of wetlands found in Assam are rivers, lakes, ponds etc. A variety of fish species from different

wetlands and rivers have been reported by several workers in Assam. Most of the species recorded and collected had economic value as food, medicinal, recreation and aesthetic purposes. In the recent year's fishes has become one of the major income sources for small scale farmers and unemployed people of the world.

Gainadi is a distributary that emerges from the Sissi River along southward direction at 2 km. north of Sissi bargaon near Tokoubari village. This branch, known as Gainadi, flows 2 km. downstream and crosses the NH-52. From this point Gainadi continues through Salahani beel for another 4 km. in the same direction. Gainadi flows leaving aside Chakamora and Chumani beel on its left side. Gainadi changes its course near Chumani beel and move towards the South- west direction and travels 3 km. downstream and merge into the Kukura beel and after flowing across the beel, finally combines with the Kapurdhowa River.

Fishes constitutes almost half of the total number of vertebrates in the world and constitutes important marine resource and considering its contribution to the overall economy of the country. A very limited work has been done on economic importance of locally available fish species in this river of Upper Assam. Therefore, the present study is an attempt with an aim to investigate the economic importance of locally available fish of Gainadi River situated at Dhemaji district, Assam and to study the different types of fishing gear used by the local inhabitants in the Gainadi River.

Methods and Methodology

Study area

The Gainadi River flows through the Dhemaji district in Assam. Dhemaji district is situated in the Brahmaputra Valley and lies in the northeastern part of Assam. The physiography of the region is characterized by plains, which are part of the larger Brahmaputra River basin. Gainadi River is a North-bank tributary of the Brahmaputra River. It is located 20 km from the Silapathar town. The river is bounded by railway line to the north; Sapekhati Gaon to the east; Bali Jan to the west and NH-15 to the south. Gainadi River originates in the Eastern Himalayas, carry heavy sediment loads, and enter the plains through narrow outlets with a great velocity. The river is situated at 27.56 N latitude and 94.66 E longitudes. The total area of the watershed is about 500.51km² and of this 297.77 km² lies in Assam and 202.74 km² lies in Arunachal Pradesh. The Gainadi River changed its course and diverted to different direction. The river is surrounded by village such as Betanipam, Thekera Guri, Sisibargaon, Pachim kachari chuk, Sapekhati Gaon and Bali Jan etc. For this study two sampling sites were selected viz; Thekera Guri (S1) and Betanipam (S2).

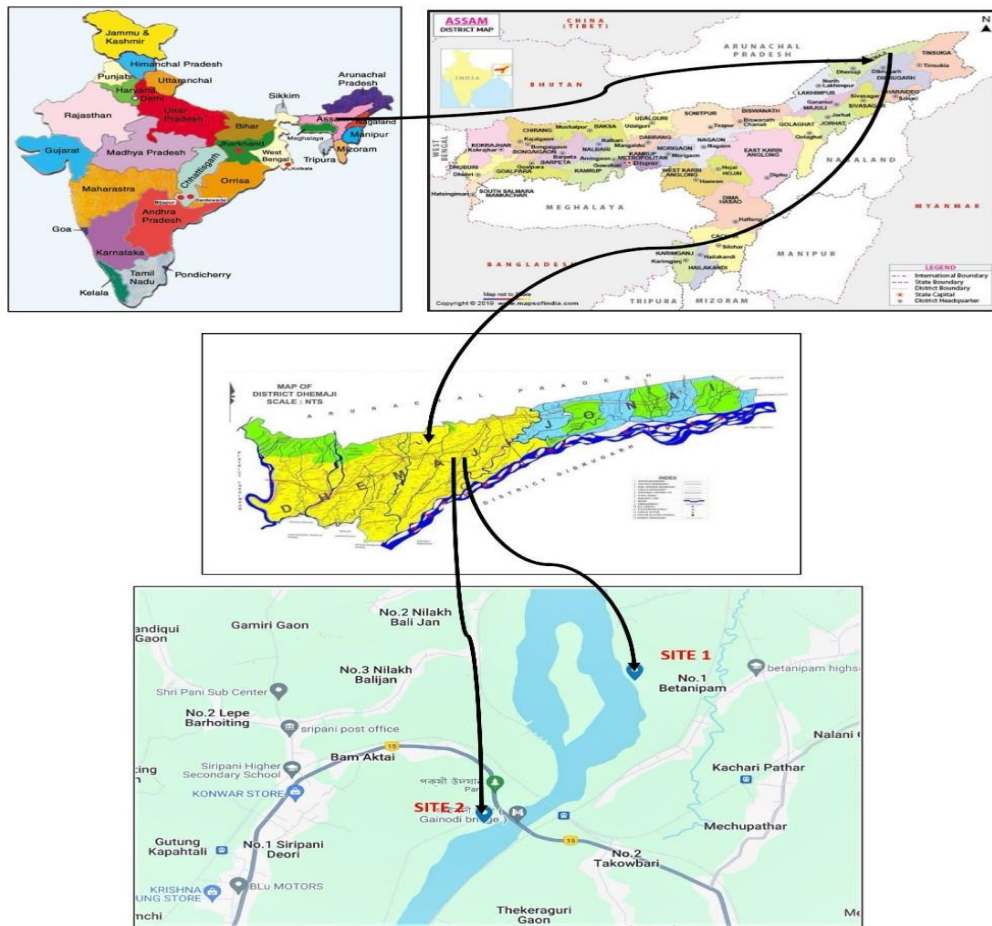


Figure 1: Map showing the Sampling sites of Gainadi River

Methods of study

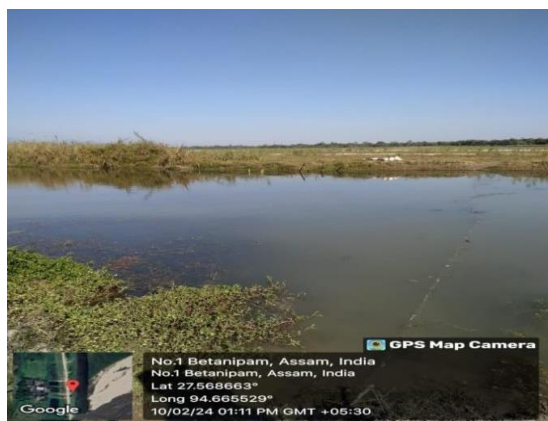
The present study was carried out in Gainadi River. It flows through the Dhemaji district in Assam. For this study two sampling sites were selected. The distance from one sampling site to another is about 1.5 km. The survey was carried out from the month of January to May 2024. Each site was visited twice in a month. The fish species were identified with the help of identification keys according to Talwar and Jhingran (1991); Jayaram (1999); Nath and Dey (2000); Vishwanath (2007). Interviews of local fishermen about the features of the gears they used, their mode of operation and the kinds of fish they catch. For more information communication with local fish contractors through questionnaires survey was carried out.

This survey was conducted twice in a month. Fishes were collected from the river with the help of local fishermen. The fish sample was collected from each sampling site in the morning session, as during morning hours fishermen collect most of the fishes. Photographs of collected live fish species were taken immediately by digital camera by placing them in a clean white paper and scale was placed along the length of the specimen in order to record the length of the collected species. During fish sample collection, the total numbers of each species were recorded for every field visit and sampling site. Depending on the size and habits fish species were collected. Market survey at the nearest markets in and around the study sites and observation and interaction with local people and fisherman communities was also done. The fish were caught with different types of fishing gears including cast net, gill net and different traditional bamboo traps had been used.

Preservation and identification of fish

For proper identification, the collected fish species are kept in an air tight plastic container and are

preserved at 10% formalin solution following Walsh and Meador (1998). The identification of fishes is done by internet (google lens). Nomenclature of unidentified fishes and valid scientific name and classification of each species was done with the help of www.fishbase.org and Catalog of Fishes (Eschmeyer, *et. al.*, 2021). The present conservation status of all the identified fish species was determined by following the IUCN Red Data List 2024. The fishes were identified with the help of identification keys according to Talwar and Jhingran (1991); Jayaram (1999); Nath and Dey (2000); Vishwanath (2007).



(a)Thekeraguri (S₁)

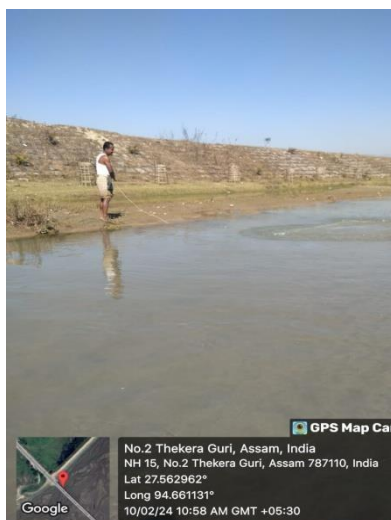


(b) Betanipam(S₂)

Photoplate 1: Photographs showing the two selected sampling sites

Fishing gear

Field surveys and personal observations made during fishing operations provided information about the different fishing craft and gears, and methods of operation. Fishing methods were categorized in accordance with Lal (1969) and Von Brandt (1972). The local fishermen were engaged to demonstrate the various fishing tactics of ten employed in the area in order to obtain full knowledge on the same. The fish were caught with the assistance of local fisherman using a cast net and drag net. Besides these methods other gears like scoop net was used. For the trapping method, local traps were constructed of wood and fiber as if a fish swims inside through its opening, it cannot get out and those traps were placed at two locations at each site for 1 hour considering the turbulent flow of the river. Wherever feasible handpicking collections were done almost at every site and according to the human approach and river depths, hooks were placed for about 1 to 2 hours at each site. Pictures of the gears were also taken for further reference and documentation. Interviews of local fishermen communities and local fish contractors through questionnaires were also conducted to collect secondary data.





Photoplate 2: Photographs showing the fishing methods

Results

Fish diversity

In the present study, a total number of 42 fish species belonging to 9 orders and 12 families were recorded from Gainadi River (Table-1). The order Cypriniformes was dominant with 26 species. Among the 12 families, the family Cyprinidae was dominant with 24 species followed by Siluridae with 3 species and Ambassidae, Channidae, Cobitidae, Bagridae and Mastacembelidae with 2 species each and Belonidae, Gobiidae, Clariidae, Schilbeidae and Tetraodontidae with one species each. The conservation status of the recorded fish has been classified into three categories viz., LC= Least Concern, VU= Vulnerable and NT= Near Threatened of which 36 species are least concern, 3 species are recorded as vulnerable and 3 species are near threatened.

Table 1: Total number of Fish fauna of Gainadi River with their IUCN status

Sl. No	Order	Family	Name of species	IUCN
1	Anabantiformes	Channidae	<i>Channa gachua</i>	LC
2			<i>Channa punctatus</i>	LC
3	Beloniformes	Belonidae	<i>Xenentodon cancila</i>	LC
4	Cypriniformes	Cobitidae	<i>Lepidocephalichthys guntea</i>	LC
5			<i>Botia dario</i>	LC
6		Cyprinidae	<i>Labeo gonius</i>	LC
7			<i>Amblypharyngodon mola</i>	LC
8			<i>Barilius barila</i>	LC
9			<i>Barilius bendelisis</i>	LC
10			<i>Botia rostrata</i>	VU

11			<i>Cabdio morar</i>	LC
12			<i>Catla catla</i>	LC
13			<i>Chagunius chagunio</i>	LC
14			<i>Cirrhinus reba</i>	VU
15			<i>Cyprinus carpio</i>	LC
16			<i>Devario devario</i>	LC
17			<i>Esomus danricus</i>	NT
18			<i>Hypophthalmichthys molitrix</i>	LC
19			<i>Labeo bata</i>	LC
20			<i>Labeo rohita</i>	LC
21			<i>Laubuca laubuca</i>	LC
22			<i>Paracanthocobitis botia</i>	LC
23			<i>Pethia conchoniis</i>	LC
24			<i>Puntius chola</i>	LC
25			<i>Puntius sarana</i>	LC
26			<i>Puntius sophore</i>	LC
27			<i>Raiamas bola</i>	LC
28			<i>Rasbora daniconius</i>	LC
29			<i>Salmostoma bacaila</i>	LC
30	Gobiiiformes	Gobiidae	<i>Glossogobius giuris</i>	LC
31	Perciformes	Ambassidae	<i>Chanda nama</i>	LC
32			<i>Parambassis ranga</i>	LC
33	Siluriformes	Siluridae	<i>Wallago attu</i>	VU
34			<i>Ompok pabda</i>	LC
35			<i>Ompok pabo</i>	LC
36		Bagridae	<i>Mystus tengara</i>	LC
37			<i>Mystus vittatus</i>	LC
38		Clariidae	<i>Clarias batrachus</i>	NT
39		Schilbeidae	<i>Clupisoma garua</i>	NT
40	Synbranchiiformes	Mastacembelidae	<i>Macrognathus aral</i>	LC
41			<i>Mastacembelus armatus</i>	LC
42	Tetraodontiformes	Tetraodontidae	<i>Tetraodon cutcutia</i>	LC

Note*LC = Least Concern, VU= Vulnerable, NT= Near Threatened

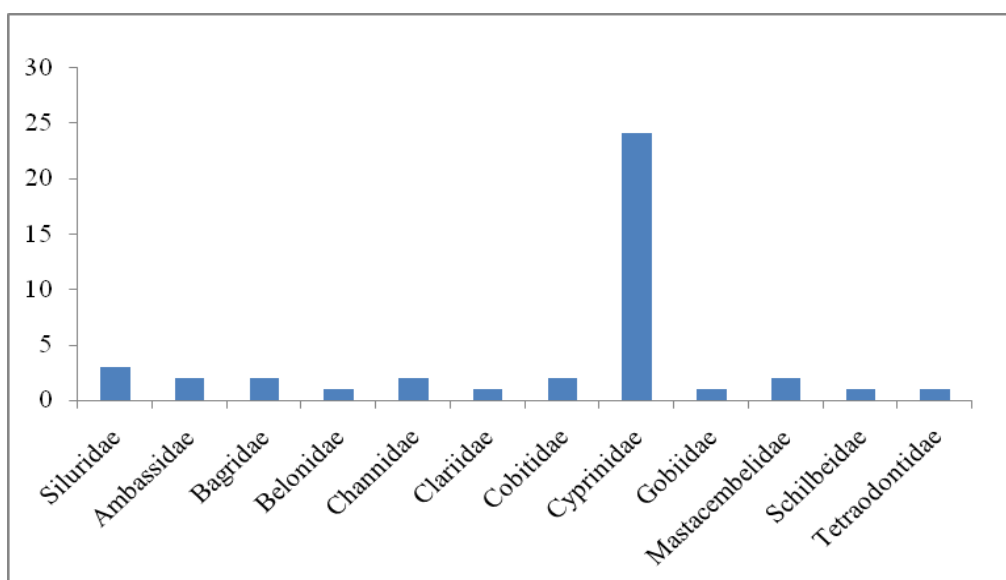


Figure 2: Family wise distribution of fish species

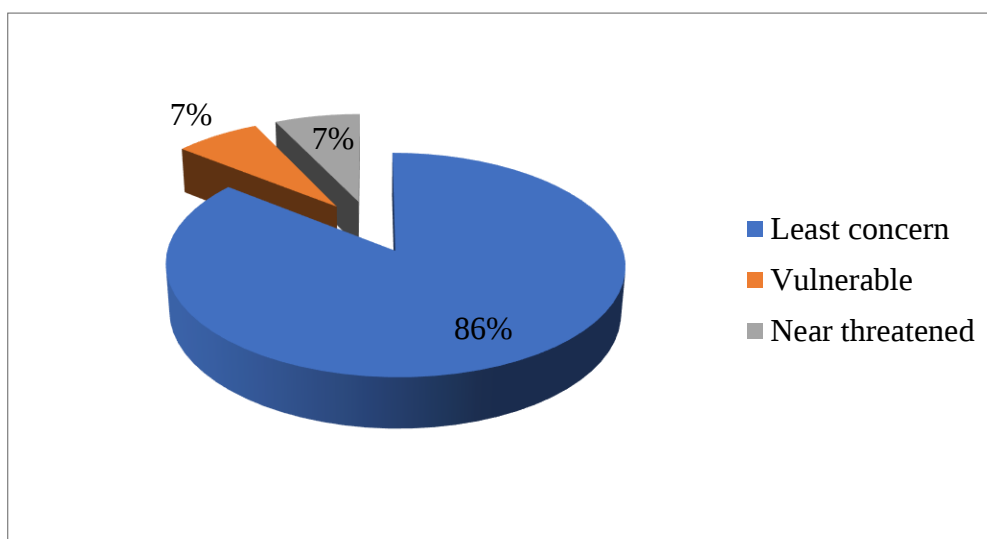


Figure 3: Pie diagram showing conservation status of recorded fish species

Economic value and feeding habit

In the present study, the collected fish species were also classified on the basis of their economic importance (Lagler, 1956) as shown in table 2. Out of the 42 species recorded, 36 species were found to be of commercial importance, 27 species have food value and 13 species are ornamental.

Based on the food and feeding habits, the fishes were also classified into herbivorous, omnivorous and carnivorous (Table-2). Out of the 42 species recorded, 8 species were herbivorous, 11 species were omnivorous and 23 species were carnivorous.

Table 2: Economic value and feeding habits of fish species of Gainadi River

Sl No	Name of species	Economic value	Feeding habit
		(Food/ Ornamental/ Commercial)	(Carnivore/ Herbivores/ Omnivore)
1	<i>Parambassis ranga</i>	Commercial	Carnivores
2	<i>Channa gachua</i>	Commercial/ Food	Carnivores

3	<i>Channa punctatus</i>	Commercial/ Food	Carnivores
4	<i>Xenentodon cancila</i>	Commercial/ Ornamental	Carnivores
5	<i>Lepidocephalichthys guntea</i>	Commercial/ Food	Carnivores
6	<i>Botia dario</i>	Commercial/ Food	Omnivores
7	<i>Labeo gonius</i>	Commercial/ Food	Herbivores
8	<i>Amblypharyngodon mola</i>	Food	Herbivores
9	<i>Barilius barila</i>	Commercial/ Food	Carnivores
10	<i>Barilius bendelisis</i>	Commercial/ Ornamental	Carnivores
11	<i>Botia rostrata</i>	Commercial/ Food	Carnivores
12	<i>Cabdio morar</i>	Food	Omnivores
13	<i>Catla catla</i>	Commercial	Herbivores
14	<i>Chagunius chagunio</i>	Commercial	Carnivores
15	<i>Cirrhinus reba</i>	Food	Omnivores
16	<i>Cyprinus carpio</i>	Commercial/ Food	Omnivores
17	<i>Devario devario</i>	Commercial/ Food	Carnivores
18	<i>Esomus danricus</i>	Commercial/ Food	Herbivores
19	<i>Hypophthalmichthys molitrix</i>	Commercial	Herbivores
20	<i>Labeo bata</i>	Commercial/ Food	Carnivores
21	<i>Labeo rohita</i>	Commercial/ Food	Herbivores
22	<i>Laubuca laubuca</i>	Commercial/ Food	Carnivores
23	<i>Paracanthocobitis botia</i>	Ornamental	Herbivores
24	<i>Pethia conchonus</i>	Ornamental	Omnivores
25	<i>Puntius chola</i>	Commercial/ Ornamental	Omnivores
26	<i>Puntius sarana</i>	Commercial/ Ornamental	Omnivores
27	<i>Puntius sophore</i>	Ornamental/ Food	Carnivores
28	<i>Raiamas bola</i>	Commercial	Carnivores
29	<i>Rasbora daniconius</i>	Ornamental	Carnivores
30	<i>Salmostoma bacaila</i>	Commercial/ Food	Herbivores
31	<i>Glossogobius giuris</i>	Ornamental/ Food	Carnivores
32	<i>Chanda nama</i>	Commercial/ Ornamental	Carnivores
33	<i>Wallago attu</i>	Commercial/ Food	Carnivores
34	<i>Mystus tengara</i>	Commercial/ Food	Carnivores
35	<i>Mystus vittatus</i>	Commercial/ Ornamental/ Food	Omnivores
36	<i>Clarias batrachus</i>	Commercial/ Ornamental/ Food	Omnivores
37	<i>Clupisoma garua</i>	Commercial	Carnivores
38	<i>Ompok pabda</i>	Commercial/ Food	Carnivores

39	<i>Ompok pabo</i>	Commercial/ Food	Carnivores
40	<i>Macrognathus aral</i>	Commercial/ Food	Omnivores
41	<i>Mastacembelus armatus</i>	Commercial/ Ornamental	Carnivores
42	<i>Tetraodon cutcutia</i>	Commercial/ Food	Omnivores
27	<i>Puntius sophore</i>	Ornamental/ Food	Carnivores

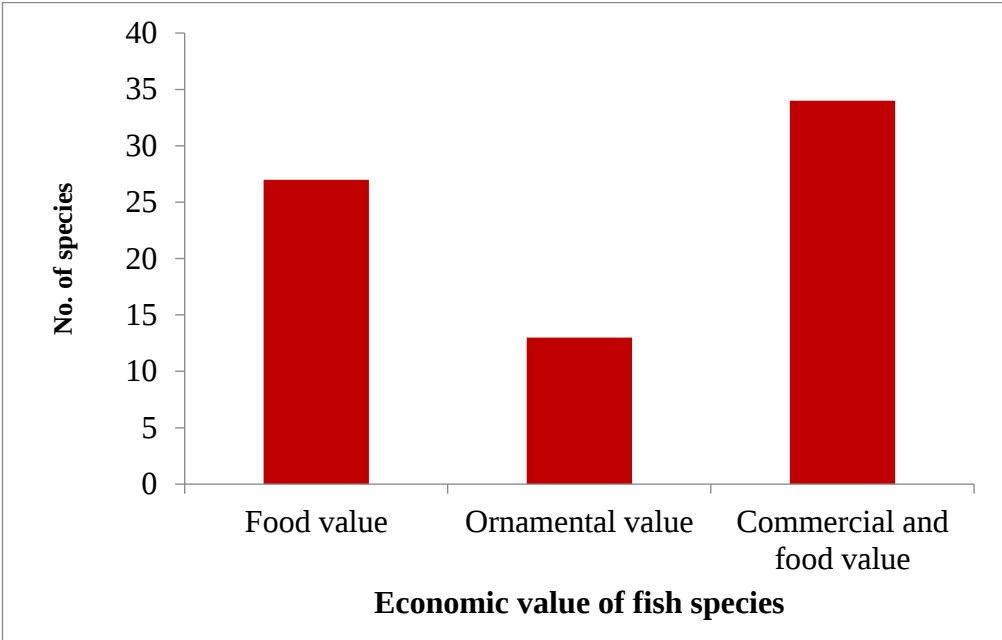


Figure 4: Economic value of recorded fish species.

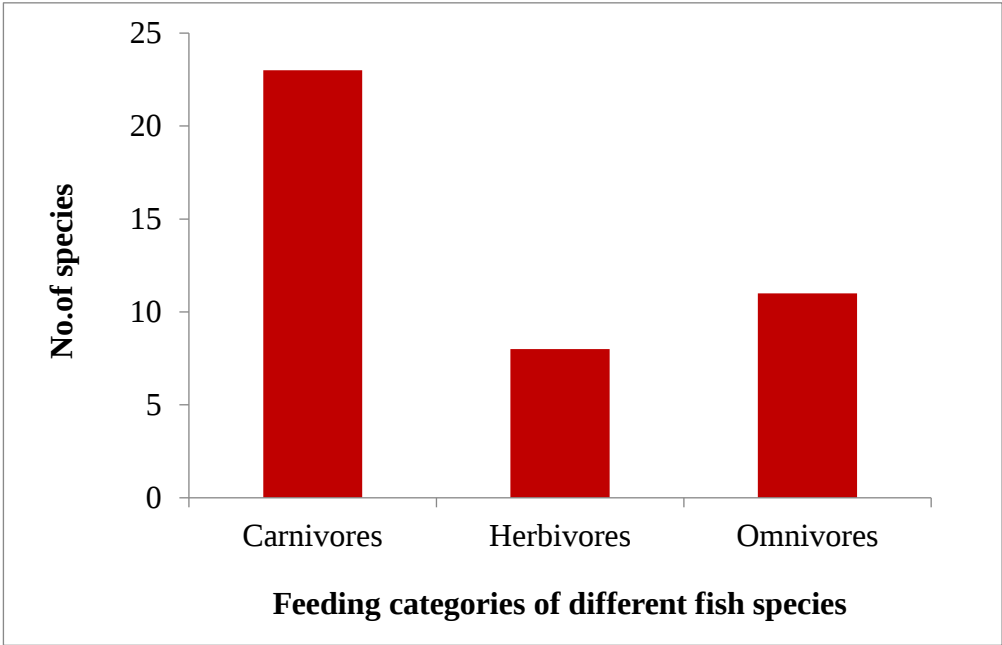


Figure 5: Feeding habits of recorded fish species.

Fishing gear

Fishing gear refers to the tools and equipment used by anglers to catch fish. The name of fishing gear, major target species and months of operation of various fishing gears used in Gainadi River are shown in table 3. Different types of fishing gears found in this area are classified into several groups and their mode of

operation is described below.

Table 3: Different types of fishing gear used in Gainadi River

Category	Method/ Name of gear	Major target species	Methods of Operation of fishing gear
Fishing without gear	Hand picking Meteka tana	<i>Barilius sp.</i> , <i>Salmostoma bacaila</i> , <i>Paracanthocobitis botia</i> , <i>Channa sp.</i>	Winter
Hooks and Lines	Sipbarashi Ponga barashi	<i>Mystus sp. and Clarias sp.</i> <i>Channa sp.</i> , <i>Catla sp.</i>	Pre-monsoon
Castnets	Khewali jaal	<i>Puntius sp.</i> , <i>Esomus danricus</i> , <i>Glossogobius giuris</i> , <i>Devario sp.</i>	All seasons
Gill nets	Phansi jaal Langi jaal	<i>Clarias sp.</i> , <i>Puntius sp.</i> , <i>Catla sp.</i> <i>Puntius sp.</i> , <i>Labeo bata</i>	Pre-monsoon And winter
Lift nets	Dheki jaal Tongi jaal	Major carps <i>Puntius sp.</i> , <i>Esomus danricus</i> , <i>Channa</i> <i>sp.</i> , <i>Catla sp.</i> , <i>Clarias sp.</i> ,	Pre-monsoon and winter
Traps	Chepa Paori Kholoha Juluki Jakoi Polo Khaloi Chalonee	<i>Puntius sp.</i> , <i>Paracanthocobitis botia</i> <i>Wallago sp.</i> , <i>Mystus sp.</i> <i>Mystus</i> <i>sp.</i> , <i>Channa punctatus</i> , <i>Labeo bata</i> , <i>Channa sp.</i> , <i>Cirrhinus reba</i> , <i>Hypophthalmichthys molitrix</i> , <i>Ompok</i> <i>sp.</i> , <i>Hypophthalmichthys molitrix</i> , <i>Wallago sp.</i> , <i>Ompok sp.</i> <i>Puntius sp.</i> , <i>Esomus danricus</i>	Pre-monsoon

1. Fishing without gear: This is the simplest method of catching fishes.

- a. Handpicking:** Hand picking, is a fishing method that involves catching fish or other aquatic organisms by hand, without the use of fishing gear such as nets, lines or traps. It is one of the oldest and simplest forms of fishing, often practiced in shallow waters where fish are easily visible and accessible. Fishes like *Barilius bendelisis*, *Salmostoma Bacaila* and *Acanthocobitis botia* that come out in the shallow channels of river and thus get caught easily.
- b. Meteka tana:** A primitive technique for fishing locally known as meteka tana, which does not using actual fishing apparatus. Air breathing fishes such as *Channa sp.*, *Clarias batrachus*, and *Mastacembelidae sp.*, take shelter within the roots of meteka. Fish are removed from the roots of the plants after they have been very carefully plucked by hand and brought onshore.

2. **Hooks and Lines:** Hooks and lines are fundamental tools for fishing, allowing anglers to catch fish by enticing them to bite onto bait or lures attached to a hook. Line and hooks are a variety of sizes and shapes. The fisherman holds the opposite end of a rope that is linked to a rod at the front end and hangs the hook. These are various types-
 - a. **Sip barashi:** It is around five to seven metres long and made of bamboo. An earthworm or grasshopper is used as bait for any long rope that has a hook tied at the end of the bamboo stem. Fish such as the *Mystus* and *Clarias* species are caught with this kind of hook.
 - b. **Ponga barashi:** Instead of bamboo, this kind of hook has a ponga which is between one and two metres long. A nylon rope is wrapped in the middle of the ponga, and a hook is fastened to it so that it may float freely at a right angle to the ponga. Generally, ponga barashi assistance is needed to capture *Channa* sp., *Catla* sp.
3. **Cast nets:** Cast nets are a traditional method of fishing that involves throwing a net into the water to catch fish. A cast net is a versatile fishing tool used for catching small baitfish and other aquatic species. It consists of a circular net with small weights around its perimeter and a central handgrip or rope attached to the center.
 - a. **Khewali jaal:** It's a conical cast net with a mesh size of 7–15 mm, approximately 4 – 6 m in length. It's the most popular kind of net. The inner border of the pocket opening is surrounded by a chain of drum-shaped sinkers, to which a rope is fastened at the cone's peak.
4. **Gillnets:** Gillnet is a type of fishing net. A gill net is typically made of nylon or other synthetic materials. Gill nets are usually set in the water in a stationary position.
 - a. **Phansi jaal:** Pansi jaal is a popular gill net. It is smaller than a langi jaal. It has a rectangular form with ropes for the head and feet. Phansi jaal is made from lightweight fabrics like cotton hemp or nylon.
 - b. **Langi jaal-** It is a rectangular gill net with head and foot edges. Its width ranges from 0.5 to 1.5 metres, and its length varies from 10 to 100 metres. It may be knotted against the river and let to drift over night. Fish entangle themselves in nets due to their operculum. There are several types of langi jaal such as puthi langi, goroi langi, kawoi langi etc.
5. **Lift nets-** Lift nets generally consist of a netting material stretched over a frame, which can be rectangular, square, or even circular. The net is lowered into the water and left for a period of time, allowing fish to swim above it. After a suitable period, the net is quickly lifted out of the water, trapping any fish above it.
 - a. **Dheki jaal:** It's a fixed kind of net, composed of either nylon or cotton, with a triangular form. A "V" shaped lever is created by tying two long bamboo poles together. The net is around twenty to twenty-five feet long, loosely bound at the top. It features a broader hole that serves as the mouth and a conical posterior end that serves as the area where fish are collected. In sluggish, moderate lotic water, the net is used. It is suspended on a stiff frame in a way that allows a pulley system to submerge it. The operator applies additional weight to the base of the triangle corner in order to raise the net.
 - b. **Tongi jaal:** The net is typically rectangular or square in shape, made of nylon or other durable materials. The net is attached to a frame that is often made of bamboo or wooden poles. These frames can be quite large. Tongi jaals are operated by hand or with the help of simple mechanical devices. The net is lowered

into the water and then lifted to capture fish.

6. **Traps:** Traps are a type of fishing gear designed to capture aquatic animals, such as fish. These devices rely on the natural behavior of the target species, often using bait to attract them. Traps can be made from various materials, including wire, wood, plastic, and come in numerous shapes and sizes tailored to specific species and environments.
 - a. **Chepa:** The chepa is constructed from pre-cut bamboo rods of the appropriate length; the two tapering ends are sewn with plastic rope or coir. The trap is constructed from bamboo splits and has one to four trap doors near the base; the fish is freed from the trap by untying one of the ends. The majority of the catch is small fish, mostly *Puntius* and *Mystus species*.
 - b. **Paori:** It's one of the most common traps in Assam. It tapers towards the other end and becomes larger and more circular near the base. Fish can enter through the trap door on the concave base. Three types have been identified based on mouth opening and harvesting techniques. During the monsoon, the trap is used in rivers and beels. The catch is a variety of species that is gathered either daily or once a week.
 - c. **Kholoha:** Kholoha is typically made from locally available materials such as bamboo, cane, or reeds. They are usually cylindrical or conical in shape. The traps have one or more narrow openings through which fish can enter but find it difficult to exit.
 - d. **Jakoi:** The 'Jakoi' is a type of wicker work shovel used to collect little fish that hide in the waterbed when the weeds are trodden underfoot. It may be used on the water's surface or dragged along the bottom. The local term for bamboo slips, or "dai," is used to cook it. Bamboo known as "Jati" is specifically utilised for a certain tool.
 - e. **Polo:** It is composed of a bamboo frame with a triangular net within. Both the base and the apex of these devices are open. With the trap in hand, the fisherman carefully wades into the water and sets it in a likely spot. Fish caught within are removed by the fisherman by pressing down forcefully on the pot and sticking one hand through the top/apex aperture. Fish of a medium size are typically caught. Fish of large sizes, such as *Labeo* and *Channa maulius*, are captured.
 - f. **Juluki:** The instrument has a dome-like form and a short, roughly 6 inch-diameter stem that is open at the top. The height varies from 2 feet to 3 feet, while the diameter at the bottom varies from 2 feet to 3 1/2 feet and even up to 4 feet. Tiny bamboo strips are used in its preparation, which are secured with delicate, flexible cane slips. Shallow water fishing is done with polo. When using it, the guy holds it by the stem's side, presses the rim on the mud, pulls it back, raises it above the water, and then presses it once more while advancing through the water.
 - g. **Khaloi:** A spear is a long, pointed weapon used for striking or impaling targets. It generally consists of metal or wood and has a sharp tip at one end and a pointed or barbed head. There are several names for Spears in Assamese riverine areas.
 - h. **Chalonee:** This round, saucer-shaped sieve is constructed from bamboo matting. In water bodies infected with weeds, the gadget is placed beneath an area of floating water hyacinth. Fish that are

seeking cover beneath and inside the water hyacinths' roots are jostled on the sieve, which causes the fish to tumble through the root tufts onto the sieve.



(A) Handpicking



(B) Metakatana



(C) Sipbarashi



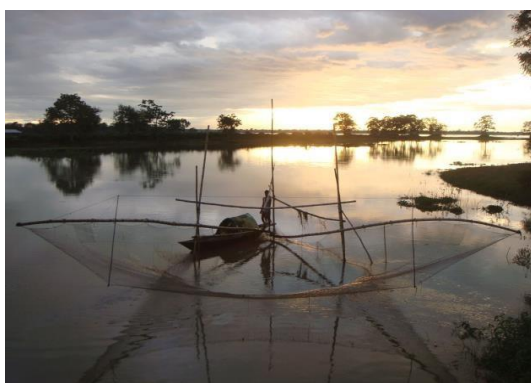
(D) Ponga barashi



(E) Khewali jaal



(F) Langi jaal



(G) Dhekijaal



(H) Tongijaal



(I) Chepa



(J) Paori



(K) Kholoha



(L) Polo



(M) Juluki



(N) Jakoi



(O) Khaloi



(P) Chalonnee

Discussion

In the present study, a total of 42 fish species belonging to 12 families and 9 orders were recorded from

the two sampling sites in Gainadi River in the present study. Cyprinidae family stands as the most dominant family in Gainadi River sampling locations. This result is in accordance with the findings of (Chakraborty *et. al.*, 2012; Deka and Dutta, 2013; Chetry and Deka, 2016; Bordoloi and Hazarika, 2015) who in their study showed the same trend of dominance in the cyprinidae family. However, previous study on fish diversity in the Gainadi River done by J. D. Mali and P. Chutia (2017) reported a total of 32 fish species belonging to 11 families and 5 orders from the same river, which is less in comparison to the present findings.

Moreover, the family Cyprinidae is dominant in northeast Indian rivers and wetlands in particular (Nath *et. al.*, 2015; Bagra *et. al.*, 2009; Bakalial *et. al.*, 2014; and Sudem, 2017), which is consistent with numerous other studies conducted in India (Singh and Agarwal, 2013; Basavaraja *et. al.*, 2014). This report is also in agreement with the studies conducted by Deori, Abujam and Biswas (2015), who reported cyprinidae as the most abundant family in Dihing River. Sarkar and Bain (2007) also found the maximum composition of Cyprinidae species in River Gomti, a tributary of River Ganga. Moreover, similar studies with cyprinidae dominance have also been reported by Mili. S. and Saikia. P. K. (2022) in the Nameri national park and its adjacent area, Assam.

Seasonal variations in the species composition and relative abundance of riverine fish communities can be attributed to ongoing changes in environmental conditions (Thiel *et. al.*, 1995). Fish that have been recorded and their conservation status are divided into three categories viz., LC= Least concern, VU= Vulnerable and NT= Near threatened of which 36 species are least concern, 3 species is recorded as vulnerable and 3 species is near threatened. The most important findings of this study is that few species viz; *Wallago attu*, *Botia rostrata*, *Cyprinus carpio* were recorded as vulnerable. On the other hand *Hypophthalmichthys molitrix*, *Clarias batrachus* and *Clupisoma garua* were recorded as near threatened.

Fish exhibit a wide variety of feeding habits, adapted to their diverse environments and nutritional needs. These habits can generally be categorized into several main types based on what they eat and how they obtain their food these are herbivorous, carnivorous and omnivorous. The most important findings of this study is that few species viz; *Labeo gonius*, *Amblypharyngodon mola*, *Catla catla*, *Esomus danricus*, *Hypophthalmichthys molitrix* etc. are mainly herbivorous and *Botia dario*, *Cabdio morar*, *Cirrhinus reba*, *Cyprinus carpio*, *Pethia conchoniensis*, *Puntius chola*, *Puntius sarana* ect. are mainly omnivorous and most of the fish species are recorded in the carnivore category in our study.

The main causes of fish population decline include anthropogenic pressure, siltation on wetlands beds, and soil erosion. Rapidly spreading water hyacinth weed slows down water currents which contribute to eutrophication. Gainadi River supports the habitat of variety of fish species with ornamental ones which is playing an important role for the livelihood for the local people. Out of the 42 species recorded, 36 species were found to be of commercial importance, 27 species have food value and 13 species are ornamental. During the survey, fisherman reported that for the past ten years, there has been a noticeable decrease in the amount of ornamental fish from these wetlands. The drop in fish output in the wetlands can be explained by the combined effect of multiple variables. The physical environment and inadequate management are the main causes of the

fish output drop in Assamese wetlands. The finding is in accordance with the study conducted by several researcher viz ; Baro *et. al.* (2014) who in their study listed 49 ornamental fish species from Sankosh River a tributary of the Brahmaputra River in Kokrajhar district. Moreover, Rahman *et. al.* (2014) has assesed 28 ornamental fish species from North Guwahati, Assam.

The fishermen of the state of Assam have created a vast array of customary fishing equipment and techniques for exploiting fisheries resources. Because the traditional fishermen create and construct the traps themselves, they have a distinct quality all their own. They take into account the area, position, and behaviour of the fish. The areas where water is shallow fishermen can easily pick the fish by hand. Hooks and lines are mainly used in pre-monsoon season. The shape and size of the hooks vary depending on their using purpose. The most commonly used fishing gear in Gainadi River is khewali Jaal (cast net). In addition to different nets such as phansi jaal, langi jaal (gillnets), dheki jaal and tongi jaal (lift nets) are also used by the fisherman in Gainadi River. Different fishing traps are especially favored by part- time fishermen. The majority of the traps are composed of bamboo strips. Catch composition vary considerably according to the construction of the gear, the habits of fishes and the time of year.

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