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Assessment of Fish Biodiversity in the Borogang River of Jaintapur Upazila in Sylhet District

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Abstract: The study conducted between July and December 2021, aimed to assess the fish biodiversity and the factors contributing to changes in the fish habitat of the Borogang River. Using a field survey method, which included the use of a structured questionnaire to gather data from three villages surrounding the Borogang River situated in the Jaintapur upazila of the Sylhet district, 43 fish species belonging to 16 different families were documented during the survey period. These species were categorized as follows: moderately available (44.19%), less available (27.91%), commonly available (18.60%) and rarely available (9.30%). Among the 16 families, the Cyprinidae family dominated, representing 30.23% of the total fish population with 13 recorded species. The second most prominent family was Bagridae, containing 6 fish species (13.95%). Additionally, 4 species from the Channidae family (9.30%), 3 species from Mastacembelidae (6.98%) and 2 species from each of the families Schilbeidae, Cobitidae, Siluridae, Clupeidae and Palaemonidae (4.65%) were recorded. Furthermore, one species from each of the families Gobiidae, Osphronemidae, Anabantidae, Nandidae, Heteropneustidae, Clariidae and Belonidae was found (2.36%). Out of the 64 threatened freshwater fish species in Bangladesh (as per IUCN, 2015), 9 were identified and recorded as threatened in the survey. Of these, 4 were classified as vulnerable (VU) and 5 were labeled as endangered (EN) within the study area. The study also revealed the various fishing methods used in the Borogang River, which included bair, bana, current jal, behundi jal, ber jal, thela jal, khepla jal, borshi and moshari jal. It was found that excessive and irresponsible fishing (88.8% of respondents) was the primary cause of biodiversity degradation, followed by practices such as fishing during the breeding season (81.1%), the use of illegal fishing gear (78.8%), katha fishing and beel water blockage (77.7%) and the involvement of a large number of people in fishing and fish-based livelihoods (77.7%). Other contributing factors to habitat changes included environmental and water pollution (75.5%), drought (72.2%), hindrance to the natural movement of fishes (68.8%), destruction of fish sanctuaries (66.6%), navigation (60%), flash floods (58.8%), the use of insecticides, pesticides and excessive chemical fertilizer in agriculture (53.3%), as well as the presence of plastics and bottles (42.2%). Additionally, filling up the connection between the river and beel (34.4%) and the leasing system of jalmohol (21.1%) were identified as influencing fish biodiversity. This information offers valuable insights into the effective management of fish diversity in the Borogang River.

Key words: Borogang River · Fish Biodiversity · Fishing Methods · Factors Contributing Habitat Changes

INTRODUCTION

Fish constitutes the primary source of protein in the Bangladeshi diet, contributing about 60% of total animal protein and per capita, fish consumption in the country reaches 62.58 gm, which exceeds their daily protein demand of 60 gm, according to the report of the Bangladesh Bureau of Statistics in 2017 [1]. As an agro-based country, the fisheries sector's contribution to the national economy has always been essential, serving as

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the primary source of animal protein, employment opportunities, food security, foreign earnings and socio-economic development [2]. Additionally, it contributes 3.61% to Bangladesh's national GDP and approximately 24.41% to the agricultural GDP, as reported by the Department of Fisheries in 2017 [3]. Over the last decade, the sector has exhibited an average growth performance of almost 5.43%. Notably, in 2018, Bangladesh achieved the 3rd global rank in inland fish production, the 5th in aquaculture production and the 11th in marine fish production, as per the Food and Agriculture Organization's report [4]. Consequently, Bangladesh has attained self-sufficiency in fish production and has garnered international recognition as one of the world's leading fish producers among countries [2]. Though in recent years, fish has faced increasing threats due to environmental pollution [5-14], it remains a crucial component of the Bangladeshi diet and plays a significant role in the country's economy.

The Borogang River, known for its abundant biodiversity, supports high fish production, emphasizing fish's significance in the diet and farming system. Aquatic biodiversity, including fish, has both economic and ecological value, playing a crucial role in environmental health and balance. However, despite abundant aquatic resources, Bangladesh faces challenges such as declining fish stocks due to habitat loss and overfishing, highlighting the need for conservation efforts. The preservation of fish and aquatic biodiversity is not just a local concern but also global imperative for a sustainable ecosystem. The river, situated in the northeastern region of Bangladesh, is of utmost importance for fish productivity and the livelihoods of local fishermen. This river serves as a critical habitat for various fish species, playing a vital role in their reproduction and feeding. The diverse fish fauna in the river contributes significantly to the production of animal protein and plays a substantial part in the nation's economy. However, human interference in river ecosystems has caused habitat destruction and the degradation of aquatic ecological systems. This disruption, compounded by natural factors, has led to a decline in fish biodiversity in rivers throughout Bangladesh, including the Borogang River. The loss of fish biodiversity is a concerning issue for both the fisheries sector in Bangladesh and the global community. To address this problem and preserve the river's natural biodiversity, it is essential to have a comprehensive understanding of the actual fish species present in the Borogang River. This knowledge will help inform conservation efforts and support the sustainability of this vital waterway.

The Borogang River plays a crucial role in Bangladesh's fisheries sector, making it the focal point of this study. With this in mind, the study aims to achieve two primary objectives: firstly, to assess the current state of fish diversity in the Borogang River and secondly, to identify the fishing equipment and methods used in this significant river system. These goals are essential for a comprehensive understanding of the river's ecological health and the sustainability of the fisheries industry it supports.

MATERIALS AND METHODS

Selection and Description of Study Areas: The selection of the study site was a crucial initial step in conducting this research. Data collection took place in various key locations, including fishing sites, fish markets and landing areas situated in Baurbhag Bazar, Jaintapur Bazar and Lakhsmi Prasad, all located around the Borogang River in the Jaintapur upazila within the Sylhet district. This river, which is one of the prominent water bodies in the northeastern region of Bangladesh, originates from the Shari-Guwain River and connects to the Noyagang River through its water flow. It spans approximately 8 kilometers in length and has a width of 66 meters.

Study Period: The study spanned six months, commencing in July 2021 and concluding in December 2021. Over these six months, the research involved regular field visits, conducted twice a month, to collect the necessary data for the study.

Scheme of Methodology: The current study was begun and finished in the following sequence of methodology:

Target Groups Identification: In the process of this study, the identification of target groups was of paramount importance. The identified target group encompassed a substantial number of individuals engaged in various aspects of the fisheries sector. This included anglers, stockists, fish marketers and local leaders who possessed significant knowledge about the fish diversity in the Borogang River. To collect valuable insights, total of 50 anglers, 30 fish sellers, 11

Table 1: Geographical location of the sampling sites.

Spots	Site name	Latitude (N)	Longitude (E)
Spot-1	Baurbhag Bazar	25°13’16’’	92°10’09’’
Spot-2	Jaintapur Bazar	25°13’53’’	92°12’59’’
Spot-3	Lakhsmi Prasad	25°12’76’’	92°13’02’’

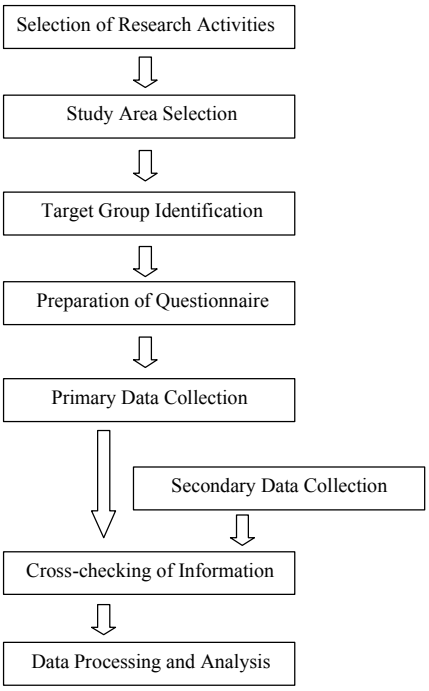

Fig. 1: Scheme presenting a quick overview of research activity.

intermediaries (aratdars) and 4 local leaders were selected through a random sampling method. These participants were drawn from three villages located in the proximity of the Borogang River in the Sylhet area and were engaged in fishing activities, fish marketing and leadership roles. They were actively involved in the questionnaire interviews, contributing their valuable perspectives to the research.

Preparation of Questionnaire: A critical component of the survey method was the development and utilization of questionnaires. In order to effectively meet the study's objectives, an initial draft of the questionnaire was created and subsequently subjected to a pre-testing phase within the study areas. The pre-test focused on using the draft interview form to capture any novel information that might not have been initially included in the questionnaire. Following the pre-test, the questionnaire underwent a process of adjustment, amendment and reorganization, incorporating insights gained from the pre-testing phase. The final questionnaires were designed in a logical and coherent manner, ensuring that anglers could respond effectively. The questionnaire was thoughtfully crafted to encompass various key aspects, including the assessment of current fish biodiversity in comparison to historical data, identification of the most prevalent fish species, inquiry about the types of fishing equipment in use, examination of fish availability based on seasonal variations and exploration of the factors contributing to changes in the fish habitat, among other relevant inquiries.

Collection of Data: In the data collection process, three sample stations were strategically chosen, primarily focusing on areas known as fish congregation and fish landing zones. The study drew from a combination of primary and secondary sources to ensure comprehensive data gathering. Several Participatory Rural Appraisal (PRA) techniques were employed during the study, including questionnaire interviews (QI), focus group discussions (FGD) and cross-checking interviews with key informants. Through questionnaire interviews and focus group discussions, primary data was collected from anglers and fish traders, capturing firsthand insights. In addition to primary data, secondary data sources played a significant role. These secondary sources included books, journals, online resources, thesis papers and inputs from key informants, such as the Upazila Fisheries Officer of Jaintapur. This multi-faceted approach to data collection ensured a robust and well-rounded dataset for the study.

Fig. 2: Data collection through interviews.

Cross Checking of Information with Key Informants: Ensuring the accuracy and validity of the data is a fundamental step in the research process. To verify the information collected through questionnaire interviews (QI) and focus group discussions (FGD), a rigorous validation process was undertaken. Key resource individuals, including the Upazila Fisheries Officers (UFO), District Fisheries Officers (DFO) and local authorities, were actively engaged during cross-checking interviews. These cross-checking interviews were conducted within the official settings during office hours. Additionally, Key Informant Interviews (KII) were carried out with respondents in their respective offices. This meticulous verification process was crucial in confirming the authenticity and reliability of the data collected, ensuring the integrity of the research findings.

Statistical Analysis: Data collection in the research area was carried out systematically, with the collected data being organized and recorded in a computer for analysis. The gathered information, primarily from the questionnaire, formed the basis for the analysis. The data underwent a thorough verification process to identify and rectify any errors or inconsistencies. Various tabular techniques and statistical tools, such as averages and percentages, were applied to manage the data effectively. Subsequently, data analysis was conducted using Microsoft Office Excel 2010 to assess the current status of fish biodiversity in the Borogang River. The research findings were presented in the thesis through the use of tables, pie charts and graphical figures to visually represent the analyzed data. This visual representation enhanced the clarity and accessibility of the research outcomes.

RESULTS

The Borogang River, located in the northeastern region of Bangladesh, is a vital waterway renowned for its diverse fish population. Notably, some of the fish species in this river have been classified as threatened by the IUCN. The river's contribution to fish output plays a pivotal role in the country's overall economy, underscoring the significance of river habitats in preserving the diversity of fish species. This rich ecosystem is home to a wide array of fish species, encompassing catfishes, carps, minnows, barbs, eels, clupeids, snakeheads, perches and more. The study conducted on the aquatic fish biodiversity of the Borogang River provides valuable insights into this unique ecosystem, shedding light on the state of fish diversity in this important waterway.

Fishing Practices

Fishes: The Borogang River is a lifeline for the local community, serving as a crucial source of sustenance and livelihood. Inhabitants employ diverse fishing techniques to meet their needs, with approximately 85% of nearby households relying on the river as their primary food source. Discussions revealed that a majority of the river's anglers, nearly 87%, are men, while women constitute 13% of the fishing community. These anglers can be categorized into three groups: professional fishers (comprising about 75% of the total), who rely on fishing for their livelihood year-round; seasonal fishers (approximately 30%), who engage in fishing periodically for income; and subsistence fishers (forming only 5%), whom primarily fish to secure their own sustenance.

Fishing Seasons: Fishing seasons are vital in determining when fish can be legally caught from water bodies and they significantly influence fishing success. These seasons vary based on geographical location, weather, lunar cycles, fish behavior and food availability in water bodies. There are typically four distinct fishing seasons, including the mild pre-monsoon season from April to June, the monsoon season in July, August and September with high water levels, the moderately busy post-monsoon season from October to December and the dry season in January to March marked by very low water levels. In some regions, fishing is categorized into just two primary seasons: the peak season from July to September with high catches and the lean season from January to March when fish availability is at its lowest, posing challenges for anglers.

Status of Fish Biodiversity in the Study Site: The Borogang River, with its connections to other water bodies and tributaries flowing into the Surma River, boasts a rich aquatic ecosystem, particularly in terms of fish diversity. By contributing to fish production, the Borogang River's ecosystems play a vital role in providing the nation with animal protein and bolstering its economic well-being. Moreover, these ecosystems are crucial for the preservation of fish biodiversity. In line with the IUCN Red List, the identified fish species were categorized based on their threatened status, including vulnerable (VU), endangered (EN), critically endangered (CR), near threatened (NT) and least concern (LC). Furthermore, the fishes were classified and scored based on their availability, falling into categories such as commonly available (CA), moderately available (MA), less frequently available (LA) and rarely available (RA) as per interviews and observations during the study. The comprehensive study revealed the presence of 43 fish species across 16

Table 2: The presence of several fish species and their IUCN (2015) status in the study region.

Family	Local Name and Scientific Name	Present Status	IUCN Status
Cyprinidae	Kalira, kalibaus (*Labeo calbasu*)	MA	LC
	Tit punti (*Puntius ticto*)	RA	VU
	Sarputi (*Puntius sarana*)	LA	NT
	Dhela,gilachaki (*Osteobrama cotio*)	RA	NT
	Mola (*Amblypharyngodon mola*)	LA	LC
	Jat punti (*Puntius sophpre*)	MA	LC
	Lachu (*Cirrhinus reba*)	CA	NT
	Gonia (*Labeo gonius*)	CA	NT
	Carpu, carpio (*Cyprinus carpio)*	LA	LC
	Rui (*Labeo rohita*)	LA	LC
	Catla (*Catla catla*)	LA	LC
	Darki, darkina (*Esomus danricus*)	LA	LC
Schilbeidae	Bacha (*Eutropiichthys vacha*)	MA	LC
	Batasi (*Neotropius atherinoide*)	MA	LC
Palaemonidae	Golda (*Macrobrachium rosenbergii*)	MA	LC
	Gura icha (*Macrobrachium lamarrei*)	CA	LC
Cobitidae	Bou, rani (*Botia Dario*)	CA	EN
	Gutom (*Lepidocephalus guntea*)	MA	LC
Clupeidae	Ilish (*Tenualosa Ilisha*)	RA	LC
	Chapila (*Gudusia chapra*)	MA	VU
Clariidae	Magur (*Clarias batrachus*)	LA	LC
Belonidae	Kakila, kaika (*Xenentodon cancila*)	MA	LC
Nandidae	Meni, bheda (*Nandus nandus*)	MA	NT
Heteropneustidae	Shing (*Heteropneustes fossilis*)	LA	LC
Gobiidae	Bele, bailla (*Glossogobius giuris*)	MA	LC

*CA = commonly available, MA = moderately available, LA = less available, RA = rarely available *CR = critically endangered, EN = endangered, VU = vulnerable, NT = near threatened and LC = least concern

families in the study area. Of these, 8 species were classified as commonly available, 18 as moderately available, 12 as less available and 5 as rarely available. Detailed information about each identified fish, including their family, local name, English name, scientific name, IUCN status and current status, is presented in Table 2 below.

The study's findings reveal that among the 16 families, the Cyprinidae family stands out as the most dominant, with a remarkable 13 fish species belonging to this family, constituting 30.23% of the total fish species identified. Following closely is the Bagridae family, with six fish species, making up 13.95% of the total. The Channidae family, consisting of four species, accounts for 9.30%, while the Mastacembelidae family, with three species, contributes 6.98% to the total fish diversity. Additionally, the families Schilbeidae, Cobitidae, Siluridae, Clupeidae and Palaemonidae each include two species, collectively representing 4.65% of the total fish population. Finally, the families Anabantidae, Gobiidae, Nandidae, Heteropneustidae, Osphronemidae, Belonidae and Clariidae each have one species, making up 2.36% of the total fish species identified.

The study classifies fish species into four distinct categories based on their availability, with the following percentage breakdown: moderately available species account for 41.86% of the total fish species observed, less available species make up 27.91%, commonly available species comprise 18.60% and rarely available species contribute 11.63% (Fig. 3).

Biodiversity of Threatened Fish Species in the Study Area: Among the 43 recorded fish species, the study identified 25 species as "least concern" (LC), 9 as "near threatened" (NT), 4 as "vulnerable" (VU) and 5 as "endangered" (EN), following the IUCN classification [28]. The four species labeled as "vulnerable" in the study are Tit Punti (*Puntius ticto*) from the Cyprinidae family, Ayre (*Sperata aor*) from the Bagridae family, Boal (*Wallago attu*) from the Siluridae family and Chapila (*Gudusia chapra*) from the Clupeidae family. In the current study, five species of fish were identified as "endangered" (EN), including Rita (*Rita rita*) from the Bagridae family, Boali Pabda or Kani Pabda (*Ompok bimaculatus*) from the Siluridae family, Gozar (*Channa marulius*) from the Channidae family, Boro

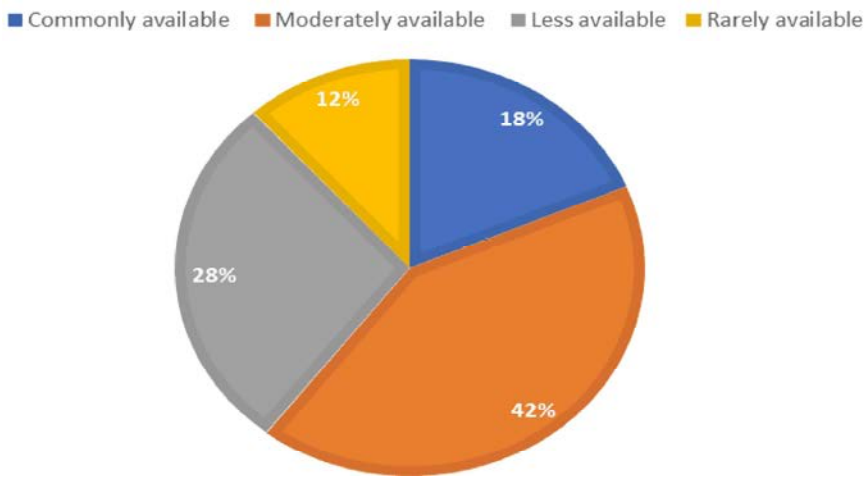

Fig. 3: Percentage of fish species from the research area with records of their availability.

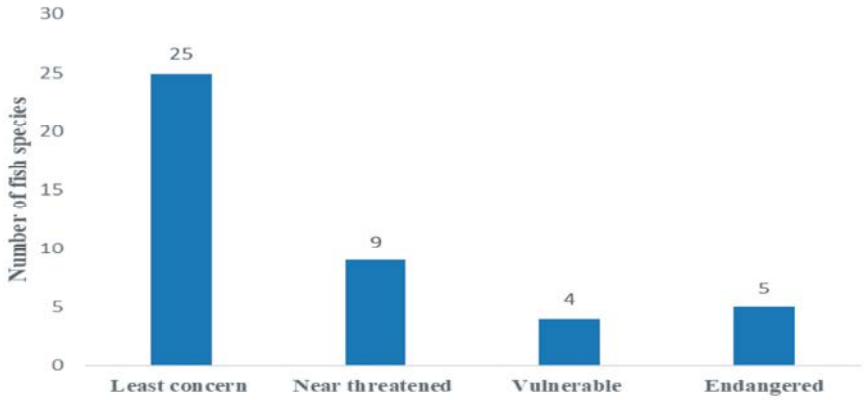

Fig. 4: Number of fish species in accordance with IUCN (2015) status.

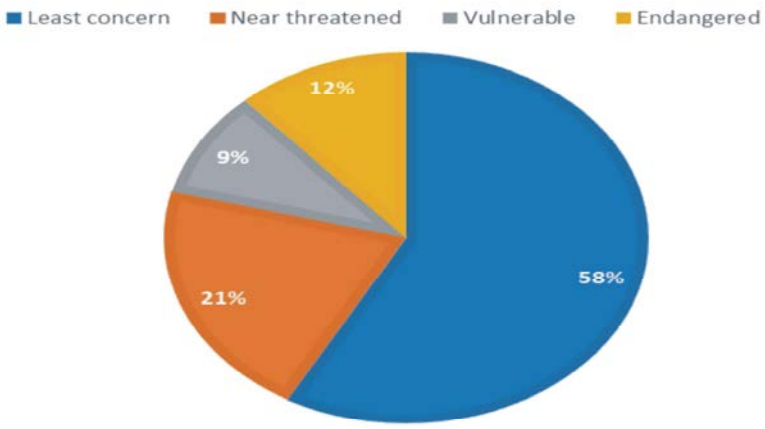

Fig. 5: IUCN status percentage of available fish species.

Baim or Shal Baim (*Mastacembelus armatus*) from the Mastacembelidae family and Rani Fish or Bou Fish (*Boia dario*) from the Cobitidae family. When considering the distribution of these fish species within the five IUCN categories, "least concern" (LC) species constitute the majority at 58.14%, followed by "near threatened" (NT) at 20.93%, "vulnerable" (VU) at 9.30% and "endangered" (EN) at 11.63% (Fig. 4 & 5).

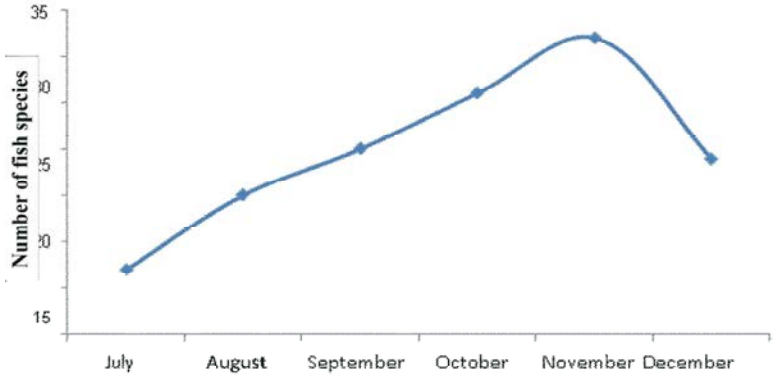

Fig. 6: Monthly variation of number of fish species found.

Table 3: Categories of fishing gears used in the Borogang River.

	Name of Gears		
Group Name	Local Name	English Name	Description of The Gears
Traps	Bair/borong	Fish trap	Made from cane materials & split bamboo. Like a tubular-shaped basket. Deploy against water current.
	Bana	Fish barrier	Bamboo-made fishing gear. Water can easily enter through it but fish cannot. pass through.
Nets	Behundi *jal*	Set bag net	A bag net has a long vertical wall of netting, often a few hundred meters in length, that runs perpendicular to the shore to disrupt their natural swim away from the shore and into a series of traps.
	Ber *jal*	Siene net	There are two borders to a rectangle. The lower borderline has sinkers, whereas the upper borderline has float. It can happen if 250m.
	Current *jal*	Gill net	Net-like bag. Four diagonal H poles are fastened at their corners. Lift poles have ties in the middle that make them act like livers.
	Thela *jal*	Push net	Rectangular single-wall net. The sinker may or may not attach in lower border, while the upper border contains float. Mesh sizes range from 2.5 cm to 10.0 cm and for larger fish, even 20.0 cm. Fixed or freely movable (drifting).
	Khepla *jal*	Throwing net	Typically composed of fabrics and iron is used to make weight.
	Moshari *jal*	Siene net	Small mesh-sized net. It collects fish. from fry to egg level.
Hooks and lines	Borshi	Angling gear	Either brass or iron is used. Fish are caught by luring them with real or synthetic bait on a single, double, or triple hook.

Fish Availability Variation on a Monthly Basis: During the study period, the highest number of fish species was identified in November, with a total of 32 species. This was followed by August (15 species), September (20 species), October (26 species) and December (19 species). In contrast, the lowest number of fish species (7) was identified in July. Notably, from September to November, there was an abundance of fish species captured in the research areas (Figure 6).

Seasonal variations were observed during the study period. According to respondent anglers, because of both natural and artificial factors, the fish availability has been decreased.

Fishing Gears Used in the Study Area: The study area featured a diverse range of fishing equipment, including both conventional and locally specific gear. The study identified 9 distinct types of fishing equipment used by fishermen in the Borogang River, categorized into three groups: traps, nets and hooks and lines.

Reasons for Declining in Fish Biodiversity: Based on data obtained through a questionnaire survey and information collected from 50 anglers, 30 fish traders, 11 fish stockers and 4 local leaders in the vicinity of the Borogang River, several factors were identified as the main contributors to the decline in fish biodiversity and overall fish abundance.

Table 4: Reasons for Biodiversity Declining of Fish

SL No.	Reason	Percentage of Respondents
1	Overfishing and irresponsible fishing because of ignorance.	88.8%
2	Fishing brood fish and fry during the breeding season	81.1%
3	Using unauthorized fishing equipment (eg. current *jal*, moshari *jal* etc.).	78.8%
4	Siltation because of *katha* fishing method and *beel* water blockage	77.7%
5	Fishing and fish-based livelihoods are practiced by a large number of individuals	77.7%
6	Environmental and water pollution.	75.5%
7	Drought in summer due to climate change.	72.2%
8	Obstruction of fish movement and construction of barriers	68.8%
9	Destruction of fish sanctuaries due to improper management	66.6%
10	Physical damage and oil pollution by navigation.	60%
11	Flash floods as a sudden natural calamity.	58.8%
12	Use of insecticides, pesticides and overdoses of chemical fertilizer in agriculture	53.3%
13	Plastics and bottles	42.2%
14	Filling up the connection between river and *beel*	34.4%
15	Leasing system of *jalmohol*	21.1%

DISCUSSION

The Borogang River is one of the important rivers in the North-Eastern region of Bangladesh. There is no existing information on the assessment of fish diversity in this river. The current study recorded overall 43 fish species under 16 families from the study region, which is fewer than Rahman *et al*. (2015) study, which found a total of 56 fish species from the Talma River in the northern portion of Bangladesh, belonging to 21 families [15]. The Bangshi River in Savar, Bangladesh, is home to 48 species of fish from 18 different families, according to research by Kamrujjaman and Nabi [16]. A total of 53 species of fish were identified by Ali *et al*. (2014) in Bangladesh's South-Western region's Chitra River. 53 fish species from 28 families were identified and reported by Mohsin *et al.* [17] at the Andharmanik River in Patuakhali district of Bangladesh. A total of 63 fish species were identified by Galib *et al*. [18] in the Choto Jamuna River in the Naogaon area. Islam *et al.* [19] identified 61 species of fish in Bangladesh's south-western Sibsa River. The biological diversity of the Borogang River is lower than that stated. At the Passur River in Bangladesh, Gain *et al*. [20] found a total of 95 finfish species, contributing to 45 families. In the river Padma, Joadder *et al.* [21] found and documented 71 fish species from 26 families that are comparable to the current study. In the current study, Cyprinidae was identified as a leading family consisting of 13 species of fish among the total recorded species (Table 1). With a different number of species, similar Cyprinidae family findings were also reported for several additional Bangladeshi rivers. Joadder *et al.* [21] identified Cyprinidae as the major fish family at the Padma River, with 23 species present. With 15 species, the Cyprinidae family was found by Galib [22] to be prevalent at the Brahmaputra River. At the Jamuna River in Bangladesh, Islam *et al*. [23] to be the family that contributed the most and had the most species (10) there identified Cyprinidae. According to Chaki *et al.* [24], the Cyprinidae family, which includes 18 fish species, is the most prevalent fish family in Bangladesh's Atrai River. The Cyprinidae family, which includes 22 species of fish, is the most prevalent fish family in the Padma River in the Rajshahi region of Bangladesh [14]. Because of the geographical variances in the rivers, the prevalent Cyprinidae family fish species varied in numerous rivers in Bangladesh. According to the analysis of the current fish biodiversity study, a sum of 8 fish varieties was found to be readily available, 18 fish species to be moderately accessible, 12 species of fish to be less available and 5 fish species were found to be rarely available in the study area. Moderately available fish species comprised 41.86% of all fish species observed, next by less available fish species at 27.91%, commonly available fish species at 18.60% and rarely accessible fish species at 11.63%. In the Bangshi River situated in Savar of Bangladesh, Kamrujjaman and Nabi [25] observed that 16 species were common comprising (33.33%) while 29 species were found to be regionally rare comprising (40.42%) of the total. Only 3 species (6.25%) were found to be extremely common. From the wetlands of Bangladesh's Sylhet districts, Islam *et al.* [26] recorded species availability status and determined that there were 24 commonly, 16 moderately and 18 rarely species of fish available. At the Payra River in Bangladesh, Islam *et al*. [19] identified species of fish as being readily available (43.86%), less readily available (29.82%), rare fish species (18.42%) and very rare fish species (7.89%). In the Bangladeshi Passur River, Gain *et al*. [20] found that most

of the fish (50%) were readily available, next by less readily available (26%), rarely available (16%) as well as extremely rare available fish species (8%). Because of the distinct geographical position of that water body and the different availability of fish throughout the study period, the number and percentage of accessible fish species identified in the current study are similar to or somewhat different from those found in the studies mentioned above. Among the eight commonly found fish species, boro baim was found to be the most plentiful in the conducted study on fish biodiversity. Rani, gonia, gura chingri, boal, lachu and taki were the next most prevalent species, followed by gulsha which was in second place in order of abundance. Numerous studies on tiny rivers came to similar conclusions. The two most prevalent species were found in Bangshi River of Bangladesh by Kamrujjaman and Nabi [16] kalo bujuri (*Mystus tengra*) and jat puti (*Puntius sophore*). In Halti beel of Bangladesh, according to research by Imteazzaman and Galib [18], Jat puti (*Puntius sophore*) is the most prevalent species of fish. Hossain *et al*. [27] recorded Jat puti (*Puntius sophore*), tit puti (*Puntius ticto*) followed by chanda (*Chanda nama* and *Parambassis ranga*), chapila (*Gudusia chapra*) and tengra (*Mystus vittatus*) as the most abundant fish species in the Chalan beel of Bangladesh.

In the present study, Nine (9) fish species, or 20.93% of the total number of species found in the study, were identified as being near threatened fish species. According to the IUCN (2015) status of threatened fishes of Bangladesh, 4 fish species (9.30%) of them were classified as vulnerable (VU) and 5 fish species (11.63%) as endangered (EN) [28]. Twenty-eight (28) fish species were identified as threatened at the river Padma by IUCN Bangladesh and were categorized as vulnerable (13%), endangered (18%) and critically endangered (8%), according to Joadder *et al.* [29]. In the Bangshi River of Bangladesh, Kamrujjaman and Nabi [16] found 52.08% threatened fish species with vulnerable 20%, endangered 36% and critically endangered 44% fish species. Rahman *et al.* [15] documented that 32.14% of threatened fish species in the river.

CONCLUSION

The Borogang River in Bangladesh, a crucial aquatic habitat, supports biodiversity and the national economy. A recent study identified 43 fish species, with 8 common, 18 moderately accessible, 12 less available and 5 rare. Some species were classified as least concern (LC), near threatened (NT), vulnerable (VU), or endangered (EN) by IUCN standards. Threats include declining water levels from upstream canal blockage, destructive fishing gear use, sedimentation, excessive fishing, indiscriminate juvenile and brood fish capture, barrage construction, illegal bottom fishing and Katha fishing. To preserve fish biodiversity and the environment, comprehensive studies targeted habitat conservation and government monitoring are recommended.

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