

Ichthyological Diversity at Harsoor and Nagoor Dam: An Ecological Survey

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Abstract: This study investigates the diversity of fish species at Harsoor and Nagoor Dams, two significant freshwater ecosystems located is situated 35 km away from the Kalaburagi. And Nagoor dam is situated 40 km away from the Kalaburagi. Understanding fish diversity is crucial for biodiversity conservation, ecosystem management, and sustainable fisheries. Through a combination of field surveys, species identification, and ecological assessment, this research aims to present a comprehensive overview of fish populations in these dams, their habitat requirements, and the threats they face. During the research period a total 20 species belongs to 9 family, 7 order and 16 genera. The highest number of fish species are recorded in the family Cyprinidae i.e 7 species and lowest in the family Belontiidae, Notopteridae, Cichidae, Siluridae, Clariidae and Mastacembelidae i.e., 1 species in each.

Keywords: Fish Diversity, Freshwater Ecosystems, Harsoor Dam, Nagoor Dam, Biodiversity Conservation

1. Introduction

Freshwater ecosystems are among the most biodiverse yet threatened ecosystems on the planet. Dams play a crucial role in altering habitat configurations, influencing species assemblages, and serving as key areas for fisheries. Fishing is one of the oldest human activities and it developed gradually, when our ancestor moved from the collection of plants and animals to hunting by using tools and weapons. The oldest fishing implements so far identified are harpoons, found in the territory of Congo, and dating about 90,000 years. Interestingly, these harpoons were found associated with the bones of a species of now extinct giant catfish. "Fish" denotes any non-tetrapod craniate (an animal with a skull and mostly with a backbone) that has gills, and whose limbs (if any are fin shaped). "Fish" generally refer to several aquatic animals but actually all of them are not fish, such as starfish, shellfish, cuttlefish, jellyfish and crayfish. The fish has two sets of paired fins, usually one or two (rarely three) dorsal fins, an anal fin and a tail fin. This also bears jaws and skin (that is usually covered with scales), and lays eggs. Fish are cold-blooded animals with a backbone (Vertebrates), gills for breathing under water, and paired fins for swimming. They live under water and are dependent on water for dissolved oxygen, support, food, shelter. Marine mammals (whales, dolphins, seals, sea otters), reptiles (turtles), amphibians (frogs and salamanders), shellfish (oysters, clams, and mussels), and aquatic invertebrates (crayfish, starfish, lobster) are not fish. Although they may not look like fish, seahorses and eels actually are fish. India has a coastline of about 8,129 km, an exclusive economic zone of 2.02 million km sq adjoining the continental regions.

This study focuses on the fish diversity at Harsoor and Nagoor Dams, contributing to increased knowledge of local biodiversity and providing essential data for future conservation initiatives.

Analyses the ecological conditions influencing fish diversity. To evaluate threats to fish populations and habitats.

2. Material and Methods

Study Area: Study on fish diversity in the Harsoor Dam and Nagoor Dam is located in Kalaburagi taluka of Kalaburagi district in Karnataka. Kalaburagi district is situated in the northern part of Karnataka state. Its geographical coordinates 17° 20' 0" north 76° 5' 0" Harsoor dam is situated 35 km away from the Kalaburagi. And Nagoor dam is situated 40 km away from the Kalaburagi. The study sites were selected for their accessibility, ecological importance, and distinct characteristics.



Plate No. 1: India



Plate No. 2: Karnataka



Plate No. 3: Kalaburagi

3. Data Collection

The research was carried out during January to November 2023. Sampling locations were chosen based on habitat types (littoral, pelagic, and benthic zones). The fishes were collected using the traps cast net and gill net. The net size is 12 mm to 50 mm. Immediately photograph was taken and live fishes collected with the help of buckets. The fishes were collected between the 08 to 11 am immediately for further analysis. The specimens were brought to the laboratory of Department of Zoology after which they were preserved in 80% of the formaldehyde solution. Fishes brought to the laboratory were fixed in this solution in separate jar according to the size of species. Smaller fish were directly placed in the formaldehyde solution, while larger fishes were given incision on the abdomen before they were fixed. These specimens contain different family, order. Since reliable information not available.



Plate No. 4: Harsoor dam



Plate No. 5: Nagoor dam



Plate No. 6: Fish collected in Bucket on site at Harsoor dam.



Plate No. 7: Fish preserved in Formaldehyde.

Species Identification: Fish species were identified using taxonomic keys and expert consultations.

4. Results

During the study period a total number of 20 species belongs to 9 family, 7 order and 16 genera recorded. The fish fauna is important aspects of fisheries potential of a water body.

It was observed that the distribution fish species is variable because of geographical condition. The present study suggests that Harsoor Dam and Nagoor Dam as a rich fauna. The availability of a good number of fish species and a production in both dams.

Fishes are classified based on their food and feeding habitat, the fish of Nagoor and Harsoor Dam categorized into the herbivores, carnivores and omnivores.

{Carnivores = Notopterus, Herbivores = Labeo rohita, Omnivores = Cirrhinus mrigala}

A total Number of 20 species of fishes from 9 family, 7 Orders, and 16 genera recorded at Harsoor and Nagoor Dams. Shown in the table no. 01.

Table 1: Showing families wise fishes recorded from Nagoor and Harsoor dam during the study period.

Sl. no	Family	No. of Species
1.	Cyprinidae	07
2.	Bagridae	04
3.	Channidae	03
4.	Belontiidae	01
5.	Cichlidae	01
6.	Notopteridae	01
7.	Clariidae	01
8.	Siluridae	01
9.	Mastacembelidae	01

The highest number of fish species are recorded in the family Cyprinidae i.e 7 species and lowest in the family Belonidae, Notopteridae, Cichidae, Siluridae, Claridae and Mastacembelidae i.e., 1 species in each.

Table 2: Showing total number of fish species recorded from Nagoor and Harsoor dam during the study period.

S. No	Order	Family	Scientific Name	Common Name
1	Anabantiformes	Channidae	<i>Channa lucius</i>	forest snakehead
			<i>Channa marulius</i>	bullseye snakehead/great snakehead
			<i>Channa striata</i>	striped snakehead
2	Cypriniformes	Cyprinidae	<i>Crossocheilus microstoma</i>	Flying Fox
			<i>Cyprinus carpio</i>	Common carp
			<i>Ctenopharyngodon idella</i>	grass carp
			<i>Cirrhinus mrigala</i>	mrigal carp
			<i>Labeo rohita</i>	rohu
			<i>Catla catla</i>	catla
			<i>Hypophthalmichthys molitrix</i>	Silver carp
3	Siluriformes	Bagridae	<i>Mystus nigriceps</i>	two-spot catfish
			<i>Sperata lamarri</i>	Wallago Catfish
			<i>Sperata aor</i>	long-whiskered catfish
			<i>Sperata aorella</i>	Golden Catfish
		Claridae	<i>Silurus glanis</i>	Wels catfish
		Siluridae	<i>Ompok siluroides</i>	pabda fish
4	Osteoglossiformes	Notopteridae	<i>Notopterus notopterus</i>	Chambery
5	Anguilliformes	Mastacembelidae	<i>Anguilla anguilla</i>	Tambu
6.	Cichliformes	Cichlidae	<i>Tilapia sparrmanii</i>	banded tilapia
7	Beloniformes	Belonidae	<i>Xenentodon cancila</i>	needlefish

Environmental Parameters

The total rainfall, humidity, and temperature were observed during the month of January 2023 to November 2023.

Recorded parameters during these months depends upon on ecological fluctuations. The average values of rainfall, humidity, temperature shown in the table no 02.

Table 3: Showing Physiochemical parameters of Nagoor dam

Sl. No	Month	Rainfall (mm)	Humidity	Temperature (°C)
1.	January	0	65.1	23.8
2.	February	0	60.9	24.1
3.	March	6.5	57.2	26.4
4.	April	101.8	59.9	27.2
5.	May	49	61.3	28.1
6.	June	89	62.9	26.9
7.	July	294.8	52	23.4
8.	August	217.8	55.5	24.4
9.	September	101	52.6	24.3
10.	October	257.3	56.6	25
11.	November	0	66.6	23.5

The study was conducted fish diversity in the Harsoor and Nagoor dam in Kalaburagi District. The maximum and minimum rainfall, humidity and temperature were recorded during the given period from January 2023 to November 2023.

The physicochemical, environmental attributes that showed variations over season and had impact they were some that varied considerably.

The water temperature was warmest during the pre – monsoon season (29°C), cooled some in monsoon season (22–23°C). Post monsoon season (24°C).

The rainfall varied by season with the monsoon (175.65 mm), pre - monsoon (52 mm), post monsoon (257.3 mm).

The humidity varied by season with monsoon (55.75), pre - monsoon (59.46), post monsoon (62.76).

Threats to Fish Populations: The primary threats identified include habitat degradation, pollution, and overfishing. noted as a potential risk to indigenous fish populations.

5. Discussion

The present study suggests that Nagoor and Harsoor dam has a rich fauna. The availability of good number of fish species their production in this river may be related to the suitable ecology of the water body, which provides proper breeding ground for fish. This also suggests that the water parameters of the river are within the favorable limits for fish and fisheries practices.

The recorded 20 species, 8 families, 5 order and 15 genera in the present study. The habitat diversity influences the structure and composition of stream fish communities most fish in small, stable streams are most broadly habitat specialist that have evolved various morphological and adaptations to exploit specific habitat types.

Present study was carried out on the atmospheric data of rainfall, temperature and humidity are in the range of fluctuation is very less and also favorable for the survival and growth of many varieties of fishes.

6. Conclusion

The study of the fish is known as ichthyology. The biodiversity plays an important role in order to understand the widespread of fishes in Harsoor and Nagoor dam, show high diversity of aquatic fishes and are considered the indicator

species in determining the water quality. During the entire period a total of the occurrence of the 20 species, belongs to 8 families, 5 order and 15 genus.

Families are Cyprinidae, Bagridae, Channidae, Chacidae, Notopteridae, Cichidae, Siluridae, Mastacembelidae from the Nagoor and Harsoor dam. They also have economic value to enhance the income of local fishermen.

The total temperature, rainfall, humidity were observed during the period of January 2023 to November 2023.

The water temperature was warmest during the pre - monsoon recorded (29°C), coolest in monsoon (22 °C).

The rainfall was high in monsoon (175.6 mm) and low in post monsoon (128.6 mm).

The study contributes to the understanding of freshwater fish diversity in [insert location] and emphasizes the need for ongoing conservation efforts. Protecting the biodiversity of these ecosystems is essential for ecological stability and the sustainability of local fisheries.

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