

ICHTHYOFAUNAL DIVERSITY AND STOMACH CONTENT ANALYSIS OF FISH
LIVE IN BARAN DAM RESERVOIR DISTRICT BANNU KHYBER
PAKHTUNKHWA (KP), PAKISTAN

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Abstract

The current study was conducted during September 2025 to December 2025.its purpose is to investigate fish fauna of Baran Dam and Stomach Content Analysis of Notopterus Notopterus (pari) and Sperata seengala (Singara). Total six fish species belonging to 3 orders and 3 families were collected from baran dam with the help of local fishermen using a variety of tools including cast nets, hand nets and

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fish gear. The result of the current study is less due to short study period and off season. The percentage composition of all collected species from baran dam bannu was in descending order as follow; Tor putitora (34.4%) > Notopterus Notopterus (18.0%) > Sperata seengala (16.3%) > Cyprinus carpio (14.7%) > Catlacatla (9.8%) > Labeorohita (6.5%). And in terms of numbers, 21 specimen of Tor putitora, 11 of Notopterus Notopterus, 10 of Sperata seengala, 9 of Cyprinus carpio, 6 of Catlacatla and 4 of Labeorohita. Second aspect of the current research study is stomach content analysis of NotopterusNotopterus (pari) and Sperata seengala (Singara). Total 16 stomachs of both are dissected. The stomach was opened and its content is poured in petridish. Small materials are examined under microscope. Out of 16, 4 are empty. In stomach of Sperata seengala (Singara) dead small fish are present and in stomach of NotopterusNotopterus (pari) aquatic insects remains are present and carnivorous in nature.

Introduction

Freshwater ecosystems are important biodiversity hotspots and have varied fish communities that play a role in ecological balance, nutrient cycling and food security (Magurran, 2009). Fish are sensitive bioindicators of environmental change, reflecting both habitat quality and anthropogenic pressures (Adams, 2000). Thus, documentation of ichthyofaunal diversity is important as it provides information on species composition, abundance and distribution which eventually helps in conservation planning and sustainable fisheries management (Naz et al., 2022).

In Pakistan, numerous studies have documented the abundance and ecological roles of freshwater fish species. Ilyas (2004) reported the ichthyofaunal diversity of Zebi Dam. Qamber et al. (2022) studied the food and feeding habits of Cyprinus carpio in Mirani Dam, Turbat Balochistan. Likewise, Naz et al. (2022) reported the current status of fish diversity and abundance at Panjab Headworks, Bahawalpur and stressed the need for ongoing surveillance of freshwater habitat. These localized studies reveal the importance of regional assessments to identify ecological patterns and conservation priorities.

Feeding ecology, studied by analysis of stomach contents, provides direct knowledge of diet preferences, trophic interactions and niche partitioning among fish populations. These analyses demonstrate how fish respond to habitat conditions and the availability of food, and thus affect growth, competition and ecosystem function (Rosenfeld, Leiter, & Lindner, 2005). Globally, research like Habib and Adunga (2021) on Oreochromis niloticus in Alwero Dam in Ethiopia highlights the value of studying stomach contents to comprehend feeding behaviors and ecological changes in various freshwater environments.

Given the increasing threats to freshwater resources from pollution, overfishing and climate variability, the integration of ichthyofaunal diversity studies with feeding ecology is becoming essential. This dual approach highlights the diversity of fish species and also provides a basis for conservation strategies, ecological modeling, and the sustainable use of aquatic resources. The present study, by combining diversity assessment and stomach content analysis, aims to contribute to a better understanding of fish ecology and to provide information on the structural and functional aspects of freshwater ecosystems.

Materials And Methods

Study Area

The current research study was conducting from September 2025 to December 2025 to investigated the Ichthyofaunal diversity of baran dam in district Bannu. Baran dam was completed in 1962.it is situated in the west of Mamand khel wazir (FR) to supply water for irrigation purposes. It is approximately 6km far from bannu city. It can be found between latitudes 33 01 N and longitudes 70-30 E, respectively the temperature around the dam is 6 C in the winter and 48 C in the summer. The dam measures an average of 3475 feet in length and 120 feet in height. The dam has an accommodation capacity of 98,125-acre feet. In actuality, the dam is filled by the vast river kurram, which originates in Afghanistan and flow directly into the districts of bannu pass and Lakki Marwat in the south. (Khan et al, 2024).

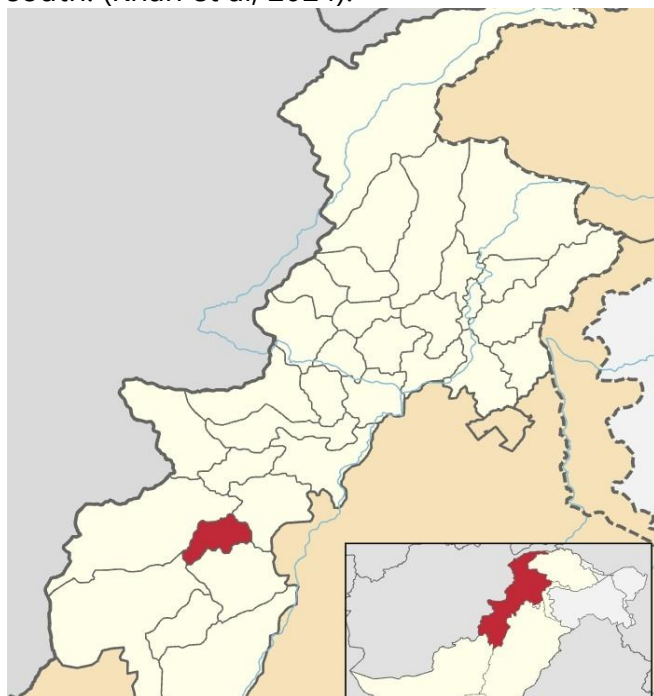


Figure 1: (a) Map of Pakistan along with Khyber Pakhtunkhwa (KP) (b) Short view of Baran Dam.

Collection and identification of fish

Fish are collected from baran dam bannu with the help of local fishermen used a variety of tools, including cast nets, hand nets and fishing gear, to harvest fish out of the dam. Total 61 fish are collected from baran dam bannu from September 2025 to December 2025. Fish are investigated on the basis of external morphology including body shape etc.

Stomach content analysis.

Second part of my current research is stomach content analysis of *Sperata seengala* (Singara) and *Notopterus notopterus* (Pari) fish. Total 16 stomachs are dissected and stomach materials are poured in petridish. Stomach materials are examined both visually and under microscope.

RESULTS

The current study was carried at baran dam from September 2025 to December 2025. Baran dam were the subject of the exploration survey. Total six fish species belonging to three orders and three families were collected from baran dam. The result of the current study is less due to short study period and off-season. Mahasheer is the most abundant fish, which I collected during my research study, and it is the national fish of Pakistan.

Table 1: Fish biodiversity collected from baran dam bannu Khyber Pakhtunkhwa Pakistan.

S. No	Order	Family	Scientific name	Local name
1	Cypriniformes	Cyprinidae	<i>Tor putitora</i>	Mahasheer
2	Osteioglossiformes	Notopteridae	<i>NotopterusNotopterus</i>	Pari
3	Cypriniformes	Cyprinidae	<i>Catlacatla</i>	Thaila
4	Siluriformes	Bagridae	<i>Sperata seengala</i>	Singara
5	Cypriniformes	Cyprinidae	<i>Labeorohita</i>	Raho
6	Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	Carp

The percentage composition of all collected species from baran dam bannu was in descending order as follow; *Tor putitora* (34.4%) > *NotopterusNotopterus* (18.0%) > *Sperata seengala* (16.3%) > *Cyprinus carpio* (14.7%) > *Catlacatla* (9.8%) > *Labeorohita* (6.5%). And in terms of numbers, 21 specimen of *Tor putitora*, 11 of *NotopterusNotopterus*, 10 of *Sperata seengala*, 9 of *Cyprinus carpio*, 6 of *Catlacatla* and 4 of *Labeorohita*.

Table 2: Percentage composition of fish species collected from Baran dam reservoir

S.NO	Scientific name	Catchment frequency	% composition
1	<i>Tor putitora</i>	21	34.4%
2	<i>NotopterusNotopterus</i>	11	18.3%
3	<i>Labeorohita</i>	4	6.5%
4	<i>Catlacatla</i>	6	9.8%
5	<i>Sperata seengala</i>	10	16.3%
6	<i>Cyprinus carpio</i>	9	14.7%
	Total	61	100%



Notopterus notopterus (Pari)



Catla catla (Thaila)



Sperata seengala (Singara)



Tor putitora (Mahasheer)



Cyprinus carpio (Carp)



Labeo rohita (Rahu)

Figure 2: Fish biodiversity of Baran Dam reservoir

Second aspect of the current research is stomach content analysis of *Sperata seengala* (Singara) and *Notopterus Notopterus* (pari). Total 16 stomachs of both *Sperata seengala* (Singara) and *Notopterus Notopterus* (pari) are dissected with a sharp knife. Out of 16, 4 are empty. Remains of fish are present in the stomach of *Sperata seengala* (Singara).and in the stomach of *Notopterus Notopterus* aquatic insects are present. Other materials in their stomach are examined under microscope. After finished my lab work I come to the point that they both are carnivore because incompletely digested fish including some other meat particles and aquatic insects are present in their stomach. Stones are also present in their stomach, which they eat to facilitate digestion.

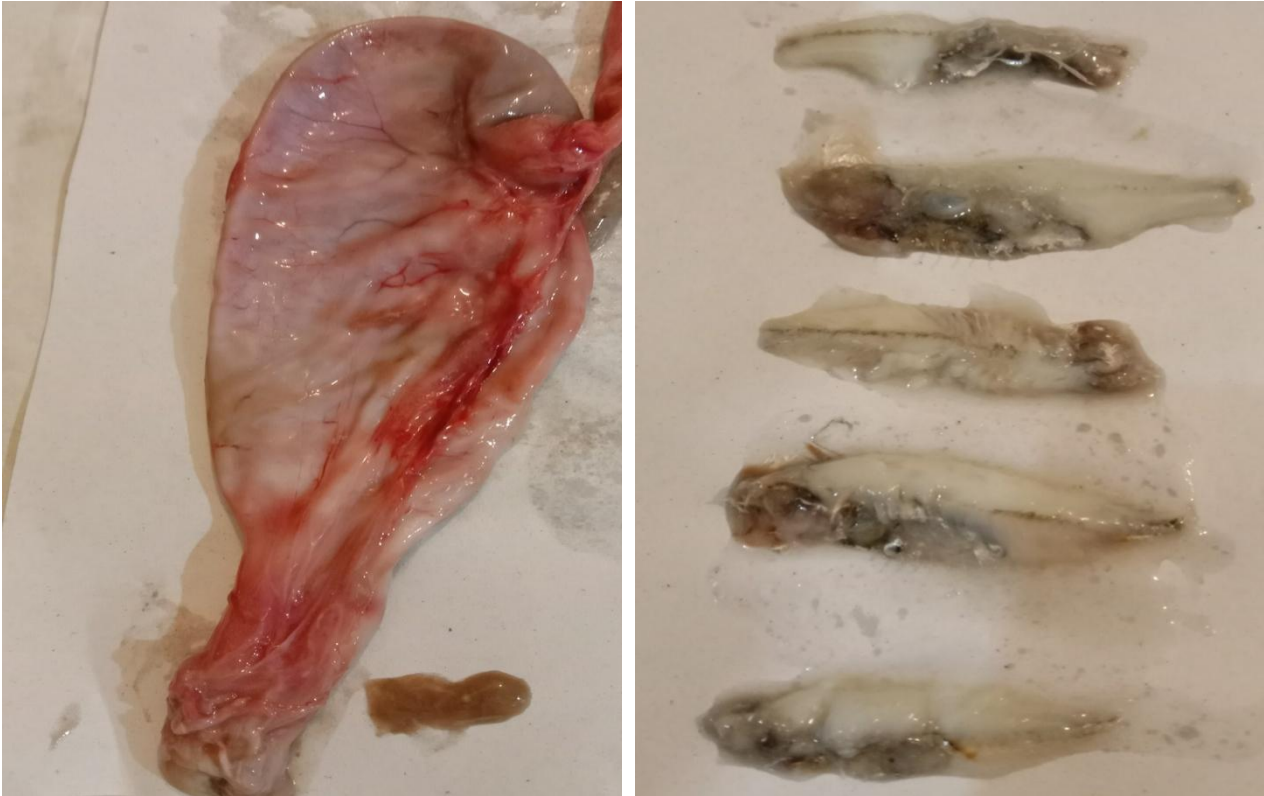


Figure 3: (a) Stomach of *sperata seengala* (Singara) (b) Stomach content of *Sperata seengala* (singara)



Figure 4: (a) Stomach of *Notopterus notopterus* (Pari) (b) Stomach content of *Notopterus notopterus* (pari)

Discussion

Total 6 species belonging to 3 orders and three families were collected from Baran Dam Bannu Khyber Pakhtunkhwa, Pakistan. The Cyprinidae family was most abundant represented by 4 species and Notopteridae and Bagridae families were represented by 1 species.

Similarly, Khan et al, (2024) recorded a total of 27 species belonging to 18 genera, 8 families and 5 orders. The Cyprinidae family was most abundant represented by 17 species, Channidae, Siluridae and Sisoridae families were represented by 2 species, Cobitidae, Bagridae, Notopteridae and Mastacembelidae families were represented by 1 species. The catchment frequency by Khan et al, was 431, majority of them was commercially important fishes. Similarly Zubida Masood et al, (2015) collected and identified five species from the Damai Stream of Tehsil Domel of Bannu District and. These five species were belonging to two orders, two families and four genera Altaf et al, (2015) recorded 34 species and 1766 number of the fishes were recorded from the river Chenab. Altaf et al. (2011) identified 33 species from the head Qadirabad. Khan et al, (2011) recorded the 50 species from the Ravi while 30 species recorded from the river Jhelum, Qadir (2010) recorded 24 species and 1506 specimen from the NullahAik and NullahPalku. Collected a total of 1902 fish specimens from river kurram which belong to six orders, eight families, 22 genera and 35 species. The most diverse order was cypriniforms followed by suliriform, Perciform, Salmoniforms and Chenniforms, while the less diverse order was Mastacembeliforms representing only one species. In family wise diversity, family that is more diverse was Cyprinadae represented by 19 species followed by Sisoradae, Cichilidae, Salmonidae, Chennidae, and Nemacheilidae, and less diverse was Mastacembelidae representing only one species. In species-wise distribution, the most abundant species was Schizothorax plageostomus in almost all study area sites. Similarly Z.Hasan et al, (2014) identified a total of 10 fish species. Family Cyprinidae was found to be the most abundant represented by 8 species, whereas Family Siluridae and Mastacembelidae was represented by a single species each. As there is no river found in Karak, hence all the fish fauna is present in the small rain filled dams. Although, no detailed work is available regarding freshwater fishes of District Karak, still few researchers have worked on the ichthyofaunal diversity of different water bodies. Khan and Hasan (2011) worked on the fishes of Changhoz dam, District Karak and reported 7 species. A similar previous work was also carried out by Ilyas (2004) on Zebi dam, District Karak in which 12 species of fishes were reported

The second aspect of this current research is the stomach content analysis of *Sperata seengala* (Singara) and *Notopterus notopterus* (Pari), Total 16 stomachs are

dissected. This task is very interesting because for this fresh fish specimen is required. As soon as fish catches then up to 1 or 2 hours their stomach content will be examined otherwise their stomach materials will be digested because enzyme in stomach are functional even when fish are out of water. Their surgery are conducted in zoology lab UST Bannu, using surgical tools including small knife etc, all these tools are present in surgical tool kit box. In stomach of *Sperata seengala* small fish are present eaten by them and in *Notopterus notopterus* aquatic insects are present. This survey means that they are both carnivore, also small stones are also being present which they eat for facilitate digestion process. Habib and Adugna (2021) determined that *oreochromis niloticus* (in baro-akobo basin, south west Ethiopia in case of Alwero dam) had ingested diverse groups of organisms of both plants and animal's origins and muds. In both population items of plant origin ingested by the fish were phytoplankton. Items of animal origin ingested by *O. niloticus* were zooplankton, insects, nematodes, and some unidentified animals. According to Otieno et al. (2014), fish mainly feed on food items that can fit into their mouth and what their stomach can digest. As fish grow, the stomach become longer, and their digestive system become more developed. Habib and Adugna (2021) also reported that among 250 stomach content used to analyze the food composition of *O. niloticus* in dry march and April and wet July and august months 49(19.6 %) were completely empty and 201 (80.4 %) observed full with phytoplankton , zooplankton, insects , mud and fish remains. This small amount of empty gut observed may be due to short time interval between capture and digestion loss or due to low digestibility of phytoplankton in small size fish.

Qamber et al, (2022) reported from the investigation of food habit and analysis of gut composition of *cyprinus carpio* from mirani dam in turbat that *cyprinus carpio* is an omnivore fish. Since *cyprinus carpio* is a widely distributed and commercially significant fish in Pakistan, researchers can readily locate and conduct study on it

Conclusion

Total 6 species belonging to 3 orders and 3 families were collected from Baran Dam Bannu. As compared to other research studies, it is less due short study period and off-season. After completion lab work, I come to the point that both *Notopterus notopterus* (pari) and *Sperata seengala* (Singara) is carnivore. Dead small fish are present in the stomach of *Sperata seen gala* and dead aquatic insects are present in the stomach of *Notopterus notopterus*.

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