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RESEARCH ARTICLE

The diversity of fish fauna in Baran dam of district Bannu, Khyber Pakhtunkhwa province (KPK), Pakistan

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Abstract

Present study deals with the diversity of fish fauna found in Baran Dam of district Bannu. Although, vast studies have been conducted largely on the systematic, biodiversity and ecology of freshwater fishes found in the different regions of Khyber Pakhtunkhwa province to improve fisheries. However, the diversity of fish fauna has never been adequately addressed in the Baran dam of district Bannu. In this connection, the diversity of freshwater fishes of Baran Dam was studied and assessed from February 2013 to May 2014. We documented and described 15 freshwater fish species of Baran Dam that were belonging to the 4 orders and 6 families and 11 genera. Among them, nine species were belonging to the family Cyprinidea, while the remaining other families i.e., Channidea, Mastacembelidea, Notopteridae and Cichlidae were represented by only single species. Hence, the result of our present study would provide useful information about the diversity of fish fauna of Baran dam that could be later valuable in the systematic, fisheries management and conservation.

Introduction

Bannu District is located approximately 192 km South of Peshawar city of Pakistan and is surrounded from all sides by the hard and dried mountain ranges of Koh-e-Safed and Koh-e-Suleiman. This district forms a basin drained by the two rivers i.e., Kurram and Gambila or Tochi, which are originated in the hills of Waziristan [http://en.wikipedia.org/wiki/Bannu_District]. Baran Dam is only one dam of district Bannu used for irrigation purpose. The word '**Baran**' is derived from Pakhto word "**Baaraan**" means "**rain"**, therefore, the main resources of water in Baran dam is mainly depends on rain collected water. This dam is situated at about 8 kilometer away from Bannu district towards the north-west. Its maximum height is 302 feet and 1477 feet. Baran dam was built in 1962 on Kurram River. This storage dam is of maximum height of 120 feet and is designed as an earth dam (information gather by personal meeting with Mr. De vajda, a F.A.O. expert at Baran dam).

A fish is defined as any member of paraphyletic group of organism that consists of all gill-bearing aquatic animals. Fishes are found below -2^0 C of Antarctic region to hot spring of 52^0 C of California with a wide range of distribution. [1]. about 193 species of freshwater fishes had been reported from Pakistan, which are belonging to 13 orders, 30 families and 86 genera (Rafique, and Khan, 2012).

Many workers have been worked on the diversity of fish fauna found in the various parts of world, furthermore, some work had also made their contribution in the study of fish fauna found in freshwater resources of Pakistan. Therefore, a considerable amount of literature was available about fish fauna from various parts of Pakistan, such as, But and Nowaz (1978) reported 62 species from northern Waziristan agency and D.I Khan Division; Mirza (1980)

had studied the systematic and zoogeography of the freshwater fishes of Pakistan and Azad Kashmir. Shah Jehan and Khan (1997) reported 17 species River Kurram at Bannu. Rafique (2000) observed the fish diversity and distribution in Indus River. Rafique and Khan (2012) described the distribution and status of significant freshwater fishes of Pakistan.

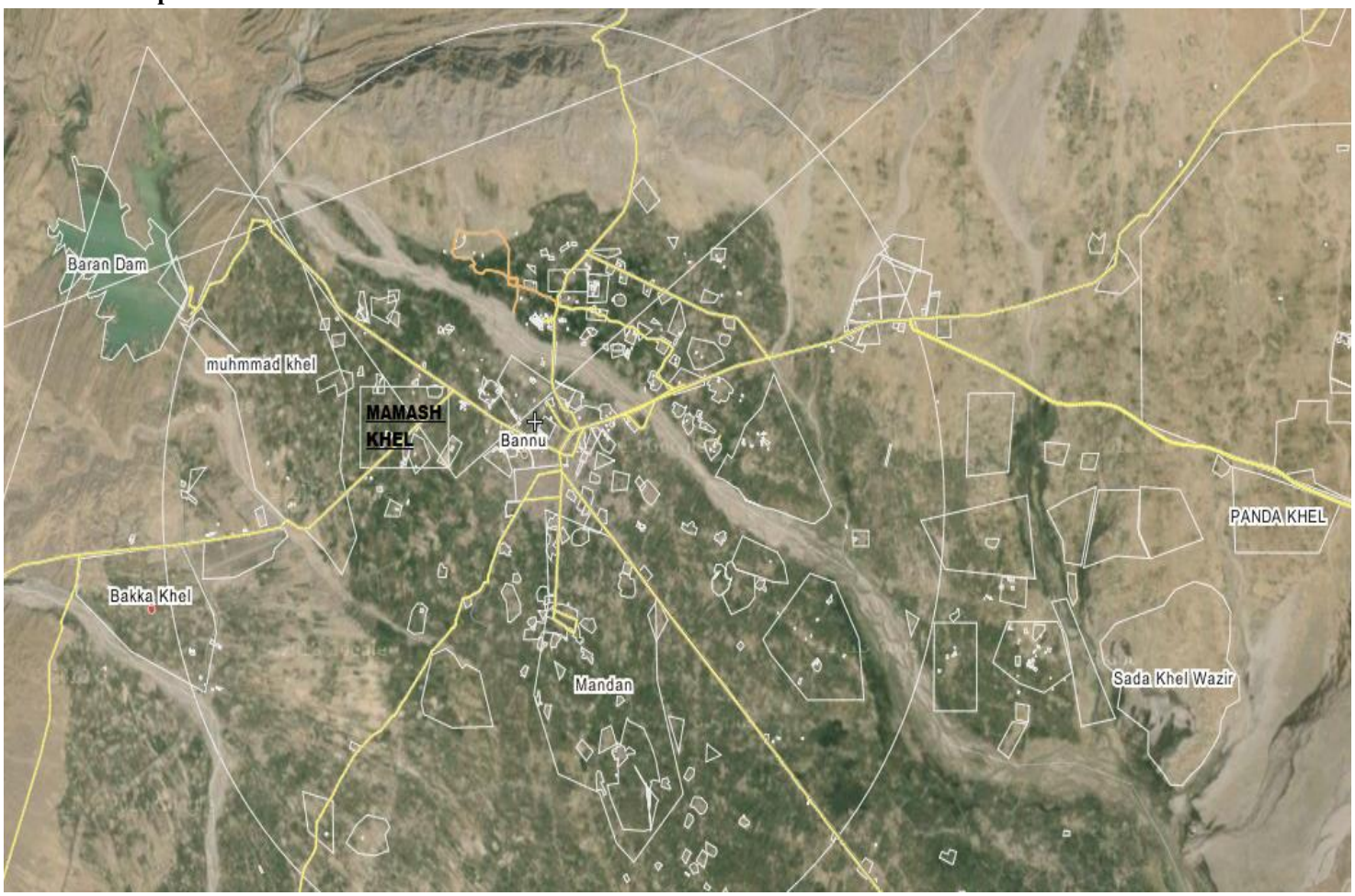
Materials and methods

Fish samples collection

Fish samples were collected randomly from the different regions of Baran dam i.e., middle, northern and southern banks, eastern and western bank by using small meshed cast nets, scoop nets and hooks. Samples were collected monthly from the period of February 2013 to May 2014 in the study area.

Fig.1. Map shows Baran dam location in District Bannu.

Fish preservation and Identification



After collection, all samples were preserved in ice and later transferred into the laboratory. In laboratory, each fish sample was identified up to species level by using keys of fish identification by Mirza (1990), Mirza and Sandhu, (2007) and Jayaram (1999), Talwar and Jhingran (1999-1981), than each sample was placed in a separate labeled plastic jar and preserved in 10% formalin solution for long term preservation.

Results and discussion

The present study was carried out to determine the current status of freshwater fish biodiversity found in Baran dam of Bannu district. During the survey of Baran dam, about fifteen species were collected and identified, which were belong to five orders, six families and eleven genera (Table 1 & 2; Fig. 1-15). Among them**,** nine species species were belong to the family Cyprinidae, two species to family Bagridae, while the remaining othe families contain only single species. These nine species of family Cyprinidae include i.e., Cyprinus carpio, Labeo rohita, Labeo dyocheilus pakistancus, Labeo calbasu, Puntius sophore, Puntius ticto, Hypophthalmiethy molitrix, Hypophthalmiethys nobilis and Cirrhimus mrigala, while the two species i.e., Mystus bleekeri and Seprata

seenghala belonged to the family Bagridae. However, the remaining other four families were represented by only single species, such as, Channa striatus (Channidea), Mastacembelus armatus (Mastacembelidea), Notopterus notopterus (Notopteridae) and Oreochromis mossambicus was belong to the family Cichlidae.
Thus, the result of the present study revealed that the large number of species in Baran dam were belong to the single family Cyprinidae, which the fish species composition belong to the other families i.e., Bagridae, Channidea, Mastacembelidea, Notopteridae and Cichlidae was found to be least. Hence, the members of the family Cyprinidae were found to be highly abundant in Baran dam of Bannu district. Such wide distribution might be related to substrate of the dam that could provide suitable habitat for nest building or geological and glacial history of study area. Climatic factor such as droughts could also affect on the distribution of cyprinid fishes as described by Lachner and Jenkins (1971). According to Araoye (2009), some other physical factors such as temperature, floods during the rainy season, change in water level of dam, size of dam and feeding habits of fish could also impact largely the species composition and their distribution. However, the temperature is the major factor that could influence directly or indirectly on the species composition, as it can easily produced changes in some other parameters such as transparency, viscosity, dissolved oxygen and other gases, pH, total dissolve solids and conductivity, as all of these are constituting very important limnological parameters that provide the basis for fisheries and water resources management. Thus, the abundance Cyprinid species throughout the study period was indicating that the habitats and environmental condition of Baran Dam of Bannu district was more suitable for the growth of these Cyprinid species. Hence, like many other fishes, Cyprinid fishes have more ability to adapt themselves according to the changing in the environmental conditions in which they lived.

According to Rafique and Khan (2012) and Sarkar et al. (2012), significant decline in distribution of some fish species might be as result of pollution, habitat loss, changes in environmental conditions, illegal fishing, water abstraction, siltation and invasion of exotic species, eutrophication, overexploitation and overharvesting as food fish, ornamental trade and as sport also. A rapid decline in the population of species might be expected due to its hybridisation with closely related and rapidly spreading newly introduces species. All these factors can cause substantial declines in inland fish species. As a result, the distributional ranges of some species have shrunk tremendously over the last decades and restricted only to localised areas.

Table1. List of species along with their local names collected from the Baran dam of Bannu district.

S.NO	**Scientific Name**	**Local name**	**English name**
1	Cyprinus carpio	Gulfam	Common carp
2	Labeo calbasu	Kalbans/ Black raho	Orange-fin labeo
3	Labeo dyocheilus pakistanicus	Botal	
4	Labeo rohita	Raho/ Dambra	Roho
5	Mystus bleekeri	Mujahid	Day's mystus
6	Mastacembelus armatus	Marmahi	Zig-zag eel
7	Chirrhinus mrigala	Mori	Mrigal carp
8	Oreochromis mossambicus	Tilapia	Mozambique tilapia
9	Notopterus notopterus	Parri	Bronze featherback
10	Puntius sophore	Sophora popra	Pool barb
11	Puntius ticto	Chiddu	Ticto barb
12	Sperata seenghala	Singara	Giant river-catfish
13	Hypophthalmichthys nobilis	Big head	Big head carp
14	Hypophthalmichthys molitrix	Silver carp	Silver carp
15	Channa striata	Soali	Striped snakehead

Table2. Showing the list of fish species collected from the Baran dam of Bannu district along with the representations of their order, families and Genera

S.NO	Order	Family	Genus	Species
1	Cypriniformes	Cyprinidea	Cyprinus	C. carpio
			Labeo	L. rohita, L. Calbasu, L. dyocheilus pakistancus,
			Hypophthalmicthys	H. nobilis, H. molitrix
			Puntius	P. sophore, P. ticto,
			Chirrhinus	C. mrigala
		Notopteridae	Notopterus	N. notopterus
2	Channiformes	Channidae	Channa	C. striatus
3	Siluriformes	Mastacembelidae	Mastacembelus	M. armatus
		Bagridae	Mystus	M. bleekeri,
			Sperata	S. seenghala
4	Perciformes	Cichlidae	Oreochromis	O. mossambicus

Fig. 1. CYPRINUS CARPIO

Fig.2. LABEO CALBASU

Fig.3. LABEO DYOCHEILUS PAKISTANICUS

Fig.4. LABEO ROHITA

Fig.5. CHIRRHINUS MRIGALA

Fig.6. HYPOPHTHALMICTHYS MOLITRIX

Fig.7. HYPOPHTHALMICHTHYS NOBILI

Fig.8. PUNTIUS SOPHORE

Fig.9. PUNTIUS TICTO

Fig.10. NOTOPTERUS NOTOPTERUS

Fig.11. CHANNA STRIATA

Fig.12. MASTACEMBELUSARMATUS

Fig.13. MYSTUS BLEEKERI

Fig. 14 SPERATA SEENGHALA

Fig.15. OREOCHROMIS MOSSAMBICUS

Conclusion.

In the present study, it had been concluded that fish fauna of Baran dam showed great variation in the species composition that might be due to the influence of various factors of their habitats. In response to the above impacts on inland fisheries, it is therefore recommended that special enhancement programmes are required to initiate sustainable use of fisheries resources. One common form of enhancement is the stocking of natural water resources with the fish seed produced in hatcheries.

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