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## Vertebrate and invertebrate fauna of Tanga dam district Karak Khyber Pakhtunkhwa Pakistan

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### Abstract

The aim of the research work was to find out the vertebrate and the invertebrate fauna in Tanga dam of district Karak, Khyber Pakhtunkhwa province of Pakistan during the period from August to October 2016. Tanga dam includes all the vertebrates, including fishes, amphibians, reptiles, birds and mammals. Fishes include *Catla catla*. Amphibians include *Rana tigrina*. Reptiles include *Xanthus vigilis* and *Lamproleptis getula*. Birds include *Passer domesticus*, *Acridotheres tritis* and *Anas crecca*. Mammals include *Capra hircus*, *Ovis aries*, *Canis adustus*, *Bos taures*, *Equus asinus*, *Canis lupus* and *Felis catus*. Among invertebrates *Pandinus imperator*, *pterostichus melanarius*, *Solenopsis invicta* and *Hirudo medicinalis* were abundant in Tanga dam. So from the present study, it may be concluded that Tanga dam is suitable for the survival of both vertebrates and an invertebrates. Hence our present study will provide useful information about the diversity of vertebrates and invertebrates in Tanga dam that could be later valuable in systematic and conservation.

**Keywords:** Fish, amphibian, reptiles, birds, mammals, invertebrates, Tanga dam, Karak

### 1. Introduction

Tanga dam is situated about 700 feet away from the Sabir Abad city which is located in district Karak. It is located at the southern side of Sabir Abad and it is covered by green and beautiful mountains. This dam was made by Barany area development project (BADP). Its catchment area is about 10 canals and its water capacity is about 10 million gallons. The depth of water is approximately 20 feet. The construction of this dam was started in 2004 and was completed in 2006. Vertebrates are chordates, which have a spinal column. The name vertebrates originated from the individual bony segments called vertebrae that make up the vertebral column. Vertebrates are different from protochordates because they have a head and vertebral column. Biodiversity of fish is the abundance of fish fauna in a particular region. In all vertebrates fishes are in large number and show the differences in habitat, shape, structure and also in functions. Fishes are the organisms which can live in both fresh water and marine water. Fishes also have the ability to tolerate salty water because of their well-developed body systems. Fish breed in a particular aquatic body. Fishes are very beneficial for human beings as they provide a direct source of food in the form of proteins and fats [1]. The fish population is decreasing day by day due to pollution, environmental variations, illegal hunting and by the addition of those species which are harmful for fish life. Today shortage of fishes can be seen due to these dangerous species [2-3]. Amphibians are the first successful vertebrates which inhabit the land. Most present day amphibians are small. Amphibians are considered as the most abundant of all terrestrial animals. Amphibians play important role in various food chains. Amphibians are evolved from fishes. The most dominant amphibians are frogs, salamanders and caecilians.

Ranidae is the family of amphibians which plays a key role because some ranid frogs are used as a food both for local usage and also for export in some region of the world. Ranids are also helpful in decreasing those insects which destroy useful crops. Skin of ranids is also used for the treatment of damaged parts of the body. The lipid portion in ranids skin is known to have medicinal role and disease controlling properties which are helpful in healing of wounds [4-5].

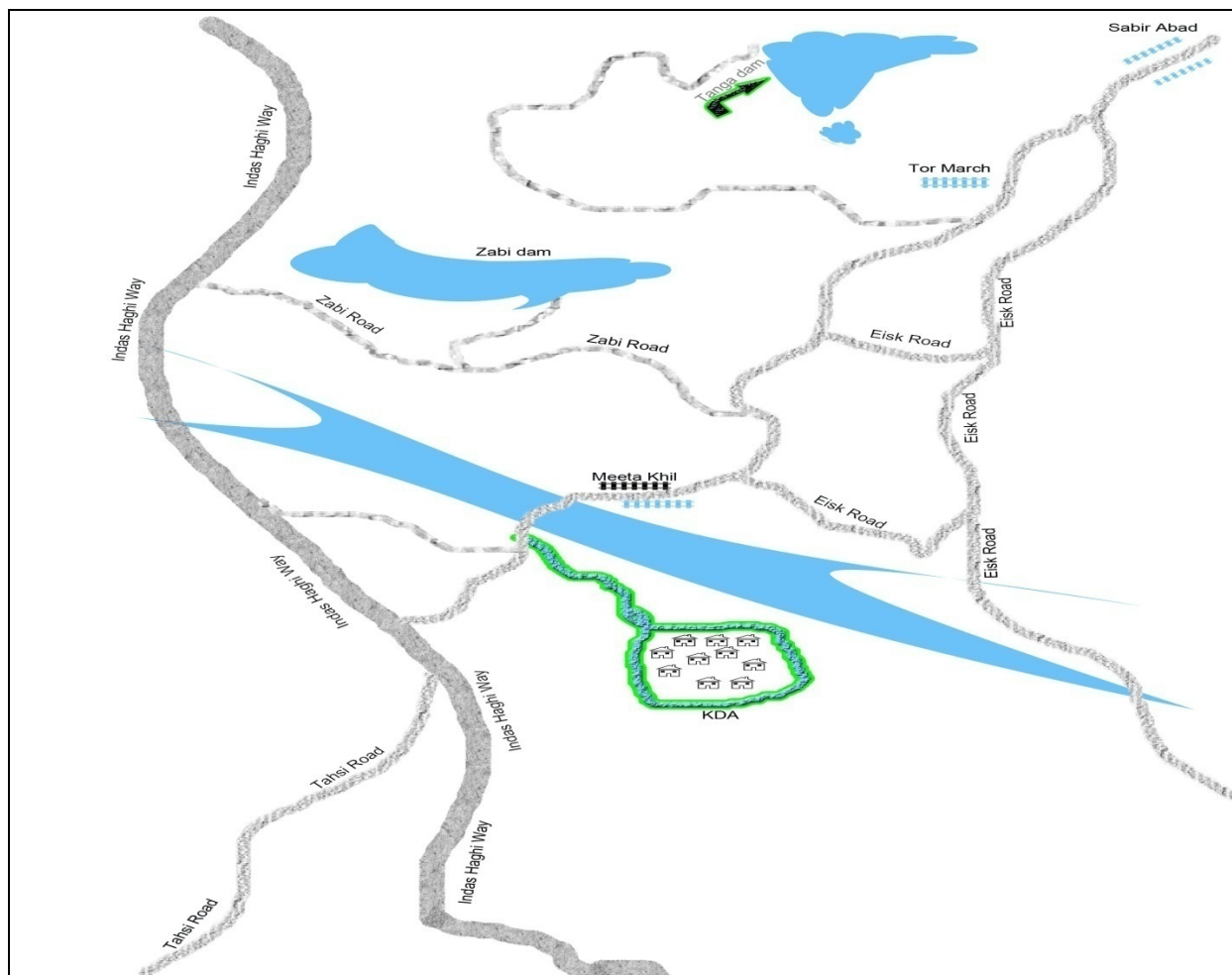
Reptiles were considered as the first truly land vertebrates. The lungs and heart of reptiles were changed for making reptiles more advanced. The skin of reptiles is covered by scales in order

to reduce the loss of water. The legs of reptiles are arranged in such a manner so that they run easily. Reptiles are called an amniotes because they contain four embryonic membranes. Today reptiles are not in a position to make us aware that either the reptiles of ancient times produced such large animals that walk on the earth. The evolutionary history of reptiles tells us that only a few orders among twenty orders are alive. In the last few years serious attention has been given for the protection of reptiles but for their protection they should be given a suitable environment in which they live. Lizards play a vital role in our biodiversity by eating small insects. Reptiles are threatened on international level due to increased human activities such as large population and disturbance of living places. In Pakistan 179 species of reptiles are identified up till now such as lizards, snakes, turtles, tortoise and crocodiles [6-7].

Birds are the most dominant and successful among all land vertebrates as they have 28 orders, 166 families and 8800 species. Teeth are absent in modern birds, but vestiges of the tail are present. Birds still have many characters of reptiles because they lay those eggs, which have amniotic membranes and also have scales on their lower legs. Avifauna establishes a major part of the environment and plays a vital role in pollination of flowers, reducing seed dormancy and also in carrying of seeds from one place to another. Birds also tell us about various ecosystems such as the boundaries of forests, damp areas of land and large rivers. During migratory movements birds help in the transformation of nutrients from one area to another [8-9].

Mammals' possess the smallest number of species as compared to other vertebrates. Larger animals living on land are mammals. Most big mammals such as lions and zebras are found in Africa. Mammals usually show two distinguishing characters from all other vertebrates that is the presence of hairs and mammary glands.

Mammals are diverse group having varieties of species, shapes, geographical habitats and different behaviors. The ratio of the extinct mammal species increases each year with the production of new individuals [10-11]. Mammals also show variations on the basis of morphology. Some mammals are small in size while others are large. For example the weight of the bumble-bee is 2g while the weight of the largest blue whale was approximately 154000 kg [12]. Like birds, mammals also perform a key role in the ecosystem by transferring pollen grains from one flower to another and also controlling various diseases [13-15]. Invertebrates are those animals which do not possess any backbone or vertebral column. Invertebrates have varied and effective groups that consist of more than 90% of the total roughly calculated 10 million species which are mainly arthropods. Most invertebrates provide food for human beings. These beneficial invertebrates are shrimps, termites, grasshoppers and honey bees. Invertebrates are used on large extent in agriculture, research, cultivation and as an exhibition in fish houses and insect houses [16-17]. Termites that live in trees or on the surface of trees may cover a total mass of organisms in a given area. Termites are helpful in a continuing process of decompositions [18-19].



Map: showing the location of Tanga dam

## 2. Materials and methods

Fishes were collected from different sites of Tanga dam with the help of local fishermen. Fishes were then brought to the laboratory and were identified by using fish identification keys. Jaya Ram (1999) [20], Mirza and Sandu (2007) [21] and Mirza (1990) [22]. Amphibians and reptiles were also observed, particularly during daytime in Tanga dam. Both were identified by using the index and identification keys of Khan, 2004 and 2006 [23-24]. Birds were seen usually at day time and they were identified through slander literature of community, i.e. for identification indirect observations were taken [25-31]. Some mammals were observed while drinking

water from the dam. Some were observed during day time while some at night like dog, cat and jackal. Mammals seen at day time were observed using binocular microscope. The observed mammal species were then identified using field guides (Robert, 2005 a, b) [32-33]. Invertebrates were also observed during the present study of tanga dam. For the proper identification of invertebrates various identification keys were used such as Dahiliwal (1998) [34] and Rafi *et al* (2005) [35].

## 3. Results

**Table 1:** Species of fishes found in Tanga dam

S/No	Local name	Class	Order	Family	Genus	Species
1.	China fish	Actinopterygii	Cypriniformes	Cyprinidae	<i>Catla</i>	<i>Catla catla</i>

**Table 2:** Species of amphibians found in Tanga dam

S/No	Local name	Class	Order	Family	Genus	Species
1.	Frog	Amphibia	Anura	Dicroglossidae	<i>Rana</i>	<i>Rana tigrina</i>

**Table 3:** Species of reptiles found in Tanga dam

S/No	Local name	Class	Order	Family	Genus	Species
1.	Desert lizards	Reptilia	Squamata	Xantusiidae	<i>Xantusia</i>	<i>Xantusia vigilis</i>
2.	Desert king snake	Reptilia	Squamata	Colubridae	<i>Lampropeltis</i>	<i>Lampropeltis getula</i>

**Table 4:** Species of birds found in Tanga dam

S/No	Local name	Class	Order	Family	Genus	Species
1.	Sparrow	Aves	Passeriformes	Passeridae	<i>Passer</i>	<i>Passer domesticus</i>
2.	Mynah	Aves	Passeriformes	Sturnidae	<i>Acridotheres</i>	<i>Acridotheris tristis</i>
3.	Common teal	Aves	Anseriformes	Anatidae	<i>Anas</i>	<i>Anas crecca</i>

**Table 5:** Species of mammals found in Tanga dam

S/No	Local name	Class	Order	Family	Genus	Species
1.	Goat	Mammalia	Artiodactyla	Bovidae	<i>Capra</i>	<i>Capra hircus</i>
2.	Sheep	Mammalia	Artiodactyla	Bovidae	<i>Ovis</i>	<i>Ovis aries</i>
3.	Cattle	Mammalia	Artiodactyla	Bovidae	<i>Bos</i>	<i>Bos taurus</i>
4.	Donkey	Mammalia	Perissodactyla	Equidae	<i>Equus</i>	<i>Equus asinus</i>
5.	Dog	Mammalia	Carnivora	Canidae	<i>Canis</i>	<i>Canis lupus</i>
6.	Cat	Mammalia	Carnivora	Felidae	<i>Felis</i>	<i>Felis catus</i>
7.	Jackal	Mammalia	Carnivora	Canidae	<i>Canis</i>	<i>Canis adustus</i>

**Table 6:** Species of invertebrates found in Tanga dam

S/No	Local name	Class	Order	Family	Genus	Species
1.	Scorpion	Arachnida	Scorpiones	Scorpionidae	<i>Pandinus</i>	<i>Pandinus imperator</i>
2.	Beetle	Insecta	Coleoptera	Carabidae	<i>Pterostichus</i>	<i>Pterostichus melanarius</i>
3.	Common green damer	Insecta	Odonata	Aeshnidae	<i>Anex</i>	<i>Anex junius</i>
4.	Ants	Insecta	Hymenoptera	Formicidae	<i>Solonopsis</i>	<i>Solonopsis invicta</i>
5.	Leech	Clitellata	Arynchobdellida	Hirudidae	<i>Hirudo</i>	<i>Hirudo medicinalis</i>



**Fig 1:** An overview of Tanga dam

## 4. Discussion

The present study was conducted in order to know about the vertebrates and invertebrate fauna of Tanga dam. Both the vertebrates and invertebrates were explained up to species level and their complete systematic representation was given in tables 1-6 respectively. During this study only one species of fish was identified, which belonged to Class Actinopterygii, Order Cypriniformes, Family Cyprinidae, Genus *Catla* and Species *Catla catla*. The observed amphibian specie of Tanga dam also consisted of one class, one order, one family, one genus and one species. It belonged to Class Amphibia, Order Anura, Family Dicroglossidae, Genus *Rana* and Specie *Rana tigrina*. Two species of reptiles were found which belonged one Class, one Order, Two

families, Two Genus and Two species. These two species were belonging to Class Reptilia, Order Squamata, Families Xantosiidae and Colubridae, Genus *Xantusia* and *Lampropeltis* and species *Xantusia vigilis* and *Lampropeltis getula*. Three species of birds were identified which belonged to One Class, Two Orders, Three Families, three Genus and three Species. The identified species of birds were belonging to Class Aves, Orders Passeriformes and Anseriformes, Families Passeridae, Sirunidae and Anatidae, Genus *Passer*, *Acridotheres* and *Anas* and species *Passer domesticus*, *Acridotheris tristis* and *Anas crecca*. During research work some mammals were observed, which used to drink water from Tanga dam. The observed mammals were consisting of one Class, three Orders, four Families, seven Genera and seven Species. These mammals belonged to Class Mammalia, Orders Artiodactyla, Perissodactyla, and Carnivore, Families Bovidae, Equidae, Canidae and Felidae, Genus *Capra*, *Ovis*, *Bos*, *Equus*, *Canis* and *Felis* and Species *Capra hircus*, *Bos taurus*, *Equus asinus*, *Canis lupus*, *Felis catus* and *Canis adustus*. Family Bovidae was the richest family of mammals. Some invertebrates, mainly arthropods were also identified during the present research work. The identified invertebrates were consisting of three classes, five orders, five families, five genera and five species. Class Insecta was the dominant class of invertebrates. The observed species of invertebrates were *Pandinus imperator*, *Pterostichus melanarius*, *Anex junius*, *Solenopsis invicta* and *Hirudo medicinalis*. Previously, six species of fishes were recognized by Hameed *et al*, 2015 during the study of Ghandiali dam. The identified species were consisting of two orders, two families, five genus and six species. The most dominant family was Cyprinidae, which have five species. The remaining species was belonged to family Hypophthalmidae<sup>[36]</sup>. Research work on amphibians is already done in some areas of Pakistan such as Baluchistan and Punjab. Here, researchers showed the presence of ten Ranidae family. Ghalib *et al*, 1976 recognized Brilliant agama (*Trapelus agilis isolepis*) in Karachi but the recent study, which was conducted from August 1999 to July 2002 showed that brilliant agama was absent in three districts of Karachi. Brilliant agama is extinct in Karachi due to disturbance of natural habitat and over population of humans<sup>[37]</sup>. Previous work on birds was done by Awan *et al*, 2004 in Muzaffarabad. Kashmir and Pakistan who recognized 59 species of birds. 24 were resident, 14 were visiting in winter and 11 were visiting in summer<sup>[38]</sup>. Previous studies conducted on mammals have shown that the desert of Pakistan and India have rich fauna of rodents<sup>[39-40]</sup>. Hence the present study revealed that both vertebrates and invertebrates were dominant in the Tanga dam of district Karak.

## 5. Conclusion

From the current study it can be concluded that Tanga dam provides suitable environmental conditions to support the diversity of both vertebrates and invertebrates. According to local fishermen, this dam is unable to support large amounts of fishes. We will try to know about this reason, in the upcoming physiochemical analysis of soil and water.

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