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RESEARCH ARTICLE

A Qualitative Study of the Wildlife of Darawat Dam, Thatta district, Sindh, Pakistan

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Key words:Protected Area,
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In the present study, species richness of mammals, birds, reptiles and amphibians was studied in 2013 at Darawat Dam, Sindh Province. A total of 48 species including 14 mammals, 23 birds, 8 reptiles and three amphibians belonging to 16 orders and 31 families were recorded during the study. A total of 33 species of flora was identified from the area. Significant wildlife species included Indian Porcupine, Asiatic Jackal, Desert Hedgehog, Desert Hare, Indian Gerbil, Indian Desert Gerbil, House Mouse, Little Grebe, Little Egret, Red –Wattled Lapwing, Little Stint, Blue Rock Pigeon, Ring Dove, Little Brown Dove, Indian Roller, Pied Bush Chat, Purple Sunbird, Indian Robin, Crested Lark and White Cheeked Bulbul. It was found that Desert Cat, Jungle Cat, Urial, Chinkara, Sindh Ibex, Indian Pangolin, Bonelli's Eagle and Chestnut bellied Sandgrouse have been recorded as a rare species from the area. Marbled teal was not found during the present study period. Habitat modification, hunting, unregulated fishing, overexploitation, community-wildlife conflict and trapping of wildlife species could be the major issues affecting wildlife composition and population.

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Introduction

Wetlands are amongst the most productive and dynamic ecosystems. Owing to their extensive and rich food webs, biological, ecological and cultural diversity, they are sometimes referred to as 'super-markets of biodiversity' [5]. During the last 50 years, number of dams in the world has increased from 5,000 to 45,000 [6]. Wildlife is an important part of our natural resources. The province of Sindh is rich in wildlife. Its unique wildlife has been protected in a network of protected areas spread over different ecosystems in the province. Earlier researchers have made a significant contribution in documenting the wildlife associated with the wetlands of Sindh Province [11,1,8,2].

Darawat dam is located near village Jhangri 20 km from Super Highway at about 70 kms West of Hyderabad and 135 km North West of Karachi across Nai Baran River in Thatta/Jamshoro districts of Sindh Province. It is located close to the Game

Reserves area in KPAC. It is situated in an area of semi arid and desert with sedimentary rocks. The hilly terrain run around the Dam. The Dam has a source of water from Hill torrential scattered over the area of 3150 km² in lower Kheirthar range. The topography of the upper catchment is sub-mountainous to hilly and plain. The area is generally barren with sparse vegetation at certain locations. 1,21,000 ft of flood water from its catchment area Nai Baran scattered over 3150 km² and irrigate 25,000 acre of district Thatta. This Dam will help in the socio-economic upliftment of remote areas of Sindh and to pave the way for irrigation, fisheries development, women emancipation, provision of water for domestic and drinking purpose, providing employment and recreational facilities as well. It supports large numbers of migratory waterbirds in the season. A number of fishes have also been found to flourish in the stored water of the dam. The area also has some important plant species peculiar to the area. As no data about the biological importance and

environmental assessment of the dam reservoir and its adjoining area are available, hence it is envisaged to compile data about the occurrence and distribution of the wildlife of the area.

The study will produce valuable data and update information about the wildlife resources of this newly created dam which may be utilized for better management of the species and their future survival. Present study was designed to investigate the species richness of mammals, birds, reptiles, amphibians and flora of Darawat Dam.

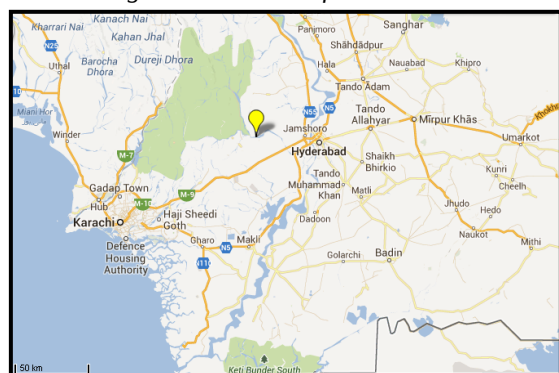
Fig. 1. A view of Darawat Dam



Materials and Methods

Field survey has been made to collect data about the mammals, birds, reptiles and plants in the selected localities and sampling points in the Protected Area. It has become a more specialized study as the impacts of this newly created water reservoir on the surrounding Protected Areas. This is the first study of its kind in this particular area. This reservoir (25° 24' 38.0 N 67°56' 37.4 E) was visited in the year of 2013 during the summer season. Data on wildlife species were collected by using different direct and indirect methods depending upon the taxa [9,10,3,12]. Mammals were observed by using Roadside Counts, Track Counts, Pellet Counts and Traps and trapping procedure. Birds were observed through binoculars and spotting scope. For reptiles and amphibians Plot Searching, Pitfall Traps, Turning of Stones, Rocks and Rotten Trees Process methods were used. Wildlife species were identified by using field guides and books [4,7,8]

Fig.2 Location of Darawat Dam



Result and Discussion

A total of 81 faunal species belonging to 16 orders and 31 families were recorded from the reservoir, including 14 (15.75%) species of mammals, 23 (66.99 %) birds, 8 (15.75 %) reptiles and three (1.47%) amphibians and 33 flora (Tables I-V).

A total of 14 mammals belonging to 9 families and six orders were recorded from the study belonged to three orders (1 from Insectivora, 3 from Carnivora, 3 from Artiodactyla, 1 from Lagomorpha, 1 from Pholidota and 5 from Rodentia). Urial and Chinkara were found here which inhabit an island within the reservoir. Significant mammals included Indian Porcupine (*Manis crassicaudata*), Asiatic Jackal (*Canis aureus*), Desert Hedgehog (*Hemiechinus collaris*), Desert Hare (*Lepus tibetanus*), Indian Gerbils (*Tatera indica*), Indian Desert Gerbil (*Meriones hurrianae*) House Mouse (*Mus musculus*) and Palm Squirrel (*Funambulus pennant*) (Table I).

During the present study, 14 species of mammals were recorded. Some Asiatic jackal, Indian porcupine, Indian Gerbil and Indian Desert Gerbil were observed quite frequently while Urial, Chinkara, Sindh Ibex, Indian Desert Cat, Jungel Cat and Indian Pangolin were rarely seen. Wild populations of Chinkara and Urial were found during the present study. The following species of mammals have been identified as species of special conservation interest being the indicator species viz. Urial, Chinkara, Information about the current status of Indian Pangolin which is quite rare in the area needs also to be Collected.

As many as 23 bird species belonging to 8 orders and 16 families were recorded (Table II). Little Grebe, Little Egret, Red –Wattled Lapwing, Little Stint, Indian Robin, Blue Rock Pigeon, Ring Dove, Little brown Dove, Indian Roller, Pied Bush Chat, Purple Sunbird, Crested Lark and White Cheeked Bulbul were recorded as common from the area, while Great White Pelican, Booted Hawk-Eagle, Lichtenstein Sandgrouse, Green Bee-eater, Blue Cheeked Bee-eater, Southern Grey Shrike and House Bunting were recorded as less common. Bonelli's Eagle and Chestnut bellied Sandgrouse were recorded as a rare species. Abundance and distribution range of these species are likely to increase in future.

Based on data 8 species of reptiles were recorded (Table III), including three species from family Gekkonidae, 3 species from Viperidae, 2 species from Agamidae and 1 species from Lacertidae.. Saw Scale Viper (*Echis carinatus*), Indian Monitor Lizard (*Varanus bengalensis*), Desert Monitor (*Varanus griseus*), Black Rock Agama (*Laudakia melanura*) and Blue -tail Lizard (*Acanthodactylus cantoris*) were recorded as less common from the area. A total of 3 amphibian species belonging to a single order

and 3 families were recorded (Table IV). Three species of amphibians reported from the reservoir are quite common throughout the country and occur in a fair number at the reservoir as well. A total of 33 species of flora were recorded from the study area viz. *Acacia jacquemontii*, *Acacia senegal*, *Aerva javanica*, *Prosopis juliflora*, *Aristida adscensionis*, *Capparis decidua*, *Euphorbia caducifolia*, *Limeum indicum*, *Indigofera oblongifolia*, *Zizyphus nummularia* etc.

Conclusion

The results here give an overall picture of bioecology of the area which will be further updated in future studies. Such information about the area is not available at present. This is the first study of its kind in relation to the documentation of fauna after creation of a new habitat and refuge particularly for the waterbirds. The study area has a complex of Wildlife Protected Areas all around which form a set

of sensitive and critical habitats. So the overall impacts of the creation of this important wetland system need to be taken into account. The near by area is liable to be affected by the impacts of development activities related to wind power and gas exploration projects, so the present data may be utilized in future environmental studies.

Recommendations

1. There is a dire need for the development of management plan for the conservation and sustainable use of reservoir's resources.
2. Ban on cutting of trees and other vegetation should be imposed. Community living near the reservoir must be provided with alternative source of livelihood so as to reduce their dependence on natural resources.
3. Local people should be provided with the opportunities for the bee-farming, fish farming, cattle farming, lily farming, etc. to increase their income.

Table I. Mammalian fauna of Darawat Dam

S.NO.	Order	Family	Scientific Name	Common Name	Status
1	Insectivora	Erinaceidae	<i>Hemiechinus collaris</i>	Desert Hedgehog	C
2	Carnivora	Canidae	<i>Canis aureus</i>	Asiatic Jackal	C
3	Carnivora	Felidae	<i>Felis silvestris</i>	Desert Cat	R
4	Carnivora	Felidae	<i>Felis chaus</i>	Jungle Cat	R
5	Artiodactyla	Bovidae	<i>Ovis vignei</i>	Urial	R
6	Artiodactyla	Bovidae	<i>Gazella bennettii</i>	Chinkara	R
7	Artiodactyla	Bovidae	<i>Capra aegagrus</i>	Sindh Ibex	R
8	Lagomorpha	Leporidae	<i>Lepus tibetanus</i>	Desert Hare	L/c
9	Pholidota	Manidae	<i>Manis crassicaudata</i>	Indian Pangolin	R
10	Rodentia	Sciuridae	<i>Funambulus pennanti</i>	Palm Squirrel	C
11	Rodentia	Hystriidae	<i>Hystrix indica</i>	Indian Porcupine	C
12	Rodentia	Muridae	<i>Mus musculus</i>	House Mouse	C
13	Rodentia	Muridae	<i>Tatera indica</i>	Indian Gerbil	C
14	Rodentia	Muridae	<i>Meriones hurrianae</i>	Indian Desert Gerbil	C

Table II. Avifauna of Darawat Dam

S.NO.	Order	Family	Scientific Name	Common Name	Status
1	Podicipediformes	Podicipedidae	<i>Pelecanus onocrotalus</i>	Great White Pelican	L/C
2	Podicipediformes	Podicipedidae	<i>Tachybaptus ruficollis</i>	Little Grebe	C
3	Ciconiiformes	Ardeidae	<i>Egretta garzetta</i>	Little Egret	C
4	Falconiformes	Accipitridae	<i>Hieraaetus pennatus</i>	Booted Hawk-Eagle	L/C
5	Falconiformes	Accipitridae	<i>Hieraaetus fasciatus</i>	Bonelli's Eagle	R
6	Charadriiformes	Charadriidae	<i>Vanellus indicus</i>	Red-Wattled Lapwing	C
7	Charadriiformes	Scolopacidae	<i>Calidris minutus</i>	Little Stint	C
8	Columbiformes	Columbidae	<i>Columba livia</i>	Blue Rock Pigeon	C
9	Columbiformes	Columbidae	<i>Streptopelia decaocto</i>	Ring Dove	C
10	Columbiformes	Columbidae	<i>Streptopelia senegalensis</i>	Little brown Dove	C

11	Pteroclidiformes	Pteroclididae	<i>Pterocles exustus</i>	Chestnut bellied Sandgrouse	R
12	Pteroclidiformes	Pteroclididae	<i>Pterocles lichtensteinii</i>	Lichtenstein Sandgrouse	L/C
13	Coraciiformes	Meropidae	<i>Merops orientalis</i>	Bee-eater	L/C
15	Coraciiformes	Meropidae	<i>Merops persicus</i>	Blue Cheeked Bee-eater	L/C
16	Coraciiformes	Coraciidae	<i>Coracias benghalensis</i>	Indian Roller	C
17	Passeriformes	Muscicapidae	<i>Saxicola caprata</i>	Pied Bush Chat	C
18	Passeriformes	Nectariniidae	<i>Nectarinia asiatica</i>	Purple Sunbird	C
19	Passeriformes	Turdidae	<i>Saxicoloides fulcata</i>	Indian Robin	C
20	Passeriformes	Laniidae	<i>Lanius excubitor</i>	Southern Grey Shrike	L/C
21	Passeriformes	Alaudidae	<i>Galerida cristata</i>	Crested Lark	C
22	Passeriformes	Emberizidae	<i>Emberiza striolata</i>	House Bunting	L/C
23	Passeriformes	Pyconotidae	<i>Pycnonotus leucogenys</i>	White Cheeked Bulbul	C

Table III. Reptilian fauna of Darawat Dam

S.NO.	Order	Family	Scientific Name	Common Name	Status
1	Squamata	Gekkonidae	<i>Hemidactylus brooki</i>	House Gecko	L/C
2	Squamata	Gekkonidae	<i>Crossobamon orientalis</i>	Yellow-tailed Sand Gecko	C
3	Squamata	Viperidae	<i>Echis carinatus</i>	Saw Scale Viper	L/C
4	Squamata	Varanidae	<i>Varanus bengalensis</i>	Indian Monitor Lizard	L/C
5	Squamata	Varanidae	<i>Varanus griseus</i>	Desert Monitor	L/C
6	Squamata	Agamidae	<i>Laudakia melanura</i>	Black Rock Agama	L/C
7	Squamata	Agamidae	<i>Calotes versicolor</i>	Garden Lizard	C
8	Squamata	Lacertidae	<i>Acanthodactylus cantoris</i>	Blue -tail Lizard	L/C

Table IV. Amphibian fauna of Darawat Dam

S.NO.	Order	Family	Scientific Name	Common Name	Status
1	Anura	Bufonidae	<i>Bufo stomaticus</i>	Indus valley toad	L/C
2	Anura	Ranidae	<i>Euphlyctis cyanophlyctis</i>	Skittering frog	L/C
3	Anura	Ranidae	<i>Hoplobatrachus tigerinus</i>	Bull frog	L/C

Status: L / c = Less common C = Common R = Rare

Table V. List of vegetation species found in the Darawat dam area

No	Plant name	Local Names:	Families Names:	Life Form.	Life Span.
1	<i>Acacia jacquemontii</i>	Buburi	Mimosaceae	Shrub	Perennial
2	<i>Acacia senegal</i>	Kor	Mimosaceae	Tree	Perennial
3	<i>Aerva javanica</i>	Booh	Amraranaceae	Sub-Shrub	Perennial
4	<i>Aristida adscensionis</i>	Lumb Gaah	Poaceae	Grass	Annual
5	<i>Boerhavia procumbense</i>	-	Nyctaginaceae	Herb	Annual
6	<i>Capparis decidua</i>	Kiror	Capparidaceae	shrub	Perennial
7	<i>Cassia italica</i>	senna/dadwhal	Caesalpiniaceae	Herb	Annual
8	<i>Commifera wightii</i>	Gogur	Burseraceae	shrub	Perennial
9	<i>Convolvulus prostratus</i>	-	Convolvulaceae	Herb	Annual
10	<i>Crotalaria burhia</i>	-	Fabaceae	Shrub	semi-perennial
11	<i>Cymbopogon jawarancusa</i>	Poi	Poaceae	Grass	Perennial
12	<i>Dactyloctenium aegyptium</i>	-	Poaceae	Grass	Annual
13	<i>Euphorbia caducifolia</i>	Tuor	Euphorbiaceae	Shrub	Perennial
14	<i>Euphorbia prostrata</i>	-	Euphorbiaceae	Herb	Annual
15	<i>Fagonia indica</i>	Pria	Zygophyllaceae	Shrub	Annual

No	Plant name	Local Names:	Families Names:	Life Form.	Life Span.
16	<i>Heliotropium crispium</i>	Kharsun	Boraginaceae	Herb	Annual
17	<i>Heliotropium europeum</i>	Kharsun	Boraginaceae	Herb	Annual
18	<i>Indigofera oblongifolia</i>	Jhile	Fabaceae	Herb	Annual
19	<i>Lasiurus indicus</i>	Sain	Poaceae	Grass	Perennial
20	<i>Leptadenia pyrotechnica</i>	Khip	Asclepiadaceae	shrub	Perennial
21	<i>Limeum indicum</i>	-	Aizoaceae	Herb	semi-perennial
22	<i>Lycium ruthanicum</i>	Garati	Solanaceae	Sub-Shrub	Perennial
23	<i>Ochthochloa compressa</i>	Gundir	Poaceae	Grass	Annual
24	<i>Panicum turgidum</i>	Ghim	Poaceae	Grass	Perennial
25	<i>Prosopis cineraria</i>	Gundo	Mimosaceae	Tree	Perennial
26	<i>Prosopis glandulosa</i>	Devi	Mimosaceae	Shrub	Perennial
27	<i>Prosopis juliflora</i>	Devi	Mimosaceae	Shrub	Perennial
28	<i>Rhazya stricta</i>	Sahaer	Apocynaceae	Shrub	Perennial
29	<i>Salvadora oleoides</i>	khavar/yar	Salvadoraceae	Tree	Perennial
30	<i>Stipagrostis plumosa</i>	Lumb Gaah	Poaceae	Grass	Annual
31	<i>Tamarix aphylla</i>	-	Tamaricaceae	Tree	Perennial
32	<i>Tribulus terrestris</i>	-	Zygophyllaceae	Herb	Annual
33	<i>Zizyphus nummularia</i>	Bir	Rhamnaceae	Small tree	Perennial

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