



## RESEARCH PAPER

## OPEN ACCESS

## Floral and faunal biodiversity and determination of negative incentives in Shella (Maslakh) Mountains, Quetta, Balochistan, Pakistan

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**Key words:** Maslakh, Fauna, Flora, Negative incentives, Positive need of actions

### Abstract

The objective of this study research was to investigate exact floral and faunal biodiversity in association with habitat status Shella Maslakh Mountains of Balochistan. This study work was carried out in 6 field trips from June 2020 to April 2021. During this research a total of 26 mammalian species were documented belonging to 6 orders and 13 families in the area. Order rodentia with 13, carnivora 4, artiodactyla 3, insectivora 3, lagomorpha 2, and chiroptera 1 species which few species were common while some were rare. Among the reptiles a total 21 species were recorded belonging to 2 orders including squamata 20 and testudines 1 species with 8 families. In amphibians 6 different species were recorded belonged to order anura with 2 families. In bird fauna 3 orders otidiformes, pterocliiformes, galliformes with one representative species for each family and order were recorded. In flora a total of 223 specimens with 21 different species were collected with 9 genera's including Artemisia 4, Haloxylon 2, chryosopogen 2, Chmbopogon 2, Astragaluse 3, Caarghana 1, Stocksia 1, Stocksii 5 and Peteropryrium 1 species representatives with a total of 8 families in which most common species are pterocaulas, microcarp, hermonis, Qaradaghens, brevicayllis, Griffithi, stocksii and maritima, vulgaris, propiedades, dracunnculus were found rare. Finding of this research work suggests that Maslakh Mountain rang has a great potential to run a healthy wildlife. Therefore, it is needed that intensive conservation of wildlife has to be preserved by government agencies for a viable and resources rich ecosystem.

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## Introduction

Balochistan is the fourth province of Pakistan. It is the wide-ranging province concerning land area, which is found in the southwestern region of the country but is the minimum populated. Quetta is the capital of this province which counts as the largest city of Balochistan. Balochistan shares borders with Khyber Pakhtoonkhwa and Punjab to the northeast, Sindh to the southeast and east, Iran to the west, and the Arabian Sea to the south, Afghanistan to the north and northwest (Gare., 2013). Quetta is the provincial capital of the Province of Baluchistan in Pakistan. It is also the largest city in Baluchistan. Which including in the 10th largest city of Pakistan. Located in northern Baluchistan and sharing a border with Afghanistan near and the road across to Kandahar, Quetta is basically a communication center and trade between two countries (Bibi *et al.*, 2015). The Bolan Pass route is near this city which is the major gateways from Central Asia to the south. According to (Ahmad, 1951) that Quetta's total geographical area is 26531km. Quetta has an area of 26531km (1,024 sq. mi).the longitude of Quetta is 66.996452 and the latitude of Quetta (Malkani., 2017). Baluchistan is 30.183270.location of Pakistan is coming at in the Cities place category with the GPS coordinates of 66°59' 47.2272" and 30 10'59.7720"N. But according (Anon,19980) that provincial city of Baluchistan is lying between 67-18 E and 67-44 E at an altitude 1700 meters and 30-3 and 3-27 and 66-44 N. Quetta, Pakistan attributes a continental arid climate with large dissimilarities between winter and summer temperatures. But according to (Razzaq *et al.*, 2014).

The climate of Quetta is totally arid and frigid (15 to -7C) and winter is too mild as (32 to 35C) in summer. But according to (Köppen-Geiger) Quetta climate is classified as cold and semi-arid climate zone it has low humidity and dry climate, frigid in winter in this city snowfall is receives in December, January, and February. Evolution of animals began 600 million over years ago in the ocean (Anderson., 1975).a high percentage of migratory birds over 30% (Roberts.,1991) Pakistan is arid and semi-arid regions

and 80% land area in case here 174 mammal species reported in Pakistan in which endemic and non-endemic subspecies (Robert., 1997) only 22 species of amphibians are recorded in which 9 is non-endemic and a number of marine species 29 fish species nine are snow trout (Hassan., 1997) Two breeds of buffalo, one of yalk, eight of cattle, 25 of goat, 28 of sheep reported in Pakistan (Usmani & Jasra 1993). Maslakh (shella) is located in the west of Quetta, but its eaten faces Quetta city. While Maslakh is a rural area of Quetta but north wise it is nearest to district Pishin and south wise it extends towards panjpai. It is almost 20km away from a Quetta city.in Maslakh we have shella which is protected area for conservation farming and rearing of karakul sheep and goats. This is protected by boundary walls no one is allowed to cut herbs and shrubs, and trees in the shella. More than less 3 to 4km square protected area for livestock as well this area is range protected area state forest area and wildlife sanctuary in which different type fauna and flora present. But sheep and goats endemic species of this area.

## Materials and methods

This work identified Maslakh areas Location, range, and climate, the habitat of fauna, flora, negative incentives, and positive need of actions. Through questionnaire a vast survey in six field trips were carried out in all ranges and conducted while walking preset travel in different routes and monitoring from different points, different locations, and two observation groups of 3-5 experienced observers went into the field each weak to observe natural habitat, of present fauna and flora in order to take pictures and to interview the nomadic communities, local hunters and also get record to shepherders and to get data from livestock departments.

### *Data collection and identification*

The data was collected in six filed trips from June 2020 to April 2021 in indicative central and peripheral areas from the Maslakh shella mountain range. Specimens were collected from all ranges and conducted while walking preset travel in different routes and monitoring from different points, different

locations, and two observation groups of 3-5 experienced observers went into the field each week to observe natural habitat, of present fauna and flora. Photos were taken and plants specimens were preserved for further analysis. In addition, data was also gathered from Nomadic communities, local hunters and also get record to shepherders and interviews with livestock departments, local resident.

#### *Location*

According (Rafi.M.,1965) Physiography Maslakh State forest is situated about 20 miles west of Quetta between 30° 3' N and 30° 21' latitude and 66° 31' E and 66° 49' E longitude. It extends over the western slopes of the Maslakh range. Maslakh peak at 7967 feet above sea level is the highest point while the lowest point in the valley is at 4613 feet. The topography of the hilly parts is rather rugged. The slopes extend down to the gentle ground and are strewn with a network of dry ravines. Grey and red shales of Swanlike without crops of sandstones occupy the area these shales are saturated with white slats and therefore, are a source of poor-quality water. The soil is shallow and is mostly covered with erosion pavement due to

server erosion; the texture of the soil in the valley is predominantly loamy fine and with very little organic matter content.

This mountain is stony Cliff which covers most of the khinjole tree and dance vegetable because in spring the rate of rainfall is too high.in case of high vegetation, most herds are found by beside of this protected area.

#### *Maslakh Forests*

Maslakh State Forest is covering an area of 1, 15,040 acres, and situated about 30km west of Quetta. The highest peak reaches 7967 feet above to sea level while the lowest point in the valley is at 4613 feet. The topography of the hilly tract is rather rugged. The slopes extend down to the gentle ground and are interspersed with dry ravines. The soils are shallow and are covered with erosion pavement. The soil texture is mostly loamy fine sand in the valleys with little organic content. The climate of the site is characterized by severe winters with hot and dry summers. The rainfall is erratic (Marwat, Q., & Khan, N. A. (1988).



**Fig. 1.** Rangeland of Maslakh with forages.

#### *Climate of area*

The climate of the area is the hot and dry high temperate type and winters are also cold and dry and summers are dry and bracing, dreg and lees occurs

more in winter. The highest maximum temperature in June is 38.8 and the lowest minimum temperature in December is -8.8 C. The persistent dry wind blows over the area for the greater part of the year.

*Land state*

The topography of the hilly tract is rather rugged. The slopes extend down to the gentle ground and are interspersed with dry ravines. The soils are shallow and are covered with erosion pavement. The soil texture is mostly loamy fine sand in the valleys with little organic content. This is protected by boundary walls no one is allowed to cut herbs and shrubs and trees in the sheila. More than less 3 to 4km square protected area for livestock as well this area is range protected area state forest area and wildlife sanctuary in which different type fauna and flora present.

*Refugees Hosting Area*

Maslakh area comprised of wasteland which was indiscriminately used for grazing by locals and powindahs. The fact remains that due to tremendous pressure during the past this State Forest has been badly depleted of ground cover and at places, the land has become barren.

Nearby to Maslakh State Forest lies a very big Afghan Refugee camp. The inmates have always been a source of damage by breaking the fence on several occasions and trying to forcibly enter to cause destruction to the vegetation leftover. The Range condition indicated that the Range is severely overgrazed at certain places, especially in areas close to the Afghan Refugee Camp because of the illicit grazing by flocks.

*Karakul sheep breeding farms*

Karakul sheep breeding farm Maslakh established in 1981-82, is situated about 45km west to the Quetta, with the objective to evolve Pak karakul sheep in Balochistan. For the implementation of the Karakul Sheep Breeding Farm Maslakh, Balochistan, Forest Department leased out 14575 ha (36000 Acre of Maslakh range out of the total of 46559 ha (115000 acres) to the Livestock and Dairy Development Department Balochistan. later the Livestock and Dairy Development Department Balochistan developed the infrastructure, which includes rest house, feed stores, medicine store and a quarter for class iv and pucca sheds at the main Daroo Station,

kaccha shed are also available at six different sites of the Maslakh range via Shella, Lower Daroo, Upper Daroo, Shinshobe, and Kodali Camps.

*Shella camp*

Shella camp is far about 16km from the main Daroo station, is comprised partially of hilly range tract, valley slopes, and bottom.

*Vegetation*

Vegetation present in this area *Artemisia maritima*, *Haloxylon Griffith*, and grasses type of *Chryosogon* and *Cymbopogon*.

*Lower Daroo*

Lower daroo is the main station where the department developed heavy structured for sheep raising activities in the Maslakh range. From this camp feed, medicines and other required items have been dispatched to the other camps located in the different areas of the Maslakh range. In the winter animals reared in others, camps are shifted to this camp to save them from cold.

*Vegetation*

Main vegetation type present in the area is *Artemisia*.

*Upper Daroo Camp*

This site is fivekm away from the main station, is comprised of the bottom of the valley with poor vegetation. The site is closed to the outside boundary of the Maslakh range shown heavy grazing, cutting/uprooting of the shrubs by the private animal flocks.

*Shinshobe camp*

The camp is located about 12km away from headquartering, is mainly comprised of the hilly and mountainous range.

*Vegetation*

*Artemisia maritima* is the major vegetation followed by *Haloxylon Griffith*, *Chryosogon aucheri*; in addition to these species a number of other shrubs are also present including *Aloonj*, *Astragalus* and *Caarghana* species.

*Kodali camp*

This camp is twentykm away from the main station, mainly comprised of hilly and mountainous range, with thick vegetation.

*Vegetation*

The following vegetation is present in the area. *Stocksia brahvia* (Kohtor), *Cousinia stocksii*, *Chryospogon aucheri*, *Artemisia*, *Peteropyruim*, *Astragalus*, etc.

**Result and discussion**

*Mammalian fauna*

On the basis of observation and consult and the studies undertaken in in different ecological zones and the peripheral and central protected area of sheila Maslakh (Fig.2). In this case 26 species of mammals which

belonging to 6 order and 13 families were observed during present study (Table.01) which include afghan hedgehog, Brandt's Hedgehog, Balochistan short tailed shrew (insectivore) (Fig.3 b) Greater Horse Shoe Bat, (chiroptera) Indian Wolf, Asiatic Jackal, common red fox, Striped Hyaena, (carnivore), angora goat, domestic goat, Beriberi, khurasani, morak, Baluchi dumda, mengali, taraki, shinwari, araghi, farhani, Kermani, khurasani, naenini, neini, yazdi (Artiodactyla) (fig.3a) cape hare, afghan pika, (Lagomorpha) migratory hamster ,mouse like hamster, Forest Dormouse, Small Five ,Toad Jerboa ,Indian Crested Porcupine, Roof or House Rat, Sundevall's Jird, Grey Spiny Mouse ,Persian Jird, Afghan Mole Vole Sand Colored Rat, Short Tail Rat, (Rodentia).



**Fig. 2.** central area of sheila Maslakh.

**Table 1.** Detailed taxonomic account of mammals of Maslakh sheila.

Order	Family	Common name	Scientific name
Insectivore	Erinaceidae	Afghan Hedgehog	<i>Hemiechinus auritus</i>
		Brandt's Hedgehog	<i>Paraechinus hypomelas</i>
Chiroptera	Soricidae	Balochistan short tailed shrew	<i>Crocidura gmelini</i>
	Rhinolophidae	Greater Horse Shoe Bat	<i>Rhinolophus ferrummequinum</i>
	Canidae	Indian Wolf	<i>Canis lupus</i>
Carnivora	Hyaenidae	Asiatic Jackal	<i>Canis aureus</i>
		Common Red Fox	<i>Vulpes vulpes</i>
		Striped Hyaena	<i>Hyaena hyaena</i>
		Angora goat/ Domestic goat	<i>Capra aegagrus hircus</i>
		Baluchi dumda, mengali, taraki, shinwari, araghi, farhani	<i>Ovis aries</i>
Artiodactyla	Bovidae	Kermani, khurasani, naenini, neini, yazdi	<i>Ovis aries</i>
Lagomorpha	Leporidae	Cape Hare	<i>Lepus capensis</i>
	Ochotonidae	Afghan Pika	<i>Ochotona rufescens</i>
	Cricetidae	Migratory hamster	<i>Cricetulus migratorius</i>
		Mouse like Hamster	<i>Calomyscus bailwardi</i>
	Gliridae	Forest Dormouse	<i>Dryomys nitedula</i>
	Dipodidae	Small Five Toad Jerboa	<i>Allactaga elater</i>
	Hystriidae	Indian Crested Porcupine	<i>Hystrix indica</i>
Rodentia	Muridae	Roof or House Rat	<i>Rattus rattus</i>
		Sundevall's Jird	<i>Meriones crassus</i>
		Grey Spiny Mouse	<i>Mus saxicola</i>
		Persian Jird	<i>Meriones persicus</i>
		Afghan Mole Vole	<i>Ellobius fuscocapillus</i>
		Sand Colored Rat	<i>Millardia gleadowi</i>
		Short Tailed Mole Rat	<i>Nesokia indica</i>
House Mouse	<i>Mus musculus</i>		



**Fig. 3.** showing (a) Angora goat (*Artiodactyla*) (b) spiny ant eater) Insectivore.

**Reptiles**

A total of 21 reptiles species were observed in present study in shella Maslakh in which 2 order and 8 family (Table 2.) in which Caucasian Rock Agama, Common Field Agama, Gard Lizard/ Common.

Tree Lizard, Ocellate Ground Agama, Kumooan mountain lizards, Badakhshana rock agama, (squamata) (Fig. 4) Kachh Spotted Ground Gecko, Persian House Gecko, Persian Sand Lacerta, kharan spider gecko, Baluch Rock gecko, Baluchistan sand gecko, Desert monitor, Persian fringe toed lizard, Pointed snouted racerunner, Small spotted lizards or long tail lizard, Golden Wolf Snake, Indian cobra, Persian Horned Viper, Central Asian/ Afghan Tortoise (Testudines) (Fig.6).

**Table 2.** Detailed taxonomic account of reptiles of Maslakh Shella.

Order	Family	Common Name	Scientific Name	
Squamata	Agmidae	Caucasian Rock Agama	<i>Laudakia caucasia</i>	
		Common Field Agama	<i>Trapelus agilis</i>	
		Garden Lizard/ Common Tree Lizard	<i>Calotes versicolor</i>	
		Ocellate Ground Agama	<i>Trapelus megalonyx</i>	
		Kumooan mountain lizards	<i>japalura kumaonensis</i>	
	Gekkonidae	Badakhshana Rock Agama	<i>paralaudakia</i>	
		Kachh Spotted Ground Gecko	<i>Cryptopodian kachhense</i>	
	Varanids	Lacertidae	Persian House Gecko	<i>Hemidactylus persicus</i>
			Persian Sand Lacerta	<i>Eremias persica</i>
			kharan spider gecko	<i>rhinogekko femoralis bunopus tuberculatus</i>
Baluch rock gecko			<i>crossobamon</i>	
Baluchistan sand gecko			<i>eversmanni</i>	
Desert monitor		<i>Varanus g.koniecznyi</i>		
Lacertidae		Persian fringe toed lizard	<i>Acanthodactylus micropholis</i>	
		Pointed snouted racerunner		
		Small spotted lizards or long tail lizard	<i>eremias acutorostris</i>	
			<i>Messalina guttulata</i>	
		<i>Lycodon striatus</i>		
Coluebrida	Golden Wolf Snake			
Elapidae	Indian Cobra	<i>Naja Naja</i>		
Viperidae	Persian Horned Viper	<i>Pseudocerastes persicus</i>		
Testudines	Testudinidae	Central Asian/ Afghan Tortoise	<i>Agrionemys horsfieldii</i>	



**Fig. 4.** spotted ground gecko) squamata.



Fig. 5. Golden Wolf Snake) squamata.



Fig. 6. Afghan tortoise.

*Amphibians*

A total 9 specimens of amphibians are recorded in present study in Maslakh sheila in which 1 order and 2 families (Table.3). In which Zugmayer’s Toad/ baloch Green Toad, Indus Valley Toad, Baloch toad ,Balochistan Karez frog, Common Skittering Frog, Baluch Mountain Frog (Fig.1).



Fig. 6. (Bufonidae) (Source: Maslakh rest house lowers Daroo.

Table 3. Detailed taxonomic account of amphibians of Maslakh sheila.

Order	Family	Common name	Scientific name
Anura	Bufonidae	Zugmayer’s Toad/ baloch Green Toad	<i>Bufo viridus</i>
		Indus Valley Toad	<i>Bufo stomatsicus</i>
		Baloch toad	<i>Chrysopaa sternosignata</i>
		Balochistan Karez frog	<i>Chrysopaa sternosignata</i>
		Common Skittering Frog	<i>Euphlyctis</i>
Ranidae		Baluch Mountain Frog	<i>Cyanophlyctis paa sternosignata</i>

*Avian fauna*

According study it has been observed that in birds that total 43 soecimens with 3 orders and 3 families including (otidiformes, Pterocliiformes, Galliformes and 3 different families’ otidiformes, pteroclididae, phasianidae.

Table 4. Detailed taxonomic account of birds of Maslakh sheila.

Order	Family	Common name	Scientific name
Otidiformes	Otididae	Houbara bustard	<i>Chlamydotis undulate</i>
Pterocliiformes	Pteroclididae	Crowned sandgrouse	<i>Pterocles coronatus</i>
Galliformes	Phasianidae	See see partridge	<i>Ammoperdix griseogularis</i>

*Flora of Maslakh*

The range of Maslakh presents many varieties of herbs, Shrubs, weeds, wild forages, medicinal plants, that are major source of feed and energy for sheep and goats rising in the farm. A total of 223 specimens of plants were collected from sheila Maslakh habitat in which 21 plants of 8 families in which asteraceae, amaranthaceous, poaceae, legume, fabaceae, spindaceae, compositae, polygonsceae. All these plants were widely spread on the range of the Maslakh which are favorably grazed by animal’s which shown in (table 5).





**Fig. 7.** Beautiful yellow and red tulips of Maslakh range in spring.

**Table 5.** Detailed taxonomic account of plants with local name.

Family	Genus	Species
Asteraceae	Artemisia	(i) <i>Maritima</i>
		(ii) <i>Vulgaris</i>
		(iii) <i>Propiedades</i>
		(iv) <i>Dracumuculus</i>
Amaranthaceae	Haloxylan	(i) <i>Grifithi</i>
		(ii) <i>Stocksii</i>
Poaceae	Chryosopogen	(i) <i>Aucheri</i>
		(ii) <i>Gryllus</i>
	Chmbopogon	(i) <i>Jwarancusa</i>
		(ii) <i>Citratus</i>
Legume	Astraguluse	(i) <i>Racemosus</i>
		(ii) <i>Crassicarpus</i>
		(iii) <i>Reventus</i>
Fabaceae	Caarghana	(i) <i>Arborescen</i>
Spindaceae	Stocksia	(i) <i>Brahuica</i>
Compositae	Stocksii	(i) <i>Pterocaulos</i>
		(ii) <i>Microcarpa</i>
		(iii) <i>Hermonis</i>
		(iv) <i>Qaradaghens</i>
		(v) <i>Brevicayllis</i>
Polygonaceae	Peteropryrium	(i) <i>Scoporium</i>

*Negative insensitive of wildlife*

*Conservation*

Wildlife utilization and protection involves different advantages. Which should take to gain excellent results economic insensitive and instrument are developed for these purpose.

The western style protection and ecotourism projects are dangerous for wildlife because they destroyed the environmental and according to the controversial new book them replace and criminalizing the local people.

The economic insensitive in the wildlife conservation is the most important to examine this study. The main objective of this study is variety of host and

wildlife. The aims are as follows that the economic believe for the conservation of wildlife used the best resources which involved in this harvesting. If the both habitat and harvesters are “homogeneous “in which the achievement are small from ELS.

The two main modification are in order, the first, is the control of harvesting the role of ELS may moderate; we disagree that the interrelation ELS may be great significance in case when it comes to habitat conservation. Second one is the first step for the best management of resources the economists setting up characteristics and land it helps. Because this first step must be completed by additional ELS to happen at a honestly global optimum, however, is not certain some time additional order and control measure to be selected and sometime no additional measure are needed. Economic efficiency and various failure environment economics has become an major subject. The reality that some wild animals and flora is endangers can be observe a best form of environmental injury.

Therefore, plans from environmental economics are applicable to wildlife organizations. First step economic productivity relate to increase of the benefits of human beings with in a society, economic measure welfares using a beneficial standard and substitute in term of economic surplus that present to economic agent in their capability as consumers and produces. The surplus accruing to consumer is given by the difference around the advantage that they get from consuming a bundle of good and services. The producer’s surplus is defined as the difference around the revitalization from the sale of goods and services and the cost of providing them.

*Needed actions*

According to study wildlife is necessary for life because wildlife has ability to stable food chain. Over killing of animals may distribute many other food chain and also used for gene preserving as the process of gene pool. It has been observed that by conserving of wildlife we can save many species from extinction and certain of animals we can leads animal by



ecological imbalance in nature and animals have their three basic needs in which food, water, and shelter and as a natural sources such as nectar, nuts, leaves, seeds and insects are necessary for keeping and attracting wildlife and all animals need water and also protection and save places for raising their young's from predators and bad weather. There 7 billion people on earth and more than and everyone is committed to it every day We need to protect wildlife by our minor actions which can major impact it possible that time when we work together by different ways we can make it possible.

Awareness among the people about endangered species and recommend about that how to save through provide information about their habitats and should be visit the convention on international trade to know about endangered species of flora and fauna cites. Visits regularly parks and different zoos to make sure to preserve endangered species and try to inform the responsible officers and inform about their habitats. Teacher should be spread awareness about endangered species to their and threatened students.

#### *Protect endangered species*

The endangered species protection as an affective safety net for imperils species and can prevent extinction species by follow instruction .and can help by to end to inhuman snare and traps if you see endangered species non target such as birds, dogs, cats immediately seek veterinary care for this anima and next report your local human society AWI and efforts to pass laws to bane inhuman snares and traps.

#### *Support federal states and local legislation*

To manage wildlife contact wildlife agency whenever you saw the cruel traps or snares and if you or someone else hires nuisance wildlife control business to address wildlife conflict situation and don't allowed them for using traps and snares and also asked trapping polices.

#### *Help protect birds*

Every day I billion birds die each year due to collision with buildings and try to learn reduce bird's strikes by making windows and make birds friendly.

### **Conclusion and recommendation**

It is concluded that Maslakh mountain range is situated in a very appropriate place for wildlife and has the capacity to host and adjust a successful wildlife because it has enough plants for herbivores to graze, and can also maintain food chain for a self-sustainable ecosystem. It is recommended that all government agencies are requested to arrange awareness workshops to community near to this mountain. Because people are still unaware of the importance of wildlife of this mountain. Many people prey wild animals without any license. Due to this, the population of the above-mentioned animals is declining day by day. The degradation of natural habitat is needed be restored for wild animals. Moreover, standard signposts for the attentiveness of masses about animals should be displayed in this mountain. To conclude, the competent authorities are also requested to launch some projects regarding awareness and rehabilitation of wildlife in Maslakh.

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### **Conflict of interest**

The author has no conflicts of interests.

### **References**

- Ahmad M.** 1951. KASHMIR IN THE UNITED NATIONS. Pakistan Horizon **4(4)**, 217-232.
- Ali MH.** 1980. Protection and management of wildlife in Baluchistan. In International Seminar on Organizing Wildlife Management in Developing Countries, November 10-12, 1980, Pakistan Forest Institute, Peshawar, Pakistan.

- Anderson JM.** 1975. The enigma of soil animal species diversity. In *Progress in soil zoology* (pp. 51-58). Springer, Dordrecht.
- Anwar M, Jasra AW, Ahmad I.** 2008. Biodiversity conservation status in Pakistan-a review. *The Pakistan Journal of Forestry* **58(1)**, 39.
- Ashraf M, Routray JK.** 2015. Spatio-temporal characteristics of precipitation and drought in Balochistan Province, Pakistan. *Natural Hazards* **77(1)**, 229-254.
- Bibi T, Ahmad M, Tareen NM, Jabeen R, Sultana S, Zafar M, Zain-ul-Abidin S.** 2015. The endemic medicinal plants of Northern Balochistan, Pakistan and their uses in traditional medicine. *Journal of ethnopharmacology* **173**, 1-10.
- Ghalib SA, Jabbar ABDUL, Khan AR, Zehra A.** 2007. Current status of the mammals of Balochistan. *Pakistan journal of Zoology* **39(2)**, 117.
- Hasan SA.** 1997. Biography and diversity butterflies of northeast area of Himalayas. In mufti. S. A., CA. Woods and S. A Hassan (Eds.). *Biodiversity in Pakistan: PMNH* pp181-204.
- Kayani SA, Masood AYEESHA, Achakzai AKK, Anbreen S.** 2007. Distribution of secondary metabolites in plants of Quetta-Balochistan. *Pakistan Journal of Botany* **39(4)**, 1173.
- Khan MZ, Siddiqui S.** 2009. Studies on bioecology and fauna of Hazarganji Chiltan National Park and development of ecotourism in protected areas. *Canadian Journal of Pure and Applied Sciences* **5(1)**, 1371-1384.
- Malkani MS, Mahmood Z, Shaikh SI, Arif SJ, Alyani MI.** 2017. Mineral resources of Balochistan province, Pakistan. *Geological Survey of Pakistan, Information Release* **1001**, 1-43.
- Marwat Q, Khan NA.** 1988. Phyto-ecological studies in Maslakh range forest Pishin, Baluchistan [Pakistan]. *Pakistan Journal of Forestry (Pakistan)*.
- Rafi M.** 1965. *Vegetation types of Baluchistan province.* Pak. Govt. Printing Press. Punjab. Lahore Pakistan 116.
- Robert TJ.** 1997. *The Mammals of Pakistan.*In *Global Diversity assessment of Pakistan* Oxford University press 1744pp.
- Roberts TJ.** 1991. *The Birds of Pakistan: Passeriformes: Pittas to Buntings (Vol. 2).* Oxford University Press, USA.
- Usmani RH, Jasra AW.** 1993. Efficient Utilization of Genetic Diversity of Farm Animals in Pakistan. *Progressive Farming* **13(5)**, 68-74.