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Ecological Adaptations, Diversity and Threats to Amphibians and Reptiles in the Cholistan Desert, Pakistan

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SUMMARY

The abundance and geographic range of several species of wildlife, specifically herpetofauna, are determined by climate and landscape. Amphibians and reptiles serve as bioindicators, play an active role in the food web, and are essential components of a healthy environment. There are 25 amphibians and 195 reptiles in Pakistan; while 8052 species of amphibians and 10369 species of Reptiles in all over the world. Amphibians are the world's most threatened species, and reptiles also face significant threats. This study aims to document the ecological trends, diversity and threats to amphibians and reptiles in the Cholistan Desert, Pakistan. The data were collected through the linear count method along with direct (i.e., physical count with the help of binoculars) and indirect observations (meetings with local people, carcasses, skins, bones, etc.) from Cholistan Desert. Data were collected by a team of five people from December 2024 to November 2025. During the survey, 7 species of amphibians, belong to 4 families, and 1 order; while 32 species of reptiles, belong to 13 families, and 2 orders are documented from the study area. Shannon-Wiener diversity index for amphibians and reptiles in Cholistan was 0.56 and 1.24, respectively. The richness index and evenness index of reptiles were higher than that of amphibians.

Keywords: Diversity, Amphibian, Reptiles, Cholistan

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INTRODUCTION

Amphibians are the world's most threatened species, and reptiles also face significant threats. Numerous studies have shown the environmental and human-centered importance of both groups (de Jesús Cervantes-López and Morante-Filho, 2024; Mouane et al., 2024). Amphibians and reptiles are ecologically important because of their relationship with both aquatic and terrestrial habitats (Moreno-Rueda and Comas, 2023). Their movement cycles critical elements like phosphorus, carbon, and nitrogen, which improves the ecosystem's general health (Taylor et al., 2021). They play an important role in multiple food webs as both prey and predators, and as poikilotherms (Hao et al., 2025). Numerous predators rely on amphibians and reptiles for a steady supply of food and nutrients. Amphibians' substantial prey consumption

on a daily basis makes them effective regulators of biomass in lower trophic levels, contributing to ecological stability (Bogenreuther et al., 2024), and they are also acting as biological controls against pests such as mosquitos, biting flies, and crop-damaging arthropods (Jamil et al., 2022).

The abundance and geographic range of several species of wildlife (Altaf, 2016), specifically herpetofauna, are determined by climate and landscape (Mi et al., 2023). Their decrease or extinction could disrupt plant ecosystems, life decay of waste and nitrogen cycling, predator-prey relationships, and invertebrate numbers. There are 25 amphibians and 195 reptiles in Pakistan (Khan, 2006); while 8052 species of amphibians and 10369 species of Reptiles in all over the world (www.iucnredlist.org).

Knowledge of the processes that control spatial variation in biodiversity has been a key subject in ecological science for many years, but our understanding of the causes is limited, especially with regard to amphibians and reptiles. Studies indicate that species diversity in these groups is modestly to highly associate with a variety of environmental conditions (Băncilă et al., 2023). While both water and climate are important explanatory factors for amphibians and reptiles, water variables explain more variance in amphibian diversity, whereas temperature-related variables explain more variability in reptile species richness. This variation correlates with the varied physiological needs of both groups (Biber et al., 2023).

Pakistan is classified as an arid region and consists of 225 significant wetlands, 19 of which are designated as Ramsar sites (Altaf et al., 2014). The Convention on Wetlands, also known as the Ramsar Convention, recognizes wetlands as having global importance. Wetlands provide benefits and services, including provisioning (food and fibre production), water balance, resupply of groundwater, and flood and storm mitigation, as well as aesthetic and social advantages, such as sacred and religious significance, recreational and tourist attractions, and supporting functions like soil formation and sediment retention (Farheen et al., 2022). Pakistan confronts considerable hurdles in sustaining its forest cover, which accounts for less than 4.68% of its total surface area due to dry and semi-arid climates and human-caused issues. Illegal use, wood exploitation, and small-scale farming all contribute to the yearly decline of these forests. These all factors are directly or indirectly impacts on the diversity and distributions of amphibians and reptiles (Batool et al., 2025). This study aims to document the ecological trends and diversity of amphibians and reptiles in the Cholistan Desert, Pakistan. Additionally, it seeks to assess variations in reptile diversity. It is also noted anthropogenic impacts on amphibians and reptiles of study area.

MATERIALS AND METHODS

STUDY AREA

The Cholistan Desert, also known as Rohi, is located in the Bahawalpur Division of Punjab, Pakistan. It spans an area of 25,800 km². The nearest major city is Bahawalpur, situated just 30 kilometers from the desert's edge. Cholistan stretches approximately 480 kilometers in length and varies in width from 32 to 192 kilometers. Sand comprises 81% of the desert, while alluvial flats and small sandy dunes make up the remaining 19%. The region is significantly affected by

desertification, primarily due to inadequate vegetation cover, which leads to wind erosion. Climate of Cholistan is an arid and semi-arid tropical desert with extremely low humidity. The average temperature of Cholistan is 28.33°C, with July being the hottest month with a mean temperature of 38.5°C. Summer temperatures can exceed 46°C, and during droughts, they can even reach 50°C. Winter temperatures can infrequently drop to 0°C. Cholistan has an average rainfall of up to 180mm, with the wettest months being July and August, while droughts are common (Rasheed et al., 2022; Hussain and Altaf, 2023).

Xeromorphic taxa are those that have adapted to flourish in many different kinds of ecological conditions, which include high aridity, salinity, climate fluctuations, and limited energy availability. The eastern half of the desert receives considerable rainfall, usually up to 200 mm per calendar year, which results in thicker vegetation cover than the southern area, known as the hyper-arid region, which receives less than 100 mm throughout the year. In addition, geographical location, soil composition, and other physiological characteristics have a substantial impact on plant distribution and the structure of communities (Arshad et al., 2002; Noureen et al., 2008; Hussain and Altaf, 2023).

METHODOLOGY

The data were collected through the linear count method along with direct (i.e., physical count with the help of binoculars) and indirect observations (meetings with local people, carcasses, skins, bones, etc.) from Cholistan Desert. Data were collected by a team of five people from December 2024 to November 2025. For correct identification field guides were used i.e. Field Guide to the Amphibians and Reptiles of Pakistan (Khan, 2006). Data were collected from sub areas of Cholistan i.e. Derawar Fort, Moujgarh, Nawakot, Bijnot, Khairgarh Fort and Islamgarh (Figures 1 and 2).

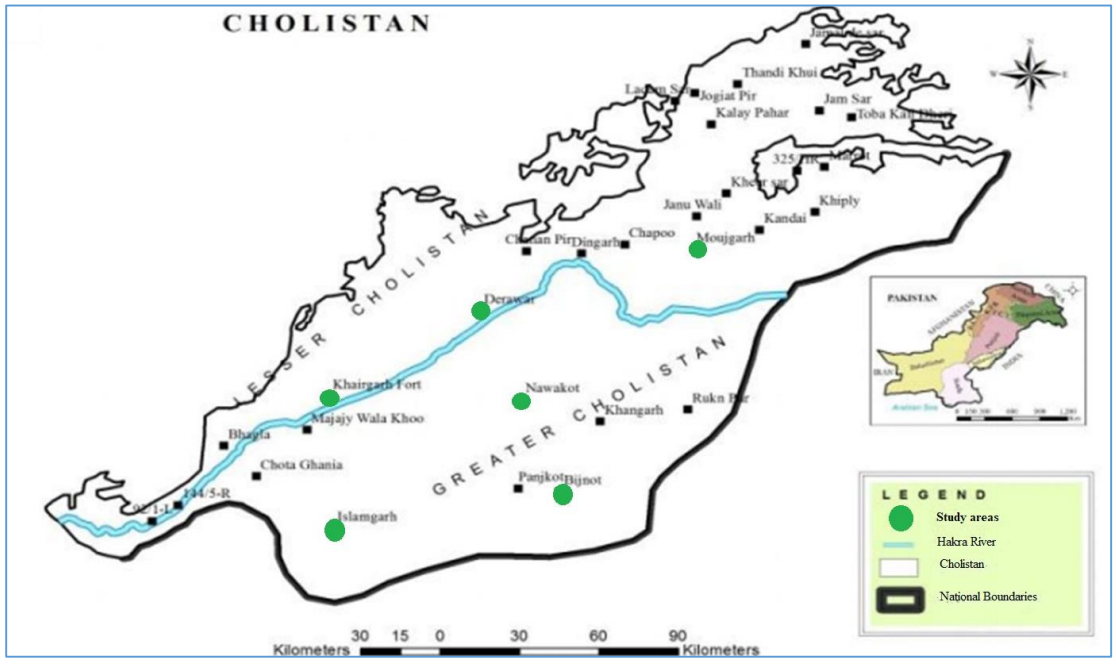

Figure 1: Map of Cholistan (Haider et al., 2021).

Figure 2: Landscape, researchers and respondents of the study area.

STATISTICAL ANALYSIS

Shannon-wiener diversity index is analyzed in order to recognize the amphibian and reptile diversity in different landscapes. It is analyzed with the help of following formula given (Weaver, 1963) as:

$$H' = -[\Sigma PiLogPi]$$

Where, H' = Shannon-wiener diversity index and
Pi= relative abundance

Richness index (R), is analyzed (Margalef, 1951) with the help of formula given:

$$R = (S - 1)/\log N,$$

Where S= total species and
N = total population documented during surveys.

Evenness index (E) is analyzed by Pielou (1966).

$$E = H'/ \log S$$

Where S= total species and
H' is the Shannon-wiener diversity index
The data were analyzed, and graphs in the manuscript are constructed with the use of MS Excel.

RESULTS AND DISCUSSION

PROFILE OF RESPONDENTS

The data were collected from Muslim respondents (n = 112), comprising both male and female individuals with diverse occupations, including teachers, students, private employees, farmers, and doctors. Most respondents are young (18 to 28 years old)

and middle-aged (29 to 50 years old). Most of them were literate, while a few were uneducated (n=37). Most of the respondents live in rural areas (n=72), while others live in urban areas (n=40) (Figure 3).

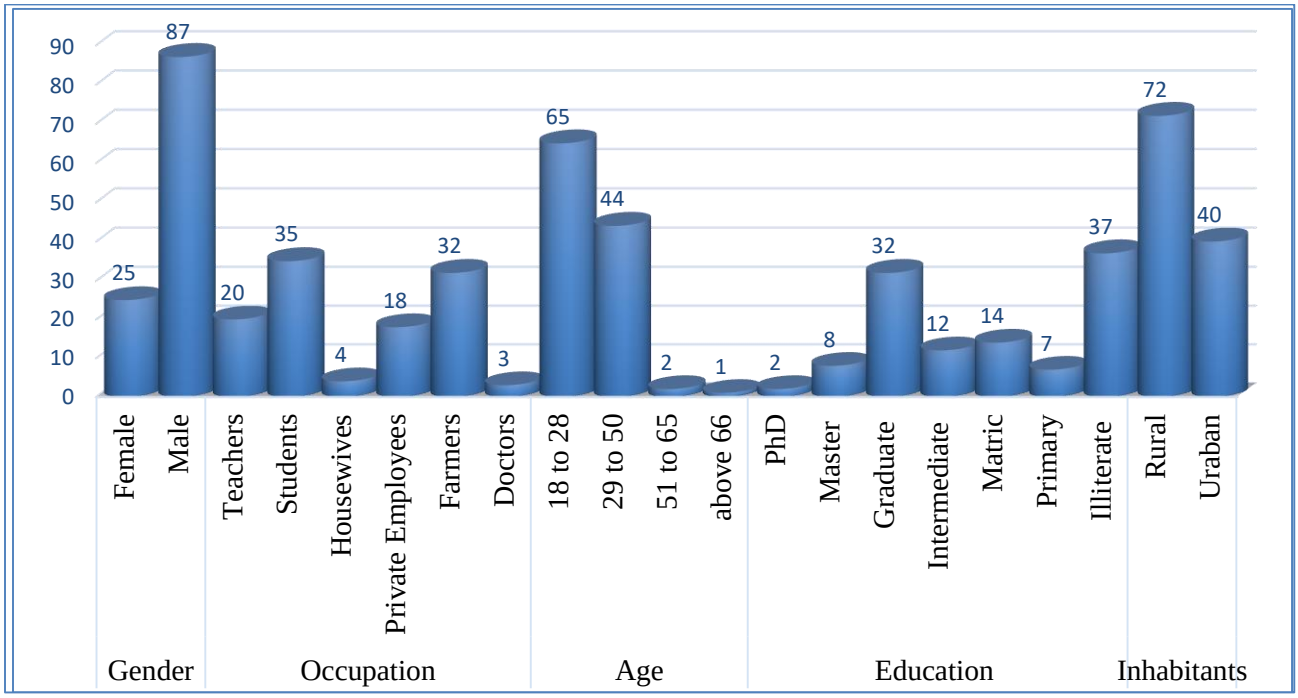

Figure 3: Profile of respondents of the Cholistan, Punjab, Pakistan.

DIVERSITY OF AMPHIBIANS AND REPTILES

During the survey, 7 species of amphibians (Table 1), i.e., *Bufo stomaticus, Microhyla ornate, Fejervarya limnocharis, Fejervarya syhadrensis, Hoplobatrachus tigerinus, Euphlyctis cyanophlyctis,* and *Duttaphrynus melanostictus,* belong to 4 families, i.e., Ranidae, Bufonidae, Microhylidae, and Dicroglossidae (Figure 4), and 1 order, i.e., Anura, noted from the study area. While 32 species of reptiles, i.e., *Chitra indica, Aspideretes gangeticus, Lissemys punctata andersoni, Kachuga smithii, Hemidactylus flaviviridis, Crossobamon orientalis, Trapelus agilis, Trapelus megalonyx, Calotes versicolor, Saara hardwickii, Acanthodactylus cantoris, Eutropis dissimilis, Eutropis macularia, Ophiomorus tridactylus, Varanus bengalensis, Varanus griseus koniecznyi, Eremias* cholistanica, *Ramphotyphlops braminus, Typhlops ductuliformes, Leptotyphlops macrorhynchus, Eryx johnii johnii, Boiga trigonata, Lytorhynchus paradoxus, Xenochrophis piscator, Psammophis condanarus, Ptyas mucosa, Spalerosophis arenarius, Spalerosophis atriceps, Bungarus caeruleus, Naja naja,* and *Echis carinatus,* belong to 13 families: Boidae, Geoemydidae, Leptotyphlopidae, Uromastycidae, Elapidae, Lacertidae, Typhlopidae, Varianidae, Agamidae, Gekkonidae, Scincidae, Trionychidae, and Colubridae (Figure 5), and 2 orders, i.e., Testudines and Squamata (Figure 6), are documented from the study area (Table 1). During the survey, look for amphibians and reptiles in various regions of the Cholistan Desert. Over 4,000 specimens from 44 different species have been documented and seen in the research region (Baig et al., 2008).

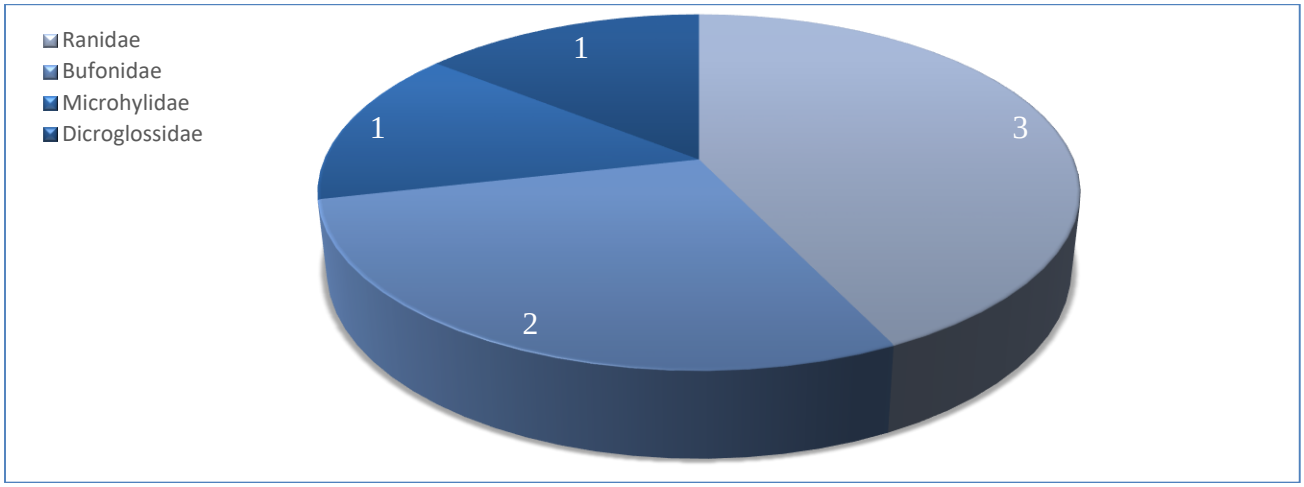

Figure 4: Families of amphibians in the study area.

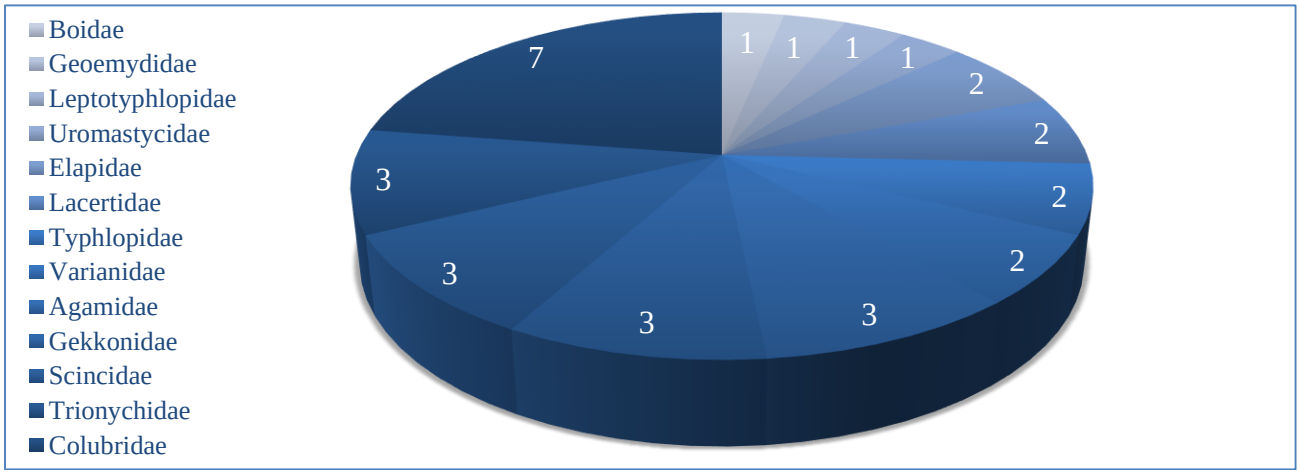

Figure 5: Families of reptiles in the study area.

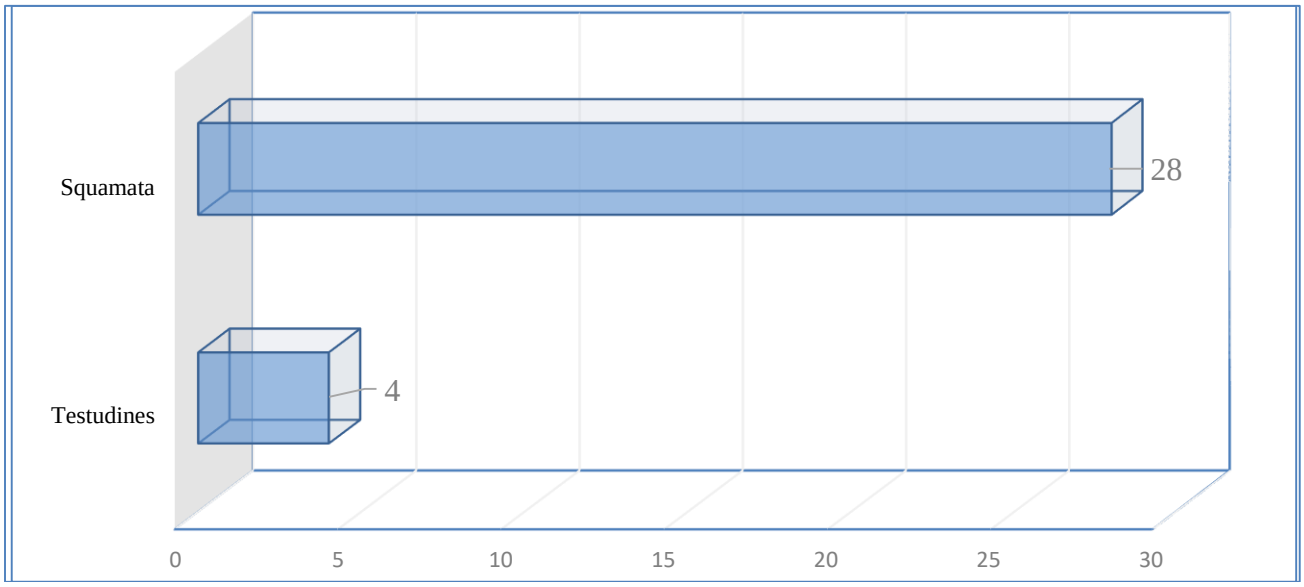

Figure 6: Orders of reptiles in the study area.

DIVERSITY INDICES OF AMPHIBIANS AND REPTILES

Shannon-Wiener diversity index for amphibians and reptiles in Cholistan was 0.56 and 1.24, respectively. The richness index of reptiles was higher (H' = 7.566) than that of amphibians (H' = 1.755). Similarly, the evenness index was higher in reptiles (E = 0.821) than in amphibians (E = 0.755) (Figure 7). While 28 species were documented from Daphar Forest Sanctuary, district Mandi Bahauddin, Pakistan. Shannon Wiener variety index was 1.33, evenness was 0.92, and the Margalef score was 10.9 (Adil et al., 2020). The Shannon–Wiener diversity index from this study indicates relatively low amphibian diversity and moderate reptile diversity in the Cholistan Desert. This finding is consistent with previous research in Pakistan's arid and semi-arid regions, where harsh climates, limited water resources, and extreme temperature fluctuations hinder amphibian populations while favoring more adaptable reptile species. Earlier studies in desert ecosystems, including the Thar, Thal, and certain areas of the Cholistan region, have similarly reported reduced amphibian diversity, which is attributed to their dependence on permanent or seasonal water sources (Baig et al., 2006; Baig et al., 2008; Hamid et al., 2021a). In contrast, reptiles exhibit greater diversity and wider ecological ranges due to physiological adaptations that enable effective water conservation and thermoregulation. The higher richness index for reptiles compared to amphibians reinforces this trend, highlighting greater species diversity and niche differentiation among reptiles in desert environments (Baig et al., 2008). Furthermore, the greater evenness index found in reptiles suggests a more equitable distribution of individuals across reptile species, whereas amphibian communities appear to be dominated by a limited number of tolerant species.

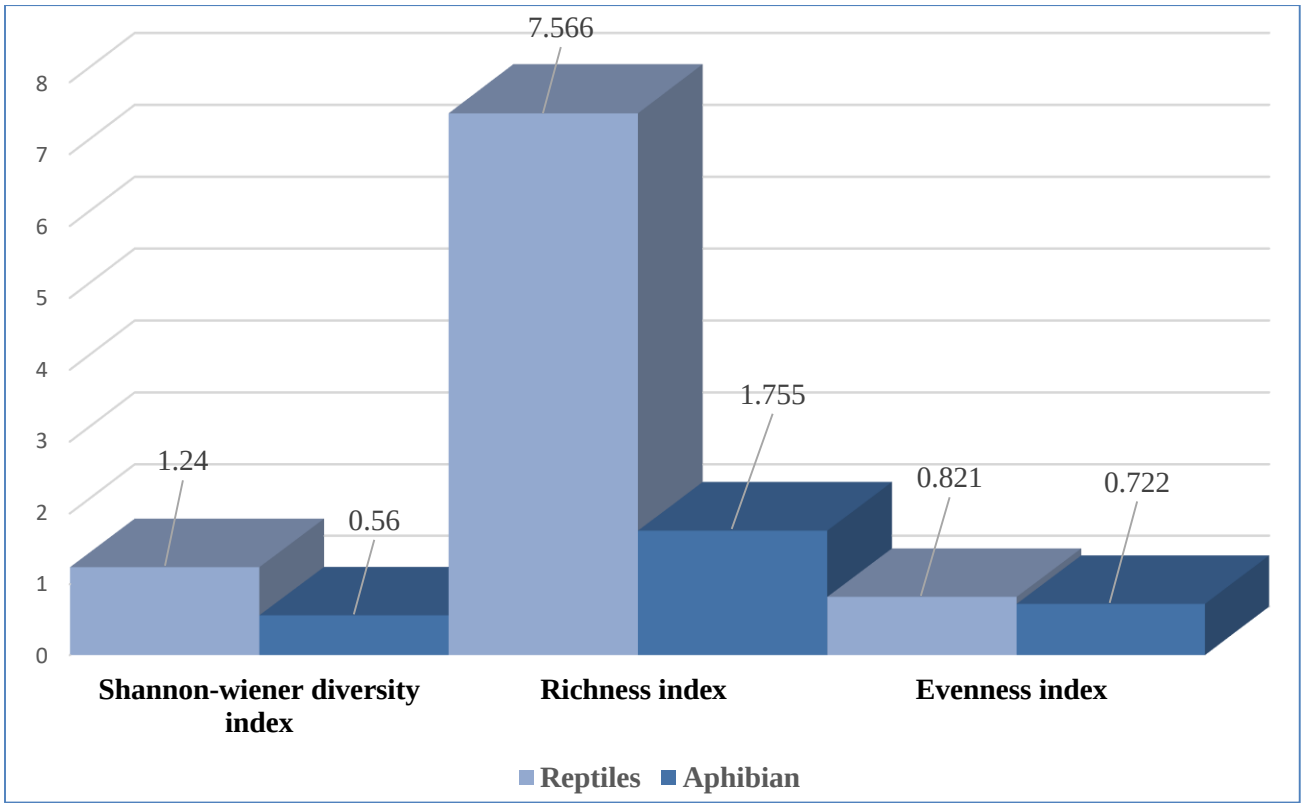

Figure 7: Diversity indices of amphibians and reptiles of study area.

AMPHIBIANS AND REPTILES ABUNDANCE

During the study, the highest relative abundance was reported for the Sindi awl-head sand snake (RA=0.097), followed by further population decreases in the Yellow-bellied House Gecko (RA=0.096), Brahminy blind snake (RA=0.095), Indian or Bengal Monitor (RA=0.091), Eastern Saw-scaled Viper (RA=0.088), Brown roofed turtle (RA=0.088), Common Spiny-tailed Lizard (RA=0.086), Indian Cobra (RA=0.083), Checkered Keelback (RA=0.081), Pakistan Desert Monitor (RA=0.015), Indian Flapshell Turtle (RA=0.014), Red-Spotted Diadem Snake (RA=0.013), Black-headed Royal Snake (RA=0.012), Sindh Sand Gecko (RA=0.012), Pakistan Agilis Agama (RA=0.011), Striped Desert Lacerta (RA=0.011), Ocellate Ground Agama (RA=0.011), Slender Pakistani Blind Snake (RA=0.011), Sind Gecko (RA=0.010), Common Krait (RA=0.010), Bronze Grass Skink (RA=0.009), Garden Lizard (RA=0.009), Indian Fringe-toed Sand Lizard (RA=0.009), Afghan Sand Swimmer (RA=0.008), Striped Grass Skink (RA=0.007), Indian Sand Snake (RA=0.007), Indian Sand Boa (RA=0.006), Indian Gamma Snake (RA=0.005), Indian Soft-shell Turtle (RA=0.002), Beaked Thread Snake (RA=0.002), Rat Snake (RA=0.001), while the lowest number of species documented was the Narrow-headed Softshell Turtle (RA=0.001) (Table 1).

It is noted that among the amphibian species, the Asian common toad (RA=0.459) was documented as the highest populated species, while the population decreased further with the Asian common toad (RA=0.459), Indus valley toad (RA=0.370), Bullfrog (RA=0.053), Alpine cricket frog (RA=0.041), Ant frog (RA=0.032), Southern cricket frog (RA=0.025), and the lowest populated species being the Indian skipper frog (RA=0.021) (Table 1).

STATUS OF AMPHIBIANS AND REPTILES BY IUCN

During the study, it was noted that out of 32 species of reptiles, 24 species (i.e. Yellow-bellied House Gecko, Sindh Sand Gecko, Pakistan Agilis Agama, Ocellate Ground Agama, Garden Lizard, Indian Fringe-toed Sand Lizard, Sind Gecko, Striped Grass Skink, Bronze Grass Skink, Afghan Sand Swimmer, Pakistan Desert Monitor, Brahminy Blind Snake, Slender Pakistani Blind Snake, Beaked Thread Snake, Indian Gamma Snake, Sindi Awl-head Sand Snake, Checkered Keelback, Indian Sand Snake, Rat Snake, Red-Spotted Diadem Snake, Black-headed Royal Snake, Common Krait, Indian Cobra, and Eastern Saw-scaled Viper) have no threats and belong to Least Concern (LC) by IUCN. Additionally, one species (i.e. Striped Desert Lacerta) has no exact knowledge and is included in the category of Data Deficient (DD). It is noted that out of 32 species of reptiles, two species (i.e. Indian Flapshell Turtle and Common Spiny-tailed Lizard) are Vulnerable, two species (i.e. Narrow-headed Softshell Turtle and Indian Soft-shell Turtle) are Endangered (EN), and three species (i.e. Brown Roofed Turtle, Indian or Bengal Monitor, and Indian Sand Boa) have no present threats but may have future threats and are categorized as Near Threatened (NT) (Figure 8). All seven species of amphibians belong to Least Concern and have no major threats according to IUCN (Table 1).

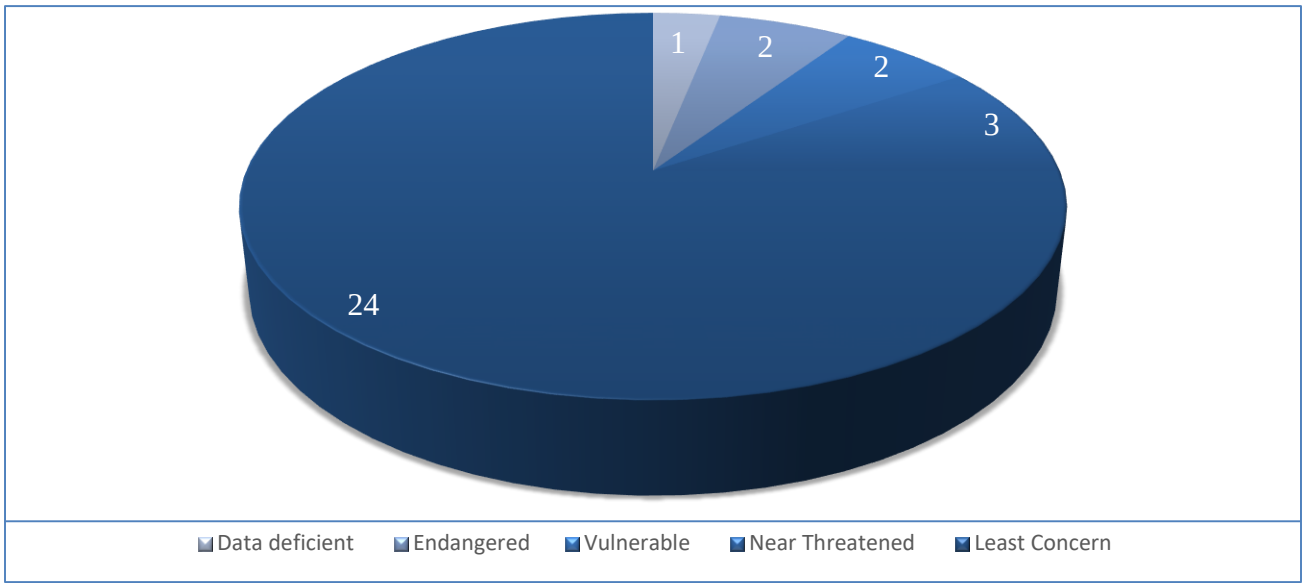

Figure 8: Status of the reptiles of the study area.

Narrow-headed Softshell Turtle *Chitra indica*

This species is Endangered (EN) by IUCN, and to be genetically evolved to have a more diversified reproductive seasonality than the sympatric soft-shelled genus *Nilssonia*; however, despite this adaptability, it attracts both natural and human predators to its nests. Human exploitation of *C. indica* eggs exceeds natural predation, posing a major concern and potentially influencing the population's status over its entire region of existence (IUCN, 2000).

Indian Soft-shell Turtle *Nilssonia gangetica*

Indian Soft-shell Turtle (Figure 9) is Endangered (EN) by IUCN, and has been heavily exploited for local consumption as well as international and regional trade across its range in recent decades and continues to do so now. Exploitation of (illegal) global trade to East Asia expanded considerably in the last years of the 19th century. Subsequently, the business appears to have shifted from live specimens to processed meat, specifically 'calipee,' the dried and processed cartilage-covered part of the carapace. Over 16,400 living specimens were confiscated from illegal commerce in 19 cargoes between 2000 and 2015, making it the fourth most frequently seized CITES-listed turtle species and the most frequently seized Appendix I turtle species (CITES CoP17 Doc73). Seized calipee cargoes can be massive and are typically not identifiable by species. In certain regions, like the Indus basin, animals are persecuted by fishermen who view them as a annoyance. Researchers also observed that habitat destruction in the Ganga and Mahanadi rivers has impacts these species (Ahmed et al., 2021).

OVERALL THREATS

During the present investigation, several threats were found that adversely affected herpetofauna. The interference of human beings is unnecessary, resulting in loss of amphibian and reptile diversity, geographic distribution, and ecological balance. People used to kill herpetofauna in the studied areas for a lot of reasons, including

ethnomedicine (Faiz et al., 2022; Khan et al., 2024), superstition, folklore (Iqbal et al., 2023), tool use (Bashir et al., 2023), financial advantage, amusement, decorative purposes (Altaf et al., 2020), magical beliefs (Adil et al., 2022), religion, and perceived food and other benefits (Bashir et al., 2021; Hamid et al., 2021b), resulting in a decline in the overall diversity and distribution of herpetofauna.

Figure 9: Threatened species of reptiles of the Cholistan desert, Punjab, Pakistan.

People who travel to these areas often discharge garbage, particularly into waterways, which is an additional significant anthropogenic cause of the decline in biodiversity. Water scarcity affects not only plant survival but also amphibian and reptile species and their breeding sites. Animals are often feared and attempt to escape, but in many cases, they are killed as targeted animals in the surrounding areas. Additionally, the previously available water sources in the affected area are depleting. Furthermore, increases in harmful substances in soil and water, pollutants in the air, and non-biodegradable garbage in cities, farming, and countryside regions are having an immense effect on forest cultivation, the availability of water to forests, and amphibian and reptile species, which include not only the number of genera but also the variety of individuals that live within each species. Human-herpetofauna conflict is substantially greater than that with other species because these are typically the most despised and potentially hazardous animals. They are perceived as dangerous. People's basic idea and belief regarding amphibian and reptile species is to observe and kill them; however, harming herpetofauna can indirectly result in the mortality of human beings.

CONCLUSION

This research highlights that, despite various identified risks, desert environments host a rich abundance and diversity of amphibians and reptiles. However, several species, including the Indian Flapshell Turtle, the Common Spiny-tailed Lizard, the Narrow-headed Softshell Turtle, the Indian Softshell Turtle, the Brown Roofed Turtle, the Indian or Bengal Monitor, and the Indian Sand Boa, are experiencing rapid declines. The primary threats to these species include human-wildlife interaction, conflict, and anthropogenic impacts, with overhunting significantly contributing to the decline of the Common Spiny-tailed Lizard. Consequently, many species are at risk of extinction in the region. This study aims to establish a baseline for future research on the impact of ecological factors on herptile assemblages.

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Table 1: Diversity of amphibian and reptiles of Cholistan, Punjab, Pakistan.

Sr.	Common Name	*Scientific name*	Species authority	Status	Family	Order	Pi	LogPi	PiLogPi
Amphibians									
1	Indus valley toad	*Bufo stomaticus*	Lütkin, 1863	LC	Bufonidae	Anura	0.370	-0.432	-0.160
2	Ant frog	*Microhyla ornata*	Dúmeril and Bibron, 1841	LC	Microhylidae	Anura	0.032	-1.500	-0.047
3	Alpine cricket frog	*Fejervarya limnocharis*	Dubois, 1987	LC	Ranidae	Anura	0.041	-1.386	-0.057
4	Southern cricket frog	*Fejervarya syhadrensis*	Annandale, 1919	LC	Ranidae	Anura	0.025	-1.606	-0.040
5	Bullfrog	*Hoplobatrachus tigerinus*	Daudin, 1802	LC	Ranidae	Anura	0.053	-1.276	-0.068
6	Indian skipper frog	*Euphlyctis cyanophlyctis*	(Schneider, 1799)	LC	Dicroglossidae	Anura	0.021	-1.679	-0.035
7	Asian common toad	*Duttaphrynus melanostictus*	(Schneider, 1799)	LC	Bufonidae	Anura	0.459	-0.338	-0.155
							H'		-0.56
Reptiles									
1	Narrow-headed Softshell Turtle	*Chitra indica*	Gray, 1831	EN	Trionychidae	Testudines	0.001	-3.018	-0.003
2	Indian Soft-shell Turtle	*Aspideretes gangeticus*	Cuvier, 1825	EN	Trionychidae	Testudines	0.002	-2.682	-0.006
3	Indian Flapshell Turtle	*Lissemys punctata andersoni*	Webb, 1980	VU	Trionychidae	Testudines	0.014	-1.867	-0.025
4	Brown roofed turtle	*Kachuga smithii*	(Gray, 1863)	NT	Geoemydidae	Testudines	0.088	-1.056	-0.093
5	Yellow-bellied House Gecko	*Hemidactylus flaviviridis*	Rüppell, 1835	LC	Gekkonidae	Squamata	0.096	-1.018	-0.098
6	Sindh Sand Gecko	*Crossobamon orientalis*	Blanford, 1876	LC	Gekkonidae	Squamata	0.012	-1.921	-0.023
7	Pakistan Agilis Agama	*Trapelus agilis*	Rastegar-Pouyani, 1999	LC	Agamidae	Squamata	0.011	-1.951	-0.022
8	Ocellate Ground Agama	*Trapelus megalonyx*	Günther, 1864	LC	Agamidae	Squamata	0.011	-1.967	-0.021
9	Garden Lizard	*Calotes versicolor*	Daudin, 1802	LC	Agamidae	Squamata	0.009	-2.056	-0.018
10	Common Spiny-tailed Lizard	*Saara hardwickii*	(Gray, 1827)	VU	Uromastycidae	Squamata	0.086	-1.068	-0.091
11	Indian Fringe-toed Sand lizard	*Acanthodactylus cantoris*	Günther, 1864	LC	Lacertidae	Squamata	0.009	-2.056	-0.018
12	Sind Gecko	*Crossobamon orientalis*	(Blanford, 1876)	LC	Gekkonidae	Squamata	0.010	-2.000	-0.020
13	Striped Grass Skink	*Eutropis dissimilis*	(Hallowell, 1860)	LC	Scincidae	Squamata	0.007	-2.143	-0.015
14	Bronze Grass Skink	*Eutropis macularia*	(Blyth, 1853)	LC	Scincidae	Squamata	0.009	-2.025	-0.019
15	Afghan Sand Swimmer	*Ophiomorus tridactylus*	(Blyth, 1853)	LC	Scincidae	Squamata	0.008	-2.076	-0.017

16	Indian or Bengal Monitor	*Varanus bengalensis*	(Daudin, 1802)	NT	Varianidae	Squamata	0.091	-1.043	-0.094
17	Pakistan Desert Monitor	*Varanus griseus koniecznyi*	Mertens, 1954	LC	Varianidae	Squamata	0.015	-1.818	-0.028
18	Striped desert lacerta	*Eremias cholistanica*	Baig and Masroor, 2006	DD	Lacertidae	Squamata	0.011	-1.951	-0.022
19	Brahminy blind Snake	*Ramphotyphlops braminus*	(Daudin, 1803)	LC	Typhlopidae	Squamata	0.095	-1.022	-0.097
20	Slender Pakistani blind Snake	*Typhlops ductuliformes*	Khan, 1999	LC	Typhlopidae	Squamata	0.011	-1.977	-0.021
21	Beaked Thread Snake	*Leptotyphlops macrorhynchus*	(Jan, 1862)	LC	Leptotyphlopidae	Squamata	0.002	-2.796	-0.004
22	Indian Sand Boa	*Eryx johnii johnii*	(Russell, 1801)	NT	Boidae	Squamata	0.006	-2.252	-0.013
23	Indian Gamma Snake	*Boiga trigonata*	(Schneider, 1802)	LC	Colubridae	Squamata	0.005	-2.319	-0.011
24	Sindi awl-head sand snake	*Lytorhynchus paradoxus*	(Günther, 1875)	LC	Colubridae	Squamata	0.097	-1.014	-0.098
25	Checkered Keelback	*Xenochrophis piscator*	(Schneider, 1799)	LC	Colubridae	Squamata	0.081	-1.090	-0.089
26	Indian Sand Snake	*Psammophis condanarus*	(Merrem, 1820)	LC	Colubridae	Squamata	0.007	-2.168	-0.015
27	Rat Snake	*Ptyas mucosa*	(Linnaeus 1758)	LC	Colubridae	Squamata	0.001	-2.842	-0.004
28	Red-Spotted Diadem Snake	*Spalerosophis arenarius*	(Boulenger, 1890)	LC	Colubridae	Squamata	0.013	-1.888	-0.024
29	Black headed royal snake	*Spalerosophis atriceps*	(Fischer, 1885)	LC	Colubridae	Squamata	0.012	-1.912	-0.023
30	Common Krait	*Bungarus caeruleus*	(Schneider, 1801)	LC	Elapidae	Squamata	0.010	-2.004	-0.020
31	Indian Cobra	*Naja naja*	(Linnaeus, 1758)	LC	Elapidae	Squamata	0.083	-1.081	-0.090
32	Eastern Saw-scaled Viper	*Echis carinatus*	Stemmler, 1964	LC	Viperidae	Squamata	0.088	-1.054	-0.093
							H'		-1.24