



# International Journal of Innovative Research in Science Engineering and Technology (IJIRSET)

*(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)*



**Impact Factor: 8.699**

**Volume 14, Issue 3, March 2025**

# **Impact of Urbanization on the Degradation of Aravalli Hills and its Consequences on Avian Diversity**

**Dr. Sangeeta Rathore, Bhim Singh Solankey**

Associate Professor & Head, Department of Zoology, B.N. University, Udaipur, Rajasthan, India

PhD Research Scholar, Department of Zoology, B.N. University, Udaipur, Rajasthan, India

**ABSTRACT:** Increased urbanization in Kankarda-Bhonabay has impacted the Aravalli hills, due to this, the bird species living here were also affected. Therefore, the present study was conducted in the Aravalli hills of Ajmer. The current study was to estimate the prevalence of Aravalli hills of Ajmer and the bird diversity found these and to prepare a list. A total of 47 species belonging to 32 families were observed during the study for eighteen months, from June 2023 to November 2024. Point count method (line transect method) was used to observe the dominance of bird species in these Aravalli hills. These observed birds were classified on the basis of their food and habitat.

**KEYWORDS:** Aravalli Hills, Urbanization, Bird diversity, Biodiversity, Urban encroachment, Habitat, Conservation.

## **I. INTRODUCTION**

The Aravalli Hills, among the world's oldest mountain ranges, are a vital ecological asset and biodiversity hotspot in India. These hills provide essential habitats for numerous avian species, both resident and migratory, thereby supporting ecological balance and enriching the region's natural heritage. However, escalating urbanization and anthropogenic pressures have led to significant degradation of the Aravalli Hills, particularly in urban settings, posing a critical threat to bird diversity.

The loss of vegetation, habitat fragmentation, and rising pollution levels are altering the delicate ecosystem that sustain avian life. Birds, as sensitive bioindicators, reflect the health of their environment, and their declining diversity signals a pressing ecological crisis. Addressing this challenge requires a deeper understanding of the interplay between urban-induced habitat loss and its impact on avian populations.

This study investigates the effects of urban encroachment on the Aravalli Hills and explores its implications for bird diversity. By analyzing these dynamics, the research aims to provide actionable insights for conservation strategies and sustainable urban development, ensuring the preservation of avian habitats and the ecological integrity of the region.

## **II. MATERIAL AND METHOD**

Kankarda-Bhonabay is located in the Northern part of Ajmer at 26.49 degrees latitude and 74.68 degrees longitude. It is situated on the both side of the Ajmer to Jaipur National highway no.08. It is spread over an area of 7 to 8 km. Binoculars Bushnells (1000meter range) were used to observe birds. Canon SX 430D power shot camera was used in photography to identify birds. Birds were observed mostly during their active time which was from 6:00am to 8:00am every day. The nomenclature of these observed birds is based on Manakdan R, Pittie A (2001). Standardized common and scientific name of the birds of the Indian subcontinent is based on *Buceros* 6(1): 1-37. Birds were classified in to different categories on the basis of their food like carnivorous, insectivorous, fruit eaters, omnivorous and grass eaters.



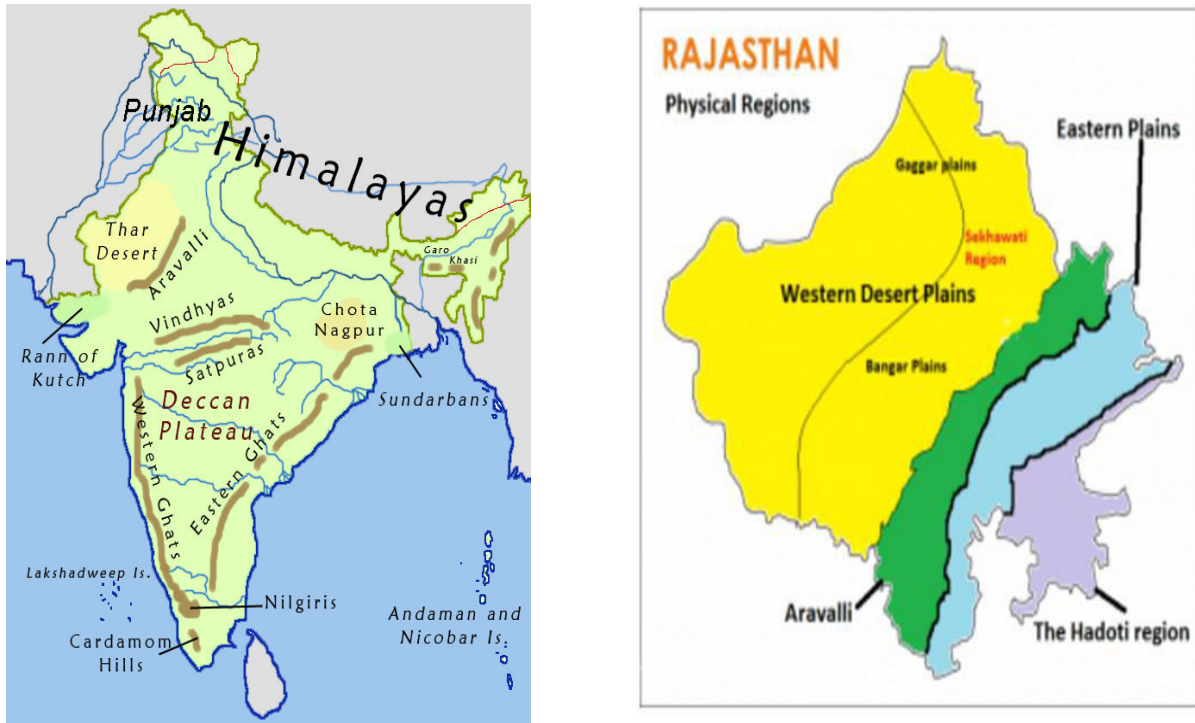


Figure 1: Study area of highlighted with in map of Rajasthan.

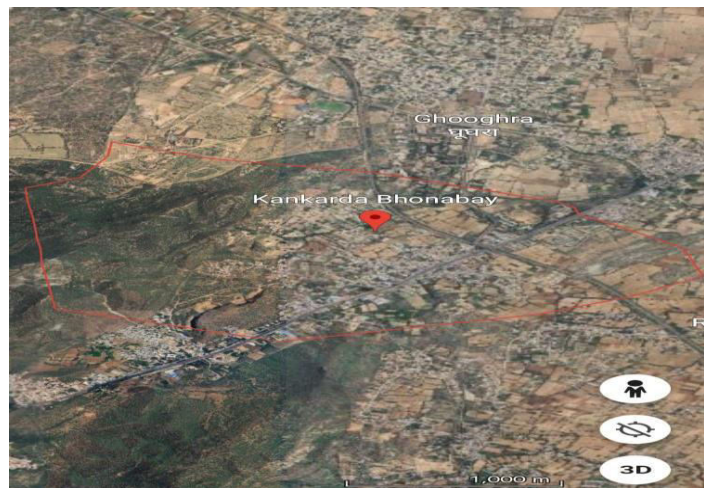
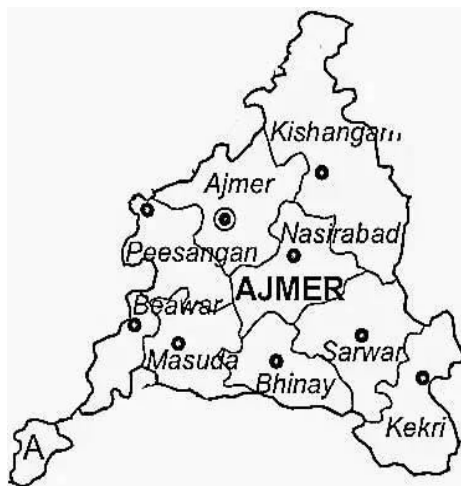


Figure 2: Satellite map of study area with highlighted Aravalli hills of Kankarda-bhonabay Ajmer.

**Data collection and Analysis:** - Relative Diversity (R Di) –

$$R Di = \frac{\text{Number of bird species in family}}{\text{Total number of species}} \times 100$$

Table No.1: Avifauna of Aravalli hills of Kankarda-bhonabay, Ajmer, Rajasthan.

S. No.	Common Name	Family & Scientific Name	Food Category
	<b>Grebes</b>	<b>Podicipedidae</b>	
1	Little Grebe	<i>Tachybaptus ruficollis</i> (Pallas,1764)	Carnivorous
	<b>Hérons, Egrets</b>	<b>Ardeidae</b>	
2	Little egret	<i>Egretta garzetta</i> (Linnaeus,1766)	Carnivorous
3	Grey Heron	<i>Ardea cinerea</i> (Linnaeus,1758)	Carnivorous
4	Cattle egret	<i>Bubulcus ibis</i> (Linnaeus,1758)	Carnivorous
5	Indian Pond Heron	<i>Ardeola grayii</i> (Sykes, 1832)	Carnivorous
	<b>Cormorant</b>	<b>Phalacrocoracidae</b>	
6	Little cormorant	<i>Microcarbo niger</i> (Vieillot,1817)	Carnivorous
	<b>Lapwings</b>	<b>Charadriidae</b>	
7	Red wattled Lapwing	<i>Vanellus indicus</i> (Boddaert,1783)	Omnivorous
	<b>Stilts</b>	<b>Recurvirostridae</b>	
8	Black winged stilt	<i>Himantopus Himantopus</i> (Linnaeus,1758)	Omnivorous
	<b>Kingfishers</b>	<b>Alcedinidae</b>	
9	White throated Kingfisher	<i>Halcyon smyrnensis</i> (Linnaeus,1758)	Carnivorous
	<b>Wagtails</b>	<b>Motacillidae</b>	
10	White wagtail	<i>Motacilla alba</i> (Linnaeus,1758)	Insectivorous
	<b>Sandpipers</b>	<b>Scolopacidae</b>	
11	Common Sand Piper	<i>Actitis hypoleucos</i> (Linnaeus,1758)	Carnivorous
	<b>Moorhens</b>	<b>Rallidae</b>	
12	Common Moorhen	<i>Gallinula chloropus</i> (Linnaeus,1758)	Omnivorous
13	White Breasted Water hen	<i>Amaurornis phoenicurus</i> (Pennant,1769)	Omnivorous
	<b>Mynas &amp; Starlings</b>	<b>Sturnidae</b>	
14	Common Myna	<i>Acridotheres tristis</i> (Linnaeus,1766)	Granivorous
15	Brahminy Starling	<i>Sturnus pagodarum</i> (Gmelin, 1789)	Granivorous
	<b>Kites, Eagles, Hawks</b>	<b>Accipitridae</b>	
16	Black kite	<i>Milvus migrans</i> (Desfontaines,1789)	Carnivorous
17	Shikra	<i>Accipiter badius</i> (Gmelin,1788)	Carnivorous
	<b>Cuckoos, Coucals</b>	<b>Cuculidae</b>	
18	Acean Koel	<i>Eudynamys scolopecea</i> (Linnaeus, 1758)	Omnivorous
19	Greater Cocual	<i>Centropus sinensis</i> (Stephens, 1815)	Omnivorous
	<b>Owls</b>	<b>Strigidae</b>	
20	Spotted owlet	<i>Athene brama</i> (Temminck,1821)	Carnivorous
	<b>Hoopoes</b>	<b>Upupidae</b>	

21	Common Hoopoe	Upupa epops (Linnaeus, 1758)	Insectivorous
	<b>Rollers</b>	<b>Coraciidae</b>	
22	Indian Roller	Coracias benghalensis (Linnaeus, 1758)	Carnivorous
	<b>Pigeons &amp; Doves</b>	<b>Columbidae</b>	
23	Red Collared Dove	Streptopelia tranquebarica (Hermann, 1804)	Granivorous
24	Eurasian Collared Dove	Streptopelia decaocto (Frisch, 1838)	Granivorous
25	Laughing Dove OR Little brown Dove	Streptopelia senegalensis (Linnaeus, 1766)	Granivorous
26	Blue Rock Pigeon	Columba livia (Gmelin, 1789)	Granivorous
	<b>Parakeets</b>	<b>Psittacidae</b>	
27	Rose Ringed parakeet	Psittacula kramera (Scopoli, 1769)	Frugivorous
	<b>Pheasants, Quails</b>	<b>Phasianidae</b>	
28	Grey Francolin	Francolinus pondicerianus (Gmelin, 1789)	Omnivorous
29	Rock bush quail	Perdix argoondah (Sykes, 1832)	Omnivorous
30	Indian pea fowl	Pavo cristatus (Linnaeus, 1758)	Omnivorous
	<b>Crows &amp; Treepies</b>	<b>Corvidae</b>	
31	House crow	Corvus splendens (Vieillot, 1817)	Omnivorous
32	Indian treepie OR Rufous treepie	Dendrocitta vagabunda (Latham, 1790)	Frugivorous
	<b>Drongos</b>	<b>Dicruridae</b>	
33	Black drongo	Dicrurus macrocercus (Vieillot, 1817)	Insectivorous
	<b>Bulbuls &amp; Babblers</b>	<b>Pycnonotidae</b>	
34	Red vented bulbul	Pycnonotus cafer (Linnaeus, 1766)	Frugivorous
35	Jungle babbler	Turdoides striatus (Dumont, 1823)	Omnivorous
36	Common babbler	Turdoides caudatus (Dumont, 1823)	Omnivorous
	<b>Robins</b>	<b>Turdinae</b>	
37	Indian Robin	Socioloides fuscata (Linnaeus, 1766)	Insectivorous
	<b>Chats</b>	<b>Muscicapidae</b>	
38	Brown rock chat OR Indian chat	Cercomela fusca (Blyth, 1851)	Insectivorous
	<b>Sparrows</b>	<b>Passerinae</b>	
39	House sparrow	Passer domesticus (Linnaeus, 1758)	Granivorous
	<b>Weavers</b>	<b>Ploceinae</b>	
40	Baya weaver	Ploceus philippinus (Linnaeus, 1766)	Omnivorous
	<b>Shrikers</b>	<b>Laniidae</b>	
41	Long tailed shriker OR Rufous backed shriker	Lanius Schach (Linnaeus, 1758)	Carnivorous
	<b>Munias</b>	<b>Estrildidae</b>	

42	Indian silver bill OR White throated munia	Lonchura malabarica (Linnaeus, 1758)	Omnivorous
	<b>Flycatchers</b>	<b>Muscicapinae</b>	
43	Red breasted flycatcher	Ficedula parva (Bechestin, 1792)	Insectivorous
	<b>Bee-eaters</b>	<b>Meropidae</b>	
44	Green bee-eater OR Small bee-eater	Merops orientalis (Latham, 1801)	Insectivorous
	<b>Tailor birds</b>	<b>Cisticolidae</b>	
45	Common tailor bird	Orthotomus sutorius (Pennant, 1769)	Insectivorous
	<b>Prinias</b>	<b>Sylviinae</b>	
46	Ashy prinia	Prinia socialis (Sykes, 1832)	Insectivorous
	<b>Sun birds</b>	<b>Nectariniidae</b>	
47	Purple sunbird	Nectarinia asiaticus (Latham, 1790)	Nectivorous

Figure 3: - Pie diagram showing of various food category of birds from Aravalli hills of Kankarda-Bhonabay Ajmer.

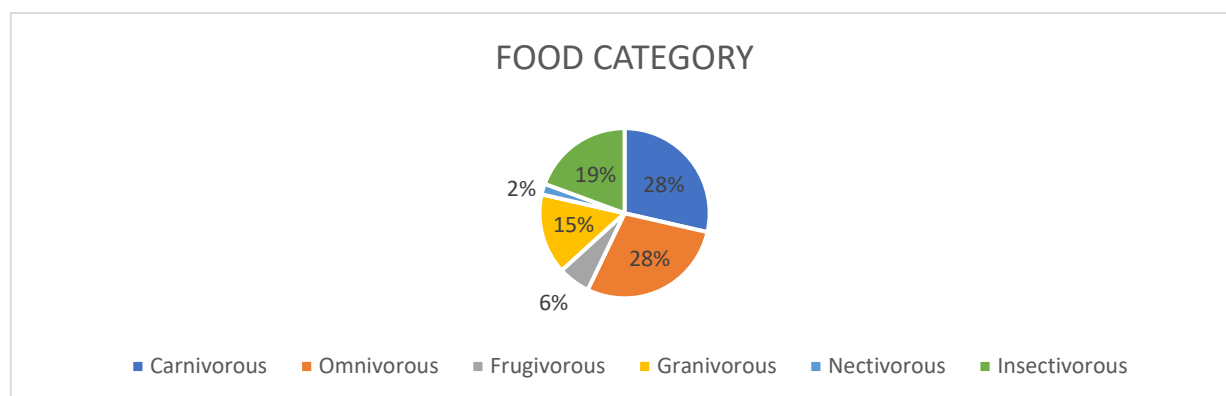
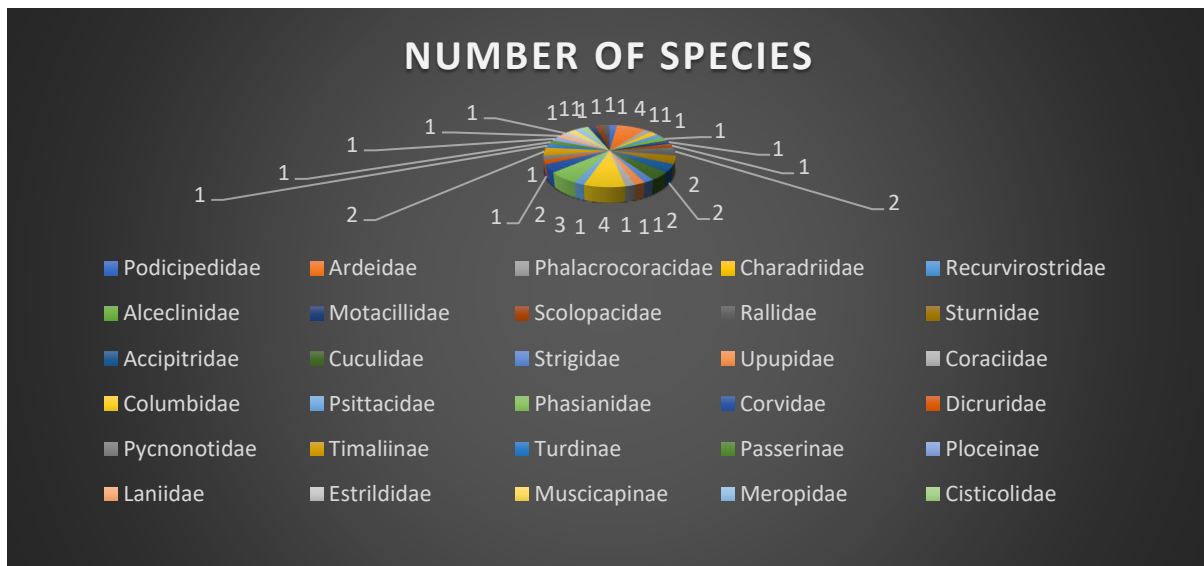


Table No. 2: According to family wise and relative diversity index.

S.No.	Family	Number of species	RD <sub>i</sub>
1	Podicipedidae	1	2.12765957
2	Ardeidae	4	8.51063829
3	Phalacrocoracidae	1	2.12765957
4	Charadriidae	1	2.12765957
5	Recurvirostridae	1	2.12765957
6	Alcedinidae	1	2.12765957
7	Motacillidae	1	2.12765957
8	Scolopacidae	1	2.12765957
9	Rallidae	2	4.25531914
10	Sturnidae	2	4.25531914
11	Accipitridae	2	4.25531914
12	Cuculidae	2	4.25531914
13	Strigidae	1	2.12765957
14	Upupidae	1	2.12765957
15	Coraciidae	1	2.12765957

16	Columbidae	4	8.51063829
17	Psittacidae	1	2.12765957
18	Phasianidae	3	6.38297872
19	Corvidae	2	4.25531914
20	Dicruridae	1	2.12765957
21	Pycnonotidae	1	2.12765957
22	Timaliinae	2	4.25531914
23	Turdinae	1	2.12765957
24	Passerinae	1	2.12765957
25	Ploceinae	1	2.12765957
26	Laniidae	1	2.12765957
27	Estrildidae	1	2.12765957
28	Muscicapinae	1	2.12765957
29	Meropidae	1	2.12765957
30	Cisticolidae	1	2.12765957
31	Sylviinae	1	2.12765957
32	Nectariniidae	1	2.12765957
33	Muscicapidae	1	2.12765957
		47	100

Figure 4: Pie diagram showing the various species in different families of birds from Aravalli hills of Kankarda-Bhonabay, Ajmer



### III. RESULT

In Kankarda Bhonabay Aravalli hills, omnivorous, insectivorous, carnivorous, frugivorous, granivorous and nectivorous species are included as the basis of their food. Here were 28% of omnivorous, 28% of carnivorous, 19% of insectivorous, 15% of frugivorous and 2% of nectivorous species. All these known species fall in ICUN Least Concern category.

Studying this area of the Aravalli Hills make it clear that, the many species of the families Ardeidae and Columbidae are present in this area. Which has the highest relative diversity index value of 8.51. At the second place is the species of Phasianidae family, whose relative density index is 6.38. After this, two species each of, Sturnidae, Rallidae, Accipitridae, Cuculidae, Curvidae and Timadiinae families are present, whose relative density index is 4.25. This



species ranks last among the remaining families, their relative density index was obtained as 2.12. Study of this Aravalli hills of this region revealed that diverse species of birds are still present here. This is the first attempt to prepare a proper database of birds observed in this particular field study.

## REFERENCES

1. Ali S (2002). The book of Indian birds, 13<sup>th</sup> Edition, Bombay Natural History Society (BNHS) and *Oxford University Press*.
2. Ali S and Ripley SD (2001). Hand book of the birds of India and Pakistan, together with those of Bangladesh, Nepal, Bhutan and Sri Lanka, Vol. IV, Frogmouths to Pittas. New Delhi: *Oxford University Press*.
3. Butler EA (1875-1877). Note on the avian fauna of Mount Abu and northern Gujrat. *Stray feathers*, 3:437-500, 4: 1-41, 5: 207-235.
4. Koli VK (2014). Diversity and status of avifauna in Todgarh raoli wildlife sanctuaries. Rajasthan, India. *Journal of Asia Pacific Biodiversity*, 401-402.
5. Liz Z, He C, Wu J (2016). The relationship between habitat loss and fragmentation during urbanization: an empirical evaluation from 16 world cities. *PLOS one*. 1(4): e0154613. <https://doi.org/10.1371/journal.pone.0154613>.
6. Manakadan R, Pittie A (2001). Standardized Common and scientific names of the birds of the Indian subcontinent. *Buceros*, 6 (1): 1-37.
7. Mehra SP, Mehra S, Sharma VK (2014). Importance of urban biodiversity, A case study of Udaipur, India. 403-418.
8. Mehra S, Mehra SP, Sharma KK (2011). Aquatic avifauna of Aravalli hills Rajasthan, India. In Animal diversity, natural history and conservation. 2. Eds. Gupta VK, Verma AK, *Daya publishing house*.
9. Niemela J (1999). Ecology and urban planning. *Bio-diversity Conservation* (8) :119-131.
10. Nilon CH et al. (2014). A global analysis of the impacts of urbanization on bird and plant diversity reveals key anthropogenic drivers. *Proc. R. Soc. B. Biol Sci* 281:20133330.
11. Sangha HS, Devarshi D (2006). Birds of Mount Abu wildlife sanctuary, Rajasthan, India. *Indian bird*, 2:26-32.
12. Sharma et al., (2012). Avian fauna of shrawan-sagar (wetland near central Aravalli foothills) distribution, current status and recent threats. *International Journal of Environment & Animal conservation*, 01: 35-43.
13. Shama R (2016). Avifaunal diversity of Ajmer Aravallis. *Journal of pharmacy and biological Science*, 11:70-72.
14. Strohbach MW, Haase D, Kabisch N (2009). Birds and the city: urban biodiversity, land use, and socioeconomics. *Ecol Soc* 14: 31-45.
15. Upadhyay et. al., (2020). Studies of the avifauna in urban limits of Ajmer, Rajasthan, India. *International Journal of Research-Granthaalayah*, 8: 281-296.





INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  [ijirset@gmail.com](mailto:ijirset@gmail.com)



[www.ijirset.com](http://www.ijirset.com)

Scan to save the contact details