



Avifaunal Assemblages in Suburban Habitat of Jammu, J&K, India

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Abstract

The present paper records the avifaunal assemblages in suburban habitat of Jammu based on the survey carried from 2011 to 2013. Line transect and point transect methods were used to study the avifaunal diversity in the area under investigation. The study recorded a total of 75 bird species representing 16 orders and 33 families. The suburban study area primarily comprises of agro ecosystem of Jammu. The study area was divided into three habitats i.e Aquatic habitat (AqH), Open cultivation habitat (OCH) and Aerial Habitat (AeH). Results indicate that the avifauna of open cultivation habitat (OCH) is more diverse than the aquatic or aerial habitat. The present paper also deals with the resident/migratory and local abundance status of avifauna of suburban habitat of Jammu.

Keywords: Suburban, habitat, bird species, cultivation, aquatic.

Introduction

Aves have adapted to flourish anywhere and are known to be the most successful species in the world. Aves need habitat to survive which depends upon a species food preference, foraging strategies and nesting sites. Ornithologists have developed the habitat concept and have gathered information regarding the distribution and abundance of birds in aspects of environment¹. The term "habitat" is used as a unifying, theoretical concept to understand the avian diversity². Birds can also settle in the human altered habitats. The birds that are not able to adapt to the city life, carve a niche for themselves in the adjoining suburban habitats. Suburban areas represent a middle habitat condition between natural and urban environment which has an ideal potential for sustaining varied avian communities³. Thus, the suburban areas provide a habitat complex that is structurally and ecologically different from the large urban and forest zones. Suburban habitat is becoming important to biodiversity conservation efforts. The present land use alteration has affected the bird species composition and only a few species are found to dominate the suburban habitats. Though many forest birds avoid suburban areas, many native birds find it a better place as a habitat. During migration and winter, many avian species utilize these suburban habitats. In J&K state, avifaunal diversity has been reported by several workers⁴⁻¹³. The present study reports the bird assemblages along with their resident, migratory status and abundance in the suburban habitat of Jammu.

Material and Methods

Study area: The state of Jammu & Kashmir lies between the Himalayas in the north and the plains of Punjab in the south. The Shivalik range comprises most of the region of Jammu. Jammu is situated on bank of river Tawi which flows along the south eastern side of the city. The coordinates of Jammu are

32° 73' N 74° 87' E and has an average elevation of 327 m.a.s.l. The suburban areas of Jammu comprises of mixture of different habitat types within a built environment of roads, buildings, and residential complexes. The different stations of sub urban habitat of Jammu are: i. R.S. Pura: Ranbir Singh Pura is located at 32° 78' 69" N latitude and 74° 54' 42" E longitudes. R.S. Pura is an agricultural belt known for rice and wheat as its major crops while mustard, barseem and vegetables are also grown. R.S. Pura produces the finest type of rice called Basmati. The Gharana Wetland Conservation Reserve, famous for the migratory waterfowls is in R.S Pura. ii. Ghomanhasa: This station lies between 32° 43' 39" latitude and 74° 45' 41" E longitudes at an altitude of 311 m.a.s.l. The main source of water at this station is the Ghomanhasa stream which is itself an offshoot of river Chenab. The major area adjoining the stream is under cultivation and the stream water constitutes the prime source for the inhabitants of the adjoining areas catering to their domestic and agricultural demands. iii. Bajalta: This station lies between 32° 76' 03" N latitude and 74° 95' 22" E longitude. This suburban area is surrounded by the scrubby hills. Wheat, Bajra and Maize are the major crops. This area is traversed by intermittent streams in form of nalas and khad. A railway line passes through this area connecting Jammu and Udhampur.

These stations are the agricultural areas and comprise of the agroecosystem of Jammu. Agriculture includes predominantly of *Oryza sativa* (Rice), *Triticum aestivum* (Wheat), vegetables and fruit trees. The dominant plant species include *Acacia nilotica* (Babul), *Acacia modesta* (Kramishatrav), *Dalbergia sisso* (Sheesham), *Morus alba* (Shahtoot), *Eucalyptus tereteicornis* (Safeda), *Mangifera indica* (Aam), *Ficus bengalensis* (Bargad), *Zizyphus* (Ber), *Lantana camara* (Kattu Hingu).

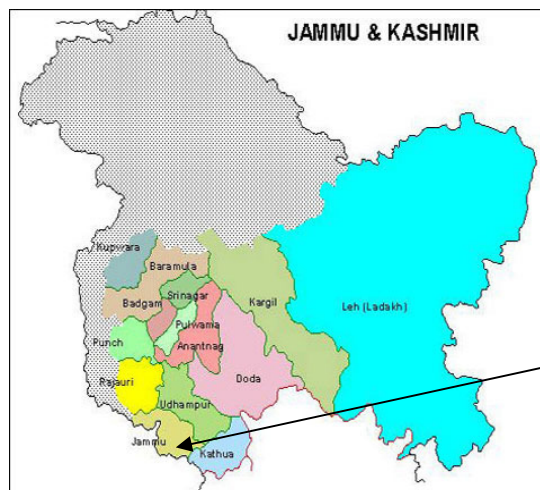


Figure-1
Map of Jammu & Kashmir



Figure-2
Map showing the Location of Sub-urban area of Jammu

Methodology: A thorough survey was done to record the avifaunal diversity of the study area from 2011 to 2013. For analysis of avian fauna, Line transect¹⁴ and point transect¹⁵ methods were used. Identification of the recorded bird species was done with help of field guides, reference books and pertinent literature: “Handbook of Birds of India and Pakistan”¹⁶, “The Book of Indian Birds”¹⁷, “A photographic guide to birds of India”¹⁸. Confirmation of the species was done with the help of “Birds of Indian Subcontinent”¹⁹. Bird watching was done early in the morning and before sunset in the evening. In order to maintain uniformity all surveys were conducted from 6.00 a.m. to 11.00 a.m. and 4.30 p.m. to 6.30 p.m. in the evening during summers and 7.30 a.m. to 11.30 a.m. and 3.30 p.m. to 5.30 p.m. during winters. Besides this, several irregular visits were also made during different hours of the day. Binocular (Bushnell make) was used to record the observations from the distance in order to avoid any disturbance to birds. Photographs were taken with help of 36 X optical zoom camera (Nikon) for easy and correct identification of bird species. Care was taken that the sun was always behind the observer so that the plumage patterns of the birds could be distinguished.

Results and Discussion

A systematic list of 75 bird species belonging to 16 orders and 33 families along with their local abundance and resident /migrant status and habitat utilization has been presented in table 1. Figure-3 shows that out of the total bird species recorded, 54 are resident, 20 species were found to be winter migrants and 1 specie was reported to be summer migrant. It was observed that the major proportion of the bird species recorded during the study as shown in figure-4 was found to be constituted by the resident bird species (72%), followed by winter migrants (27%) and summer migrant (1%). The record of the habitat preference of the bird species in the different types of habitat identified in the study area is also presented in figure-5 where 42 bird species were found in the open cultivation

habitat, 27 species were found in the aquatic habitat, 5 species utilized more than one habitat and one specie i.e House Swift occupied aerial habitat as it was always observed on wings. The proportion of birds recorded was highest in the open cultivation habitat (56%), followed by aquatic habitat (36%), followed by those utilizing more than one habitat (7%), and aerial habitat (1%) as shown in figure-6. The migratory waterfowls such as Bar Headed Geese, Indian Pintail, Northern Shovellar, Gadwall, Eurasian Wigeon and Lesser Whistling Duck belonging to Order Anseriformes preferred the aquatic habitat of Gharana Wetland Reserve of R.S. Pura and were only reported from this site in the winters. Indian Moorhen and Indian white Breasted Waterhen inhabit the aquatic habitat but were also found on the ground during feeding. The birds of Order Falconiformes were observed to hover over the open cultivated areas in search of prey. The resident and summer visitors preferred the open cultivation habitat to fulfil the requirements in terms of feeding, roosting and nesting sites. The birds feed on grains, seeds, fruits, green vegetation of the crop plants and insects²⁰. The dominance of five to six bird species such as Crows, Mynas, Red Vented Bulbul, White Wagtail, Spotted Munia and Doves was observed in the suburban bird community. Some birds reach peak densities in suburban habitat while others reach peak densities at natural habitats²¹. Granivorous bird species have adapted to the agricultural habitats and have increased in numbers. Suburban areas of Jammu have intensively cultivated areas and have a number of dairy, poultry farms interspersed among crop fields. The variety of native trees along roadside, crop fields, and human habitation provide food to birds in form of tree-fruits, seeds, nectar, etc. Crows throughout the year moved around human habitation because of easy resources of food available²². Crows were observed to prefer agricultural fields for foraging and trees for roosting and breeding. Babbler were well habituated to live in close proximity with man searching for food in gardens and areas with ground vegetation²³. Crows, Mynas, were commonly sighted on trees, fields and roadside. Grainivorous birds such as Pigeon, Doves

are well adapted to the open country. They were seen perching on telephone and electric wires and on the ground for foraging the seeds in the open and semi open lightly wooded areas. The various ground feeders such as House sparrow, Pigeons, Doves and Magpies were found to be tolerant to the human presence and activity and utilize buildings and other structures as nest sites in preference or in addition to trees and other vegetation.

Conclusion

To conclude it can be said that the suburbs of Jammu have a great potential as a habitat for the avian species which are resident as well as migratory. Suburban environment exhibits

high abundance of some bird species. A fine mixture of habitats in the suburbs provides opportunities for birds to exploit a range of resources in form of food and shelter. Open cultivation and aquatic habitats in form of rice fields and wetlands are the most preferred landscapes of birds and conservation measures need to be oriented in this direction. Suburban sprawls of Jammu are surrounded by matrix of built developmental environment and agriculture. They are thus important for conservation to protect bird diversity. We should understand suburban community ecology and environment in order to inform our biodiversity conservationists to conserve the avian community.

Table-1
Systematic list of avifauna of suburban area of Jammu along with their status, abundance and habitat

S. No	Common name	Scientific name	Status	Abundance	Habitat
Order: Podicipediformes Family: Podicipedidae					
1	Little Grebe	<i>Podiceps rudicollis capensis</i> (Salvadori)	Rst	C	AqH
Order: Pelecaniformes Family: Phalacrocoracidae					
2	Little cormorant	<i>Phalacrocorax niger</i> (Viellot)	Rst	C	AqH
3	Large cormorant	<i>Phalacrocorax carbo</i> (Linnaeus)	WM	R	AqH
Order: Cicconiformes Family: Ardeidae					
4	Night Heron	<i>Nycticorax nycticorax</i> (Linnaeus)	Rst	F	AqH
5	Indian Pond Heron	<i>Ardeola grayii grayii</i> (Skyles)	Rst	C	AqH
6	Grey Heron	<i>Ardea cinerea rectirostris</i> (Linnaeus)	WM	R	AqH
7	Cattle Egret	<i>Bubulcus ibis coromandus</i> (Boddaert)	Rst	C	AqH/OC H
8	Little Egret	<i>Egretta garzetta garzetta</i> (Linnaeus)	Rst	C	AqH
Order: Anseriformes Family: Anatidae					
9	Bar Headed Geese	<i>Anser indicus</i> (Latham)	WM	O	AqH/OC H
10	Northern Pintail	<i>Anas acuta</i> (Linnaeus)	WM	O	AqH
11	Northern Shovellar	<i>Anas clypeata</i> (Linnaeus)	WM	O	AqH
12	Common Teal	<i>Anas Crecca</i> (Linnaeus)	WM	C	AqH
13	Gadwall	<i>Anas strepra</i> (Linnaeus)	WM	O	AqH
14	Eurasian Wigeon	<i>Anas Penelope</i> (Linnaeus)	WM	O	AqH
15	Lesser Whistling Duck	<i>Dendrocygninae javanica</i>	WM	O	AqH
Order:Falconiformes Family:Accipitridae					
16	Pariah Kite	<i>Milvis migrans govinda</i> (Skyles)	Rst	C	OCH
17	Scavenger Vulture	<i>Neophron percnopterus</i> (Linnaeus)	Rst	R	OCH
18	Marsh Harrier	<i>Circus areuginosus</i> (Kaup)	WM	R	AqH
19	Indian Shikra	<i>Accipiter badius dussumieri</i> (Temminck)	Rst	O	OCH
Order:Gruiformes Family:Rallidae					
20	IndianWhite Breasted Water Hen	<i>Amauromis phoenicurus phoenicurus</i> (Pennant)	Rst	C	AqH
21	Indian Moorhen	<i>Gallinula chloropus indica</i> (Blyth)	Rst	C	AqH

22	Common Coot	<i>Fulica atra</i> (Linnaeus)	WM	C	AqH
23	Purple Moorhen	<i>Porphyrio porphyrio</i> (Linnaeus)	Rst	C	AqH
Order:Charadriformes, Family:Charadriidae, SubFamily:Charadreinae					
24	Red Wattled Lapwing	<i>Vanellus indicus indicus</i> (Boddert)	Rst	C	AqH/OC H
SubFamily:Recurvirostriinae					
25	Black winged Stilt	<i>Himantopus himantopus himantopus</i> (Linnaeus)	Rst	O	AqH
Family:Scolopacidae					
SubFamily: Scolopacinae					
26	Common Sandpiper	<i>Actitis hypoleucos</i> (Linnaeus)	WM	O	AqH
Family:Jacanidae					
27	Pheasant Tailed Jacana	<i>Hydrophasinus chirurgus</i> (Scopoli)	WM	R	AqH
Family:Glareolidae					
28	Collared Pratincole	<i>Glareola pratincola</i> (Linnaeus)	WM	O	OCH
Order:Columbiformes, Family:Columbidae					
29	Indian Blue Rock Pigeon	<i>Columbia livia intermedia</i> (Strickland)	Rst	C	OCH
30	Indian Ring Dove	<i>Streptopelia decocoto decocota</i> (Frivaldszky)	Rst	C	OCH
31	Indian Spotted Dove	<i>S. chinensis chinensis</i> (Gmelin)	Rst	C	OCH
32	Little Brown Dove	<i>S.senegalensis cambayensis</i> (Gmelin)	Rst	C	OCH
Order:Psittaciformes, Family:Psittacidae					
33	Large Indian Parakeet	<i>Psittacula eupatria nipalensis</i> (Hodgson)	Rst	C	OCH
34	Rose Ringed Parakeet	<i>P.krameri manillensis</i> (Bechstein)	Rst	F	OCH
Order:Cuculiformes, Family:Cuculidae					
35	Indian Koel	<i>Eudynamis scolopacea scolopacea</i> (Linnaeus)	Rst	C	OCH
36	Pied Crested Cuckoo	<i>Cuculus serratus</i> (Sparmann)	SM	O	OCH
Order:Strigiformes, Family:Strigidae					
37	Northern Spotted Owlet	<i>Athene brama indica</i> (Franklin)	Rst	O	OCH
Order:Apodiformes, Family:Apodidae, Subfamily:Apoinae					
38	House Swift	<i>Apus affinus</i> (J.E Gray)	Rst	C	AeH
Order:Coraciformes, Family:Halcyonidae					
39	White Breasted Kingfisher	<i>Halcyon smyrnensis smyrnensis</i> (Linnaeus)	Rst	C	OCH/ AqH
Family: Cerylidae					
40	Pied Kingfisher	<i>Ceryle rudius</i> (Temminck)	Rst	O	AqH
Family: Alcedinidae					
41	Common Kingfisher	<i>Alcedo atthisbengalsis</i> (Gmelin)	Rst	C	AqH
Family:Meropidae					
42	Small Green Bee Eater	<i>Merops orientalis orientalis</i> (Latham)	Rst	C	OCH
43	Blue Tailed Bee Eater	<i>M.phillipinus phillipinus</i> (Linnaeus)	Rst	R	OCH
Family:Coraciidae					
44	Indian Roller	<i>Caracias bengalensis</i> (Linnaeus)	Rst	O	OCH
Order:Upupiformes Family:Upupidae					
45	Hoopee	<i>Upopa epops</i> (Linnaeus)	Rst	C	OCH

Order: Bucerotiformes Family: Bucerotidae					
46	Grey Hornbill	<i>Tockus birostris</i> (Scopoli)	Rst	O	OCH
47	Common swallow	<i>Hirundo rustica</i> (Linnaeus)	Rst	C	AqH
48	Red Rumped Swallow	<i>Hirundo daurica erthropygia</i> (Skyes)	Rst	C	AqH
49	Wire Tailed Swallow	<i>Hirundo smithi</i> (Stephens)	Rst	O	AqH
Family: Lanidae					
50	Rufous Backed Shrike	<i>Lanius scachach erythronotus</i> (Vigors)	Rst	C	OCH
Family: Dicruridae					
51	Black Drongo	<i>Dicrurus adsimilis albirictus</i> (hodgson)	Rst	C	OCH
Family :Sturnidae					
52	Indian Myna	<i>Acridotheres tristis tristis</i> (Linnaeus)	Rst	C	OCH
53	Bank Myna	<i>A.ginginnianus</i> (latham)	Rst	C	OCH
54	Indian Pied Myna	<i>Sturnus contra contra</i> (Linnaeus)	Rst	O	OCH
Family: Corvidae					
55	House Crow	<i>Corvus splendens splendens</i> (Vieillot)	Rst	C	OCH
56	Jungle Crow	<i>C.macrorhynchos culminates</i> (Skyes)	Rst	C	OCH
Family :Pycnonotidae					
57	Red Vented Bulbul	<i>Pycnonotus cafer cafer</i> (Linnaeus)	Rst	C	OCH
Family: Muscicapidae, Subfamily: Timaleinae					
58	Jungle Babbler	<i>Turdoides striatu somervillei</i> (Skyes)	Rst	C	OCH
Sub-family: Sylvinae					
59	Indian Tailor Bird	<i>Orthotomus sutorius guzuratus</i> (Latham)	Rst	F	OCH
Sub-family: Turnidae					
60	Indian Robin	<i>Saxiccoloides fulicata cambeiensis</i> (Latham)	Rst	F	OCH
61	Indian Magpie Robin	<i>Copsychus saularis saularis</i> (Linnaeus)	Rst	C	OCH
62	Brown Rock Chat	<i>Cercomela fusca</i> (Blyth)	Rst	F	OCH
63	Indian Collared Bush Chat	<i>Saxicola torquata indica</i> (Blyth)	Rst	O	OCH
64	Dark Throated Thrush	<i>Turdus ruficollis</i> (Pallas)	WM	R	OCH
Family: Motacillidae					
65	Indian White Wagtail	<i>Motacilla alba dukhunesis</i> (Skyes)	WM	O	OCH/AqH
66	Indian Large Pied Wagtail	<i>M. maderaspatensis</i> (Gmelin)	WM	O	AqH
67	Paddy field pipit	<i>Anthus rufulus</i> (Vielliot)	Rst	F	OCH
68	Grey Wagtail	<i>Motacilla. Cinerea</i> (Tunstall)	WM	O	OCH
69	Blue Headed Yellow Wagtail	<i>Motacilla flava beeema</i> (Skyes)	WM	O	OCH
Family: Nectarinidae					
70	Purple Sunbird	<i>Nectarinia asiatica asiatica</i> (Latham)	Rst	C	OCH
71	Yellow Backed Sunbird	<i>Aethopyga siparaja seheriae</i> (Tickell)	WM	O	OCH
Family: Alaudidae					
72	Crested lark	<i>Galerida cristata</i> (Franklin)	Rst	O	OCH
Family: Passeridae, Subfamily: Passerine					
73	Indian House Sparrow	<i>Passer domesticus</i> (Linnaeus)	Rst	C	OCH
SubFamily: Ploceinae					

74	Baya Weaver Bird	<i>Ploceus phillipinus phillipinus</i> (Linnaeus)	Rst	O	OCH
SubFamily: Estrildinae					
75	Spotted Munia	<i>Lonchura punctulata</i> (Linnaeus)	Rst	F	OCH

C- Common, R- Rare, F- Frequent, O- Occasional. OCH- Open cultivation habitat, AqH- Aquatic habitat, AeH- Aerial habitat, Rst- Resident, WM- Winter Migrant, SM- Summer Migrant, For assigning the status to the avian species observed during the survey of the study area based on sight records, the terminology of ²⁴ was followed: C- Common: means it can invariably be seen in that habitat where it occurs with the provision that the season is also appropriate. F-Frequent: means that even visiting appropriate habitat, it will not be seen or heard invariably, perhaps only in one visit out of three. O- Occasional: means seen in or heard only in one visit out of six. R- Rare: means even less likelihood of occurrence. Besides this ,depending upon whether the species of the birds are sighted in all months/season of year or only in particular season/ some months of the year and absent in others from the study area, it was referred as Resident (Rst) or Migrant (M),respectively. Migrant category is further differentiated into: SM- Summer Migrants: Those which visit the study area in summers. WM- Winter Migrants: Those which visit the study area in winters.

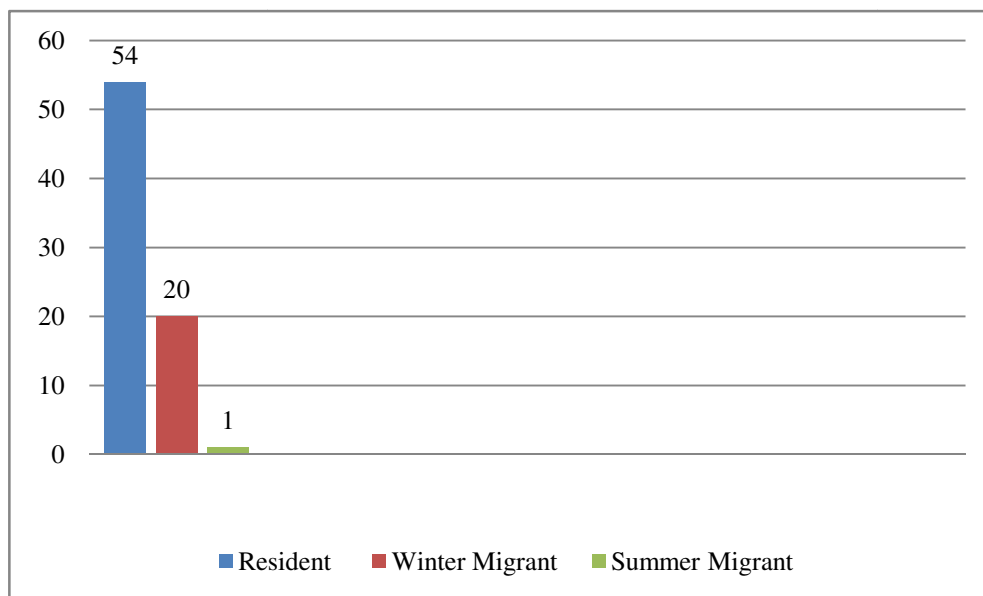


Figure-3
 Showing the No of Resident, Winter Migrant and Summer Migrant Bird species

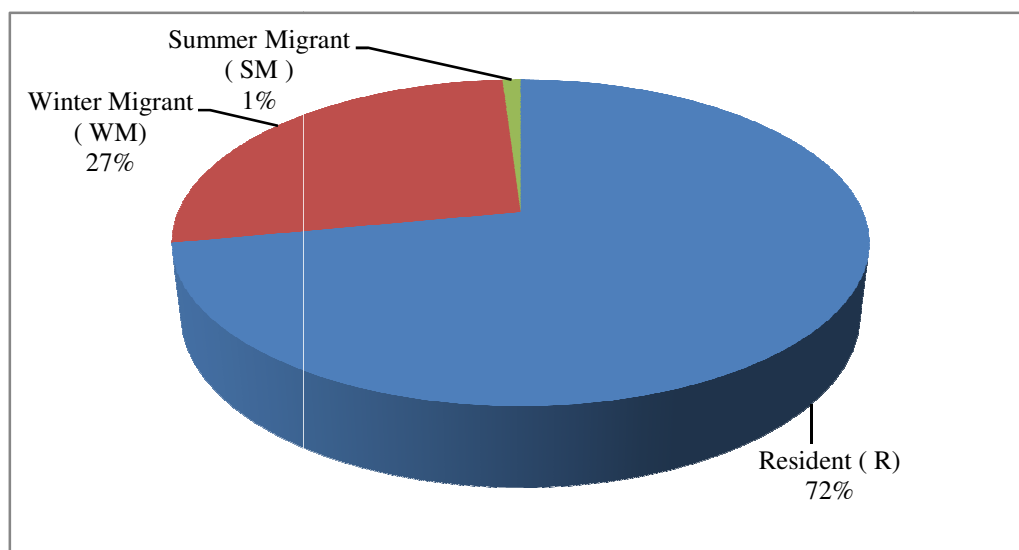


Figure-4
 Showing the % of Resident, Winter Migrant and Summer Migrant Bird Species

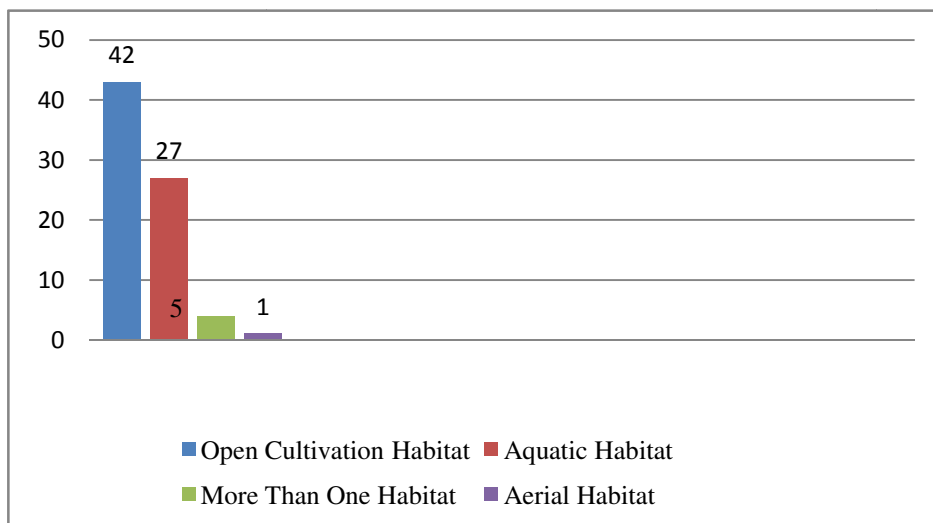


Figure-5
 Showing the no of birds utilizing different habitats

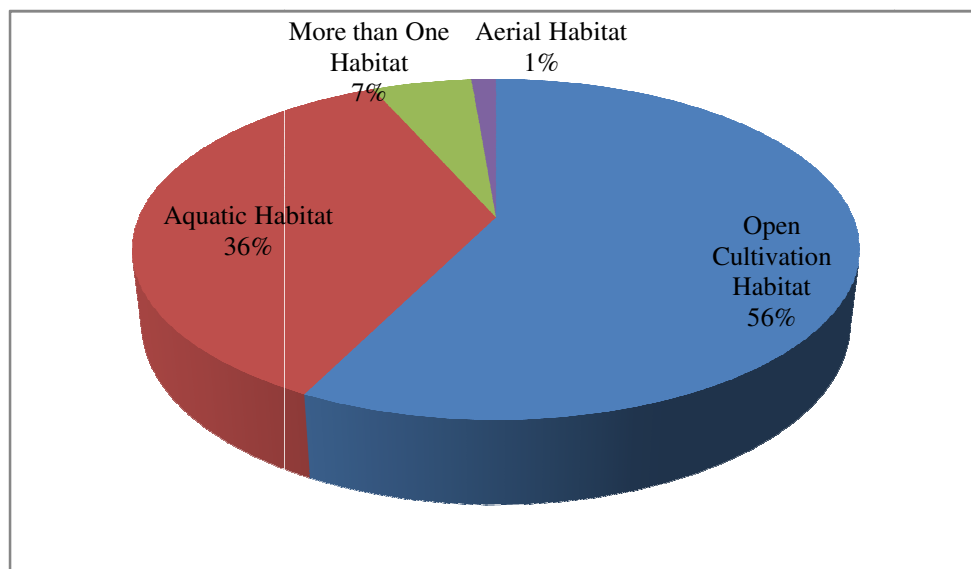


Figure-6
 Showing the % of birds utilizing the different habitats

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