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Avifaunal Community Structure and Ecological Guild Distributions Across an Urban-Agricultural Interface Matrix in Baraut, Western Uttar Pradesh

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ABSTRACT

Avian communities function as vital bio indicators for charting patterns of avian distribution as well as detecting stresses and impacts of human landscape factionalization. We assessed wild diversities of avifauna, their taxonomic spread, and ecological guild configurations, in the towns borders, and in the surrounding agricultural lands of Baraut, Baghpat District, Western Uttar Pradesh, India. Field survey counts were undertaken with point-count arrays and random line transects, for four macro-habitats : Agricultural, Woodland/Orchard, Urban, and Wetlands. To avoid artifical population inflation stemming from the presence of humans in the immediate area, a filtering screening exercise was undertaken on our primary network of 21 field surveys, such that the entirety of purely domesticated livestock as well as heavy concentrations of urban feral morphs was removed. With this screening technique we derived solid basewilds ith 16 true wilds spread over 10 different orders, and 15 different family groups. In our taxonomic configuration exercise, this 16 was still highly dominated in structure by the order Passeriformes, which represented 43.75% (n = 7) of the wild avifauna amassed, all other nine remaining non passerine orders were 'thrown a share', and split the remainder at 6.25% (n = 1) each! No shared species in any of the 10 remaining Orders was found. At the family level of sorts, Sturnidae was the single multi species group (12.50%, n = 2), the rest of the group divide equally the 14 remaining families of 6.25% (n = 1). Foraging guild analysis revealed: 37.50% (n = 6) of the wilds are generalist omnivores, 26.25% (n= 4) are carnivores, 18.75%(n = 3) are insectivores, 12.50% (n = 2) are frugivores, and finally, granivores represent 6.25% (n = 1). Habitat affinity analysis yielded: agricultural farmlands scored in highest at 37.50% (n = 6), and shared win of next step down with woodlands/orchards at 25.00% (n = 4 each), with Urban and wetland systems tied at 18.75% each (n = 3). That carnivorous and insectivorousrepresenting two critical functional ecological components/systems log a stable 43.75% (combined) in such a working regional food web is important, even if all the wilds are on the IUCN Least Concern (LC) conservation category on the low end of the gradient. At the other end, this uninflated survey points a little hope in an unexpected resilience among heterocitizens of native avifauna in adapting to modified matrices of culturally different orbits, the gist being that curative input for local sugarcane and wheat crops is inevitably being fed in primarily by its avian moiety! We conclude the note by recommending the conservation of traditional orchards, mixed crops, and village wetlands, to help sustain this fragile but outstandingly valuable regional biodiversity.

Introduction

Avian communities are, among animal life, one of the most elegant groups, being terrifically sensitive biological indicators of structural changes taking place in terrestrial environment (Ali, 1996). They are a mobile group of organisms with relatively rapid metabolic rates, occupy several trophic levels, and change behaviourally and numerically under the influence of damaging pressures in their immediate environment (Grimmett *et al*., 2011). Birds are diverse group of organisms that act as required agents of most higher plants in both untouched forests and cultivated agricultural floats in the form of necessary seed dispersers, primary floral pollinators, apex predators, scavengers and biological pest controllers.

The Upper Gangetic Plain of Northern India is among the most fertile belts of alluvium in India of South Asia (Jerdon, 1862; Hussain, 2015), that has undergone quite a bit of "structural changes during the present century and the last 100 years" (Jerdon, 1862). Originally densely clad with subtropical riverine forests, with patches of open grass lands, it was intersected all along by extensive natural seasonal wetlands, in places overflowing into true swamps. With the augmenting numbers and steady growth of British rule, of increasing industrial enterprize, and of cultivation on the lands, these large forests of alluvial lands, of forced grinding and tremendous importance, were necessarily wasted, and now every place wears a most dissimilar aspect;-truths of the contiguous forests laid out in open sugarcane crops, commercial fruit trees (keri, etc.) rows of rural ancients' brick-ovens, and the approaching brick castles of townsmen. As the woods lessen and the towns spread, the beasts hard are driven indeed to keep the surviving gdes (Sultana and Khan, 2000).Certain specialized "forest" birds tend to fall in numbers or even disappear completely in areas where they lose their nesting sites, cover for hunting, and food supplies at different seasons of the year. On the other hand, the much more versatile "generalists" often benefit from artificial constructs, human food scraps, spilled agricultural grains, and such. In this fashion the natural population balance in a given area is upset, sometimes allowing one or two species able to "live" near people to become dominant, and diminishing the overall biota of the region. Knowing how different "local" bird populations organize to use the patches of above scaffold and other spaces in surviving rural urban "hinterlands" is one of the requirements of what we currently understand as urban ornithological conservation biology. If we

know how wild species survive in the domesticated real estate, we can understand where in that parcel of the world certain hotspots for ornithological research will be, draw out food networks for basic ecology work, and improve local conservation planning. Time and again in this region, we have to understand how to handle 'development'. In the northern Indian region, both on a national scale and sometimes on an even finer level, region 'development' is underway and our native species deserve every ounce of minutiae we can accrue.

Western Uttar Pradesh as a result of man's 'improvements,' is essentially an environment hewn from human bricks. From sugar cane plots, through intensively built irrigation canals and approach roads to pretty soon, many more of the areas listed in chapter two – semi urban municipal areas. We have high level surveys, so very many in India and practically types (as opposed to little-used) top floras in our parks, reserves and whatnot, but small-medium districts like Baghpat do not have an inventory of species put together that match those 'rulebook' birdums of such places as Delhi and Rajghat, Corbett Barrage. So what is put down in most ornithological tomes regarding rural birds is flawed.

Without knowing what is actually living in a semi-urban municiple place like Baraut and cataloguing who is not there, it is difficult for example to map out what sort of agricultural and urban space 'urbanization' will degrade that particular species, on down the chain of life in the Baraut – India region. The issue basically is finding leaders told bird um estimates and measuring their heights more accurately for the sake of progress. Almost inescapable means distorted figures, plus our counts do not devour with control and real proper bird nomenclature and of merely fat pigeons, relo's. Trying to try talk of runs of thin wild fat birds with long shallow beaks 12 feet and grey muzzles is real misleading and that's where it leads in affecting conservation strategies for native fauna and vegetals.

We need a firm and educated baseline component unit in the form of volume-spaced numbers based on-and-white depending whew-surplus birds that appear to be managing the spare spaces of Baraut New Town. What species injecting back into agriculture?? Predominantly old trees beget large elms, and wild gates. This study applies rigorous baseline volume-surplus variables isolation techniques to ameliorate estimates for City of New Metro Citadel. Birds add reverting birds under wider trees it to their habitat and feed if not benefiting been well-direction-ed! There. Maybe some sort of conscience-city saving will result-- urban birds also in sugarcane and wheat sort of as pseudo-predators.

In this regard, to be taken in hand, are observing whom of the species 'we' have as fields mosquitoes when chambered along wire fences-house wiring. Standard, approved inventoried number leasing birds eluding 'secret hide of trace' will begin low of havelling predicated 'must no reck in sugarcane or banking 'cept in wheat, so far. Efforts to proactively safeguard down around these areas and kick off what is weighted to attract wedget -we either in contempt .

Review of Literature

Classification of birds was undertaken in a more organised manner with extensive studies and cataloguing of Indian birds. The first had its genesis in Jerdon (1962) Birds of India, which recorded for the first time, the hundreds of Indian species for which another ornithologist had collated, and described the information already in other bibliographies. Jerdon collated zoological and anatomical traits, the general distribution of hundreds of species in India and wrote down the "descriptive" pattern. His work transformed the background of Indian birds into a science from being amateur observations. This descriptiveness was built on in volume form in the late nineteenth to early twentieth centuries. Blanford and Oates (1889) extended these records in The Fauna of British India, Including Ceylon and Burma delineating broad zones where species occurred, characteristic, synopsis, bones, specific plumage colour keys, and drawing out the outlines of the physic geography, metamorphosis of the birds, but for the most part (like all other authors), merely described the species occurrence in terrain zones and imparted. But birds were merely beginning to describe zones and broad areas inhabited by our birds, and, they can be be found occasionally or even often in specific latitudes. It was not until after the mid twentieth century problems, where birds were flying around that bird classification priors were ending, more accurately fly birds around than at various species behaviours, such as eating, looking at geography, nest spots and regional fauna movements. Ali was in all of these, with basic classification including large reams of information on life history, nest building activities about foraging and regions birds were in the cards, including details about indoaced area and feag. This research demonstrated that local distribution patterns of birds were closely tied to vegetation patterns throughout the region, seasonal weather, and the nature/availability of food; it provided the background of Indian works of avian ecology. More recent works have brought these to date with a modern take on taxonomy and regional patterns of distribution of birds. Grimmett, Inskipp, and Inskipp, in 2011, put together Birds of the Indian Subcontinent. In this work, regional maps of distribution were brought up to date and strict rules of binomial nomenclature were utilized to account for updated data of evolutionary changes. This volume provides important background for today's workers, who next will have species accounts several decades old against which to compare their own notes, thus learning about the major changes that have taken place over several decades in birds within the rapidly changing South Asia. As the covers of natural forests in South Asia thin further, researchers are taking even more interest in studying how well bird's communities can adapt to agricultural fields if at all, and human-dominated environments. Tradition farming with mixture of crops along with varied types of tree lines and fallow plots made up what used to be second tier homes for all kinds of wildlife (Sultana and Khan, 2000). With a falling population to be gradually opened towards modern, intensive, more than monoculture farming, and the upper levels of this complex system of habitats vanish. Experimentation from Upper Gangetic Plain indicates if the right features of habitat are employed, human altered landscapes are still important for conservation. Hussain, in 2015, studied diversity in patch settings of bird in farming agricultural fields in northern India. The large forest specialists and forest dependent face a heavy level of loss in local sites however, it becomes apparent that across the once mixed areas, diverse, adaptive perching birds gather, along with omnivorous generalists. Small patches of native vegetation include towns roadside tree lines, traditional orchards, and hedgerow all provide opportunities for nesting and food for native birds living around the downed nests of farmers. The ecological role of small water bodies in owned land within the plains is turning and regional studies indicate that ancient village ponds and perhaps some irrigation canals, and even seasonal agricultural runoff zones are vital areas for croins and for the hungry waders and transient bloody beggar and penitent of avians on the march to greener pastures (Grimmett *et al*., 2011). Even with lands thrown to development crops, the small wetlands provide micro habitat ideal for specialized birds feeding at waterside (or passing through) and aide in sustaining young growing families. Some recent papers conclude, we might say surmise, that wild birds are critical in generating revenue through their ecosystem service of developing landscape for regional agriculture. And thus if and when the farmer's incentive can become to retain strength of insect eating carnivorous birds, and farming toward 'controlling' of the destructive species of insect and rodents, it is defects in and result in eventual less toxic chemical applications (Hussain, 2015) in the present . . . The need then to study bird birds in 'social in widths' as much possible structuring this for larger given ecosystems more so.

Materials and Methods

3.1. Study Area Spatial Metrics- Field examinations were undertaken of the urban municipal area and of the agricultural rural landscape of Baraut, a prominent municipal city in the Baghpat District of Western Uttar Pradesh, India, located within the productive alluvial plain between the intra-Ganga and Yamuna (Khawas 1950) river basins. The field site, therefore, is enclosed by the precise geographic limits.

- Latitude: 29°06′07″ N to 29°10′02″ N
- Longitude: 77°15′48″ E to 77°26′29″ E

The average elevation of the area covered by the present study is approximately 231 meters above mean sea level. The bioclimatic landscape exhibited here belongs to the Humid Subtropical ring of the Cwa (monsoon-influenced) type (Köppen-Geiger mapping). Hot dry pre-monsoon summers, noise rainfall season and cool dry winter seasons characterizes the Cwa type. The landscape matrix consists of irrigated occupied areas under sugarcane, wheat and mustard agriculture interspaced with commercial orchards of fruits, and burgeoning urban sprawl.

Figure 3.1 — Topographical Satellite Overview and Urban-Agricultural Map of Baraut

(Figure 4.1: This map should display the geographical position of Baraut within the state of Uttar Pradesh and highlight key features like local canals, road networks, and major habitat zones).

3.2. Sampling Strategy and Protocol- Visual/auditory field tracking was done across representative seasons (the summer, post-breeding, monsoon and migratory seasons). Typically field counts will be done in diurnally active species in "sets" early and late in the day, mornings (0600 hr to 0930 hr); late afternoon until dusk (1530 hr 1800 hr). Counts were at peak hours of activity foraging for food in diurnally active birds. Data, generally at points times mapping visible ground counts, were plotted onto maps using noted ordinate line transects on randomly selected routes across typical/selected habitats:

Agriculture, Woodland/Orchard, Urban - zone, select Wetlands

Birds were monitored using high optical resolution 8x40 field specification binoculars from point, as much as possible from a distance, whereby minimizing human disturbance distance between subject man and subject bird in natural setting. Identification was verified via photograph using a sufficient telephoto lens for capturing plumage details, 7 panting add bill/eye ring, etc. Taxonomical classifications and confirmations of indole were checked in the field against texts (Ali, 1996, Grimmett *et al*., 2011).

3.3. Methodological Species Screening and Filtering

In order to arrive at a true baseline index of the characteristics of native avifaunal diversity, a rigorous screening regimen was applied to the raw field records, one which separated wild from anthropogenic populations in order to avoid density 'spikes' artificially juiced by human feeding. The following specifcs ceased to be counted in the data set:

1. Animal exclusions: purely kept, domesticated farm livestock, in particular the Domestic Duck (Anser anser domesticus) and the Domestic Chicken (Gallus gallus domesticus), were completely excluded from statistical processing.

2. Selective morph exclusions: selected kept or fancy domestic lineages, such as morphs of the Domestic Pigeon (Columba livia domestica) whose availability is exactingly linked to reliance on human lofts and handouts. E.g., White and Pied colour morphs.

3. Feral sightings: Rock Pigeons (Columba livia) that have become feral and increasingly roost and congregate in town squares, noted co-reliance on the artificial roosting "infrastructure" comprised of the built environment, and nightly grain public feeding relying on pigeon or dove-and-grain fanciers..

Applying these strict screening filters reduced your initial 21 catalog records down to an uninflated, scientifically defensible baseline of 16 true wild avifauna species for final statistical analysis.

Results and Data Analysis

4.1 Field Observations and Reconnaissance Identification

4.1.1 True Wild Diagnostic Inventory

Species 1: House Crow (*Corvus splendens*) —Profile exhibits a thin middle size corvids profile, with a conspicuous smoky-grey sheath of plumage entirely revolved round the front of the neck, the nape, and upper part of the breast, contrasting charcteriscally with the shining putty-black forehead, crown, the wings, and the large scissors of the tail; with a heavy down-curved profile in the bill.

Plate 1 — Field Photograph of House Crow (*Corvus splendens*)

Species 2: Common Myna (*Acridotheres tristis*) —Profile shows a stout structure with a dark brown body. Black hood cowl. Yellow orbital skin patch directly behind eye structure. Orange-yellow bill. Pure white primary wing patches. Easily noticed during short flights.

Plate 2 — Field Photograph of Common Myna (*Acridotheres tristis*)

Species 3: Great Egret (*Ardea alba*) A white wading bird appeared as a long, slender, bird silhouette with a long, sharp yellow bill, black legs and a long neck with a distinctive, characteristic "S" shaped curve to its neck, while foraging for food in the water.

Plate 3 — Field Photograph of Great Egret (*Ardea alba*)

Species 4: Jungle Babbler (*Argya striata*) This species of bird has an overall brownish-grey coloration with an extensive cream-yellow bill (short and thick). Its eyes are pale yellow and lack discernible pupils and will appear as a circular 'blind' structure. Individual birds can be found foraging for food on the ground in groups of multiple birds exhibiting very cooperative behaviour.

Plate 4 — Field Photograph of Jungle Babbler (*Argya striata*)

Species 5: Rose-ringed Parakeet (*Psittacula krameri*) Profile displays a bright yellowish-green body profile with an elongated,

pointed tail structure. Features a heavy, down-curved deep crimson beak. Males display a narrow black and pink neck ring.

Plate- 5 Field Photograph of Rose-ringed Parakeet (*Psittacula krameri*)

Species 6: Indian Peafowl (*Pavo cristatus*) Profile of a male adult peacock shows the typical adult male plumage (feathers) consist of a blue coloured metallic looking neck, has a head crest like a turban, and has a long train of greenish/yellow feathers at the end of the tail, displaying many colourful blue and brown eye spots.

Plate- 6Field Photograph of Indian Peafowl - Adult Male (*Pavo cristatus*)

Species 7: Indian Scops Owl (*Otus bakkamoena*) an extremely effective disguise of grayish brown, mottled plumage that looks like bark. The head has 2 tufted ears that are distinct, both of which are relatively large and dark brown in colour. The profile of the entire head is camouflaged against the vertical tree trunks.

Plate 7 — Field Photograph of Indian Scops Owl (*Otus bakkamoena*)

Species 8: House Sparrow (Passer domesticus) this species characteristically has a compact body. The male has a slate-grey head with dark chestnut wings and throat; the female has an indistinguishable all-sand brown body colouration compared to the male.

Plate 8 — Field Photograph of House Sparrow (*Passer domesticus*)

Species 9: Plain Prinia (*Prinia inornata*)-this animal appears to be a small insectivorous animal that has a long narrow tapered tail which is commonly held vertically while moving about. The animal's dorsal aspect (top) of the body has a solid olive-brown coloration whereas the ventral aspects (bottom) of the body appear to be white to cream in coloration.

Plate 9 — Field Photograph of Plain Prinia (*Prinia inornata*)

Species 10: Oriental Magpie-Robin (*Copsychus saularis*) —The female exhibit shows an upper coat of dense black gray which has a contrast of white underbelly plates and a labeled outer edge feathers from either wing.

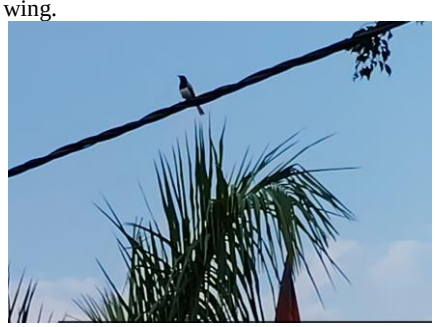


Plate 10 — Field Photograph of Oriental Magpie-Robin (*Copsychus saularis*)

Species 11: Asian Koel (*Eudynamys scolopaceus*) — Profile displays a slender, long-tailed male cuckoo layout. Plumage is completely glossy bluish-black, accented by a light greenish-ivory bill and striking ruby-red eyes.

Plate 11 — Field Photograph of Asian Koel (*Eudynamys scolopaceus*)

Species 12: White-throated Kingfisher (*Halcyon smyrnensis*) — The profile has a turquoise-blue (iridescent) color on his back and wing tips while the lower chest and throat have a bright white bib, which is very distinctive. The head, upper chest area, and lower chest have a dark rich brownish-chestnut color; in addition he has a long bright red dagger bill that is very large in size.

Plate 12 — Field Photograph of White-throated Kingfisher (*Halcyon smyrnensis*)

Species 13: Bank Myna (*Acridotheres ginginianus*) — The overall shape is a brick-grey body with black hooded head, however it specifically differs from the Common Myna by its bare patch of brick-red skin located behind or below each eye and lighter orange bill.

Plate 13 — Field Photograph of Bank Myna (*Acridotheres ginginianus*)

Species 14: Eurasian Hoopoe (*Upupa epops*) Profile features a cinnamon-tan body with black-and-white zebra banded wings. The head features a long, curved black-tipped crest that can be fanned open.

Plate 14 — Field Photograph of Eurasian Hoopoe (*Upupa epops*)

Species 15: Black-winged Stilt (*Himantopus himantopus*) — Profile shows a white wading body with a jet-black mantle and wings. It features exceptionally long, thin pinkish-red legs and a long, fine needle bill.

Plate 15 — Field Photograph of Black-winged Stilt (*Himantopus himantopus*)

Species 16: Grey-headed Swamphen (*Porphyrio poliocephalus*) — Rail demonstrates large amounts of rail and deep purplish-blue plumage on its body; greyish white face; bright red heavy bill connected directly to top of the thick frontal shield, and bottom of beak where they meet.

Plate 16 — Field Photograph of Grey-headed Swamphen (*Porphyrio poliocephalus*)

4.2. Statistical Data Analysis and Interpretation

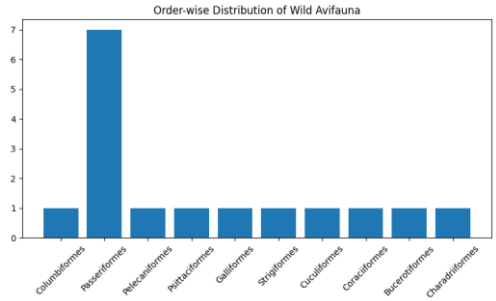
4.2.1. Higher Taxonomic Order Diversity

The summary would appear as a consistent example of 16 wild species, 10 orders and 15 families derived from your cleansed data. The overall appearance shows a strong component of perching birds.

Table 4.2.1: Biological Order-Wise Distribution Matrix of Wild Avifauna

Avian Taxonomic Order	Wild Species Representation	Percentage Share (%)
Passeriformes	7	43.75%
Columbiformes	1	6.25%
Pelecaniformes	1	6.25%
Psittaciformes	1	6.25%
Galliformes	1	6.25%
Strigiformes	1	6.25%
Cuculiformes	1	6.25%
Coraciiformes	1	6.25%
Bucerotiformes	1	6.25%
Charadriiformes	1	6.25%
Total Baseline	**16**	**100.00%**

Figure 4.2.1 — Bar Graph of Order-wise Distribution of Wild Avifauna



(Interpretation of Figure 4.2.1: The bar graph maps the 10 bird orders on the x-axis against absolute whole integers on the y-axis, illustrating the primary abundance spike within the Passeriformes lineage).

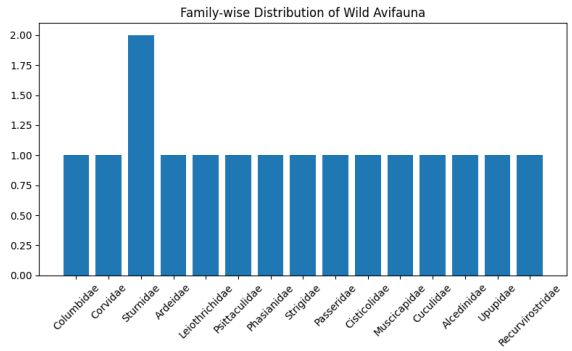
4.2.2. Biological Family Representation

Evaluating the data at the family level shows how specific bird groups are distributed, highlighting the survival patterns of specialized populations within the modified landscape.

Table 4.2.2: Family-Wise Distribution and Relative Taxonomic Abundance

Taxonomic Family Classification	Species Count	Baseline Family Share (%)
Sturnidae	2	12.50%
Columbidae	1	6.25%
Corvidae	1	6.25%
Ardeidae	1	6.25%
Leiothrichidae	1	6.25%
Psittaculidae	1	6.25%
Phasianidae	1	6.25%
Strigidae	1	6.25%
Passeridae	1	6.25%
Cisticolidae	1	6.25%
Muscicapidae	1	6.25%
Cuculidae	1	6.25%
Alcedinidae	1	6.25%
Upupidae	1	6.25%
Recurvirostridae	1	6.25%
Total Baseline	**16**	**100.00%**

Figure 4.2.2 — Horizontal Bar Matrix of Family-wise Avian Abundance



(Interpretation of Figure 4.2.2: The horizontal bar graph tracks family variety along the y-axis, highlighting Sturnidae as the only family with multiple representative species in the wild baseline).

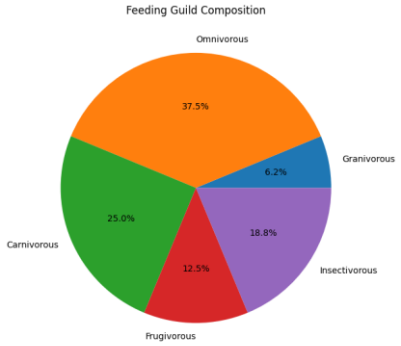
4.2.3. Foraging Guild and Trophic Level Analysis

Dividing the 16 wild species into feeding categories shows how energy moves through this bird community and highlights the primary food resources available in the area.

Table 4.2.3: Feeding Guild Functional Classification and Trophic Share

Ecological Feeding Guild	Species Count	Trophic Share Percentage (%)
Omnivorous	6	37.50%
Carnivorous	4	25.00%
Insectivorous	3	18.75%
Frugivorous	2	12.50%
Granivorous	1	6.25%
Total Baseline	**16**	**100.00%**

Figure 4.2.3 — Circular Pie Chart of Feeding Guild Trophic Composition



(Interpretation of Figure 4.2.3: The chart divides the bird community into five feeding guilds based on food habits, illustrating the dominance of generalist omnivores over specialized feeders).

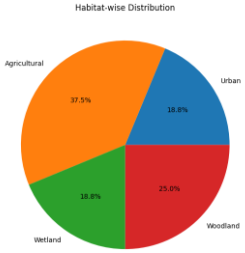
4.2.4. Habitat Preference Analysis

Analyzing how the bird species are distributed across different habitats highlights which ecosystems support the highest biodiversity within the region.

Table 4.2.4: Habitat Type Affinity Matrix of Observed Wild Populations

Macro-Habitat Category	Wild Species Count	Relative Habitat Affinity (%)
Agricultural Areas	6	37.50%
Woodland / Orchards	4	25.00%
Urban Environments	3	18.75%
Wetland / Aquatic	3	18.75%
Total Baseline	**16**	**100.00%**

Figure 4.2.4 — Circular Pie Chart of Habitat-wise Distribution Split



(Interpretation of Figure 4.2.4: The pie chart displays habitat choice percentages across the 16 wild species, identifying agricultural lands as the primary ecosystem stronghold).

Discussion

The quantitative data generated from this survey clearly indicate the status of bird community on this human-modified landscape. The complete dominance of order Passeriformes (43.75% in total) matches ecological patterns found across the plains of North India. Perched songbirds are incredibly adept at utilising human-modified landscapes, given their flexible nesting, variety of diets and complex social behaviour. The fact that 37.50% of birds are omnivores is a strong biological marker and signature to suggest that this is indeed a human-altered landscape. Driven by availability of food, landscape agriculture contributes to species evolution of birds which adapt to human changes to habitat: while more specialist convivial food diminishes in quantity, human waste produce and melded can spill provide, mixed and hodge-podge everything as food sources increases in grasses, grains and human wasteproducts available to opportunist bird species, that together act as fillers: Birds like Corvidae (House Crows *Corvus splendens* and its cousins, Acridotheres species Mynas etc) exploit and cache these disproportionately softened displays of bounty. This freedom of availability of food being absent, barnacles and other generalist feeders survive, with hardties to maintain sustainable populations where meek and weak would not at food bars. The simple presence of an 25.00% carnivorous group and an 18.75% insectivorous group indicates, however, that food pyramid webs that are regional, are alive and functioning, as predators like Indian Scops Owl *Otus bakkamoena* are also biodiversity barometers for smaller trophic levels to eat. White-throated Kingfisher *Halcyon smyrnensis* and Eurasian Hoopoe Upupa epops are insect eaters that denote that enough insects remain to let them sustain themselves here. Conversely, the very fact that in a region predominantly cleared of natural jungle, the mere presence of 18.75% birds being wetland birds suggests that it is mainly thank of effort, like old village ponds and plain and irrigation canals and marshy lowlands, no matter how indigently questioned of success, stitched and sewn together trees and planters made from cotton reeds and sickle grasses, buildings and mansions, gives largely about seemingly bloody, if pointless toggeds, holding enough sanguine sway to even let foraging specialists like Great Egrets *Ardea alba* wade through it and the Black-winged Stilt *Himantopus himantopus* simply comb through the paper thin water themselves. In shedding away created data programmes, in this instance intentionally unrewarded by cattle and lined water birds they ricochet or charge across like horsemen in declamations vicarious, ascend, reacts to precariously belligerent heaven to imhorn the final data collectedhere, if not actually representative, can be some way closer with ornithology buckled.

Conclusion

The home range or the wild bird community across Baraut, Baghpat District, comprises of 16 true wild species scattered across 10 taxonomic orders and 15 families in our datasheet. There is a strong domination by passerine species and of generalist omnivores that are obviously “successful” at adapting to habitats modified by humans. It is reassuring to note that, even if just a few, insect eating and carnivorous birds remain, indicating that the local agricultural ecosystem still supports a multi-tiered food web, albeit a less diverse one. Some farmlands, fruit orchards and local wetlands remain important refuges for the local wild birds. To preserve this regional biodiversity and biodiversity of species in general locally, local planners need to protect traditional orchards; preserve old village ponds and ensure sugarcane fields use only the least harsh chemicals. In summary, the wild bird population of Baraut is largely resilient but still adult dependent on the survival of mixed farms and small-scale wetlands. It is essential that these non-urban green spaces are developed with, not in spite of the continued survival of our wild birds alongside the growing human settlements.

Appendix A: Descriptive Inventory of Methodologically Excluded Anthropogenic and Feral Avifauna

A.1. Methodological Rationale for Exclusion

In landscape ecology and urban avifaunal mapping, documenting populations that depend entirely on begging from or residing within captive housing or artificial aviary setups can severely distort the data (Sultana and Khan 2000). Including these birds inappropriately boosts regional species profile richness, clouds proper habitat affinities, and biases foraging guild percentages toward generalist omnivores. In order to arrive at an uninflated scientifically defensible assessment of the region (N=16), five previously recorded variations of birds were excluded from the main body of the statistical models. We retain the descriptive field profiles and photograph records of those birds to ease understanding of both approaching the avifauna as a whole of the Baraut area study, as well as provide a complete history of all birds observed there.

A.2. Screened Taxonomic Profiles and Visual Plates

1. Domestic Pigeon — White Morph Variant (*Columba livia domestica*)

Taxonomic Classification

Kingdom: Animalia

Phylum: Chordata

Class: Aves

Order: Columbiformes
Family: Columbidae
Genus: *Columba*
Species: *C. livia*

•**Morphological Description:** Features a plumage morph that is completely snow-white. Cere at base of bill soft cream-white. Irises with deep red or orange-red pigment ring. Legs and feet smooth dull pink; this is the white variety that lacks both the classic grey plumage and the parallel black wing bars of the wild type of which domestic varieties were bred under artificial selection.

•**Exclusion Criteria:** Systematically excluded from primary ecological data models due to direct reliance on human lofts, artificial shelter complexes, and intentional public grain feeding networks within dense urban matrices.

Plate A.1 Field Photograph of Domestic Pigeon - White Morph

2. Domestic Pigeon-Pied Morph Variant (*Columba liviadomestica*)

Taxonomic Classification
Kingdom: Animalia
Phylum: Chordata
Class: Aves
Order: Columbiformes
Family: Columbidae
Genus: *Columba*
Species: *C. livia*

•**Morphological Description:** Patches of a remarkably irregular pattern of clean white and deep charcoal-grey feathers on the mantle, wings, and underparts. The head and upper breast often have an irregular patch of iridescent green and purple metallic lustre. The bill varies in structure to a dull grey colour with very conspicuous powdery cere of white.

•**Exclusion Criteria:** Not included in baseline statistics because this is a human-supported town variant. Individuals perch, nest, and roost on residential concrete ledges and roofs using completely out of the natural wildlife foraging guilds.

Plate A.2 — Field Photograph of Domestic Pigeon - Pied Morph

3. Feral Rock Pigeon (*Columba livia*)

Taxonomic Classification
Kingdom: Animalia
Phylum: Chordata
Class: Aves
Order: Columbiformes
Family: Columbidae
Genus: *Columba*
Species: *C. livia*

•**Morphological Description**: Exhibits the normal ancestral plumage pattern, with a slate grey, the body mantle, a glossy green and purple colouration on the neck, a pale grey lower back, and two parallel dark black bars present on the secondary flight feathers of the wings.

•**Exclusion Criteria:** Although morphologically indistinguishable from wild rock doves, the populations within the urban grid of Baraut function as feral town assemblages. Their subsistence, high density and reproductive cycles are sustained by public grain-feeding squares and artificial architectural nesting structures.

Plate A.3 — Field Photograph of Feral Rock Pigeon

4. Domestic Duck (*Anas platyrhynchos domesticus*)

Taxonomic Classification
Kingdom: Animalia
Phylum: Chordata
Class: Aves
Order: Anseriformes
Family: Anatidae
Genus: Anas
Species: *A. platyrhynchos*
Subspecies: *A. p. domesticus*

•**Morphological Description**: The body outline is heavy and robust, with a flat broad bill of orange, with very short webbed orange feet; plumage varies from pure white to very earthy brown in the mixed birds according to stock descended from. The ladies are shorter in the wing, and plumper or heavier on the body (body mass index) than migratory wild ducks, etc.

•**Exclusion Criteria:** Filtered out from the wild wetland dataset as they are all captive farmed livestock or semi-captive pond variants. Their population is controlled by government or landowners and cannot thus reflect the actual carrying capacity of the region.

Plate A.4 — Field Photograph of Domestic Duck

5. Red Junglefowl / Domestic Chicken Variant (*Gallus gallus*)

Taxonomic Classification
Kingdom: Animalia
Phylum: Chordata
Class: Aves
Order: Galliformes
Family: Phasianidae
Genus: *Gallus*
Species: *G. gallus*

•**Morphological Description**: Exhibiting traditional variations of domesticated farm types. Males have a large, fleshy, vertical red head comb and throat wattles along with long, curved lanceolate neck hackle feathers. Females are compact in body frame and have brown color patterns built into their bodies to provide camouflage.

•**Exclusion Criteria**: Excluded from the wild terrestrial galliform data models, these birds are domestic farm poultry. They thrive inside village's backyards, agricultural homestead's spaces, and even smaller coops and they rely directly on the protection of humans and supplemental grams foodstuffs.

Plate A.5 Field Photograph of Domestic Chicken Variant

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