

Bird species associated with agro ecosystem and their economic status in selected area of the Patan district

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ABSTRACT

Birds constitute a very important component of agro-ecosystem. Many birds perform a dual role in agriculture. Birds as pests to the agriculture are a very old problem but at present most farmers are equally aware of the dual role of birds as well as their usefulness as biological control of insect pests of agricultural crops. During the present investigation 37 bird species were found useful, 8 species as harmful and 31 species were observed as facultative in Patan district.

Key words : Birds, Harmful, Useful, Facultative

INTRODUCTION

Agriculture provides a concentrated and highly predictable source of food to birds (Oaeconnor and Shrub, 1986). Various studies regarding depredatory habits of birds to crop have been made but the other side of the coin. The birds being useful to crop have received little attention. Insectivorous birds and birds of prey are considered to be beneficial for agriculture as they keep a check on population of insects and rodents pests, respectively (Dhindsa and Saini, 1994). Further they also reported that 25 out of 1200 species of birds found in India (only 2.1%) inflict serious damage to crops and fruits. Surveys of literature compiled by Agarwal and Bhatnagar (1982) and Dhindsa and Saini (1994) on problem birds in agriculture suggest that the Roseringed parakeet (*Psittacula krameri*), House crow (*Corvus splendens*), Blue Rock Pigeon (*Columba livia*), Ring dove (*Streptopelia decaocto*) and House sparrow (*Passer domesticus*) are amongst the bird species damaging crop and stored grains. Insectivorous birds are good biological control agent in reducing insect pest population (Parasharya *et al.*, 1994). An omnivorous species (facultative) of bird which may be harmful to a particular crop may be useful in another stage of the crop. Crop fields attract many birds from sowing to ripening stage. This paper analyses the structure of bird community and evaluate their role in relation to crops in different economic status agro-ecosystem.

MATERIALS AND METHODS

Patan district is situated in the Northern part of Gujarat. It is bound on the North West and north by Rann of Kutch and Banaskantha district. Patan district lies between 23° 41' and 23° 55' n latitude and 71° 31' and 72° 20' E longitude. The region is having the minimum

temperature as low as 5°C -10°C and maximum temperature as high as 40°C – 48°C. The average rain fall in the region is about 701 mm. The survey on bird fauna was conducted in 7 talukas and 2 sites in each taluka selected for the study purpose and large number of bird species was noticed. The inhabitants of the Patan city have migrated from surrounding villages and basically deal in agriculture. Several species of crop plants are cultivated.

Crop fields were chosen randomly. Birds were identified and counted by using binoculars (7x50), observations were taken twice or thrice a week, in each crop field chosen for observation of one hour duration. The number of insect pests and bird species were recorded, their economic status, whether useful or harmful or facultative assessed looking to the food taken in the field.

RESULTS AND DISCUSSION

The birds found in agro ecosystem in the study area were classified into three broad groups according to their food (Table 1).

Useful birds:

Feeding on insects, rats etc.

Harmful birds:

Depredating on grains, vegetables, fruits.

Facultative birds:

Food habit changes according to its availability.

The results presented in Table 1, indicate that majority of birds were useful (37 species; 48.7%), followed by facultative (31 species; 40.8%) and minimum number of harmful species (8 species; 10.5%) (Fig. 1). In India, 26 species of birds have been reported to prey on insect

Table 1 : Bird species associated with agro ecosystem and their economic status

Sr. No.	English common name	Scientific name	Food habit
Useful			
1.	Cattle egret	<i>Bubulcus ibis</i>	In
2.	Brahminy kite	<i>Haliastur indus</i>	In
3.	Tawny eagle	<i>Aquila rapax</i>	In
4.	White – eyed buzzard	<i>Butastur teesa</i>	In
5.	White breasted waterhen	<i>Amauromis phoenicurus</i>	In
6.	Greater coucal	<i>Centropus sinensis</i>	In
7.	Eurasian eagle-owl	<i>Bubo bubo</i>	In
8.	Spotted owl	<i>Athene brama</i>	In
9.	Small blue kingfisher	<i>Alcedo atthis</i>	In
10.	Small green bee-eater	<i>Merops orientalis</i>	In
11.	Indian roller	<i>Coracias benghalensis</i>	In
12.	Common hoopoe	<i>Upupa epops</i>	In
13.	Coppersmith barbet	<i>Megalaima haemacephala</i>	In
14.	Lesser golden backed woodpecker	<i>Dinopium benghalense</i>	In
15.	Bay-backed shrike	<i>Lanius vittatus</i>	In
16.	Rufous-backed shrike	<i>Lanius schach</i>	In
17.	Rufous-tailed shrike	<i>Lanius isabellinus</i>	In
18.	Black drongo	<i>Dicrurus macrocercus</i>	In
19.	Small minivet	<i>Pericrocotus cinnamomeus</i>	In
20.	Common iora	<i>Aegithina tiphia</i>	In
21.	Red-throated flycatcher	<i>Ficedula parva</i>	In
22.	White-browed fantail – flycatcher	<i>Rhipidura aureola Lesson</i>	In
23.	Rufous- fronted prinia	<i>Prinia b Buchanan</i>	In
24.	Zitting cisticola	<i>Cisticola juncidis</i>	In
25.	Common tailor bird	<i>Orthotomus sutorius</i>	In
26.	Variable wheatear	<i>Oenanthe picata</i>	In
27.	Yellow fronted wood pecker	<i>Dendrocopos mahrattensis</i>	In
28.	Oriental magpie-robin	<i>Copsychus saularis</i>	In
29.	Indian robin	<i>Saxicoloides fulicata</i>	In
30.	Large pied wagtail	<i>Motacilla maderaspatensis</i>	In
31.	Indian sliverbill	<i>Lonchura malabarica</i>	In
32.	Oriental white eye	<i>Zosterops palpebrosus</i>	In
33.	Red rumped swallow	<i>Hirundo daurica</i>	In
34.	Common swallow	<i>Hirundo rustica</i>	In
35.	Wire tailed swallow	<i>Hirundo smithii</i>	In
36.	House swift	<i>Apus affinis</i>	In
37.	Black redstart	<i>Phoenicurus ochruros</i>	In
Harmful			
38.	Lesser - whistling – duck	<i>Dendrocygna javanica</i>	C

Table 1 contd....

Contd.... Table 1

39.	Blue rock pigeon	<i>Columba livia</i>	C/OS/P/M
40.	Eurasian collared-dove	<i>Streptopelia decaocto</i>	C/M
41.	Red collared-dove	<i>Streptopelia tranquebarica</i>	C/M
42.	Spotted dove	<i>Streptopelia chinensis</i>	C/M
43.	Laughing dove	<i>Streptopelia senegalensis</i>	C/M
44.	Rose-ringed parakeet	<i>Psittacula krameri</i>	C,OS,P,F,W ,M
45.	White-throated munia	<i>Lonchura malabarica</i>	C/W/M
Facultative			
46.	Oriental white ibis	<i>Threskiornis melanocephalus</i>	C/I
47.	Black Ibis	<i>Pseudibis papillosa</i>	C/I
48.	Grey francolin	<i>Francolinus pondicerianus</i>	C/I
49.	Indian peafowl	<i>Pavo cristatus</i>	C/V/I
50.	Red –wattled lapwing	<i>Vanellus indicus</i>	C,I
51.	Yellow-legged green-pigeon	<i>Treron phoenicoptera</i>	F/C/I
52.	Pied crested cuckoo	<i>Clamator jacobinus</i>	F/I
53.	Asian koel	<i>Eudynamis scolopacea</i>	F/I
54.	Red winged bushlark	<i>Mirafra erythroptera</i>	S/I
55.	Ashy-crowned sparrow -lark	<i>Eremopterix grisea</i>	S/I
56.	Eurasian golden oriole	<i>Oriolus oriolus</i>	F/I
57.	Brahminy starling	<i>Sturnus pagodarum</i>	C/F/I
58.	Common myna	<i>Acridotheres tristis</i>	C/F/I/M
59.	Bank myna	<i>Acridotheres ginginianus</i>	C/F/I
60.	Indian treepie	<i>Dendrocitta vagabunda</i>	C/OS/F/I/M
61.	House crow	<i>Corvus splendens</i>	C/OS/F/I/M
62.	Jungle crow	<i>Corvus macrorhynchos</i>	C/OS/F/I/M
63.	White-eared bulbul	<i>Pycnonotus leucotis</i>	F/I
64.	Red-vented bulbul	<i>Pycnonotus cafer</i>	F/I
65.	Yellow-eyed babbler	<i>Chrysomma sinense</i>	C/F/I
66.	Common babbler	<i>Turdoides caudatus</i>	C/F/I
67.	Large grey babbler	<i>Turdoides malcolmi</i>	C/F/I
68.	Jungle babbler	<i>Turdoides striatus</i>	C/F/I
69.	Purple sunbird	<i>Nectarinia asiatica</i>	F/I
70.	Yellow-throated sparrow	<i>Petronia xanthocollis</i>	C/V/I/F/M
71.	Baya weaver	<i>Ploceus philippinus</i>	I/C/M
72.	Black –headed bunting	<i>Emberiza melanocephala</i>	M/I
73.	Red-headed bunting	<i>Emberiza bruniceps</i>	M/I
74.	Red-munia	<i>Amandava amandava</i>	M/I
75.	Spotted munia	<i>Lonchura punctulata</i>	C/W/I/M
76.	Black headed munia	<i>Lonchura malacca</i>	C/W/I/M

Descriptions of abbreviations:

Food habit : C = Cereals; Os = oil seed; P = Pulses; F = Fruits; V = Vegetables; W = Weeds; I = Insects.

pests of agricultural crops (Raheja, 1992) while Bhalodia *et al.* (1997) found 10 bird species feeding on crops in Morzar village. According to the availability of food at the particular area, specific types of birds are found.

The birds and the food present at particular habitat called feeding guilds. The thing on which bird feed is known as feeding habits. Total 76 bird species were observed for above purpose. On the basis of major food components, birds can be divided into eight groups. They are: Birds feeding on Cereals, Oilseeds, Pulses, Fruits, Vegetables, Weeds, Millets and Insects. According to the principal food component, maximum bird species were found to depend on insect as their main food (30%) followed by cereals(25%), fruits(17%), millets(16%), oilseeds (5%), weeds(4%), pulses(2%) and vegetables (2%) in the study area. In past, among the birds observed in rice fields, insectivores were the dominant group followed by soil invertebrate feeders and granivores (Subramanya and Veeresh, 1998; Prajapati, 2006, Patel, 2008).

All the observed birds were granivorous, insectivorous or facultative (omnivorous). Blue rock pigeon and Indian ring dove are granivorous birds and they damaged sown seeds of sesamum, sorghum and pearl millet. Indian peafowl was observed feeding on tender leaves and flowers of cucumber, blackgram and cotton.

Table 2 : Principal diet components of birds

Sr. No.	Major diet	No. of species	Percentage
1.	Cereals	27	25
2.	Oil seeds	05	05
3.	Pulses	02	02
4.	Fruits	19	17
5.	Vegetables	02	02
6.	Weeds	04	04
7.	Millets	18	16
8.	Insects	33	30

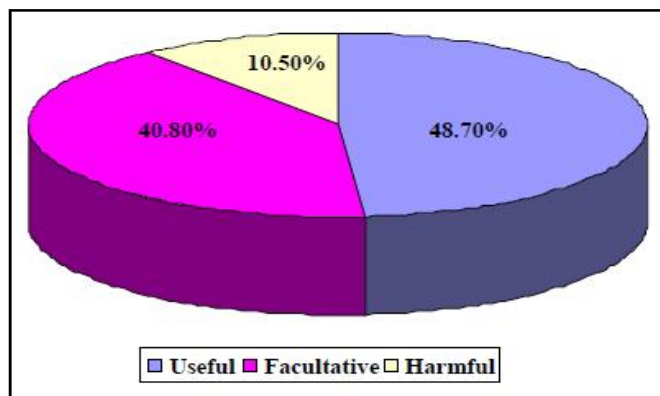


Fig. 1 : Relative distribution of bird species based on food habit

Roseringed parakeet was observed feeding on fruits, chilli and millet crops. Bay weaver bird performed dual role as it was found to feed upon larvae of insects on different crops but damaging leaves of sorghum for nest construction. Common Myna, blank Myna, Common babbler and Rosy pastor were observed feeding mainly on insect pests of various crops mentioned in Table 1. Birds were found as a biological control agent of white grub. Ten bird species were found feeding on the white grub exposed during ploughing operation (Parasharya *et al.*, 1994).

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REFERENCES

- Agarwal, R.A and Bhatnagar, R.K. (1982).** Management of problem Birds in aviation and agriculture, Ministry of Defence and ICAR, New Delhi.
- Bhalodia, Ketan, Shukla, Madhavi and Soni, V.C. (1997).** Evaluation of beneficial and harmful role of birds In agroecosystem of morzar village of Jamnagar district, *PAVO*, **35** : 1-5
- Dhindsa, M.S, and Saini, H.K (1994).** Agricultural ornithology; an Indian perspective. *J. Bio. Sci.*, **19**:391-402.
- Oaeconnor, R. and Shrubbs, M. (1986).** *Farming and Birds* Ed., Cambridge University Press, Cambridge.
- Parasharya, B.M., Dodia, J.F., Mathew, K.L. and Yadav, D.N. (1994).** Natural regulation of white grub (*Holtrichia* sp.: Scarabidae) by birds in agroecosystem. *J. Bio. Sci.*, **19** (4) : 381-389.
- Patel, K.B. (2008).** Assessment of avian community and its impact on millets agro-ecosystem in selected area of the Patan district (North Gujarat) Ph.D. Thesis, Hemchandracharya North Gujarat University, Patan.
- Prajapati, K.M. (2006).** Ecological evaluation of avian diversity at emerging town-Gandhinagar, Ph.D. Thesis, Hemchandracharya North Gujarat University, Patan.
- Raheja, A.K. (1992).** Research highlights of AICRP on Agricultural Ornithology, ICAR, New Delhi.
- Subramanya, S. and Veeresh, G.K. (1998).** Avifaunal patterns in the rice fields of Bangalore, *Birds in Agricultural Ecosystem*, Society for Applied Ornithology (India), 30-53.

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