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Status Survey of House Sparrow (*Passer domesticus*) at West Godavari District, Andhra Pradesh, India

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Abstract: House Sparrow, the tiny bird was once a familiar bird species and was abundant around our habitats. A drastic decline of House Sparrow was observed for the past four decades. The recent surveys in 2021 also supported their decline. Non-availability of breeding spaces, reduction in the availability of food resources and indiscriminate usage of pesticides are some of the main threats for their survival. A survey was conducted across West Godavari district of Andhra Pradesh to know the status of House Sparrow in the year 2014. Data was collected from the senior citizens by framing a questionnaire related to their status during 1980-90 decade to find out various factors contributing to their abundance during that decade and to compare with the present trend. The survey reported that the sparrow population has been declined by 92% in all over the district. From some villages, it has been vanished completely. The survey data revealed that availability of food resources and spaces for nest construction were decreased.

Keywords: House sparrow, Sparrow status, Sparrow survey, Sparrow decline, West Godavari district

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Introduction

House Sparrow (*Passer domesticus*) spread all over the globe, excluding the Polar Regions. It is the most adaptive avian species that survive all geographical conditions and thus became human commensal. The abundance of this tiny bird population was decreased globally in the post half of the 20th century. The decrease in the abundance of the House Sparrow was observed in 1920 in Britain. Due to various reasons like changes in transportation of harvested grains, changes in house design etc. caused costs around

60% of farmland House Sparrow in Britain and 70% of House Sparrow population in Spain (Murgui and Macias, 2009). The architecture of houses also contributed to the sparrow decline in Germany (Shaw *et al.*, 2008). According to Birdlife International studies, in Italy, the decline rate was about 40%, which was increased to 54.2% from the year 2012 to 2015. Besides all these causes, the infection by *Plasmodium* results in around 75% population declines in 1995 in London (Dadam *et al.*, 2019).

As per the reports of several ornithologists, the declining status of this universal bird is the same as other countries including India (Rahmani, 2003). The survey of the Indian Council of Agricultural Research also found that the population was declined by 20% in all Indian states. The decline status in Andhra Pradesh was increased to 80% (Hussain *et al.*, 2014). The recent global studies also stated that the sparrow population is still under decreasing trend (Berigan *et al.*, 2021).

No detailed survey of house sparrow was conducted in the state of Andhra Pradesh, especially in and around the district of West Godavari. Before the start of our conservation work, field surveys were conducted across West Godavari district of Andhra Pradesh, in January 2014, to know the status of the House Sparrow population.

Materials and Methods

Study Area:

The West Godavari District is the “Rice Bowl of Andhra Pradesh”. Its name derived from its location towards the west of river Godavari. The British bifurcated the Godavari district as east and west Godavari districts for administrative reasons in 1925. It is located in the 16.31277° to 17.65223° N latitudes and 80.85041° to 81.86046° E longitudes. The district is on East-coast, with 8,506 km² area. The West Godavari district is physiographically divided into three main natural regions namely alluvial plain, upland areas and hill ranges. The Alluvial plains covered about 30 % of the district, appear on the southern side of the district. The uplands constitute about 70 % of the total district, extending from middle to North-west to north directions. The other physiographical structures are Structural hills, Pediplain, Pediment inselberg complex, Coastal landforms and Valley hills towards north. On an average more than 16.7 per cent of the total district’s geographical area, covered by forests, which include undisturbed, non-planted areas and the canopy extends 5 m

that comes around 1375.11 sq km. The district is distributed in the Tropical climate zone. During the summers i.e. from March to June, the climate is very hot and dry; often the temperature reaches 50 C. From June onwards it is a discontinuous summer, and due to the South-west monsoon the district receives rainfall up to September. North-east monsoon appears during the post-October and November months.

Paddy was the major crop in the district of West Godavari, and is popularly known as the Rice Granary of Andhra Pradesh. Paddy farming constitutes 60% to 65% of the total crop area. The average yield is 3,597 kg/ Hector. The other predominant crops are bananas, Sugarcane, Chillies, Coconut, Maize and Tobacco. Now, Oil palm is on expanding agro cultivation in uplands.

House Sparrow Survey in West Godavari District:

Objectives of the Survey were to assess the population trend of the House Sparrow of 1980-90 decade and to compare that with the current status. bird population can be surveyed in two methods—(i) Line Transect method and (ii) Point Count method. Line Transect method is used to find out the density and number of species in an area. It is mainly used for forest birds. The line may be a straight line or road transect, with fixed distance. End points must be marked with flagging tape. Census must be done at a fixed time of the day with regular intervals. Each sample point must be assigned with a unique identification mark. Birds are counted either by physical identification or by its call. Point Count method is used to count the bird species and their population at a point on line transects or non-line transect. Point count method is used to count the wet land birds and also used in forest birds. In urban areas for their census Point-count method is preferred method (Jenny De Laet *et al.*, 2011).

Opportunistic Bird sightings is also a method, to identify the bird species other than the transect methods, while passing through that way. Location, time of sighting, number of birds, and all

details to be noted down. This method provides valuable additional information to build the list of birds.

For the status of the house sparrow population, the only method to obtain the data is from the senior citizens. Questionnaires are the method of text-based instrument that provided with series of questions to answer or to respond towards the object (Young, 2015). The questionnaire method is employed when the resources are limited (Roopa and Rani, 2017). For inferential research, the smaller sample size may be recognized, but it must have statistical significance (Dörnyei, 2007). This method deduces the results from a small representative sample and attributed the characteristics to a bigger population. According to Dörnyei (2007) the correlational research should have at least 30 participants. For framing a questionnaire, the researcher should understand the objectives of the survey, and should plan accordingly. The questions are designed in such a way to get the information in order to accomplish the aim of the survey. According to Sreejesh *et al.* (2014) the content of the questions must be framed to reflect the problems of the objectives.

House Sparrows are colonial roosters and non-migratory. For foraging, they used to move within 70 m radius of the nest during breeding season. Roshnath *et al.* (2015) conducted survey on House Sparrow in Kannur District, Kerala, India. They used an open-ended type questionnaire in local language. For survey, they selected the respondents of age group between 35 and 55 years.

Survey:

An open ended question survey was conducted in January 2014 in West Godavari to know the status of House Sparrow, by randomly choosing various places. We had chosen the survey locations of three different physiographical regions. The locations Bhimavaram (16.5449° N, 81.5212° E), Narasapuram (16.4330°N, 81.6996°E), Attili (16.6885°N, 81.6037°E), Peravali (16.7511°N,

81.37418°E) and Mupparthipadu (16.6883°N, 81.5610°E) are in delta region. Nidadavole (16.8971°N, 81.6634°E) and Nallajerla (16.9479°N, 81.4045°E) are in the junction of upland and delta, Jangareddigudem (17.1223°N, 81.2923°E) is in hilly zone (Fig.1).

Fig.1: Map showing the surveyed areas of West Godavari district.

For our survey, the respondents were selected in the age group of 45 to 65 to obtain the data regarding various factors where the house sparrow is in abundance during the 1980-90 decade. To know the current status, House Sparrow census was done by Point Count Method. At each location, data was collected at the houses and where the sparrows were thought to be abundant and made nests in their roofs. The systemic survey was conducted for eight factors as per the designed questionnaire format that include sightings of the sparrow, reasons for decline, distribution of nests and nesting sites, changes in the house design, bushes around the residential area, food resources, predation and vegetation.

Results and Discussion

Survey revealed a remarkable reduction in the population of House Sparrow in West Godavari District. The sightings of the extant number of sparrows indicated severe decline. Sparrow population was dropped to beyond 91.35%. In the town, Bhimavaram, as per the sightings data (from 1980s to 2014), the decline was found to be 95.88%. In the town, Narasapuram population

dwindled about 94.34%. At the small town Peravali, the decline trend was 92.05%. In the town, Nidadavole, the population reduced by 91.37%. About 90% lessen population was recorded at Attili town. At the town, Nallajerla, an area located between plain and upland, around 85% decline was noticed. In the town Jangareddigudem, the decline status of House sparrows was 86%. At Mupparthipadu, a remote village in delta region, the population was declined about by 96.2% (Fig. 2).

Fig.2: Comparison of Sightings of Sparrow in the 1980s decade and 2014.

The sightings of nests in the roofs clefts were also decreased. The number of nests is positively correlated to the population status of the sparrow number. Construction of the nests was also proportionately reduced by 88.84% (Fig. 3). Habitat loss is one of the main threats for the survival of the House Sparrow. Sparrows used to build nests in the clefts of thatched houses and tile-roofed houses. Our survey revealed that the number of thatched houses is decreased to 0.03% and tile-roofed houses (including local and Kerala tiles) houses are only 3.26%. Such reduction in the sparrow habituated houses also caused their decline.

As per the data collected from the senior citizens, the availability of food resources to the sparrows has also been decreased. Collecting paddy, drying and storing at the residential area were different in the past days from the current period of study (2014). But now, the agricultural

practices have totally been changed. As manpower became scarce and more expensive, Paddy Combine Harvesters replaced the manpower. Such change in harvesting methods reduced the availability of grains to the sparrows in residential areas. In those days, farmers used to store the paddy in their residential areas by various methods that provided the sparrows with food grains. But the trend has been changed and farmers are selling the paddy to millers during the harvesting time itself.

Fig.3: Comparison of Sightings of Sparrow Nests in the 1980s decade and 2014.

As per the data obtained, there was a large gathering of House Sparrows, a flock of 2000 sparrows were counted at a Rice mill, located at the core of town Bhimavaram in 1994. But such sightings are now no more. The other major reasons for the decrease in the availability of food resources are the conversion of the paddy fields to aquaculture ponds. Around 35,864 hectares of paddy cropland was being converted to aquaculture ponds. Figures 4 and 5 explain the comparison of paddy fields in the 1980-90 decade and to the present status (2014). Figure 6 shows the aquaculture ponds (District survey report 2018). Such a Blue revolution has a greater impact on the non-availability of grainy food to these tiny birds. It also resulted in the closure of rice mills in some areas that also shortened the availability of food. The reduction of open areas around the houses has a significant impact on the availability

Fig. 4

Fig. 5

Figs. 4 and 5: The reduction of paddy culture in West Godavari District by 2014.

Fig. 6: Aquaculture ponds at delta area of West Godavari District (2018).

of food. Public used to throwing of the food wastes and bowl wastes on open grounds, which were fed by birds. But, lack of open places, wash basin in

kitchen made unavailability of such disposed food to the birds. Studies by Shaw *et al.* (2008) at urban areas reported that sightings of house sparrows

are more at the places where there are public with low socio-economic status. To summarize, the present way of human life-style resulted in the non-availability of food resources to house sparrows.

Sparrows prefer bushes or shrub plants to roost especially orange trees, pomegranate, Jujube etc. The reduction of number of bushes also reduced due to urbanization and modern architecture in rural areas (Fig. 7). The bushes in and around our residential areas play roles for sparrows-- they act as roosting sites and also the invertebrate food resource. The reduction of bushes also caused the non-availability of larvae to the nestlings and thus they increased the mortality of nestlings.

Fig.7: Comparison of Sightings of Bushes in the 1980s decade and 2014.

The role of predators remained stable all these days. The noticeable predators to sparrows are-- domestic cat (*Felis catus*), House Crow (*Corvus splendens*) and often Shikra (*Accipiter badius*). Except in the municipal corporations (Bhimavaram), the predators number has been raised, which include domestic cats and crows (Fig. 8). The availability of food resources, lack of their predators in the urban areas could be one of the reasons for their rise, irrespective of the sparrow population. House sparrows are the optional food resource to these predators. Crows use to collect nestlings or hunt early fledglings. Cats hunt the sparrows during their bulk-gathering for feeding or when the sparrows are at

the ground level bushes. The survey results explain that there is no direct impact of crows and cats on the decline of sparrow numbers. Studies by Ghosh *et al.* (2010) and Sharma *et al.* (2020) state that the predators like Tawny Owl (*Strix aluco*), Feral cat (*Felis catus*) and Sparrow Hawk (*Accipiter nisus*) affect the sparrow population. Our studies also revealed that the predators number has been raised at 62.5% of the surveyed areas. The sightings of the Common Pariah (*Milvus migrans govinda*) were not recorded in the recent surveys. It disappeared in all the surveyed areas.

Fig. 8: Comparison of predators of Sparrows in 1980s decade and 2014.

Studies of Robinson *et al.* (2005), De Laet Summers-smith (2007) and Kumar *et al.* (2015) reported that the sparrow decline was more in urbanized areas than rural areas. But our survey at West Godavari District showed that the decline trend in rural and urban areas was almost similar. In the remote village, Mupparthipadu, we found only eight birds during our survey.

Conclusion

The human commensal secondary consumer bird the House Sparrow population has been dropped to 5% in the delta areas, whereas to 14% in uplands, in the past three decades. Reduction of the availability of food resources and lack of breeding spaces are the direct causes for their decline. Conversion of paddy fields as aquaculture ponds resulted in the disappearance of bulk food resources that has a greater impact on their

dwelling. Government policies to get permanent houses also has an impact on changes in the house design, conversion of Thatched houses as RCC slab building during the years 2005-2006 also has a major impact on their breeding spaces.

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