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A review on the need for conserving the house sparrow in India

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Abstract

The common house sparrow is one of the most ubiquitous birds around us and is one of the more familiar winged companions of human beings. It has, over a period of time, evolved with us. This bird has been on the decline over much of its natural range, both in the urban and rural habitats. The decline of the house sparrow is an indicator of the continuous degradation of the environment. There are various factors responsible for the decline of house sparrows. These include lack of food, pollution, predation by domestic cats or sparrow hawks, competition for food from other urban species, loss of nesting sites, increased use of pesticides, change of environment, pollution, electromagnetic radiations disease transmission etc. The paper reviews the causes and efforts to conserve them in their natural habitat and increase their number so that the avian diversity is sustainably managed.

Keywords: House sparrow, habitat, conservation, diversity and environment

1. Introduction

House sparrow is a well-known bird of family Passeridae. Females and young birds are pale brown and grey, while males have brighter black, white, and brown markings. According to the latest sparrow census reported by various environmental organizations, there has been an 80 percent decline in their numbers during the past decades in India. The disappearance of sparrows in India has been widely reported, although responses have been quite muted. Their recent decline around the world has put them in the list of the International Union for the Conservation of Nature.

March 20 has been designated as World House Sparrow Day. The marking of the day is an international initiative by the Nature Forever Society, in collaboration with the Bombay Natural History Society, and numerous other international organizations.

The present study analyzes the factors responsible for decline in the population of house sparrow, once a very common bird, in Sikar and India. And suggest methods to increase their abundance and diversity.

2. Diversity of house sparrow

The work on morphology and biology of the house sparrow was initiated around 1900^[1]. Aggressive flocks of sparrows discourage other species of birds from foraging in the same area. Abundance and congregation of house sparrow in a particular area depends on the availability of food sources for both adults and nestlings and essential nest sites around those food sources. Occurrence and abundance of a species in a particular area is determined by biotic factors and different habitat variables such as food sources, habitat covers and relative abundance of other bird species.

The following explanatory variables were supposed to affect the abundance of house sparrow Population in a particular area: The food sources are mostly categorized in to three categories.

- 1. Leftover food:** This category includes all types of leftover food which are thrown out from the houses and grocery shops and the left over rice grains present in the rice twigs of thatched roof. The left over foods also constituted the rice, wheat, green gram and black gram grains.
- 2. Plant buds:** Guava, Citrus, Drum stick trees, and Papayas are the major sources of buds throughout the years. Birds were observed feeding while roosting in the above mentioned trees.
- 3. Arthropods:** Arthropods form the major constituent of the nestling diet. There is significant contributions in the field of diversity and conservation of sparrows^[2-7].



Fig 1: House Sparrow looking for food in Sikar Rajasthan

According to IUCN Red list of threatened species, (Fig 1) the house sparrow population has been declining above 10% in the last three decades in several parts of the world. For this reason the house sparrow has evaluated as Least Concern (IUCN, 2012).

3. Importance of house sparrow

Fossil evidence from a cave in Bethlehem dating back 4,00,000 years suggests that the house sparrow shared its space with early humans. It simply cannot live without humans and is never found where we are not.

Sparrow is a very important member of various urban and natural food chains and food webs and plays a crucial role in ecological balance (Fig 2). The house sparrow is commensal with humans and is considered to be one of the most highly adapted species to urban conditions [8].



Fig 2: Female house sparrow in daytime at Sikar Rajasthan

It feeds on grains and also on larva of insects especially mosquitoes which breeds in the water and this mechanism is a natural pest control process. It has proven well suited for studies in evolutionary mechanisms, temperature regulation and pest control. It also feeds on larva of mosquitoes which breeds in the water stagnated in the inaccessible area of house. The sparrows go in search of larva and feeds on them. This mechanism is a natural pest control process in which human being also favored without any expenses. Sparrow visits many flowers in a day and at the time of visit they carry pollen and thus is important for pollination.

4. Possible causes of decline in sparrow population A number of hypotheses have been derived as the possible causes of the decline in House Sparrows in urban-suburban habitats: predation, ecological reason, competition, lack of nest sites, disease, food availability and pollution.

4.1 Predation: There are three major candidate predators that could conceivably affect House Sparrow numbers: the Tawny Owl, the domestic or feral cat and the Sparrow hawk.

4.2 Competition: Inter-specific or intra-specific competition for food is another factor that can regulate House Sparrow numbers. When different species feed together on the same food, individuals of a dominant species can greatly reduce the feeding rates of individuals of subordinate species. The Collared Dove and Wood Pigeon are both granivorous species. As such, they can be the two most likely competing species against House Sparrows for food.

4.3 Lack of nest sites: Houses built between 1945 and 1984 are more suitable for House Sparrows [9] and those built post 1984 homes are less attractive for nesting sparrows. The occurrence of house sparrow, was *P. domesticus* in and around Bangalore was studied and it was found that more number of sparrows were found in rural and market area of Bangalore. This was based on the availability of a variety of food sources for both adults and nestlings, and essential nesting sites around the food sources [10]. It was found in the study area of two Tamil Nadu Districts which are highly urbanized the population of house sparrow decreased [11]. Thus urbanization is major threat to sparrow breeding site. Being a cavity nest bird, use of artificial nest box may be an attempt to reduce the population loss of house sparrow [12].

4.4 Disease: As disease spreads between individual birds, they will become weak prone to more diseases. If an individual lacks immunity, it becomes vulnerable to diverse types of diseases. Research undertaken on the effects of haemotophagous mites on nestling body mass in house sparrows showed that chicks from nests with relatively high ectoparasite loads had lower overall body masses than chicks from nests with relatively low mite loads [13].

4.5 Food availability: Food shortage can also affect individuals directly, by causing the breeding failure or starvation [14]. It has been found in many cases that the population of house sparrow was high in agricultural area or open fields of rural areas as compared to residential areas. The high number of house sparrows in agricultural areas (rural areas) is because of the available food grains, insects and suitable nesting site for them. The supplementary feeding increases nestling feather in house sparrow [15].

4.6 Loss of tree canopy: In the industrialized era of development the urban trees are cut down without understanding ecological importance of the trees. It was reported that the number of house sparrow's nests towards concrete buildings was found to have a negative correlation in the urban and suburban regions of Jammu Kashmir [16]. A link was established between the degree of urbanization and the level of developmental stress in an urban exploiter (the house sparrow, *Passer domesticus*), which has recently been declining in multiple European cities [17]. Recently, it has been suggested that urban conditions could be especially detrimental to developing sparrows. Urban conditions correlate negatively with growth, body size, and feather quality [18]. There is also effect of electromagnetic radiation on house sparrows and these are disappearing from areas contaminated with electromagnetic waves arising out of increased number of cell phones.

5. Conclusion

It can be concluded that the sparrow's population is decreasing without specifications of the cause. For sparrow conservation it is the time to take fruitful efforts to conserve the tiny social bird from becoming rare in future. Long term observations considering various environmental stresses are needed to find the causes of decline of sparrow population and for proper planning to increase their productive rate. This study would help in preparing the conservation strategies and tracking the different factors which may be responsible for declining of house sparrow population.

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