



## **Population status and factors affecting abundance of house sparrow (*Passer domesticus*): A review**

**Pratibha Sharma<sup>a\*</sup>, Manpreet Binner<sup>b</sup> and Gaurav Narwal<sup>c</sup>**

<sup>a</sup> Student, Department of Zoology, School of agriculture and natural sciences, CT University, Ludhiana, 142024, Punjab

<sup>b</sup> Assistant Professor, Department of Zoology, School of agriculture and natural sciences, CT University, Ludhiana, 142024, Punjab

<sup>c</sup> Student, Department of zoology, School of agriculture and natural sciences, CT University, Ludhiana, 142024, Punjab

Corresponding author's e-mail: [ps705652@gmail.com](mailto:ps705652@gmail.com)

### **ABSTRACT**

*The fluffy brown sparrows are 15cm in length and distributed all over India up to 4000m in the Himalayas. The disappearance of sparrows has been widely reported in India. In many places like Punjab, Haryana, West Bengal, Bangalore etc a very sharp decline has been observed by ornithologist. The species has shown a conservation concern in its native ranges. According to a recent study by Indian Council of Agricultural Research (ICAR) the house sparrow population in Andhra Pradesh has reduced upto 88% and in other states like Kerala, Gujrat, Rajasthan it has dropped down upto 20%. In coastal areas of India the population has tremendously dropped to 70 to 80%. The main cause of decline of this species remains unidentified but it is believed the unavailability of nests because of modernization, constructions, and deforestation can lead to their decline. The other causes might also include rapid use of insecticides, competition with other species etc. Modern houses do not leave any space for the species to build their nests but in past few years artificial nest boxes are promoted like wooden nest boxes, shoes boxes as nests or earthen pots as nests, which give house sparrows an alternative to live in.*

**Keywords:** Species; Population; Decline; Ornithologists; Artificial Nest Boxes.

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### **INTRODUCTION**

The Gouraiya or the House sparrow belongs to the family Passeridae and is a little, stocky song bird with thick bill, short leg, measuring about 14-16cm, weight 26-32 gram and having a wing span of 19-25 cm. the sexes are dimorphic, that is, the males and females look different. It is most widely spread and abundant birds in the world [2]. In the Indian subcontinent they are commonly found in India including introduced populations in Andaman Islands; Pakistan, Bangladesh, Srilanka and Maldives, [31]. House sparrow is a small bird with huge importance as it acts as an indicator of ecological balance of a habitat. It is closely associated with human habitation and can live in urban or rural areas. They are found in widely varied habitats and climate; it typically avoids extensive woodlands, grasslands and deserts away from human development. It feeds mostly on seeds of grains and weeds but also eats insects and other foods. Sparrow population has decreased considerable in many parts of the globe in particular urban suburban gradient, [41]. In recent years India has seen a dramatic decline of house sparrow population and ornithologists have observed a sharp decline in house sparrow population across West Bengal, Bangalore, Punjab, Rajasthan, Delhi and Haryana, etc [5]. Perhaps, the transformation of human social organization influenced and is influencing the distribution of this species in many ways. Some of the ecologists believe that mentioned bird is a symbiotic species with human, hence recognizing and identified as bird species depended on human environments. It is an essential bird species as an equilibrant factors in ecosystems which have educational, recreational, economical and aesthetic values [16]. High reduction of sparrow population in London (60%), Glasgow (99%) and Hamburg (77%) has led to the inclusion on the UK

Conservation Red List [26]. This article tries to provide the overview of population decline in house sparrow around India.

## DISTRIBUTION

A small plump brownish bird, which is a widely distributed species in most parts of Europe and Asia, is blue-black slowly disappearing from urban areas [43]. The ancient Romans introduced the house sparrow to Europe from North Africa and Eurasia. In Australia, between 1863 and 1870 they were first released in Victoria and then to other areas including Sydney, Brisbane, and Hobart. The House sparrows introduced independently in a number of American cities in between 1850 and 1875 as a means of pest control. India provide a variety of ecosystems ranging from hot and humid evergreen forests to the scorching deserts providing habitats to about 250 species that are variously adapted to different habitats. The house sparrow is abundant in temperate climates. They can survive in a wide range of temperature.

## Scientific classification

Kingdom: Animalia

Phylum: Chordata

Class: Aves

Order: Passeriformes

Family: Passeridae

Genus: *Passer*

Species: *P.domesticus*

Binomial name: *Passer domesticus*

## General Features of *Passer domesticus*

Local Name: Gouriya (Hindi, Urdu), Guora (Nepali)

Size: 14-16 cm

Wingspan: 19 - 25 cm

Weight: 26 - 32 g

Small, Stocky songbird, legs short, chest unstreaked, wing bars monogamous.

Females and young birds are coloured pale brown and grey, and males have brighter black, white, and brown markings

**Habitat:** House sparrows are closely related to humans and their habitat. They can be easily found around livestock and rarely in extensive woodlands, forests and grasslands.

**Food:** Sparrows feed on grains, seeds, livestock feeds and discarded food material. They also eat insects and also feed them to their young.

**Nesting:** House sparrow likes to nest under covers and mostly nest in holes of buildings. Cavities are preferred as nest sites. It also uses the nests of other birds and old tree cavities for nesting. It sometimes uses deserted nests by driving away the occupants. House Sparrow nests are made of coarse dried vegetation, often stuffed into the hole until it's nearly filled. The birds then use finer material, including feathers, string, and paper, for the lining.

**Behavior:** House Sparrows hop rather than walk on the ground. They are social, feeding in crowded flocks and squabbling over crumbs or seeds on the ground. They roost communally in shrubs or tress. Dust or water bath and head scratching are common practices for body maintenance. Females are dominant in comparison to males. House sparrows produce chirping calls for communication.

**Migration:** House sparrow is a summer visitor (March -October) to higher elevations in Baluchistan and in the Himalayas

**Mating:** House sparrow is monogamous and mate for life. They have multiple broods.

**Breeding season:** They breed during March-June in the north, September-October in central India and throughout the year in Southern India.

**Reproduction:** House sparrow lays 4-5 eggs. At least two clutches are usually laid. The eggs are greenish or bluish white with brown or grey spots. The incubation period of house sparrow lies between 10-12 days.

## STATUS IN INDIA

According to an ornithological survey conducted by the Indian Council of Agricultural Research (ICAR), the sparrow population in Andhra Pradesh alone has dropped by 80% and in other states like Kerala, Gujarat and Rajasthan it has fallen by 20%, while the turn down in coastal areas was as sharp as 70% to 80%.

In recent years, ornithologists have observed sharp decline in house sparrow population across India in Uttar Pradesh, West Bengal, Punjab, Rajasthan, Delhi, Haryana, Bangalore, Mumbai and Hyderabad. In

parts of Thiruvananthapuram, (Kerala), they had disappeared without a trace by 2003. A survey organized by the Bombay Natural History Society (BNHS) along with the Central Ministry of Environment and Forests indicate that the Hyderabad-Ranga Reddy zone saw a steep drop in the number of house sparrows from 2005 onwards. In Lucknow (Uttar Pradesh) recent surveys reveal the complete absence of House sparrows in several sites since 2013. According to Bombay Natural History society (BNHS) the population of sparrow have indeed declined and low number of nests.

### CAUSES OF DECLINE

Reasons for the Sparrow decline are numerous such as loss of habitat, cell phone towers, loss of tree canopy, lack of preferred food and modern lifestyle [14]. Modern buildings and landscaped gardens do not have cavities which are important for House Sparrows to make nests [4]. Several studies carried on house sparrow have cited varied reasons for their decline [18]. However, [22, 24], stated that any population under stress, when affected by detrimental factors in the in the environment, would badly affect the populations to cause local extinctions and this would have lead to the large scale decline of the house sparrow. Some studies have demonstrated a number of relationships between density of house sparrows and human population density [20], conditions of buildings and hence availability of nest-sites, [9], food supply, [19], and amount of vegetation (green space) on breeding grounds, [20]. The consensus emerging from these studies on the cause of urban sparrow declines was summarized by [19], who reasoned that variation in the development and maintenance of urban landscapes explains the evidence that sparrows have declined less in areas with lower socio-economic status. [15] Stated that decline in population is due to changes are related to the increasing intensification of agriculture, can be attributed to a decrease in resource availability, primarily weed seeds and cereal grain. According to [28], cereal, and other crop, seeds are increasingly sown with seed-dressings, which is likely to decrease the palatability of the seed to birds [27], revealed that populations have declined in urban and suburban since the mid 1970's due to the drastic alterations to the quality and composition of the urban landscapes. Several studies have shown that the availability of insectivorous food for nestlings during the breeding season influences the breeding success of the sparrows [38].

- Increased predation: Many hawks and owls hunt and feed on house sparrows. These include Eurasian Sparrow hawks *Accipiter nisus*, and domestic cats *Felis catus*. The domestic cat, on the other hand, is a significant predator of House Sparrows [3]. Domestic dogs, raccoons and many snakes are also predators of house sparrow. The chicks are also attacked by predators such as crows, shikra and black kites.
- Competition for food from other urban species: Feral Pigeons *Columba livia* and gulls *Larus*, particularly Lesser Black-backed Gulls *L. fuscus*, are the main potential competitors for food, but it is unlikely that either would give rise to a differential effect between the two urban habitats.
- Loss of nesting opportunities: A reduction in the availability of suitable nest holes in modern buildings and renovated old buildings must have occurred. There is competition for nesting sites among the doves, Rock chats, Bulbuls and House Sparrows. Modern designs and house plans do not leave any crevices or space even outside the buildings that can be used for nesting by the sparrows.
- Disease: House Sparrow populations affected by epidemic disease have been reported by [42], but such declines are limited in duration because the disease organism attenuates as the host develops resistance – in other words, quite different from the present urban-center decline, which has continued for at least ten years.
- Traffic: Greater volume of traffic leads to increased disturbance and pollution from exhaust fumes, both of which would be greater in city centers than small towns
- The criss-crossing cable wires and the flow of electromagnetic waves from cell phone towers injure the sparrows. It causes irritation, it reduces their reproductive capacity.
- Sparrows are gregarious birds that they like to go around in gangs. When number drop below a certain level they all go.

### CONSERVATION STRATEGIES

House sparrows are opportunists and are able to live wherever there are suitable nesting sites, roosting sites and enough food availability. The recent decline of house sparrow (*Passer domesticus*) in India as well as timely recognized. Therefore strategies and effort for their conservation are being implemented throughout the country to put a halt to the declining population before urbanization leads them to the category of the Critically Endangered.

In India, the Nature Forever Society (NFS), started by Mr. Mohammed Dilawar, has been working for the conservation of sparrows and other common flora and fauna since 2006. It has spearheaded programs

and projects that are making a visible difference to sparrow population in cities. Some of the initiatives started by the NFS are "Common Bird Monitoring of India", "World Sparrow Day", "Project Save Our Sparrows", "Nature Forever Society Sparrow Award" and "Adopt a Feeder and Nest Program", among others. The Biodiversity and Wildlife Conservation Lab in the Department of Zoology, University of Lucknow together with the Uttar Pradesh State Biodiversity Board has also embarked upon sparrow conservation efforts through awareness. Artificial Nest boxes are being promoted by presenting them as mementos to dignitaries in various awareness programs. Mohammed Dilawar, one of the winners of Time magazine's Heroes of the Environment-2008 started the Box Initiative from Mumbai city by putting up little wooden boxes on trees which sparrows could use as nests.

The BirdLife International, Royal Society for the Protection of Birds (RSPB), a UK-based organisation and the Bombay Natural History Society (BNHS) has identified 466 sites for the long-term protection of threatened and common Indian birds. These sites are denoted as Important Bird Areas or IBAs.

On 15 August 2012, the then Chief Minister of Delhi Ms Sheila Dikshit declared sparrow as the "State Bird of Delhi". This declaration was part of "Rise for the Sparrows"-India's largest conservation program for sparrows. On January 2013, Bihar Chief Minister Mr. Nitish Kumar also announced the sparrow as the State Bird of Bihar.

The Nature Forever Society celebrated the first World Sparrow Day in India on 20<sup>th</sup> March 2009. The idea was to convey the message of conservation of the House sparrow and other common birds and also unmark a day of celebration to appreciate the beauty of biodiversity which we take so much for granted. The World Sparrow Day attempts to bring sparrow lovers and nature supporters on a common platform and start a conservation movement to save the common flora and fauna of the world. If possible people should provide an alternative nesting site for the House Sparrow. In this manner perhaps, we may succeed in bringing back the House Sparrow in our lives so that the future generation can also enjoy the pleasure of watching these small and chirping little birds in their homes.

## CONCLUSION

It would be expected that, with man's dominance of the world, the future would be bright for the bird, but it is now becoming evident that this is not the case. Thus it is clear that the availability of nesting sites is an important factor for maintaining a sustainable population in urban gradient regions. Hence, from the present study it is inferred that placing of artificial nest box is one of the best solution to enhance the dwindling house sparrows population, particularly in urban-suburban areas. After creating a congenial habitat it is in the hands of people to place an artificial nest in the city for house sparrows and also the concerned State Department should take necessary steps to monitor the sparrow populations regularly to prevent the vanishing species from the city and villages.

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## DECLARATION

The authors do not have any conflict of interest.

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