



Vol. 5 Issue No. 2, April - June 2023

e-ISSN 2456-7701

Journal of Science and Technological Researches

A Peer Reviewed Journal

Origin of Innovation

Domain: www.jstr.org.in, Email: editor@jstr.org.in

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Date of Received

24 April 2023



Date of Revised

19 May 2023



Date of Acceptance

25 June 2023



Date of Publication

30 June 2023

DOI Link : <https://doi.org/10.51514/JSTR.5.2.2023.9-15>



JSTR

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I-3 Vikas Nagar, Housing Board Colony, Berasia Road, Karond Bhopal-462038

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ABSTRACT

House sparrow (*Passer domesticus*) commonly known as Chidi or Gouriya is found everywhere in the world. The purpose of the study was to determine the sparrow population's status in and around Patna Pakshi Vihar. Considering the issue, an attempt has been made to monitor the current status of house sparrow in Patna bird sanctuary and found a total of 185 sparrows in the area. An open-ended type questionnaire survey was also conducted to know the perspectives of the people. Majority of the respondents recommended the installation of nest boxes in strategic locations to provide additional nesting opportunities for House sparrows, particularly in areas with limited natural nesting sites.

Keywords: Nest box, House sparrow, conservation, Environment etc.

INTRODUCTION

The House Sparrow (*Passer domesticus*) is a familiar bird species, intertwined with human history, and often considered a companion of urbanization. It is most widely spread and abundant birds in the world [1]. Despite its ubiquity and close association with human settlements, alarming population declines have been reported in various regions globally, raising significant concerns among ecologists and conservationists. The Patna Pakshi Vihar Sanctuary, an important refuge for avian life in India, along with its surrounding areas, presents an intriguing setting to examine the status and ecological aspects of the House Sparrow.

Male house sparrows are often bulkier and larger than female [2]. Male has warm brown coloration while the female has a cream colored band above each eye and pale yellowish bill (Figure 1). This bird species is well known for its adaptability, thriving in diverse habitats ranging from urban to rural settings. However, shifts in human lifestyle, loss of nesting sites, and decreased food availability are believed to have contributed to their population decline. Understanding the status and ecological aspects of this species is vital to developing effective conservation strategies. The Patna Pakshi Vihar Sanctuary and its surrounding areas, with their combination of urban, suburban, and rural landscapes, provide an excellent case study to investigate the current situation of House Sparrows.

The House Sparrow's status in and around the Patna Pakshi Vihar Sanctuary can be examined in terms of its population size, distribution, and trends. While the species is traditionally associated with human-altered environments, its presence in protected areas like the Pakshi Vihar Sanctuary indicates its ability to exist in relatively undisturbed habitats. Furthermore, exploring the population trends in the sanctuary and surrounding regions can offer insights into the species' resilience and highlight potential areas of concern.

Investigating the status and ecological aspects of the House Sparrow in and around Patna Pakshi Vihar Sanctuary provides valuable insights for conservation efforts. The knowledge derived from such investigations can guide strategies to maintain and bolster House Sparrow populations, ultimately contributing to overall avian biodiversity.

The House Sparrow's status in the Patna Pakshi Vihar Sanctuary and its surrounding areas serves as an indicator of broader environmental health. Given their long-standing association with human settlements, these birds have often been considered part of the anthropogenic environment. A decrease in their populations may not only signal changes within their own species but may also be symptomatic of wider ecological shifts, including loss of habitat, pollution, and climatic changes. Thus, careful examination of their population trends could potentially shed light on these interconnected environmental issues.

Beyond acting as bioindicators, House Sparrows play a crucial role in the ecosystem. They contribute to the control of insect populations, aid in seed dispersal, and form a part of the food chain, thus playing a part in the delicate balance of urban and natural ecosystems. Therefore, the decline in their populations may disrupt these functions, leading to broader ecological implications.

The ecological aspects of House Sparrows in the Patna Pakshi Vihar Sanctuary, such as habitat preferences, diet, and breeding behavior, offer an opportunity to gain a comprehensive understanding of their ecological needs and challenges. For instance, changes in their habitat preferences could indicate shifts in land use or availability of resources. Alterations in their diet could suggest changes in local biodiversity or the availability of food resources. Changes in breeding behavior, such as the choice of nesting sites, the number of broods per year, or the success rate of fledglings, can provide insight into pressures faced during reproduction.

Furthermore, understanding the interspecific interactions of House Sparrows within the sanctuary can offer a glimpse into the intricacies of ecological communities. As they compete for resources, share habitats, or fall prey to other species, House Sparrows influence and are influenced by the community dynamics of other bird species and fauna. Thus, their

status and behavior can have ripple effects on the overall structure of these communities.

All the passerine species faced a severe decline in their population [3 4] including house sparrows. Sparrow population has decreased considerable in many parts of the globe in particular urban suburban gradient, [5]. The population of sparrows in India has also been reported to be declining [6]. Due to urbanization and industrialization, suitable foraging and nesting locations are not available for this species, contributing to the decline of the sparrow population [7]. Apart from these there are many more reasons behind the decline of the sparrow population, like dismantle of old type building [8], alteration in agricultural practices [9], competition [10], environmental pollution [11], electromagnetic radiations [12], and lack of nest sites [13]

Additionally, the study of House Sparrows can serve as an entry point to engage the public in bird conservation. Given their familiarity and association with human dwellings, House Sparrows are often one of the first bird species that people recognize and relate to. Harnessing this familiarity, efforts to conserve. House Sparrows can raise public awareness about broader issues of bird conservation and environmental change, thereby promoting a culture of coexistence and respect for biodiversity.



Figure 1: study of House Sparrows (a) male and (b) female

MATERIAL AND METHODOLOGY

Study Area

The Patna Pakshi Vihar Sanctuary, situated in the heart of India, is a site of vibrant avian diversity, hosting both endemic and migratory bird species as marked in the map (Figure 2). Local communities living in and around the sanctuary often have close

encounters with these birds, influencing their perception of the avifauna. The sanctuary's birdlife also has significant socio-cultural importance. Many bird species hold cultural or spiritual significance for local communities, with their presence being deeply intertwined with local customs, folklore, and traditions. Additionally, birdwatching and eco-tourism

centered around avifauna can contribute to the local economy, making the conservation of avian diversity

not just an ecological imperative, but also a socio-economic one.

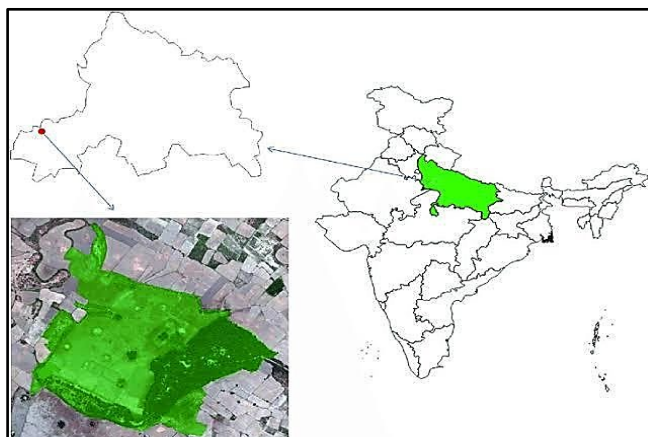


Figure 2: Map of Study Area of Etah district.

METHODOLOGY

To target the appropriately representative environment of the study location stratified random sampling techniques were used. To know the status of sparrow data of distance sampling used as described above. Sparrows nest searched before the onset of the breeding season to observe the breeding activity. The repeated monthly surveys were conducted in the morning from 6.0 AM to 9.0 AM to locate active sparrow nests (parents carrying food for the nestlings or nestlings making a call) during the breeding period. The survey did not carry out on days with high wind and rain. A vegetation survey also carried out at each point count station using a quadrat of 10 m×10 m for trees, 5m×5m for shrubs, and 1m×1m for the herbs. An open-ended type questionnaire survey was also conducted in and around Patna Pakshi Vihar. Every single respondent was in the age range of 25_55 years.

CONSERVATION MEASURES

Based on the research findings, the following conservation recommendations are proposed to support House sparrow populations in and around Patna Pakshi Vihar Sanctuary:

- **Habitat Preservation:** Preserve and enhance suitable nesting and foraging habitats within the sanctuary and its surroundings, with a focus on maintaining green spaces and promoting bird-friendly urban environments.
- **Pollution Control:** Implement measures to reduce pollution and mitigate the impact of

anthropogenic activities on House sparrow habitats.

- **Community Awareness:** Engage with local communities and stakeholders to raise awareness about the importance of House sparrows and their conservation needs.
- **Nest Box Installation:** Install nest boxes in strategic locations to provide additional nesting opportunities for House sparrows, particularly in areas with limited natural nesting sites as mentioned in (Figure 3).
- **Monitoring Program:** Establish a long-term monitoring program to track House sparrow populations, assess their response to changing environmental conditions, and evaluate the effectiveness of conservation efforts.



Figure 3: Artificial Nest of House Sparrow

People's perception regarding sparrows

House sparrow plays an important part in sustaining the ecosystem's health. They extract worms and insects from grains of food, acting as important pest control agents. To know people perception

towards house sparrow an open-ended type questionnaire survey was conducted in the study site. Interviews were limited to one respondent per home (preferably the oldest one). Both men and women older than 25 years were interviewed. The semi structured questionnaire was made to gather data on the respondents socioeconomic and demographic traits (education, livestock holdings, land ownership, income sources, and economic losses), experiences of crop damage and livestock predation by wild animals and (attitudes toward wildlife conservation (i.e. wild life to be conserved or not). In order to obtain unbiased statement, interviewees were given assurance that their comments would be kept private.

Public perception of house sparrow can be multifaceted, varying from individual to individual. For some, sparrow may hold aesthetic value, seen as symbols of beauty or freedom. Others may value for their ecological roles as pollinators or pest controllers. Still, others may view certain bird species as nuisances, particularly if they interfere with human activities or properties (Figure 5). To understand these perceptions, it would be essential to examine local community interactions with the avifauna of the Patna Pakshi Vihar Sanctuary and analyze their beliefs, attitudes, and experiences.

Understanding people's perception of the sparrow of Patna Pakshi Vihar Sanctuary can provide pivotal information for conservation initiatives and sanctuary management. If local communities appreciate and value the avifauna, they are more likely to support conservation efforts. Conversely, if negative perceptions exist, it could indicate potential conflicts that need to be addressed to promote the sanctuary's long-term success and the preservation of its avian biodiversity.

Moreover, public perception not only reflects the prevailing attitudes and values but also influences behaviour towards bird conservation. When local communities appreciate and recognize the significance of avifauna, they are more likely to engage in protective actions, such as litter control, reduced disturbance, and supporting conservation measures. In contrast, negative or indifferent attitudes can contribute to behaviours that potentially harm the avian life or their habitats. Therefore, understanding public perception is critical to guiding education and awareness programs, fostering positive behaviours towards bird conservation in the sanctuary.

The perception of the local community can also shape the social acceptability of conservation policies and actions. Effective conservation measures often require changes in human behaviors and practices, such as restricted access to certain areas or bans on certain activities. The success of these measures greatly depends on the understanding, acceptance, and cooperation of local communities. Hence, gauging their perception of avifauna provides valuable insights into potential challenges or opportunities for implementing conservation measures in Patna Pakshi Vihar Sanctuary.

Different ornithologist have noted a considerable fall in the population of the house sparrow particularly across Bengaluru, Mumbai, Hyderabad, Panjab, Haryana, Delhi, Uttar Pradesh, and other cities (14). Various reasons suggested by public for the declining number of house sparrow in Patna Pakshi Vihar (figure 4). The possible cause of its decline have been identified as shortage of nesting sites, disease, lack of food availability, population explosion, competition, predation etc. [15].

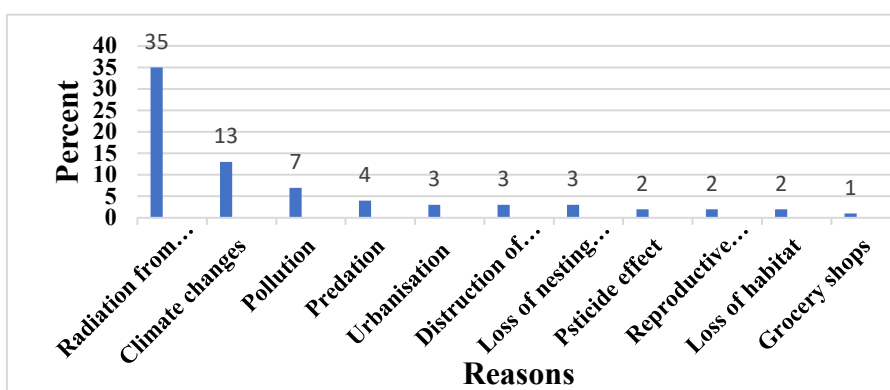


Figure 4: Reason suggested by the public for the decline in sparrow number in Patna Pakshi Vihar.

RESULT AND DISCUSSION

The findings of this investigation indicate a less population of House sparrows in and around Patna Pakshi Vihar Sanctuary, particularly in urban and suburban habitats. There are certain threats, such as habitat loss and pollution, require attention to ensure the continued success of this iconic urban bird species. By implementing the recommended conservation measures, stakeholders can contribute to the protection and well-being of House sparrows in the study area and support their persistence for future generations.

Increasing concrete structure effected the population of *Passer domesticus*.

The research shows that as urbanization and human development lead to more concrete structures such as buildings, roads, and paved areas, it can affect the house sparrow's habitat and overall population in several ways:

1. **Loss of nesting sites:** House sparrows typically nest in cavities and crevices, such as holes in buildings, under roofs, or in wall crevices. As more concrete structures replace natural habitats, suitable nesting sites for house sparrows may be lost. This can result in a decline in their breeding success and population size.
2. **Reduced foraging opportunities:** House sparrows are opportunistic feeders and rely on a varied diet that includes seeds, grains, and insects. Increasing

concrete structures can lead to a loss of green spaces and natural areas, reducing food availability for the sparrows. As a result, their populations may decline due to a lack of suitable foraging grounds.

3. **Increased urbanization and noise:** House sparrows are known for their adaptability to urban environments. Singh (2013) stated that extensive urbanization and development in the Jammu and Kashmir's urban and suburban areas lead to the absence of vegetation [16-19]. However, excessive noise and disturbance from human activities in highly urbanized areas can stress the birds and lead to altered behaviors, potentially affecting their reproductive success and survival.
4. **Pollution and contaminants:** Urban environments, particularly around concrete structures, can be associated with increased pollution levels [20]. This may include air pollution, chemical contaminants, and litter, which can negatively impact the health and breeding success of house sparrows.
5. **Competition and displacement:** Some bird species, like pigeons and starlings, are better adapted to urban environments and may outcompete house sparrows for resources such as food and nesting sites [21]. This competition can lead to a decline in the house sparrow population in urban areas.

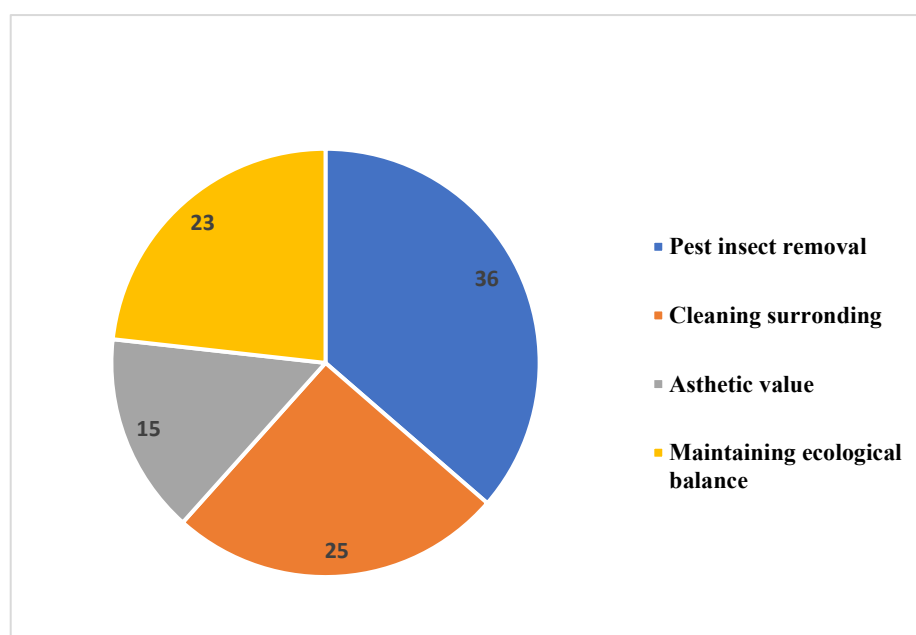


Figure 5: Percentage composition of suggested usefulness of house sparrows.

CONCLUSION

Overall, the increasing prevalence of concrete structures and urban development can create challenges for the house sparrow's survival and population dynamics. However, it's essential to implement conservation measures and urban planning

strategies that consider the needs of wildlife, including providing green spaces, creating bird-friendly habitats, and reducing pollution to help mitigate the negative impacts on house sparrows and other urban wildlife.

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