



DECLINE OF HOUSE SPARROW (*PASSER DOMESTICUS*) IN SOUTH EAST RAJASTHAN.

Zoology

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ABSTRACT

House sparrow, the *Passer domesticus* is a member of family Passeridae, it is a small bird which contributes to the preservation of rural and urban ecosystems. These avian faunae play very important role in the food chain and are useful scavengers. The global population of House sparrow exhibits a decreasing trend. *Passer domesticus*, continue to disappear. There are many causes of decline of this species. The study is focused on causes of decline of house sparrow and occupation of nesting site of house sparrow by avian fauna of other species in Southern east Rajasthan. Searching, selection and occupation of nesting site is not an easy task for house sparrow. The availability of nesting sites is an important factor for maintaining a sustainable population of this avian fauna. During selection of nesting site, *Passer domesticus* has to compete with members of other species for occupation of nesting site. It is necessary to create and enhance healthy habitat for *Passer domesticus* and provide alternate nesting site that provides essential resources, food, water and shelter throughout the year.

KEYWORDS

Passer domesticus, decline, habitat loss, nesting site.

INTRODUCTION:

House sparrow, *Passer domesticus* common name, Goraiya is a small bird. This avian fauna contributes to the preservation of rural and urban ecosystems. According to the IUCN Red List house sparrow is categorised as Least Concern, but during present time House sparrows, continue to disappear. This small bird has suffered extensively in India and throughout the world. About 80% decline in the population has been recorded in some surveys. According to a survey by ICAR the population of *passer domesticus* has reduced up to 80%, in Gujarat and Rajasthan it has fallen by 20%. South east region of Rajasthan is rich with flora and fauna. In south east region of Rajasthan, the human population is increasing very fast so the natural vision of the area is reducing. It is believed that modernization, constructions, and deforestation can lead to the unavailability of nests and their decline. There are many causes of decline of this species. Loss of habitat, Cell phone towers, loss of tree canopy, lack of preferred food and modern lifestyle can be reasons for the Sparrow decline in this area. Modern buildings and landscaped gardens do not have cavities which are important for House Sparrows to make nest. Some studies have demonstrated a number of relationships between density of house sparrows and human population density, conditions of buildings and availability of nest-sites, food supply, and amount of vegetation on breeding grounds. The sparrows have declined less in areas with lower socio-economic status. Decline in population of *Passer domesticus* can be due to the increasing intensification of agriculture. Several studies have shown that the availability of insectivorous food for nestlings during the breeding season influences the breeding success of the sparrows. It is necessary to create and enhance healthy habitat for these avian faunae and provide alternate nesting site.

House sparrow:

House sparrow is a small bird, about 16 cm in length. Females and young birds are coloured pale brown and grey, and males have brighter black, white, and brown markings. The scientific name of the species, *Passer domesticus*, denotes the domestic nature. *Passer domesticus* are useful scavengers. House Sparrow plays a role in the functioning of ecosystems by maintaining the food web and an ecological balance. It has been proved that House Sparrow is an effective pest control agent because it feeds on seeds, grains, and larvae. House sparrows visit flowers and transferring pollen so pollination is performed. These are excellent indicator of any biological or environmental change and these birds can also represent the health of an ecosystem. *Passer domesticus* feeds on the seeds of grains, flowering plants and weeds. It is an opportunistic, omnivorous eater, and commonly catches insects, their larvae, caterpillars, invertebrates and many other natural foods. During their breeding season House Sparrows eat insects and feed them to their young. House Sparrows eat corn, oats, wheat, and sorghum, birdseed, millet, milo, and sunflower seeds. Trees and cavities inside trees are often used by these species for shelter and protection from predators. The *Passer domesticus* prefers to nest in manmade structures like walls of building, street lights and nest boxes. This avian fauna contributes to the preservation of rural and urban ecosystems through pollination, seed dispersal, forest regeneration,

scavenging, and weed and pest control.

Causes of decline of House sparrow, *Passer domesticus*:

Habitat Loss, Loss Of Nesting Opportunities And Struggle For Occupation Of Nesting Site:

In the southern east region of Rajasthan the human population is increasing very fast so the natural vision of the area is reducing. Deforestation is the result of converting forest area in to human residence and cutting forests. Habitat loss is greatest increased threat to *Passer domesticus*. Ornithologists have observed sharp decline in the population of house sparrow. In recent years, decline of sparrow populations has been reported in the cities and towns of southern east region of Rajasthan. Natural habitat of house sparrow has been destroyed because of industrialization, urbanization and manmade construction in southern east Rajasthan. Iron fences replace green hedges that are common visit places and nesting sites of the house sparrows. A reduction in the availability of suitable crevices and holes for nest construction in modern buildings have occurred. Modern designs and house plans do not leave suitable space outside the buildings that can be used by house sparrow for nest. Green area of southern east of Rajasthan region provides a safe and long growing season of forest. Natural forest resources are available in almost all areas for nesting and food availability for house sparrow. This area is rich with wide varieties of flora and fauna and has a lot of space for breeding and nesting for avian fauna. But because of manmade constrictions, urbanization the natural habitat has been decreased. So less nesting site is left for avian fauna. Often competition for nesting sites among the doves, Rock chats, Bulbuls, Brahminy starling and House Sparrows has been reported. Moreover, they generally occupy buildings and residential spaces for nesting. Breeding season is very important for *Passer domesticus*. During breeding season of *Passer domesticus* is from month of March to month of August. The conflict often reported between Brahminy starling, *Sturnia pagodarum* and *Passer domesticus*. *Passer domesticus* has to compete with Brahminy starling for occupation of nest in safe places. *Passer domesticus* often constructs its nest inside ventilator of the building. Sparrows use novel materials such as threads, strings, paper, and wool besides feathers, grass, roots, and stalks to build nests. Sparrows are gregarious that they like to go around in gangs. When male and female *Sturnia pagodarum* approach the nest of *Passer domesticus*, the male and female house sparrow and other members of species of *Passer domesticus* aggressively defend their nest by making noise and able to drive the *Sturnia pagodarum* male away from that site, often male and female *Sturnia pagodarum* enter the nest of a *Passer domesticus*, destroy the nest and throw their eggs and pick up the newly hatched chicks and throw out them on the ground. The male and female *Sturnia pagodarum* often occupy the nest of the *Passer domesticus*. House sparrow has to compete with other avian fauna of overlap breeding season and because of its small size the nest of house sparrow often occupied by other avian fauna.

Use Of Chemically Treated Seeds And Pesticides:

Use of pesticides in agriculture lands in high quantity is lethal to small

avian fauna, *Passer domesticus*. House sparrow feeds on the seeds of grains. House sparrow decline can be caused because of decrease in resource availability, primarily weed seeds and cereal grain, cereal, and other crop, seeds are increasingly sown with seed-dressings, that can be the cause of decrease the palatability of the seed to birds. Use of pesticides badly affect the feeding habits of house sparrow.

Population of Rock Pigeons and doves is found to be more than compare to house sparrow. Rock Pigeons and Dove aggressively feed on grains provided by people to house sparrow. *Passer domesticus* is smaller in size and can't compete with these avian faunae. Competition and struggle for food with other avian species can be the cause of decline.

Predation:

Hawks, owls, snakes and cats are major predators of house sparrow. Many species of snakes are found in the South east region of Rajasthan. Snakes often approach the nest of house sparrow in trees and attacked the chicks and eggs. Many hawks and owls hunt and feed on house sparrows. *Felis catus*, the domestic cat is common visitor in buildings and manmade construction and houses, these places are nesting site of *Passer domesticus* specially during breeding season. *Felis catus* is a significant predator of House Sparrows. Domestic dogs are also predators of house sparrow. The chicks of house sparrow are also attacked by predators such as crows and kites.

Traffic:

Many industries, vehicles and fuel burning are releasing the gases. Because of population explosion, the pressure on natural resources is continuously increasing. Greater volume of traffic leads to increased disturbance and pollution from exhaust fumes, both of which would be greater in city than small towns. This pollution is also a create lethal effect on this small bird.

The network of cable wires and the flow of electromagnetic waves from cell phone towers injure the house sparrows. This causes problems and reduces the reproductive capacity of house sparrow. Electromagnetic radiation that came along during the digital revolution is also considered a risk to this avian fauna as the air passages get jammed.



Fig 1: Natural Nesting Site



Fig 2: Urban Nesting Site

CONCLUSION

Present study revealed that searching and selection occupation of nesting site is not easy for avian fauna, house sparrow, *Passer domesticus*. South east region of Rajasthan is rich with flora and fauna but deforestation has disturbed the habitat of this avian fauna. Any population under stress, when affected by detrimental factors in the environment, would badly affect the populations to cause local extinctions and this would have led to the large-scale decline of the house sparrow. In south east region of Rajasthan, the human population is increasing very fast so the natural vision of the area is reducing. Scarcity in many dimensions has been appeared so *Passer domesticus* has to compete with other avian fauna like Brahminy

starling, *Sturnia pagodarum* during breeding season for nesting site. Southern east region of Rajasthan provides various sites for nesting to avian fauna but often struggle for shelter between avian fauna has been noticed. As a result, reproductive success has been reduced due to poor nest site selection. The factors that negatively influence House Sparrow populations include loss of nesting sites, lack of availability of food resources, predation from natural as well as stray animals, and competition. Man made construction and buildings replace the natural trees also poses a threat. Human-imposed activities such as pollution, use of pesticide, and expansion of agriculture urbanization and industrialization have led to the loss of suitable habitats and resources for house sparrows. Avian fauna contributes to the preservation of rural and urban ecosystems. Avian fauna take part in pollination, seed dispersal, forest regeneration, scavenging, and weed and pest control. sparrows have eased their process of adapting to various ecosystems. Thus, they have not only been established amongst forests but also in rural as well as urban regions. One of the most abundantly found bird species, house Sparrows have learnt to rely upon human-built structures. *Passer domesticus* play very important role in the food chain and are useful scavengers, they feed on insects, harmful to agriculture and worms such as caterpillars, beetles and aphids. *Passer domesticus* helps keep the number of insects in check. The availability of nesting sites is an important factor for maintaining a sustainable population of avian fauna. It is necessary to create and enhance healthy habitat for these avian faunae that provides essential resources, food, water and shelter throughout the year. Solution of this problem is to protect natural habitat of avian fauna and provide safe and artificial nesting site for *Passer domesticus* to avoid predators and other enemies and conflict between the species.

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