

**RESEARCH ARTICLE****Strategies and efforts for conservation of House Sparrow (*Passer domesticus*) in India****Akhilesh Kumar, Amita Kanaujia, Sonika Kushwaha, and Adesh Kumar**Biodiversity & Wildlife Conservation Lab, Department of Zoology,
University of Lucknow, LucknowEmail: akhilesh.kumar958@gmail.com, wildlifeconservation.lko@gmail.comReceived: 15th May 2014, Revised: 31st October 2014, Accepted: 1st December 2014**ABSTRACT**

The House Sparrow (*Passer domesticus*) is closely associated with human habitation and cultivation throughout the world from historic time. Despite this historical success, the species has been declining since the early 1980s in several part of the world, including many countries across Europe. House sparrows are opportunist and are able to live wherever there are suitable nesting and roosting sites and enough food. The recent decline of the House Sparrow (*Passer domesticus*) in India is widely recognized. Therefore strategies and efforts for their conservation are being implemented throughout the country. Nature Forever Society (NFS) has been working for the conservation of House Sparrows and other common flora and fauna since 2006. Since it started in 2008 NFS has spearheaded programs and projects that are making a visible difference to sparrow populations in cities. Some of the initiatives started by Nature Forever Society are Common Bird Monitoring of India, World Sparrow Day, Project Save Our Sparrows, NFS Sparrow Awards and Adopt a Feeder and Nest program, among others. Biodiversity conservation Lab, Department of Zoology, University of Lucknow together with Uttar Pradesh State Biodiversity Board is doing remarkable efforts for sparrow conservation through Research Projects, Awareness Programmes and workshops in Uttar Pradesh. They involve the students through various events during Wildlife Week and World Sparrow day. The workshops bring together all the local people. Importance of presence of sparrows as an indicator of healthy ecosystem for human beings has been emphasized recently when Chief Minister of Delhi Sheila Dikshit on 15th August 2012 declared sparrow a "State Bird of Delhi". This declaration was part of "Rise for the Sparrows", which is India's largest conservation programme launched recently to save the species and enhance awareness about their life and habitat. Government, NGOs as well as individuals are now adopting Sparrow houses to provide them the nesting space. People are being encouraged to provide bird feed and water for sparrows.

Key Words: Conservation, House Sparrow, Awareness, Population.**INTRODUCTION**

House sparrow is non-migratory bird The House Sparrow (*Passer domesticus*) is closely associated with human habitation and cultivation throughout the world from historic time. It is found in highest abundance in agricultural, Rural, suburban and urban areas. House sparrows are opportunist and are able to live wherever there are suitable nesting and roosting sites as well as enough food. House sparrow is a very social bird and flock together in search of food and may cover a range of 1.5 to 2 miles. It is gregarious bird form colonies of around 10-20 pairs (Summers-Smith, 1988). Sparrows are usually faithful to its breeding, nesting, roosting and foraging areas within a range of 1.5- 2 Km. House Sparrows reproduce three to four broods every year having 3-4 clutches of egg. It has even been mentioned in some of our Mythologies and Folklores. It was once a very common bird that is well known for its cheeping and chirruping all around our houses. In South India people believed it to be a good omen, if a house sparrow built a nest inside the house the people. The house sparrow provides a number of services. They are useful in eradicating insects. They feed their chicks with the larvae of the alfalfa weevil and cut-worms, both of which harm alfalfa crops. The humble house sparrows are nature's bio-indicators and enjoy a historical relationship with humans for thousands of years. Sometimes sparrow also helps in seed dispersal. The House Sparrow has verified well-suited for studies of general biological problems, such as

evolutionary mechanisms, temperature metabolism and pest control. There was a close bond between man and sparrow that it was named as a domestic species and hence the name *Passer domesticus*. Despite this historical success, the species has been declining since the early 1980s in several part of the world, including many countries across Europe. Therefore strategies and efforts for their conservation are being implemented throughout the country

MORPHOLOGY OF HOUSE SPARROW

In Hindi commonly it is known as *Gouraiya*, It is a small, stocky song bird, thick bill, short leg, having a size of 14-16 Cm, weight 26-32 gram with 19-25 cm of wing span. The sexes are dimorphic. The male is warm brown above, with a grey crown and nape. It has grey cheeks and grey under parts with black round the eyes. The mantle and scapulars are boldly streaked black, chestnut and buff, and the tail is dark brown. The bib has black feather with white tips that are gradually abraded so that's why the beginning of the breeding season the bib becomes uniformly black (Summers-Smith, 1988). The female is rather featherless with a grey brown crown, a pale, buff supercilium, to wings bars and an unmarked throat and breast. The bill becomes darker during the breeding season and a few birds have a completely black bill (Lowther and Cink, 1992). Juvenile looks similar to adult female.

Before the implementation of conservational strategies it is of vital importance to know about the behavior, status as well the threats of the species concerned. The conservational measures are fruitful when planned according to the behavior of the House Sparrows. Until and unless the status and threats are known, the conservation plans cannot be undertaken.

BEHAVIOUR

House sparrow is a gregarious bird. They always live and breed in small groups usually of about 10- 20 pairs. After the breeding season House Sparrows are normally found in flocks that associate in many activities, ranging from communal roosting to feeding, dust and water bathing, and 'social singing' when the birds collect in bushy plants and call together. This can occur when they emerge from their roosting sites prior to searching for food and regularly on dull winter afternoons (Summers-Smith, 1988). It is highly vocal. Breeding in small colonies, the house sparrow makes its homes in areas closely associated with human habitation, and is a common resident of agricultural, urban and sub urban communities. The male house sparrow is highly territorial, aggressively defending the nesting site during breeding season. Dust bathing is a very important behavior of House sparrow; they take dust baths even when water is available. House sparrows prefer very fine dust and will flap up a storm when they find a patch of it. By digging a hollow with their feet, they push their bellies into the dust (Fig 1). The main reason for dust bathing may be for making smothers skin and feather parasites and absorbs excess oil that is removed as the dust is preened away. The House Sparrow is primarily a seedeater and sometime supplemented by some insects. In rural areas sparrow feed on the seeds of cultivated grain crops such as oats, wheat, barley, corn, and maize. The other major food source is the seeds of annual herbs such as grasses (Graminae), rushes (Juncidae), goosefoot (Chenopodium), docks (Polygonaceae) and chickweed (*Stellaria spp.*) (Wilson *et al.*, 1999).

Their diet comprises of natural vegetable matter with a variety of household scraps, such as rice, bread and peanuts (Fig 2). They also feed on grains such as bajra and kakun. In rural areas sparrow feed on the seeds of cultivated grain crops such as oats, wheat, barley, corn, and maize (Kanaujia *et al.*, 2012). It has been also observed that the nestlings are fed almost exclusively on insects and other invertebrates with the prey species varying with season. The most important insects are aphids (Aphidoidea), spiders (Arachnida), beetles (Coleoptera), weevils (Curculionidae), grasshoppers (Orthoptera) and caterpillars (Lepidoptera) (Wilson *et al.*, 1999).

Fig. 1: Dust Bathing**Fig. 2:** Group Feeding

The breeding season starts in April and runs through to August. House Sparrows are a species that are generally regarded as monogamous although extra pair paternity can vary from population to population, (Summers-Smith, 1988). It nests in all environments, but often in the close vicinity of man, choosing, however, diverse places for its nest. Different types of place are chosen by the sparrow for nest building (Fig 3). The house sparrow uses very diverse nest material; that can be divided in two Natural and Artificial materials which is from plants as well as of animal origins, these are hay, straw, dead leaves, bents of grasses, feathers (feathers of different birds) ,thread, pieces of paper, and cloth etc (Fig 4).

Fig. 3: House Sparrow nest in the hole of house

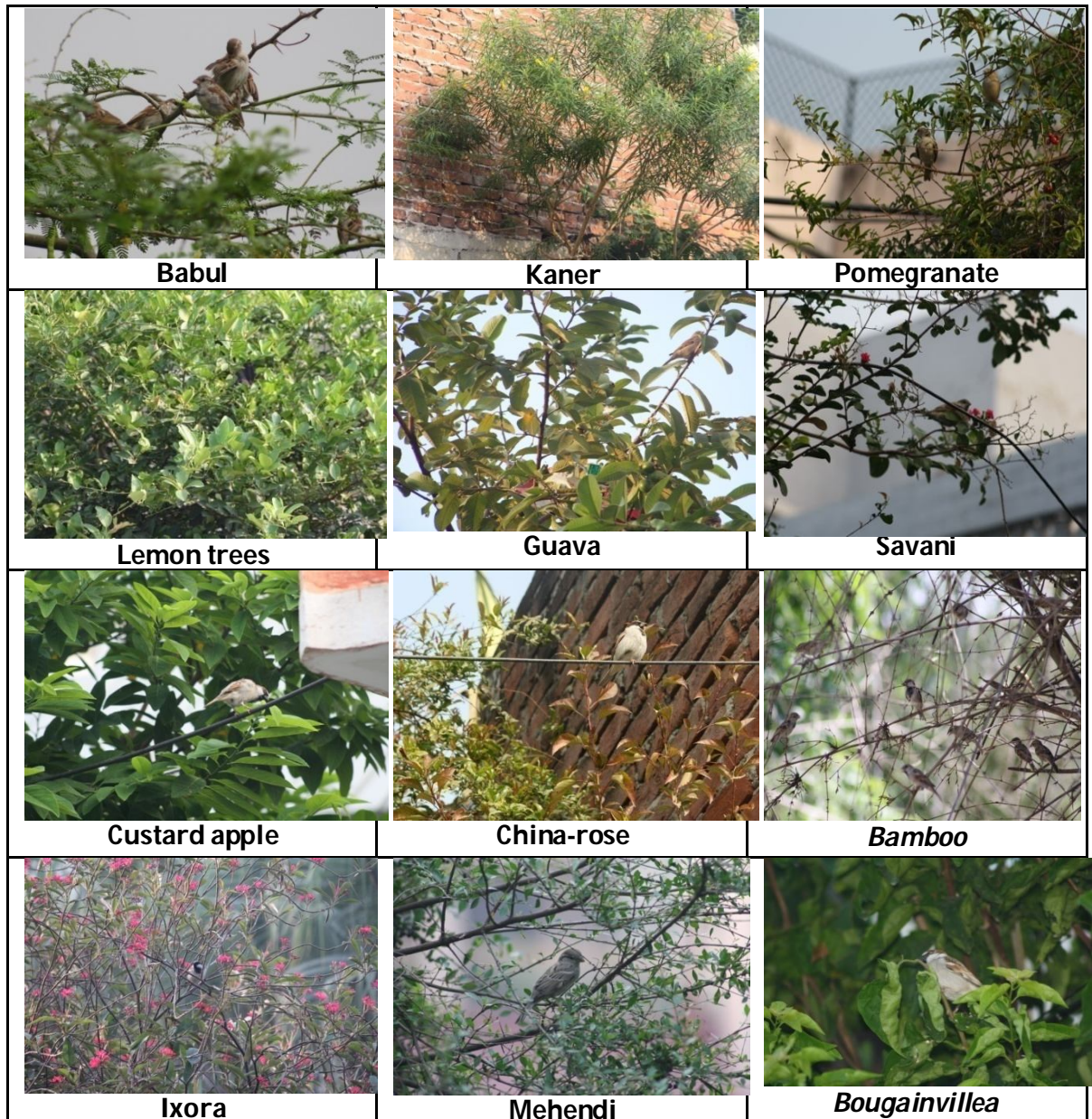
Fig. 4: Material collection for making nest



Fig. 5: Parental care



Fig. 6: Roosting plants preferred by House Sparrows



Parental care is shared by both male and female. Once fledged the adults continue to feed their young for a further 10 – 14 days (Fig 5) before they become nutritionally independent. The sparrows roosted mostly on bushy trees and shrubs such as Babul (*Acacia nilotica*), Kaner (*Thevetia peruviana*), Ber (*Zizyphus mauritiana*), lemon trees, Guava, pomegranate, Custard apple, bottle brush, chandni, Chameli (*Jasminum officinale*) and Mehendi (*Lawsonia inermis*) (Fig.6). They also preferred *Bougainvillea*, *Combretum indicum* (Madhu Malti, Bamboo tree etc. (Kanaujia *et al.*, 2014).

STATUS OF HOUSE SPARROW

Since historical times House sparrow has a symbiotic relationship with human. House Sparrow is one of the commonly distributed birds in the globe (Summers & Smith 1988). It inhabits all forms of locale like agricultural land, rural, semi urban and urban areas. Regardless of this historical accomplishment, the House Sparrows has been declining since the early 1980s at several parts of the world, including a number of countries across Europe reported by Crick *et al.* (2002), Prowse (2002), Vincent *et al.* (2002), Kelcey and Rheinwald (2005), Murgui and Macias (2010), Kekkonen *et al.* (2011), in North America by Erskine (2006), Lowther (2006), in Australia by Olsen *et al.* (2003). Robinson *et al.* (2005) and De Laet and Summers-Smith (2007) reported the most drastic declines particularly in urbanized landscape of Britain. According to Baillie *et al.* (2010), the house sparrow is now listed as a species of conservation concern in Europe (SPEC category 3) and of special conservation concern (Red List) in Britain. There has been difference in the timing and rate of decline in the rural and urbanized populations as reported by Chamberlain *et al.* 2009, Robinson *et al.* (2005) and Erskine (2006), De Laet and Summers-Smith (2007) and Shaw *et al.* (2008) suggested that different causes are responsible for change in population trends in various habitats with respect to urbanization.

In India, according to Dandapat *et al.* (2010), there has been noticeable decline in the number of house sparrows in several parts of the country particularly across Bangalore, Mumbai, Hyderabad, Panjab, Haryana, West Bengal, Delhi and other cities. According to an ornithological survey conducted by Indian Council of Agricultural Research, 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%. Several surveys conducted at different places of India on the occurrences of house sparrows by Rajashekar and Venkatesha (2008), Daniels (2008), Khera *et al.* (2010), Bhattacharya *et al.* (2010), Ghosh *et al.* (2010) suggest that their population has decreased considerably at present. Drastic decline of house sparrow has been reported by Rajan *et al.* in 2013. Recent studies in Uttar Pradesh also indicate decline of House Sparrows in rural, urban and suburban regions of Uttar Pradesh.

THREATS FOR THE VANISHING HOUSE SPARROWS

A number of hypotheses have been put forward as possible causes of the decline of House Sparrows in Rural, urban and suburban habitats:-

- 1. Lack of nest sites:** Hundreds of trees and bushes are being cleared for big buildings. The terraced buildings preferred over the tiled houses have no crevices or holes, leading to a drastic decline in nesting sites for house sparrows.
- 2. Food un-availability:** House sparrows are grains as well as insect eaters. Availability of these food items has been affected by the arrival of pre-cleaned food grains; garden cleaning of grains has become a rarity. So the resulting grain spills pecked by these birds are now gone. The vegetable gardens in the old world houses have been replaced by Crotons and ornamental plants which supports less insect life, that is the major food items for sparrows.
- 3. Electromagnetic Radiation from Mobile phone towers:** Mobile phone towers pose one of the biggest threats to sparrows. The electromagnetic radiation causes irritation, reduces their reproductive capacity as well as the hatchlings are either destroyed or born with serious deformities.

4. **Predation:** Natural predator such as Sparrow hawk, crow, cats, snakes and some other predatory birds also accountable for mortality of sparrows. This is to the because of poor nest site selection which makes the brood and yearling more vulnerable to predators.
5. **Due to Change in human life style:** Modern life styles have led to major architectural changes in houses. The terraced buildings preferred over the tiled houses have no crevices or holes, leading to a drastic decline in nesting sites for house sparrows.
6. **Use of pesticides:** Excessive use of pesticides and insecticide in the agricultural field and garden the insects are being killed. Mortality of chicks and yearling may be high due to both lack of protein rich insects for food as well as by eating contaminated dead insects and grains.
7. **Competition:** The Collared Dove, Rock Pigeon (*Columba livia*) and Rock chat are likely to compete with House Sparrows for food and nesting place.
8. **Disease:** Salmonella is a very common and infectious disease in House sparrow during winter and spring season (Macdonald, 1978). Infection with Salmonella typhimurium (a strain of bacteria) has shown to be a cause of death in House Sparrows found dead in urban or suburban habitats (Pennycott, 2004). Eggs may also be affected by microorganisms such as Enterobacteriaceae, Micrococcaceae, Streptococcaceae, Bacillaceae and Cryptococcaceae.
9. **Pollution:** By the combustion of unleaded fuel (petrol) used in automobile vehicles produces compounds such as Methyl Tertiary Butyl Ether, a compound which is highly toxic for small insects, which forms a major part of a young sparrow's diet. This can be attributed to the insect population decline in urban locality.
10. The increasing use of catapults (lethal weapon, shooting at a speed of 40 feet per second) to target birds is also responsible for sparrow decline.

CONSERVATION STRATEGIES FOR HOUSE SPARROW

House sparrows are opportunist and are able to live wherever there are suitable nesting sites, roosting sites and enough food availability. The recent decline of the House Sparrow (*Passer domesticus*) in India is widely recognized. Therefore strategies and efforts for their conservation are being implemented throughout the country.

Nature Forever Society (NFS) has been working for the conservation of House Sparrows and other common flora and fauna since 2006. Since it started in 2008 Nature Forever Society has spearheaded programs and projects that are making a visible difference to sparrow populations in cities. Some of the initiatives started by Nature Forever Society are Common Bird Monitoring of India, World Sparrow Day, Project Save Our Sparrows, Nature Forever Society Sparrow Awards and Adopt a Feeder and Nest program, among others.

Biodiversity and Wildlife Conservation Lab, Department of Zoology, University of Lucknow together with Uttar Pradesh State Biodiversity Board are doing remarkable efforts for sparrow conservation through Research Projects, Adopt a Feeder and Nest Box, Sparrow Census, Awareness Programmes and workshops in Uttar Pradesh (Dilawar *et al.* 2013). They involve the students through various events during Wildlife Week and World Sparrow day (Uttar Pradesh State Biodiversity Board, 2013). Besides various competitions for students, the volunteers spot the Sparrows in the aforesaid areas and create awareness by distributing flyers, pamphlets, posters and calendar on sparrows to the local people. They also distribute the Sparrow count forms. Celebrating this day is an attempt 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 (Uttar Pradesh State Biodiversity Board, 2014). The workshops bring together all the local people.

To overcome with the problem of fast declining population of house sparrow due to one of the most important cause i.e. unavailability of nesting space, artificial houses have been installed for the Sparrows. Three types of nest boxes that are installed includes Wooden nest boxes, Shoe box Sparrow nests and Earthen pot as nest boxes (Fig 7).

Fig.7: Three types of Nest boxes installed in Lucknow



Fig.8: Four types of supplementary feed distributed to the public



Besides nest boxes four types of supplementary feeds are also provided from time to time to the local people so as to reduce the unavailability of food. The supplementary feeds include Kakun, Rice, Bajra and mixture of all three (fig 8).

Importance of presence of sparrows as an indicator of healthy ecosystem for human beings has been emphasized recently when Chief Minister of Delhi Sheila Dikshit on 15th August

2012 declared sparrow a "State Bird of Delhi". This declaration was part of "Rise for the Sparrows", which is India's largest conservation programme launched recently to save the species and enhance awareness about their life and habitat.

Recently on 9 January, 2013 Bihar Chief Minister Nitish Kumar also announced the sparrow as a state Bird of Bihar to save the endangered species. A tribal farmer Mr Parmar Ramsingh from village Kamboi of Limkheda taluka, district Dahod, Gujarat state of India has demonstrated that even the low cost housing shelters can provide houses acceptable for sparrows and that we can still improve conditions for sparrows with very small investment. Parmar Ramsingh experimented with the new idea and then started to maintain a series of low cost sparrow houses made up of waste cardboard boxes thus providing shelter to the birds within his housing complex. In the urban areas, replicating the low cost demonstrations made by Ramsingh could significantly reduce cost of conservation of sparrows and can make it an activity for multiple houses. It could also become a part of environment education programme for students in schools so that the future generation becomes more sensitive to conservation of nature (Himsingh *et al.*, 2012).

Government, NGOs as well as individuals are now adopting Sparrow houses to provide them the nesting space. People are being encouraged to provide bird feed and water for sparrows.

CONCLUSION

Although a number of conservational efforts are going on for House Sparrow Conservation in India. But still we need more conservational initiatives for House Sparrow. Like Conservation based awareness programmes, projects, seminars, workshops, training courses should be done. Therefore, by adopting these initiatives we can easily bring back the house sparrows in our lives, so that our further generation can also enjoy the pleasure of watching these small and chirping lives in our homes. There is still time to start their conservation and maintain their population in all the landscapes. Sparrows can be conserved by individuals as well with little efforts.

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