RESEARCH ARTICLE

Conservation of House Sparrow (*Passer domesticus*): People Perception in Upper Nilgiris, Tamil Nadu, India

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Study Area: Nilgiri Mountain, India

Coordinates: 11, 12' & 11, 43' N; 76, 14 & 0 77, 1' E

Key words:

Abstract

House sparrows *Passer domesticus* is the commonest and widest distributed bird species in nature. It is primarily associated with human habitation e.g., agricultural land, village, and urban areas. The study was conducted in selected areas of Rural, Suburban, and Urban areas in the Nilgiris. Two sets of questionnaires were developed for this study. Namely "Precise and Closed" and the other one was "Broad and Open-ended. A total of 452 peoples were interviewed most of the respondents were interviewed in the Urban area. a total of 93% of people were knowing about House sparrow. Most of the respondents replied that House sparrows are not harming humans and also accepted that House sparrows are playing a vital role in pest control in the agricultural fields. Peoples opined that House sparrows are Aesthetic values according to rituals and were also opined that House sparrows populations are decreasing nowadays. Finally, 86% of respondents were opined that House sparrow conservation is needed for the environment and interesting to note that respondents were opined that artificial nest boxes are the ideal one for House sparrow conservation for the modern urbanization areas to conserve the House sparrows.

Introduction:

House Sparrows *Passer domesticus* is the commonest and widest distributed bird species in nature. It is primarily associated with human habitation e.g., agricultural land, village and urban areas (Lowther & Clink, 1992). The optimum habitat for House Sparrow in temperate regions is a combination of buildings with holes under tiles or eaves to provide suitable nesting sites and sufficient green areas to provide insect food for the young (Summer-Summers-Summers-Summers-Smith, 1988). House Sparrow numbers have declined by about 60% in urban and suburban areas and the habitat composition and quality in urban-suburban landscapes are likely to have changed over this period (Dott, 2006). In large cities, the number of House Sparrows decreased significantly in recent decades. High reduction of sparrow population in London (60%), Glasgow (99%), and Hamburg (77%) have to lead to the inclusion on the UK Conservation Red List (Crick *et al.*, 2002; Prowse, 2002; Summers-Smith, 2003). The main reasons for the decline of this species in the urban-suburban landscape where the loss of suitable foraging

habitat (Robinson *et al.*, 2005) and the loss of suitable nesting sites. According to the survey at different places of India on the occurrences of the House Sparrow, it was reported that their population also has decreased considerably at present (Rajashekar & Venkatesha, 2008; Daniels, 2008; Khara *et al.*, 2010; Ghosh *et al.*, 2010). The study of bird ecology and urbanization is an under-utilized area of ecological research, but one of the increasing importance given the extension and magnitude of anthropogenic effects today (McDonnell & Pickett, 1990). Urbanization has complex direct and indirect effects on native flora and fauna. Concerning birds, Marzluff (1997) suggested that settlement can change ecosystem processes, habitat, food, predators and competitors, and disease. These effects lead to significant changes in the population biology of birds in urban areas with effects on the structure and composition of bird communities (Marzluff, 2001). Some studies were undertaken for House Sparrow in Nilgiris. Karthick *et al.* (2016) studied the population of the House Sparrow in Ketty Valley, The Nilgiris. Karthick *et al.* (2017) reported that House Sparrows feeding on dressed

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meat. Jayaraman *et al.* (2017) studied the utilization of artificial nest boxes by House Sparrow in the Nilgiris. Samson *et al.* (2017) found that House Sparrows breeding in nests of the Red-rumped Swallow (*Hirundo daurica*) in Nilgiris. Dilip Clinton *et al.* (2019) observed the first melanistic sparrow in Nilgiris, India. The present study was aimed to assess the general people's perception of conservation of House sparrow in the Nilgiris.

Materials and methods:

Study area: the Nilgiris or "Blue Mountains" is a major part of the Nilgiri Biosphere Reserve. The Nilgiris is situated in the North-Western corner of Tamil Nadu in Southern India. They are bounded on the North by the State of Karnataka and in the West and southwest by Kerala and East and South by the Coimbatore district of Tamil Nadu. The Nilgiris occupies a total area of 2542.49 sq. km and the elevation of the Nilgiris range from 300 to about 2,700 meters. Nilgiris, as the most forested district of the state, signifies an important stretch of Western Ghats in Tamil Nadu and is the junction of the Western and Eastern Ghats. The peak of Doddabetta is the highest elevation in Nilgiris with an altitude of 2637 meters. There are other hills namely Elk hills, Devarshola hill, Hulical hill and Cairn hill. The present study was conducted in the Upper Nilgiris (above 2000m MSL). A total of three areas were selected for this study namely Rural area (Lovedale), Sub Urban area (Ketti Valley) and Urban area (Ooty) in the Nilgiris to analyze the people's perception on House sparrow conservation.

Methodology: the study was conducted in selected areas of Rural, Sub Urban, and Urban areas in the Nilgiris in the year of October 2014 to March 2015. Two sets of questionnaires were developed for this study. Namely "Precise and Closed" and the other one was "Broad and Open-ended. The respondents were briefed about the purpose of the visit and verbal consent was taken for voluntary participation in interviews. At least one adult (≥ 18 years old) was interviewed in his/her residence. Face to face interviews was made it easier to clear any ambiguity had about the question. The survey was based on the four components namely knowledge on House sparrows, Economic values of Houses sparrows, Decline reasons of House Sparrows, and Conservation mashers to boost up the House sparrows in Nilgiris via peoples perception.

Results:

A total of 452 peoples were interviewed during the study period in selected areas of rural, suburban and urban in the Nilgiris of which most of the respondents were interviewed in the Urban area (48% $n=214$) followed by Sub Urban area (28% $n=128$) and Rural area (24% $n=110$). Demography of peoples interviewed result revealed that most of the respondents were Male (56% $n=254$) and female (44% $n=198$).

Knowledge on House sparrow among the peoples: results revealed that 93% ($n=420$) respondents known the House sparrows 88% ($n=398$) and also opined that they are regularly watching the house sparrows in the surrounding areas. The social behavior of house sparrows in the environment result revealed that 88% ($n=400$) respondents replied that they only saw house sparrows lived in groups and feeding on insects and grains (93%, $n=420$). Habitat and the breeding behavior of House Sparrow insight on respondent's results show that 78% ($n=354$) respondents told that they construct their nests in holes and roof gaps in the houses and shops *etc.*

Economic values of House Sparrow: a total of 82% ($n=372$) of respondent replied that House sparrows are not harming to the humans and also 87% ($n=394$) peoples accepted that House sparrows are playing a vital role in pest control in the agricultural fields as well as 77% peoples believed that this kind of things are made house sparrows are biological control of insect in the environment and keep the environment clean (71% $n=325$). Peoples views on Houses sparrows in their home as well as hearing sounds its shows that 67% ($n=302$) peoples opined that House sparrows are Aesthetic values in according to rituals similarly 70% ($n=316$) peoples also considered that to see a sparrow or to hear its sounds it will create good things in her lives its Good omen one.

The decline of House Sparrow: respondents opined that House sparrows populations are decreasing 72% ($n=325$) nowadays compare that earlier. Respondents are also strongly stated that 91% ($n=410$) not hunt and consuming the House sparrows as well as they are strongly believed that roosting trees decreasing (56% $n=250$), Habitat loss (79% $n=357$), Lack of nesting sites (61% $n=276$), Urbanizations (67% $n=302$) as well as Modern Infrastructures (72% $n=327$) are the main reason for House sparrows declining. Respondents also opined that Environmental pollution (68% $n=308$), Cell Phone Tower radiation (83% $n=375$), Biocides effects (85% $n=384$) and Climate Change (65% $n=294$) are also a positive one for House Sparrows declining.

Conservation perspectives of House Sparrow: a total of 86% of respondents were opined that House Sparrow conservation is needed one for the environment. Peoples are also accepted that Planting of roosting trees ($n=315$) Afford food grains ($n=400$), Facilitate nesting place for House sparrows in their homes, minimize the pesticide uses and maximize the natural pesticides are the immediate remedy for to bring back the House sparrows population and interesting to note that ($n=378$) respondents were opined that artificial nest boxes are the ideal one for to House sparrow conservation for the modern urbanization areas to conserve the House sparrows.

Discussion:

This study shows some critical views on House Sparrows

conservation among the peoples. General knowledge on House sparrow was very good on especially they know about the House Sparrows and their importance and nesting behavior and nature of the birds in the Nilgiris. The economic value of the House Sparrows among the people's views shows that 82% of people opined that House Sparrows are not a harming bird to humans. This result shows that peoples are believed that house sparrows are very friendly to humans and not create any problems for human beings. 87% people opined that House Sparrows are playing a vital role in pest control in the agricultural fields as well as 77% peoples accepted that this kind of things are made house sparrows are biological control of insect in the environment and keep the environment clean (71%). Simwat (1977) reported that 84% of sparrow nestlings comprised of insects, with caterpillars contributing 38% in the nestling's diet. These results show that the peoples believe that House sparrows are one of the biological control of the insect in the environment it's a positive attitude of House Sparrow conservation in Nilgiris. Peoples views on Houses Sparrows in their home as well as hearing sounds its shows that 67% people opined that House Sparrows are Aesthetic values in according to rituals similarly 70% people opined that to see a sparrow is to hear her sounds it will create good things in her lives its Good omen one. These results indicated that peoples have a positive approach to House Sparrows presence in their living areas and this kind of response shows that House Sparrows conservations are possible for long-lasting in Nilgiris.

Knowledge on House Sparrow declining among the people's view shows that House sparrows populations were decreasing 72% nowadays compare to earlier. These results indicated the sparrows are a very huge population in earlier times but not at present. Hence, this data suggested that there has been a decline in the populations of sparrows in the Nilgiri district. 91% of peoples do not hunt and consuming the House Sparrows as well as they are strongly stated that roosting trees decreasing (56%). These results are indicated that peoples attitude towards conservations of House Sparrows as well as Roosting trees importance's also, nowadays our world is facing dangerous threat for global warming due to deforestation these results show people's views on conservation of this species is create such kind of awareness among the people is highly appreciated one as well as promoting the awareness of tree planting also. The declining of House Sparrow views on peoples revealed that Habitat loss (79%), Lack of nesting sites (61%), Urbanizations (67%) as well as Modern Infrastructures (72%) are the main reason for House sparrows declining. These results indicated that habitat loss, lack of nesting habitat, urbanization, and modern infrastructure these reasons are un doubtable to expose that humans are nowadays more expose their buildings into the modern

structure as well as more developed civilization. Our observation corroborates with the previous study also Summers-Smith (2003), who stated that reduction in the availability of suitable nesting sites in modern buildings and rehabilitation of old buildings would have declined the House Sparrows' population in an area. Summers-Smith (2005), who discussed the reduction in the availability of suitable nesting sites in modern buildings and rehabilitation of old buildings in the urban areas result in a decline in the population in London. Singh *et al.* (2013) stated that extensive urbanization and development in the urban and suburban regions of Jammu and Kashmir lead to the absence of vegetation. Hence the roosting places of house sparrows were replaced by concrete buildings, walls, playgrounds, wire fences. The vegetation cover is the important site for the House Sparrows as they use it for roosting, resting, preening their feathers, and protection from predators. Peoples are also opined that Environmental pollution (68%), Cell Phone Tower radiation (83%), Biocides effects (85%), and Climate Change (65%) are also a positive one for House Sparrows declining. Electromagnetic radiations from the mobile towers were the most suggested reason even though no proper scientific validation is available in this context (Balmori & Hallberg, 2007). Other important reasons were climatic changes and its associated temperature rise (13%) Global warming is known to affect physiology in House Sparrows (Yom-Tov, 2001). As well as Biocides are the major reason for the population decline of House sparrows in Nilgiris according to the people's views we have to concentrate this aspect for future studies because nowadays modern agricultural plays a vital role for human development so lots of biocides are utilized in the agricultural practice most of the avian communities are depends upon insect for their major diet so this aspect is vital one for to testing the declining of not only the House sparrows population as well as depending on insects for their major diet avian population on agricultural habitats also.

Conservation mindset on peoples about House sparrow results revealed that 86% of respondents were opined that House sparrow conservation is needed one for the environment. Peoples are also accepted that Planting of roosting trees (n=315) of small heights of less than 5m is found to support and host good numbers of roosting sparrows (Dhanya & Azeez, 2010). Afford food grains (n=400), Facilitate nesting place for House sparrows in their homes, minimize the pesticide uses and maximize the natural pesticides are the immediate remedy for to bring back the House Sparrows' population and interesting to note that (n=378) respondents were opined that artificial nest boxes are the ideal one for to House Sparrow conservation for the urbanization (modern based) on this study we are concluded that artificial nest boxes are one of

the crucial tools for promoting the general public to increasing the House Sparrow population in Nilgiris. Our conclusion was corroborated with Shaw *et al.* (2008) stated that sparrows are expected to build nests in any available places including nest-boxes as well as Jawale (2012) reported that studies showed that artificial nest boxes can enhance the population of sparrows in urban and sub-urban areas. Hence, with the preliminary knowledge of the status of sparrows in the Nilgiris district and with the suggestion from the public, we decided to create and fix nest boxes for sparrow conservation. A total of 600 different types of nest boxes like wooden nest box, Paper box, Bamboo pieces, PVC pipes, and Mud pots were fixed in identified sparrow inhabiting selected sites in rural, suburban, and urban the Nilgiris district, which later was there is a good response was observed on the artificial nest boxes by House Sparrows areas in Nilgiris.

References:

- Balmori, A. & Hallberg, O. (2007): The urban decline of the House Sparrow *Passer domesticus*; a possible link with electromagnetic radiations. *Electromagn. Biol. Med.*, 26(2):141-151.
- Chetan, S.J. (2012): Improved design of nest box for Indian house sparrow, *Passer domesticus indicus*. *Biosci. Disc.*, 3(1):97-100.
- Crick, H.Q.P., Robinson, R.A., Appleton, G.F., Clark, N.A. & Rickard, A.D. (2002): **Investigation into the Causes of the Decline of Starlings and House Sparrows in Great Britain. A Report**. Pub. by: British Trust for Ornithology, Thetford, vii+307pp.
- Daniels, R.J.R. (2008): "Can we save the sparrow?" *Current Sci.*, 95(11):1527-1528.
- Dhanya, R. & Azeez, P.A. (2010): The House Sparrow *Passer domesticus* population of Arakku township, Andhra Pradesh, India. *Indian Birds*, 5(6):180-181.
- Dilip Clinton, S., Ramakrishnan, B., Samson, A., Karthick, S., Girikaran, P. & Deepan, R. (2019): First record of a melanistic House Sparrow *Passer domesticus* in India. *Int. Stud. Sparrows*, 42:19-20.
- Ghosh, S., Kim, K. & Bhattacharya, R. (2010): A survey on house sparrow population decline at Bandel, West Bengal, India. *J. Kor. Earth Sci. Soc.*, 31(5): 448-453.
- Jayaraman, A., Ramakrishnan, B. & Samson, A. (2017). Utilization of artificial nest boxes by House Sparrow *Passer domesticus* in urban areas of Udhagamandalam, the Nilgiris, India. *Int. Stud. Sparrows*, 41: 31-37.
- Karthick, S., Subramanian, C., Ramakrishnan, B., Samson, A., Santhoshkumar, P. & Karthick, K. (2016): Population status of House Sparrow (*Passer domesticus*) in Ketti Valley, The Nilgiris, Tamil Nadu. *J. Sci. Trans. Environ. Techno.*, 9(4): 222-224.
- Karthick, S., Ramakrishnan, B., Samson, A. & Santhoshkumar, P. (2017): House Sparrows *Passer domesticus* feeding on dressed meat. *Indian Birds*, 13(2):56.
- Khera, N., Das, A., Srivastava & Jain, S. (2010): Habitat- wise distribution of the House Sparrow *Passer domesticus* in Delhi, India. *Urban Ecosys.*, 13(1):147-154.
- Lowther, P. & Cink, C. (1992): **The House Sparrow**, 34-67 p. In, Poole, A., Stettenheim, P. & Gill, F. (eds.): The Birds of North America. Pub. by: The American Ornithologists' Union and the Academy of Natural Sciences of Philadelphia.
- Marzluff, J. (1997): **Effects of Urbanization and Recreation on Songbirds. Songbird Ecology in Southwestern Ponderosa Pine Forests: A Literature Review**. (Block, M. and Finch, D. M.). General Technical Report RM-GTR 292. (USDA Forest Service)
- Marzluff, J. (2001): Worldwide Urbanization and its Effects on Birds. In Avian Ecology and Conservation in an Urbanizing World, p. 19-47. Marzluff, J.M., Bowman, R. & Donnelly, R. (eds.): **Avian Ecology and Conservation in an Urbanizing World**. Pub. by: Kluwer Academic Publishers Group.
- McDonnell, M. & Pickett, S. (1990): Ecosystem Structure and Function Along Urban-Rural Gradients: An Unexploited Opportunity for Ecology. *Ecology*, 71, 1232-1237.
- Prowse, A. (2002): The urban decline of House Sparrow. *British Birds*, 95:143-146.
- Rajashekar, S. & Venkatesha, M.G. (2008): "Occurrence of house sparrow, *Passer domesticus indicus* in and around Bangalore". *Current Sci.*, 94(4):446-449.
- Robinson, R.A., Siriwardena, G.M. & Crick, H.Q.P. (2005): Size and trends of the House Sparrow *Passer domesticus* population in Great Britain. *Ibis*, 147(3):552-562.
- Samson, A., Ramakrishnan, B. & Manigandan, S. (2017): House Sparrows *Passer domesticus* breeding in nests of the Red-Rumped Swallow *Hirundo daurica*. *Int. Stud. Sparrows*, 41:38-39.
- Shaw, L.M., Chamberlain, D. & Evans, M. (2008): The House Sparrow *Passer domesticus* in urban areas: reviewing a possible link between post- decline distribution and human socioeconomic status. *J. Ornithol.*, 149:293-299.
- Simwat, G.S. (1977): Studies on the feeding habits of House sparrow, *Passer domesticus* and its nestlings in Punjab. *J. Bombay Nat. Hist. Soc.*, 74:175-179.
- Singh, R., Kour, D.N., Ahmad, F. & Sahi, D.N. (2013): The causes of decline of house sparrow (*Passer domesticus*) in urban and suburban areas of Jammu. *Munis Entomol. Zool.*, 8(2):803-811.
- Summers-Smith, J.D. (2005): Changes of House Sparrow population in Britain. *Int. Stud. Sparrows*, 30: 23 - 37.
- Smith, S.D. (1988): **The Sparrows**. Pub. by: T & A D Poyser Pub. Ltd, Calton. 24 p.
- Summers-Smith, J.D. (2003): The decline of the House Sparrow: A review. *British Birds*, 96(9):439-446.
- Yom-Tov, Y. (2001): Global warming and body mass decline in Israeli passerine birds. *Proc. Royal Soc. B (Bio. Sci.)*, 268(1470):947-952;