



## **Impact of urbanization on House sparrow (*Passer domesticus*) diversity from Erode and Namakkal districts, Tamilnadu, India.**

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### **Abstract**

The present study was carried out in 10 village of Tiruchengode taluks and Erode taluks. A large numbers of house sparrows were recorded in the Tiruchengode taluks, Koottapalli village with an average of (30%) house sparrows followed by Rajagoundapalayam (18%), Kokkarayanpettai (25%) and Periyachettipalayam (19% ). A low number of house sparrows were recorded from the village of Sanarpalayam (10%) Allimadai (11%), Kaspapettai (20%), China Chettipalayam (17%) Pudhur (0%), Pattalur (13%).The present investigation concluded that the study area is highly urbanized due to that the population of house sparrow was decreased and we analyzed urbanization is major threat to sparrow breeding site.

**Keywords:** Nest constructing site, Sparrow and Grid (1.Sq.km)

### **Introduction**

House sparrow has undergone Associate in nursing extreme decline within the past few decades. Currently it's listed in Red information Book of International Union for Conservation of Nature and Resources that wants high conservation concern and it's includes within the IUCN red list (Cramp *et al.*, 1985). This decline in true sparrow numbers seem to be widespread everywhere the world. The uncontrolled uses of pesticides leading to the absence of insects required by newborn sparrows area unit one in all the major reason in declining population. Recently, World true sparrow Day was declared and celebrating per annum on March 20<sup>th</sup> 2010 to commemorate concerning sparrow population decline (Samik Ghosh *et al.*, 2010).

The city urban center has adopted sparrow because the State Bird. This chirruping pretty bird is closely related to individual and human settlements since times of yore. This bird was one in all the neglected bird species by researchers for several years; however it's within the late nineteenth century that reports concerning disappearing of sparrows attracted several biologist and conversationalists. (Peymanikaili *et al.*, 2012).

Tiruchengode is one of the agri-based and recently evolved urban space, Industrialization in textile, plastic producing and mining field has generated employment opportunities within the city for few years. It's exerting pressure on the resources of the geographic region. The population is though not

terribly high however the density has matured up to a pair of, 267.9 individuals per sq. kilometer. The boundaries of human settlements area unit increasing endlessly and new residential colonies area unit being established on agriculture land.

Due to the urbanization the ancient breeding places for house sparrow were attenuated. The fast industrialization and installation of communication towers produces varied radiation sick effects of Cell phone towers, Environmental consultants say's that sparrow isn't ready to stand up to the microwave impact from telephone towers (Hindu 2013). The totally different varieties of toxic substances on with waste matter into the setting urbanization turn out varied varieties of tropic significance magnitude relation true setting. It adversely have an effect on the sparrow population directly or indirect by radiation, industrial effluent, solid waste and some gasified emission that inhibit the fecundity and promote mortality. The works pertaining to diversity and its impacts of urbanization in hand-picked villages from 2 different District of Erode and Namakkal District.

Finally, to create Biodiversity conservation education, climatic change effects and house sparrow importance among general public and school, college student in the Elayampalayam region.

## Materials and Methods

### Study area:

The present study focuses on the populations of *Passer domesticus* in selected villages from two taluk

in Trichengode and Erode of Namakkal and Erode Districts. The study sites were randomly selected Villages (Koottapalli, Rajagoundapalayam, Sanarpalayam, Allimadai, Kokkarayanpettai, Patulur) from Namakkal and Erode Districts (Periyachettipalayam, China chettipalayam, 46 Pudur, Kaspapettai,) Erode Districts. The survey of house sparrow in Namakkal District and Erode District was carried out for the period of six months from October 2017 to march 2018.

### Point count method:

Population data was collected by using the method of Point Counts Method (Ralph *et al.*, 1993). The study area is to be divided into grids of 1 sq.km. In each grid of 1 sq.km, 5 points were selected and the population of house sparrow to be counted. In a census grid, the points should be 100 m apart from each other points. Along with the number of house sparrow, other details such as, number of old building of nest built by the house sparrow also to be counted and noted. Generally, point counts are used to compare the relative population of bird recorded in different sites. points count is the main method in monitoring the population changes of breeding land birds. Point counts involve an observer standing in one spot and recording all the birds seen or heard at either a fixed distance or unlimited distance or a fixed radius of 20 meters. The count time of house sparrow in the field is limited to 10 minutes to maximize detection and to minimize error due to double counting or mistakenly counting birds flying into the sampling area Yahaghi *et al.*, (2011).



Nest of House Sparrow in roof



*Passer domesticus*

## Results

### Population Studies:

The present investigation was carried out in 10 village of Tiruchengode taluks and Erode taluks, Tamil Nadu, Southern India for a period of six month from October 2017 to March 2018. The observations were made of population of house sparrow in different places by taking account of the habitat structure and agricultural practices of an area. A large numbers of house sparrows were recorded in the Tiruchengode taluks, koottapalli village with an average of (30%) house sparrows followed by Rajagoundapalayam (18%), kokkarayanpettai (25%) and Periyachettipalayam (19%).

A low number of house sparrows were recorded from the village of Sanarpalayam (10), Allimadai (11%), Kaspapettai (20%), Chinachettipalayam (17%) pudhur (0%), Pattulur (13%). The result shows in Table .1.

While the comparing the population of house sparrow with the number of old/abandoned buildings, it was found that the village with the maximum number of old and abandoned buildings supports a large number of house sparrow in Erode and Tiruchengode taluks. The habitat of house sparrows was found to be lost in the village of Allimadai, Sanarpalayam, 46 Pudhur and pattulur were there low number of old and abandoned buildings in that areas. The number of nests of house sparrows was also maximum in the habitat in which the maximum number of old and abandoned buildings were found. The house sparrows were also maximum in the village where there were maximum acres of land under cultivation taking place

The present investigation concluded that, the study area is highly urbanized due to that the population of house sparrow was decreased and we analyzed urbanization is major threat to sparrow breeding site (Nest).

**Table. 1** Diversity of House sparrow in selected villages from Namakkal and Erode District.

S.No	Village name	District	No. of agriculture land in acres	No. of old and abandoned building	No. of house sparrow In village	No. of nest
1	Koottapalli	Namakkal	1%	64%	30%	5%
2	Rajagoundapalayam		6%	74%	18%	2%
3	Sanarpalayam		0%	82%	16%	2%
4	Allimadai		0%	89%	11%	0%
5	Kokkarayanpettai		18%	55%	25%	2%
6	pattulur		23%	64%	13%	0%
7	China chettipalayam	Erode	0%	83%	17%	0%
8	Periya chettipalayam		0%	79%	19%	2%
9	Kaspa pettai		2%	75%	20%	3%
10	46 Pudhur		0%	69%	0%	0%

## Discussion

The present investigation carried out by two different districts Erode and Namakkal Districts. The House sparrows were recorded maximum in Koottapalli, Rajagoundapalayam, Kokkarayanpettai, Sanarpalayam, Allimadai, when compared to the other sites.

Bokotey and Gorben (2005) reported that the changes in the population of house sparrows were mainly due to changes in the urban habitats resulting from urbanization processes such as, constricting of green areas, development of new microhabitats with very little greenery and architecture unsuitable for nest construction, building houses in rural areas covered with weeds.

In Koottapalli and Rajagoundapalayam village the house sparrow's nests were observed in the temporarily kept constructing building house and the nests were found to be hanging in the trees which showed that there was no permanent habitat to build its nests. During the rehabilitation of the building for painting, the nest kept in the objects like pipelines and photo frames are destroyed.

Similar kinds of results were supported by 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. Which was one of the reasons for the decline in the population in London. Similar kinds of results were supported by Singh *et al.*, (2013) who reported that the number of house sparrow's nests towards concrete buildings was found to have a negative correlation in the urban and suburban regions of Jammu Kashmir.

In 46 Pudhur villages, the absence of house sparrows may be due to the modernization of buildings with a new architectural style. Similar kinds of results were supported by Murgui and Macias (2010) who stated that, the overall population of house sparrows had decline in Valencia of Spain from 1998 to 2008 and it was coincided with the high intensity of urban development, reduction in the amount of wastelands and other feeding habitats of house sparrow.

## References

Anderson, T. R. 2006. Biology of the ubiquitous House sparrows: From genes to Population. Oxford University Press, New York, pp: 6-32.

- Balaji, S. S. Baskaran, M. K. Rajan and Pavaraj, M. 2013. Investigating the causes for the decline *Passer domesticus* in Sivakasi Taluk, Virudhunagar District, Tamil Nadu, India. *World Journal of Zoology*, 8(3): 278-284.
- Balmori, A. and Hallberg, O. 2007. The urban decline of the House Sparrow (*Passer domesticus*): a possible link with electromagnetic radiation. *Electromagnetic Biology and Medicine*, 26:141-151.
- Bandel, H. 2010. Proceedings of National Seminar on Biodiversity, Water resource and Climate change issues, Department of Environmental Science, Kalyani University, pp.147-152.
- Baskaran, S., Rajesh, P., Pavaraj, M. and Bakavathiappan, G. A. 2010. Occurrence of House Sparrow *Passer domesticus indicus* L. in Sivakasi, Virudhunagar District, Tamil Nadu, India. *Indian Journal of Natural Sciences*. 1(3) : 155-158.
- Beckerman, A. P., Boots, M. and Gaston, K. J. 2007: Urban bird declines and the fear of cats. *Anim. Conserv.* 10: 320-325.
- Bhattacharya, R., Roy, R., Ghosh, S. and Dey, A. 2010. Observations on house sparrow at Bandel, Hoogly. Proceedings of National Seminar on Biodiversity, Water resource and Climate change issues, March 10, 2010, Department of Environmental Science, Kalyani University, Pp147 - 152.
- Bhattacharya., R, Roy., R, Goswami C. 2011. Studies on the response of House Sparrows to artificial nest. *International Journal of Environmental Sciences*, 1574.1581.
- Bokotey, A. A and Gorban, I. M. 2005. Numbers, distribution and ecology of the House Sparrow in Lvov (Ukraine). *Int. Stud. Sparrows*, 30: 7-22.
- Chamberlain, D. E., Toms, M. P., ClearyMcHarg, R. and Banks, A. N. 2007: House Sparrow (*Passer domesticus*) habitat use in urbanized landscapes. *J. Sparrow at Bandel, Hoogly*, Proceedings of National Seminar on Biodiversity; 13 (1):154-156.
- Chetan, S. J. 2012. Improved design of nest box for Indian house sparrow, *Passer domesticus indicus*. *Biosci.Discov.* 3: 97-100.
- Cramp, S. K., Simmons, R., Gillmor, P., Hollom, R., Hudson, E., Nicholson, M., Ogilvie, P., Olney, C., Roselaar, K., Voous, D., Wallace, J., Wattel, Dj Brooks And Dunn, E. 1985. Handbook of the bird of Europe the Middle East and North Africa, the birds of the western pale arctic, volume IV, Tern to Wood Peckers ,Oxford University Press.

- Crick, H. Q., Robinson, R. A., Appleton, G. F., Clark, N. A. and Rickard, A. D. 2002. "Investigation into the causes of the decline of starlings and House Sparrows in Great Britain", Department for Environment, Food and Rural Affairs (DEFRA), London, BTO Research Report No. 290.
- Dandapat, A., Banerjee, D and Chakraborty, D. D. 2010: The case of the disappearing House Sparrow (*Passer domesticus indicus*). *Veterinary World*, 3 (2): 9.
- Daniels, R. J. R., 2008. Can we save the sparrow. *Current Science*, 95, 1527-1528.
- Denis Summer and Smith J. 2003. Changes in the House Sparrow Population in Britain. *International Studies on Sparrows*, 30: 23-37.
- Ghosh, S., Ki Hyun Kim and Bhattacharya, R. 2010. A survey on house sparrow population decline at Bandel, West Bengal, India. *Journal of Korean Earth Science Society*, 31 (5) : 448- 453.
- Girish, C., Ajay, K and Parmesh, K. 2012. Population of House sparrow, *Passer domesticus* in different habitats of District Kurukshetra, Haryana, *Nature and Science*, 10: 1113-122. The Hindu (2013) Cell phone radiation may be harmful, but not lethal. Chennai, India.
- Holt, R. D 2003. On the evolutionary ecology of species' ranges. *Evolutionary Ecology Research* 5: 159–178. House Sparrow (*Passer domesticus*) in Delhi, India. *Urban Ecosystem*. 13:147-153.
- Kamath, V., Mathew A. O., Lewlyn, I. and Rodrigues, R. 2014: Indian Sparrows on the brink of extinction: population dynamics combined with ecological changes *Inter.J. Renew Energy and Envir. Engi*, 02 (01); 17-22.
- Khera, N., Das, A., Srivastava, S. and Jain, S. 2010. Habitat wise distribution of the House Sparrow (*Passer domesticus*) in Delhi, India. *Urban Ecosystem*. 13 (1); 147-154.
- Kler, T. K. and Kumar, M. 2014: Prevalence of bird species in relation to food habits and habitat. *Agric. Res. J.* 52(1); 50-53.
- Kler, T. K., Vashishat, N. and Kumar, M. 2015: Bird composition in urban landscape of Punjab. *Int. J. Adv. Res.* 3 (5): 1113-1118.
- LaxmiNarayana, B. 2011. Population of House Sparrow (*Passer domesticus*) in Yellampet, Nizamabad, Andhra Pradesh, India. *Newsletter for Birdwatchers*. 51(2). Pp 21-22.
- Möller, A . P. 1989. Parasites, predators and nest boxes: facts and artifacts in nest box studies of birds. *Oikos* 56: 421-423.
- Murgui, E and Macias, A. 2010. Changes in the house sparrow *Passer domesticus* population. *Bird Study*, 57:3, 281-288.
- Nath, A., Kalaimani, A. and Debahutee, R. 2012. A note on House Sparrows of Thengumahada, Nilgiris. *Newsletter for Birdwatchers*.(4): 52.
- Newton, I. 1995. The contribution of some recent research on birds to ecological understanding. *Journal of Animal Ecology*. 64:675–696.
- Newton, I. 1998. *Population Limitation in Birds*. Academic Press Limited, London, pp 2.
- Newton, I. 2004. The recent declines of farmland bird population in Britain: an appraisal of causal factors and conservation factors. *Ibis* 146:579–600.
- Nilsson, S. G. 1975. Clutch size and breeding success of birds in nest boxes and natural cavities. *VarFagelvarld*, 34: 207-211.
- PeymanMikaili, (Romana) Iran Dolati, Mohammad HosseinAsghari and JalalShayegh 2012. *European Journal of Experimental Biology*, 2 (1):222-241.
- Prowse, A. 2002. "The urban decline of House Sparrow". *British Birds*. 95: 143-146.
- Rajashekher, S and Ventkanteha, M. G. 2008. Occurrence of house sparrow, *Passer domesticus indicus* and around Bangalore. *Current Science*, 94 (4): 446-449.
- Ralph, C. J., Geupel, G. R., Pyle, P., Martin, T. E and Desante, D. F. 1993. *Handbook of field methods for monitoring landbirds*. Gen. Tech. Rep. PSW-GTR-144. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, p.41.
- Robbins, C. S. 1973. Introduction, spread, and present abundance of the house sparrow in North America. *Ornithological Monographs*, 14: 3–9.
- Robinson, R. A., Siriwardena, G. M and Crick, H. Q. P. 2005. Size and trends of the House Sparrow *Passer domesticus* population in Great Britain. *Ibis*.147:552–562.
- Ruiz, G., Rosenmann, M., Novoa, F. F and Sabat, P. 2002. Hematological parameters and stress index in rufous-collared sparrows dwelling in urban environments. *Condor*, 104, 162–166.
- Schrey, A., Coon, C. A .C., Grispo, M., Awad, M. and Imboma, T. 2012. Epigenetic variation may compensate for decreased genetic variation with introductions: A case study using House sparrows *Passer domesticus* on two continents. *Genetics Research International* doi:10.1155/2012/979751.
- Shaw, L. M., Chamberlain, D and Evans, M. 2008. The House Sparrow (*Passer domesticus*) in urban areas: reviewing a possible link between post-

- decline distribution and human socioeconomic status. *Journal of Ornithology*, 149: 293-299.
- Singh, R., Kour, D. N., Ahmed, F & Sahi, D. N. 2013. The causes of decline of house sparrow (*Passer domesticus*) in urban and suburban areas of Jammu Region, J & K. *Munis Entomology & Zoology*, 8 (2): 803-811.
- Simwat, G. S. 1977. Studies on the feeding habits of House sparrow, *Passer domesticus* (L) and its nestlings in Punjab, *Journal of Bombay Natural History Society*, 74: 175 -179.
- Smith, J. D. S. 2005. Changes of House Sparrow population in Britain, *Int. Stud.Sparrows*,30: 23 - 37.
- Summers-Smith, D. 1999. Current status of the House Sparrow in Britain. *British Wildlife*, UK, 381-386.
- Summers-Smith, J. 1988. *The Sparrows Illustrated* by Robert Gillmor, Calton, Staffs, England: T. and A. D. Poyser. 1-11.
- Summers-Smith, J. D. 2003. The decline of the House Sparrow: a review. *British Birds* 96: 439–446.
- Sundar, K. S. G. 2010. Sparrows, science and species conservation in India. *The New Indian Express*. (Zeitgeist Suppl.) Pp 6.
- Yahaghi, A., Behrouzi-Rad, B., Amininasab, S., Askari ,R. 2011. Determination of Number and Biometry of House Sparrow *Passer domesticus* Eggs in Public Parks of Shushtar in South of Iran (Spring 2010). *World Journal of Science and Technology*, 1(5): 56-61.

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**How to cite this article:**

S. Deepalakshmi and A. Antilin Salomi. (2019). Impact of urbanization on House sparrow (*Passer domesticus*) diversity from Erode and Namakkal districts, Tamilnadu, India. *Int. J. Adv. Res. Biol. Sci.* 6(11): 22-27.

DOI: <http://dx.doi.org/10.22192/ijarbs.2019.06.11.004>