IMPROVED DESIGN OF NEST BOX FOR INDIAN HOUSE SPARROW, *PASSER DOMESTICUS INDICUS*

Jawale Chetan S.

Department of Zoology
H.P.T. Arts R.Y.K. Science College, Nashik 422005 (M.S)

ABSTRACT

Indian house sparrow, *Passer domesticus indicus* is a symbiotic bird species with human habitation. Its vanishing population created awareness among peoples. Our changing life style and loss of nesting site proved a major cause of disappearance of sparrow. Many people try to provide non scientific artificial nest box for these bird in India. So, we experimented with the various design of Standard European sparrow nest box and presented ideal nest box designed which improves the nesting and breeding potential in urban area. Improved dimensions are 15.24 cm length and 12.7 cm width. Depth was reduced to 7.62 cm. We also able to improve the aesthetic look of these boxes which lead to increased acceptance by common people for their fixing around their houses. We found that availability of nesting material and height of nest box installation would not affect the nesting attempt by Indian sparrow. This improved designed of nest box will definitely help people, organizations and groups in their attempt to increase sparrow population.

Keywords: *Artificial nest box, Indian house sparrow, Nesting material, Nest box design, Passer domesticus.*

INTRODUCTION

House sparrow *Passer domesticus indicus* belongs to *Passeriformes* order and *Passeridae* Family. It has worldwide distribution and lives in all continents and many of oceanic Islands (Cramp *et al.,* 1985). Some of the ecologists believe that mentioned bird is a symbiotic species with human, hence recognizing and identified as bird species depended on human environments. It is an essential bird species as an equilibrant factors in ecosystems which have educational, recreational, economical and aesthetic values (Ghosh *et al.,* 2010). These organisms receive more attention in urban areas. They can play vital role in conservation of natural ecosystems health (Yahaghi *et al.,* 2011). It has even been mentioned in most of our Mythologies and Folklores, along with the common crow, Eagles and other such birds, which used to exist in close proximity to human dwellings.

The nest is build around the human habitation, in wall holes, roof spaces, undisturbed locations in the house, specially windows, or any such places found suitable for nesting around the human house and apartments. It feed on variety of foods, include, grains, seeds, insect, nectars, and cooked food left over by man. However large decreases of sparrow population are reported by different countries over the world (Crick *et al.,* 2002; Prowse, 2002; Denis Summer-Smith, 2003). According to the survey at different places of India on the occurrences of house sparrow, it was reported that their population has decreased considerably at present (Rajashekar and Venkatesha, 2008; Daniels, 2008; Khera *et al.,* 2010; Bhattacharya *et al.,* 2010; Ghosh *et al.,* 2010) Many researchers have reported different causes of this decline in population. Among all, one of the prime reasons is declining nesting sites in urban and suburban region. (Raghavendra Rao 2000; Denis Summer-Smith, 2003; Cramp, *et al.,* 1985). To increase the population of this bird, many researches suggested the use of artificial nest box (Newton, 1998; Nilsson, 1975; Moller, 1989; Bhattacharya *et al.,* 2010; Ghosh *et al.,* 2010) Hence, now a day increased awareness of vanishing sparrow from the cities initiated the movement of fixing sparrow nest around the house (Sundar, KSG. 2010; World Sparrow Day). Most of the time people use any material including shoe boxes to plastic tin as a nesting box for the sparrow, this not only cause failure of attempt and waste of breeding season of the house sparrow but also stand unsuccessful efforts of the peoples for novel cause. Now days many organizations and groups in India have started distributing sparrow nest boxes without knowing her needs for maximum successful nesting and breeding. To find out the best ideal designed for the Indian house sparrow *Passer domesticus indicus*, present work was undertaken.

MATERIAL AND METHODS

This study was undertaken in the Nashik city, it is the fast developing metropolitan city in the Maharashtra state of India, Situated at Latitude

19^0-33' and 20^0-53' North, Longitude 73^0-16' and 75^0-6' East covering total Area of 259.13 Sq. Km. The city has an estimated population size of 4,987,923 inhabitants and encompasses an area of 259.13 Sq. Km. The city, located in the Western Ghats, has become a center of attraction because of its beautiful surroundings and cool and pleasant climate. Nashik has a personality of its own due to its mythological, historical, social and cultural importance. Being a part of Western Ghat, ample of green vegetation and good weather are available for flourishing maximum biodiversity in this area.

Six different study areas were chosen to represent different points along an urbanization gradient, from the city centre (Including industrial / factory type areas), through two urban, two suburban areas and two rural areas. A total of 103 nest-boxes were erected within these nine study areas at variable heights ranging from 3 to 21 meters. In the two successive years various designs of nest boxes were made and most successful nest box designed with the aesthetic look was selected, total 103 boxes were fixed in and around the Nashik city at various heights and localities to conform the success rate of this design (Fig.1). The basic designed of wooden nest box suggested by British Trust of Ornithology (Chris, 2005) was modified by observing sparrow nest in their natural habitat like in cracks and holes in walls and ceilings, lamp post, window, ventilators, etc. The detail measurements were taken and accordingly the depth, width and length in basic design were modified (Fig.2) The top cover was also modified in the typical hut type with both the sides slanting, which gives decorative artistic house like look to it. The entry hole was kept 3.2 cm fixed in all designs, which assured the nesting of only *Passer domesticus indicus* in it. No provision for the nesting material, food, and water was made around the nest boxes. No additional protection was given to the nest boxes. Various designs were made and tested for sparrow nesting with respect to the nesting efforts, Quantity of nesting material, Easy exit of the young ones from nest for their first flight, Protection from the predators, Ventilation, Strength of nest, wood Quality for making nest box, Easy installation, Aesthetic look for quick acceptance by the people.

RESULTS AND DISCUSSION

During experimentation it was observed that, when depth was reduced to 7.62 cm, nesting efforts were also reduced as compare to European standard design where depth is 24.13 cm. The length and width was kept 15.24 cm and 12.7 cm inside respectively based on its natural nest dimensions, where as both side sloping top was kept at 90 degree angle, which give a typical hut look and reduced the requirement of internal top covering of nesting material. No brood was found trapped in the nest box as the nesting material was sufficiently levelled up to the exit hole from inside. The assembling and the nailing were done systematically to provide require strength to it. Installation was done with proper drilling and heavy nail with holder, so that it can not be removed from its fixed place by just giving jerk, which ensured the safety from the attack of the predators. The nest boxes were made from the eco-friendly chips plywood, which was solid and treated with the waterproof and termite proof chemical coating. The rusting of nails due to humid climate makes them more tightened to the plywood. In the final designed no provision for the opening and cleaning was kept (Fig. 3) because it was observed that *Passer domesticus indicus* prefer to use the previous nesting material by little cleaning and addition into it. This may be reducing there nesting period and enabling them to use same nest box maximum time in the season.

Ventilation slits keep the nest box airy and dry, where as drainage hole at the bottom; help in case the eggs are broken. The overall external look of this design was very well admired and accepted by the people for fixing nest box on outer walls of there houses. The nest box installation height causes no effect on the nesting, if sufficient quantities of insects are available in the area for raising their broods. Successful Nesting was observed from 3 meter to 21 meter heights, which was an important aspect in the modern residential apartment. Ideal height was found to be around 6 meters, with no restriction of directions. The safe location for installation was keenly observed, where ever the nest boxes were fixed near the predator's approachable location, no nesting was found. When such nest boxes were shifted to safe location, they are attempted and used. When all above criteria's were followed, nesting was found in every nest box irrespective of locality. The nesting materials quality varies with the locality. In densely populated old city area, the broom twigs and soft plastic was used for constructing nest (Fig. 4), Where as in the garden apartments, lawn grass was exclusively used for nesting (Fig. 5).

Fig. 1: The nest box fixed in the apartment at 21 meter height

Fig. 3: Improved artificial nest box used in present study.

Fig. 4: Nesting material in densely populated urban area.

Fig. 5: Nesting material in garden apartment.

Fig. 6: Nesting material in rural area.

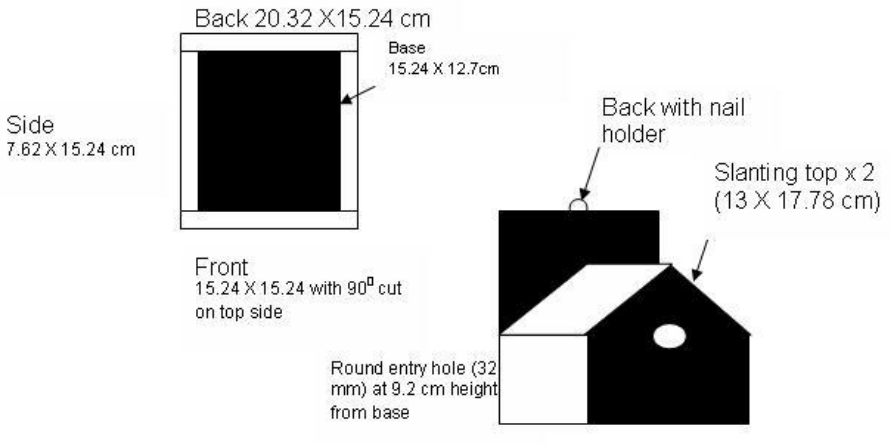

Fig. 2: Improved design of artificial nest box for Indian house sparrow.

In suburban and rural area mixture of small twigs, feathers and wild grass was used (Fig. 6). These indicate that sparrow make use of any available material in the area for nesting, only they required the safe nesting sites and properly designed nest box. In future this nest box designed will improve the nesting and breeding performance of the Indian sparrow. This design will help people, organizations, and campaigner in increasing the vanishing population of the *Passer domesticus indicus* in India. Yet there is need of improvement in the many more nest designs for the other indigenous bird species.

ACKNOWLEDGMENT

We are thankful to Hirval foundation, Nashik for there help in the installation and voluntary services given for the data collections.

LITERATURE CITED

Bhattacharya R, Roy R, Ghosh S, 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.

Cramp S, K Simmons, R Gillmor, P Hollom, R Hudson, E Nichelson, M Ogilvie, P Olney, C Roselaar, K Voous, D Wallace, J Wattel, DJ Brooks and E Dunn, 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 HQ, Robinson RA, Appleton GF, Clark NA, Rickard AD, 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.

Daniels RJR, 2008. Can we save the sparrow. *Current Science*, **95**(11)**:** 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, KiHyun 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.

Khera N, Das A, Srivastava S, Jain S, 2010. Habitat wise distribution of the House Sparrow (*Passer domesticus*) in Delhi, India. *Urban Ecosystem,* **13**(1):147-154.

Möller AP, 1989. Parasites, predators and nest boxes: facts and artifacts in nest box studies of birds. *Oikos.* **56:** 421-423.

Newton I, 1998. *Population Limitation in Birds.* Academic Press Limited, London, pp 2.

Nilsson SG, 1975. Clutch size and breeding success of birds in nest boxes and natural cavities. *Var Fagelvarld,* **34:** 207-211.

Prowse A, 2002. "The urban decline of House Sparrow". *British Birds*. **95**: 143-146.

Raghavendra Rao, 2000. A Field Study of The House Sparrow (*Passer Domesticus*) http://www.indianwildlifeclub.com/ResearchPapers/Field-Study-of-House Sparrow.aspx

Rajashekar S, Venkatesha MG, 2008. Occurrence of house sparrow, *Passer domesticus indicus* in and around Bangalore. *Current Science,* **94**(4): 446-449.

Sundar KSG, 2010. Sparrows, science and species conservation in India. *The New Indian Express*. (Zeitgeist Suppl.). Pp 6

World Sparrow Day website http://www.worldsparrowday.org/

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