NEST CHARACTERISTICS OF SOME BIRD SPECIES IN MAGWAY TOWNSHIP

Chaw Su Shwe[1], Win Ei Khaing[2], Daw Win[3]

Abstract

Nest has important effects upon bird's growth and breeding. Nest characteristics of some bird species were studied in Magway Township during December, 2016 to November, 2017. Nests of 14 bird species were observed. Five different nesting types were observed; globular or dome nest, platform nest, cup-shaped nest, pendent nest and irregular-shaped nest. Birds used different plant species as nesting substrate. They preferred spiny tree for prevention from predators. They used a variety of nesting materials, mostly straw, grasses, sticks and feathers. The highest mean nesting height 18.54±8.85 m was found in *Columba livia* and the lowest mean nesting height 0.53±0.07 m was found in *Chrysomma sinense.* Cup nest type in *Aegithina tiphia*, *Orthotomus sutorius*, *Chrysomma sinense*, *Pycnonotus cafer* and *Pycnonotus blandfordi*, and pendant nest type in *Prinia inornata* and *Ploceus phillipinus* were recorded. Dome nest were found in *Lonchura punctulata* and *Passer flaveolus*. Two platform nests were observed in *Columba livia* and *Streptopelia chinensis*. Nest of *Passer domesticus*, *Passer montanus* and *Acridotheres tristis* were irregular shaped. The major aim of this study was to provide the basis information about bird's nest, placement, other key factors for nest construction which can be helpful as reference for such studies in other areas.

Keywords: species, predators, *Columba livia*, *Chrysomma sinense*

Introduction

Birds vary a great deal from one another in most of their life pattern like habitat, food, colorations, beaks, feet, size, plumage pattern, distribution and so on, likewise nests of birds are also having huge variations in their size, shape, structure, construction material used, construction pattern, selection of site for nest, nest architecture etc. Nest building in birds require extreme skills of engineering. In this regard birds have proved themselves expert engineers. Nest construction skills can be considered as a part of parental care or Instincts. Birds provide care to their young ones before birth by constructing nests. (Raval, 2011)

Birds build nest to protect themselves their eggs and their young from predators and from adverse weather. Other animals also build nests, but birds do so in a great variety of forms, from a great variety of materials and on a great variety its sites (Gill, 2001).

All birds construct nests in which to lay eggs and/or raise offspring. Traditionally, it was thought that natural selection and the requirement to minimize the risk of predation determined the design of completed nests. (Mainwaring, *et al*., 2014)

The nest is built in roofs of houses, holes of walls, trees, railway station and wells. Nesting materials were categorized and identified into different groups such as twigs of *Azadirachta indica, Delonix regia, Cocos nucifera*, grass, feathers of birds, plastic, cloth, flowers of Acacia, Rubber rings, matal wire and snake slough, which were found in nest cavity (Dhandhukia and Patel, 2012). Different environments are likely to favor the positioning of nests in different places, whenever nest predators, microclimates, nest parasites, or competitors differ (Yeh *et al*., 2007).

Magway Township is situated in Magway District within the Dry Zone of Central Myanmar, which has dry and hot climate. It has an area of 1098.37 km^2. It is situated on the eastern bank of the Ayeyawady River. It stands at the height of 54.86 m above sea-level. The temperature

[1] Lecturer, Department of Zoology, University of Magway
[2] Lecturer, Department of Zoology, University of Magway
[3] Associate Professor, Department of Zoology, University of Magway

ranges from 10˚ to 45˚C. It is surrounded by dry forests, cultivated lands, some hilly regions and human habitations. Agriculture is important for the people of Magway.

Although great research effort has been focused in study of nest-site selection and nest-site characteristics of birds, the information from this study is largely lacking. Therefore, this study was conducted to investigate the occurrence of nests in some areas of Magway Township and to assess the nest characteristics of some nesting bird species.

Materials and Methods

Study area

Magway Township is situated in Dry Zone of Myanmar, which has dry and hot climate. It is located at the eastern bank of the Ayeyawady River. It lies between 20˚ 6′ 44.38″ and 20˚ 10′ 30.22″ N and between 94˚ 54′ 42.06″ and 94˚ 57′ 57.26″ E.

Three study sites were allocated in Magway Township. These three study sites were (i) Magway University Campus (Site I), (ii) Wa-taw-chaung Village (Site II) and (iii) Kyit- Sone-Pwe village (Site III). (Fig.1)

Figure 1 Location map of study area and study sites

Study period

This study was carried out from December, 2016 to November, 2017.

Data collection

Field survey was conducted for regular day of every week. A few nests were located by watching birds carrying nesting material. Nesting bird species were firstly viewed, and immediately taken on photographs by using Cannon SX 430 IS45x.

Identification of species

The bird species were identified referring to the taxonomic descriptions given by Smythies (2001), Robson (2011) and Robson (2015). The nesting plants were checked according to Kress *et al.* (2003).

Results

Number of nesting birds and nests

A total of 14 species of nesting birds and their 105 nests were recorded from three study sites during December, 2016 to November, 2017. It consists of 11 genera, nine families and two orders.

Characteristics of nests of some breeding bird species

Columba livia

A total of four nests were recorded. The shape of nest is platform type. Nest height from the ground ranged from 9.1 to 27.43 m (18.54±8.85 m). The length of nest ranged from 23 to 28 cm (26.13 ± 1.88cm) and the height of nest ranged from 2.5 to 3.2 cm (2.93 ± 0.26 cm). They built their nests with sticks and twigs (Table 3, Plate 1). The nests were observed on the window ledge of buildings.

Streptopelia chinensis

A total of five nests were observed. The shape of nest is platform type. Nest height from the ground ranged from 1.98 to 4.8 m (3.27±1.05 m). The length of nest ranged from 12.6 to 15.2 cm (13.66±0.9 cm) and the height of nest ranged from 2.5 to 3 cm (2.76±0.22cm). They built their nests with sticks and twigs (Table 3, Plate 1). Nests were encountered on the trees such as *Dypsis lastellina* (Ohn) and *Senegalic catechu* (Shar).

Aegithina tiphia

A total of two nests were recorded. The shape of nest is cup-shaped type. Nest height from the ground ranged from 1.8 to 2.13 m (1.97±0.17 m). The length of nest ranged from 5 to 5.5 cm (5.27±0.25 cm) and the height of nest ranged from 3.8 to 4 cm (3.9±0.1 cm). They built their nests with soft grass, root fiber and wool (Table 3, Plate 1). The nests were found on the tree *Senegalia catechu* (Shar).

Acridotheres tristis

A total of three nests were recorded. The shape of nest is irregular-shaped type. Nest height from the ground ranged from 6.8 to 7 m (6.9 ± 0.1 m). The length of nest ranged from 17.4 to 18 cm (17.7 ± 0.3 cm) and the height of nest ranged from 8.6 to 9.3 cm (8.95 ± 0.35 cm). They built their nests using twigs, grass, leaves and sticks. (Table 3, Plate 1). The nests were found in the hole of the wall and in the crevice of building.

Pycnonotus blanfordi

A total of eight nests were encountered. The shape of nest is cup-shaped type. Nest height from the ground ranged from 1.6 to 2.9 m (2.28±0.43 m). The length of nest ranged from 6.7 to 10.3 cm (8.26±0.98 cm) and the height of nest ranged from 2.8 to 5.4 cm (4.73±0.77 cm). They built their nests with grass, straw, sticks, string and wool (Table 3, Plate 1). Nests were encountered on the trees such as *Vachellia nilotica* (Sue- Phyu), *Citrus limon* (Shauk) and *Ziziphus jujube* (Zi).

Pycnonotus cafer

A total of five nests were encountered. The shape of nest is cup-shaped type. Nest height from the ground was 0.08 to 2 m (1.4±0.6 m). The length of nest was 11.3 to12 cm (11.65± 0.35 cm) and the height of nest was 4.5 to 5.3 cm (4.9±0.4 cm). They built their nests with twigs and sticks. (Table 3, Plate 1). Nests were encountered on the tree *Cedrela febrifuga* (Yay-Tamar) and *Vachellia nilotica* (Sue- Phyu).

Prinia inornata

A total of three nests were recorded. The shape of nest is pendant type. Nest height from the ground ranged from 0.02 to 7.3 m (2.45±3.43 m). The length of nest ranged from 6 to 7 cm (6.33±0.47cm) and the height of nest ranged from 9 to 12 cm (10±1.41 cm). They built their nests

with used twigs and grass (Table 3, Plate 1). The nests were found on the tree *Ricinus communis* (Kyat-su).

Orthotomus sutorius

A total of two nests were observed. The shape of nest is cup-shaped type. Nest height from the ground was 1 to 2.4 m (1.7±0.7 m). The length of nest was 6 to 7 cm (6.5±0.5 cm) and the height of nest was 10.6 to 12 cm (11.3±0.7 cm). They built their nests with thread and wool (Table 3, Plate 1). The nest was found on the trees of *Mangifera indica* (Tha-yet) and *Terminalia catappa* (Bar-dan). They stitch leaves together to make a nest, using its needle-shaped beak and fine thread.

Chrysomma sinense

A total of two nests were recorded. The shape of nest is cup-shaped type. Nest height from the ground ranged from 0.46 to 0.6 m (0.53±0.07 m). The length of nest ranged from 7 to 7.3 cm (7.15±0.15 cm) and the height of nest ranged from 5 to 5.2 cm (5.1±0.1 cm). They built their nests with twigs and sticks (Table 3, Plate 1). The nests were found on the tree *Senegalia catechu* (Shar).

Passer domesticus

A total of 26 nests were found during the study. The shape of nest is irregular. Nest height from the ground ranged from 1.98 to 15.24 m (5.59±2.74 m). The length of nest ranged from 7 to 29 cm (17.8±7.21 cm) and the height of nest ranged from 15 to 31 cm (18.6±2.96 cm). They built their nests with feathers, string, paper, grass inflorescences, stalks, threads, straw, wool, leaves and any other available materials (Table 3, Plate 1). The nests were found on the ceiling, in the fan and under the electric light, in the artificial nest house, on the top of pagoda, on the ceiling and in the pipe, on the shelf of air-conditioner and on the lamppost.

Passer flaveolus

A total of four nests were found. The shape of nest is dome type. Nest height from the ground ranged from 2.1 to 3.5 m (2.58 ± 0.54 m). The length of nest ranged from 13 to 16.3 cm (14.9 ± 1.2 cm) and the height of nest ranged from16 to 18.7 cm (17.18 ± 0.97 cm). They built their nests with used feathers, human hair, wool, grass and straw (Table 3, Plate 1). The nests were found on the trees *Senegalia catechu* (Shar) and *Ziziphus jujube* (Zi).

Passer montanus

A total of five nests were recorded. The shape of nest is irregular-shaped type. Nest height from the ground ranged from 4.14 to 5.03 m (4.56±0.32 m). The length of nest ranged from 15 to 20 cm (17.52±2.11 cm) and the height of nest ranged from 20 to 25.3 cm (22.62±2.2 cm). They built their nests with grass, straw, twigs and wool (Table 3, Plate 1). Nests were encountered on the trees such as *Azadirachta indica* (Ta- mar), *Cedrela febrifuga* (Yay-Tamar) and *Mimusops elengi* (Kha-yay).

Ploceus phillippinus

A total of 18 complete nests and 7 incomplete nests were found. The shape of nest is pendant type. In complete nests, nest height from the ground ranged from 4.14 to 22.1 m (17.33±5.44 m). The length of nest ranged from 13 to 19 cm (16.61±1.53cm) and the height of nest ranged from 23 to 32 cm (27.39±2.63 cm). They built their nests with used twigs and grass (Table 3, Plate 1). Nests of *Ploceus phillippinus* were encountered on the trees such as *Cocos nucifera* (Ohn) and *Albizia saman* (Kote-ko).

Lonchura punculata

A total of 22 nests were found. The shape of nest is dome type. Nest height from the ground ranged from 1.5 to 27.43 m (4.05±5.33 m). The length of nest ranged from 9.6 to 19.5 cm (13.56±2.16 cm) and the height of nest ranged from 15.9 to 23 cm (18.05±1.91 cm). They built their nests with used feathers, hair, wool, grass and straw (Table 3, Plate 1). Nests were encountered on the trees such as *Dypsis lastellina* (Ohn), *Vachellia nilotica* (Sue- Phyu) and on the window ledge of buildings, *Azadirachta indica* (Ta- mar), *Ziziphus jujube* (Zi), *Acacia leucophloea* (Hta-naung), *Senegalic catechu* (Shar) and *Citrus limon* (Shauk).

Occurrence of nests in study sites

Three nests of *Columba livia*, were found two nests in each of Site II and III. In the case of *Streptopelia chinensis*, two nests in each of Site I and II and one nest in Site III were recorded. Regarding *Lonchura punculata*, eight nests in Site I, five nests in Site II, and nine nests in Site III were observed. Among the species of genus *Passer*, five nests of *Passer domesticus* were recorded in Site I, nine nests in Site II and 12 nests in Site III respectively. Two nests of *Passer flaveolus* was observed in each of Site II and III. Two nests of *Passer montanus* were observed in Site II and three nests in Site III. Two nests of *Aegithina tiphia* were observed in only Site III. One nest of *Chrysomma sinense* was found in each of Site II and III. Two nests of *Acridotheres tristis*, were found only in Site I. 18 nests of *Ploceus phillipinus* was observed in only Site I. Three nests of *Prinia inornata* was recorded in only Site III. One nest of *Pycnonotus cafer* was found in each of Site I and III. Four nests of *Pycnonotus blanfordi* were recorded in Site I, three nests in Site II and one nest in Site III. One nest of *Orthotomus sutorius* was found in each of Site II and III (Table 2 and Fig 2).

Altogether 40 nests in Site I, 27 nests in Site II and 38 nests in Site III were recorded (Table 2 and Fig 2).

Occurrence of nests in study months

During the study period, one nest of *Columba livia* was observed in each month of December, April, July and October. One nest in each month of January, March, July, August and October were recorded for *Streptopelia chinensis*. Five nests in June, six nests in each month of July and August, four nests in September and one nest in October were represented by *Lonchura punculata*. *Passer domesticus* revealed three nests in each of December, August and October, one nest in each of January, March and April, two nests in each month of Feburary, May, June, September and November and four nests only in July. Two nests of *Passer flaveolus* were observed in month of May and one nest in each of June and July. Two nests of *Aegithina tiphia* was found only in July. Two nests in April and one nest in each month of May, June and July were observed in *Passer montanus*. One nest of *Chrysomma sinense, Acridotheres tristis* and *Pycnonotus cafer* were recorded in each month of June and July. Six nests in June, eight nests in July and four nests in August were that of *Ploceus phillipinus*. Two nests of *Prinia inornata* were observed in July and one nest in August. *Pycnonotus blanfordi* revealed two nests in each month of May and July, one nest in June and three nests in August. One nest in each month of July and August were recorded in Orthotomus *sutorius* (Table 4).

Table 1 List of recorded bird species

Sr No	Order	Family	Scientific Name	Common Name
1	Columbiformes	Columbidae	*Columba livia* Gmelin, 1789	Pigeon
2			*Streptopelia chinensis* (Scopoli, 1768)	Spotted Dove
3	Passeriformes	Aegithinidae	*Aegithina tiphia* (Linnaeus, 1758)	Common iora
4		Sturnidae	*Acridotheres tristis* (Linnaeus, 1766)	Common myna
5		Pycnonotidae	*Pycnonotus blanfordi* Jerdon, 1862	Streak-eared Bulbul
6			*Pycnonotus cafer* (Linnaeus, 1766)	Red- vented bulbul
7		Cisticolidae	*Prinia inornata* (Sykes, 1832)	Plain Prinia
8			*Orthotomus sutorius* Horsfield, 1821	Tailor Bird
9		Paradoxornithidae	*Chrysomma sinense* (Gmelin, 1789)	Yellow-eyed babbler
10		Passeridae	*Passer domesticus* (Linnaeus, 1758)	House Sparrow
11			*Passer flaveolus* Blyth, 1844	Plain- backed Sparrow
12			*Passer montanus* (Linnaeus, 1758)	Tree Sparrow
13			*Ploceus philippinus* (Linnaeus, 1766)	Baya Weaver
14		Estrildidae	*Loncura punculata* (Linnaeus, 1758)	Scaly-breasted Maunia

Table 2 Number of nests of nested bird species recorded in different study sites

Sr No	Study species	Site			Total
		I	II	III	
1	*Columba livia*	-	2	2	4
2	*Streptopelia chinensis*	2	2	1	5
3	*Aegithina tiphia*	-	-	2	2
4	*Acridotheres tristis*	2	-	-	2
5	*Pycnonotus blandfordi*	4	3	1	8
6	*Pycnonotus cafer*	1	-	1	2
7	*Prinia inornata*	-	-	3	3
8	*Orthotomus sutorius*	-	1	1	2
9	*Chrysomma sinense*	-	1	1	2
10	*Passer domesticus*	5	9	12	26
11	*Passer flaveolus*	-	2	2	4
12	*Passer montanus*	-	2	3	5
13	*Ploceus phillipinus*	18	-	-	18
14	*Lonchura punctulata*	8	5	9	22
	Total	**40**	**27**	**38**	**105**

Table 3 Mean values of nest characteristics of nested bird species

Sr. no	Species	Nest height from ground (m)	Nest length (cm)	Nest height (cm)
1	*Columba livia*	18.54 ± 8.85	26.13 ± 1.88	2.93 ± 0.26
2	*Streptopelia chinensis*	3.27 ± 1.05	13.66 ± 0.9	2.76 ± 0.22
3	*Aegithina tiphia*	1.97 ± 0.17	5.25 ± 0.25	3.90 ± 0.10
4	*Acridotheres tristis*	6.9 ± 0.1	17.7 ± 0.3	8.95 ± 0.35
5	*Pycnonotus blandfordi*	2.28 ± 0.43	8.26 ± 0.98	4.73 ± 0.77
6	*Pycnonotus cafer*	1.4 ± 0.6	11.65 ± 0.35	4.9 ± 0.4
7	*Prinia inornata*	2.45 ± 3.43	6.33 ± 0.47	10 ± 1.41
8	*Orthotomus sutorius*	1.7 ± 0.7	6.5 ± 0.5	11.3 ± 0.7
9	*Chrysomma sinense*	0.53 ± 0.07	7.15 ± 0.15	5.1 ± 0.1
10	*Passer domesticus*	5.59 ± 2.74	17.80 ± 7.21	18.60 ± 2.96
11	*Passer flaveolus*	2.58 ± 0.54	14.90 ± 1.20	17.18 ± 0.97
12	*Passer montanus*	4.56 ± 0.32	17.52 ± 2.11	22.62 ± 2.20
13	*Ploceus phillipinus*	17.33 ± 5.44	16.61 ± 1.53	27.39 ± 2.63
14	*Lonchura punctulata*	4.05 ± 5.33	13.56 ± 2.16	18.05 ± 1.91

Table 4 Monthly number of nests of different species encountered during the study period

Sr.no	Study species	Dec	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Total
1	*Columba livia*	1	-	-	-	1	-	-	1	-	-	1	-	4
2	*Streptopelia chinensis*	-	1	-	1	-	-	-	1	1	-	1	-	5
3	*Aegithina tiphia*	-	-	-	-	-	-	-	2	-	-	-	-	2
4	*Acridotheres tristis*	-	-	-	-	-	-	1	1	-	-	-	-	2
5	*Pycnonotus blandfordi*	-	-	-	-	-	2	1	2	3	-	-	-	8
6	*Pycnonotus cafer*	-	-	-	-	-	-	1	1	-	-	-	-	2
7	*Prinia inornata*	-	-	-	-	-	-	-	2	1	-	-	-	3
8	*Orthotomus sutorius*	-	-	-	-	-	-	-	1	1	-	-	-	2
9	*Chrysomma sinense*	-	-	-	-	-	-	1	1	-	-	-	-	2
10	*Passer domesticus*	3	1	2	1	1	2	2	4	3	2	3	2	26
11	*Passer flaveolus*	-	-	-	-	-	2	1	1	-	-	-	-	4
12	*Passer montanus*	-	-	-	-	2	1	1	1	-	-	-	-	5
13	*Ploceus phillipinus*	-	-	-	-	-	-	6	8	4	-	-	-	18
14	*Lonchura punctulata*	-	-	-	-	-	-	5	6	6	4	1	-	22
	Total	4	2	2	2	4	7	19	32	19	6	6	2	105

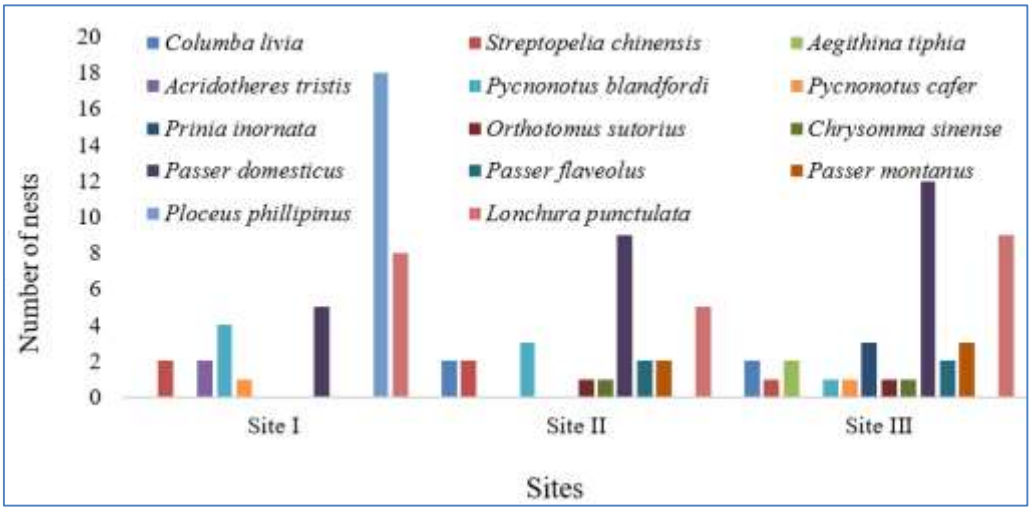

Figure 2 Relative numbers of nests of bird species recorded in different study sites

Columba livia and its

Streptopelia chinensis and its nest

Aegithina tiphia

Nest of *Aegithina tiphia*

Acridotheres tristis and its

Pycnonotus blandfordi

Nest of *Pycnonotus blandfordi*

Pycnonotus cafer

Nest of *Pycnonotus*

Prinia inornata

Nest of *Prinia inornata*

Orthotomus sutorius

Nest of *Orthotomus sutorius*

Chrysomma sinense

Nest of *Chrysomma*

Passer domesticus

Nest of *Passer domesticus*

Passer flaveolus

Nest of *Passer flaveolus*

Passer montanus

Nest of *Passer montanus*

Ploceus phillipinus and its nest

Lonchura punctulata

Nest of *Lonchura punctulata*

Plate. 1 Bird species studied and their nests

Discussion

A total of 14 species of nesting birds representing 105 nests was recorded from three study sites of Magway Township during December, 2016 to November, 2017. The 14 species of birds are distributed among 11 genera, nine families and two orders and all are terrestrial birds.

Collias and Collias (1984) observed that birds construct nests in a variety of different shapes, such as cups, domes, scrapes, or burrows and these act as an extended phenotype. Different types of nests were found in the present study such as platform type, dome type, irregular-shaped type, pendant type, cavity type and cup-shaped type respectively.

Hansell (2000) stated that the majority of nests are differentiated structures that are constructed from a variety of materials which can generally be classified as being either structural materials or lining materials. While structural materials make up the general shape of the nest and provide structural support for the parents and offspring. The lining materials generally create a suitable microclimate in which parents can raise their offspring. During the present study, 14 bird species used materials to construct the nests such as sticks, twigs, feathers, hair, wool, grass, straw, string, paper, grass inflorescences, stalks, threads, wool, leaves, human hair, spider silk and any other available materials.

Ashpole, *et al.* (2015) revealed that breeding season of *Columba livia* varies between regions. It breeds year-round in the U.K. and Ireland with peak breeding in April. In the Mediterranean it breeds between March and July and in Cyprus from March to May. The nest is a cup loosely fashioned from stems, leaves, roots, driftwood, seaweed and feathers. In this research, new nests of *Columba livia* were observed in each month of April, July, October and December. But they stayed in these nests the whole year.

Rajashekara and Venkatesha (2013) observed that the nest of *Streptopelia chinensis* was constructed on three to four ramified branches of a Croton plant, at a height of 1.52 m from ground level. The simple and fragile saucer nest was built with a loose platform of thread-like sticks and a few dried Croton leaves. During the present study, nest of *Streptopelia chinensis* is platform type. Nest height from the ground ranged from 9.1 to 27.43 m. The length of nest ranged from 23 to 28 cm and the height of nest ranged from 2.5 to 3.2 cm. They built their nests with sticks and twigs.

In the present study, the nest of *Aegithina tiphia* used sticky spider silk for nest building. Nest height from the ground is 1.8 m (5.91 ft) to 2.13 m (7 ft). The nest is a compact little cup, soft grass and root fibers neatly rounded off at the bottom.

Dhandhukia and Patel (2012) stated that the myna may also construct nest in holes on the wall of houses even in city area and old forts. Its colony size is often delimited by the availability of holes in manmade structures like bridge. Nest materials were grass, feathers of birds, plastic, cloth and flowers of Acacia. In this study, the common myna built their nests in the hole of the wall and in the crevice of building with twigs, grass, leaves and sticks.

Smythies (1953) observed that the breeding season of *Pycnonotus blanfordi* extends from March to August, but an odd nest may be found in almost any month, as with most of the common bulbuls. In the present study, three nests of *Pycnonotus blanfordi* revealed two nests in each May and July, one nest in June and three nests in August.

Rao *et al*. (2012) found that Red-vented Bulbul mostly preferred the small leafy, dense bushes and small leafy trees for nesting. *Pycnonotus cafer* constructs the nest at the junction of the bifuracated or trifurcated branch or on some similar substrate so as to get a firm support at bottom. It prefers the material for built up the nest like as small and smooth dry branches of stems and roots of herbs and grasses. Bulbul generally selects 2.0 to 3.5 height for nest construction. In the present study, nest height from the ground was 0.08 to 2 m. They built their nests with twigs

and sticks. Nests were encountered on the tree *Cedrela febrifuga* (Yay-Tamar) and *Vachellia nilotica* (Sue- Phyu).

Gajera *et al.* (2009) stated that nest of Plain prinia and black-breasted weaver were preferably constructed among grasses and sedges, *Pennisetum typhoides* and *Typha angustifolia.* During this study, *Prinia inornata* selects their nest site marshy grasses especially *Lolium perenne* (Myat).

Tiwari and Anupana (2006) observed that nesting season of *Orthotomus sutorius* is from June to September. The usual nest type is a pouch formed by stitching together two leaves. The nest was a cup of soft material, slung from a small shelter of dry and dead date-palm leaves, 1.2 m above the ground. During the present study, nest of *O. sutorius* was found in the month of June and August. The nest was found on the trees of *Mangifera indica* (Tha-yet) and *Terminalia catappa* (Bar-dan) with thread and wool. Nest height from the ground was 1 to 2.4 m (1.7±0.7 m). They stitch leaves together to make a nest, using its needle-shaped beak and fine thread.

Nirmala (2015) stated that Yellow-eyed Babbler placed the nest at the junction of the main bifurcated branches so as to get a firm support at the bottom. The nests are easily distinguished with a definite deep statant cup, and were built with grass, rootlet and fully lined by cobweb outside, which gives the appearance of cemented outer layer. Leaves softened the inner base. In this study, the nest of *Chrysomma sinense* is deep cup shaped. They built their nests with twigs and sticks and the outside is covered by cobwebs.

House Sparrow built nest in small cavities like caves of houses holes in brick walls, dense trees and bushes and other natural and man-made nest boxes. Nest were made of coarse material on the outside such as, straw, twigs, paper, leaves, grasses and any other available material. Inside the nest was lined with feathers or fine grasses. House sparrow nest often in enclosed place and may expand to fill available volume. Nest in trees are usually globular structure with a side entrance. Dail (2003) reported that nest construction and placement are correlated with breeding season, suitable nest sites, nesting materials availability, food availability and predator's interaction. This study is in conformity with the finding of Dail, 2003.

Summers-Smith (1981) observed that the sites of *Passer flaveolus* included the outer branches of trees, where the nests were lodged in the forks and well concealed by the leaves; the crowns of coconut and sugar palms; a hole in a tree. During the present study, the nest of *Passer flaveolus* is dome type. They built their nests on the tree of *Senegalia catechu* (Shar) and *Ziziphus jujube* (Zi) used with feathers, human hair, wool, grass and straw.

Achegawe *et al.* (2016) stated that nesting material was used to construct the nest proper that was 1-2 ft by *Ploceus phillipinus.* When the monsoon starts during month of July, August each year in this part of the world, the grasslands flourish and grow well till end of August to September. In the present study, pendant nests were constructed by the Baya Weaver. Pendant nests are elongated sacs woven of pliable materials such as grasses and soft plant fibers. The Baya Weaver prepared Palm and Coconut trees for nest construction. Many males may construct their nests on *Cocos nucifera* (Ohn) and *Albizia saman* (Kote-ko) and nest height from the ground ranged from 4.14 m (13.58 ft) to 22.1 m (72.507 ft).

In the present study, Scaly-breasted Munia built globular and dome-shaped nest with a lateral entrance hole. Grass blades were used to build the nest. Nest was largely built on the twigs present inside the canopy. Nests were encountered on the trees such as *Dypsis lastellina* (Ohn), *Vachellia nilotica* (Sue- Phyu) and on the window ledge of buildings, *Azadirachta indica* (Ta-mar), *Ziziphus jujube* (Zi), *Acacia leucophloea* (Hta-naung), *Senegalic catechu* (Shar) and *Citrus limon* (Shauk). The present study is in agreement with early finding of Kumari, *et al.* (2016) who suggested that breeding season of Spotted Maunia was initiated in rainy season from end of June

and continued till November. However, its peak was observed to be during August and September. Maunia was globular or dome shaped made of grass blades and leaves with a lateral entrance hole oriental mainly along the most frequent wind direction. The majorities of the nests was located on the thorny plants species as well as on ornamental trees and shrubs and were placed on twigs towards the centre covered with thick tree canopy.

A total of 105 nests of birds were recorded during study period. In study Site I, Magway University Campus, a total of 40 nests in seven species were recorded. During the present study, two nests of *Streptopelia chinensis,* eight nests of *Lonchura punculata,* five nests of *Passer domesticus,* two nests of *Acridotheres tristis,* 18 nests of *Ploceus phillipinus,* one nest of *Pycnonotus cafer* and four nests of *Pycnonotus blanfordi* were recorded in Site I. Site I is located in the center of city with median and large trees, some crops plants and bushes.

In study Site II, Wa-taw-chaung Village, a total of 27 nests in nine bird species were recorded. It has cultivated crops and large and small trees. In this Site II, two nests of *Columba livia,* two nests of *Streptopelia chinensis,* five nests of *Lonchura punculata,* nine nests of *Passer domesticus,* two nests of *Passer flaveolus,* two nests of *Passer montanus,* three nests of *Pycnonotus blanfordi*, one nest of *Chrysomma sinense* and one nest of *Orthotomus sutorius* were found.

In study site III, Kyit- Sone Pwe Village, a total of 38 nests but twelve species of bird's nest were recorded. It is located beside of Magway- Naypyitaw highway and it is rural area with thick vegetation, standing or flowing water and ponds, large and median size trees. This site provides various kinds of bird species. Two nests of *Columba livia,* one nest of *Streptopelia chinensis,* nine nests of *Lonchura punculata,* 12 nests of *Passer domesticus,* two nests of *Passer flaveolus,* three nests of *Passer montanus,* two nests of *Aegithina tiphia*, one nest of *Chrysomma sinense,* three nests of *Prinia anorata,* one nest of *Pycnonotus cafer* and one nest of *Pycnonotus blanfordi* were recorded in Site III. This site provides various kinds of bird species.

The occurrence of bird nest in different habitats may be due to availability of suitable breeding site and local environmental condition. These kinds of habitat provide concealment to the nest from higher risk of predation and anthropogenic disturbance.

In the present study bird species showed denser canopy of trees and thorny plant species as nesting substrate. The denser canopy of the nesting tree could provide safe nesting place from the predators as well as weather related problems. This present study was conducted very short period and future long-term studies covering all aspects to understand the bird nest-site selection are needed.

Conclusion

In conclusion, Magway Township is situated in a central dry zone of ecosystem, and the habitat coverage of Magway Environ is sound for birds. Bird population, richness, and density are depended on habitat condition of their habitat area. Thus, habitat conservation is needed to more variety of birds for shelter, food and breeding. During the study period, the habitat was destroyed by people. Therefore, the bird population was reduced conspicuously. Hence, conservation should be done not to destroy the habitats for the breeding of birds. This is not only to protect the habitat but also to maintain the population status.

Acknowledgements

I would like to thank Dr Khin Maung Oo, Rector, University of Magway, for permitting the opportunity to present this paper. I owe Pro-Rectors Dr. Win Soe and Dr. Than Than Oo for their encouragement to present this paper. I would like to express my special thanks to Dr Cho Cho Oo, Professor, Head, Department of Zoology, University of Magway, for her valuable suggestion and comments for this paper.

References

Achegawe, R.M., Chavan, S.,P., Patil, P.V. and Tarte, S.H., (2016). Nesting of Baya Weaver (*Ploceus phiilippinus)* in S.R.T.M. University, Naded and Fields along Asana River at Nanded, Maharashtra, India. *International Journal of Current Research and Academic Review*, 4: 51-60

Ashpole, J., Burfield, I., Ieronymidou, C., Pople, R., Wheatley, H. and Wright, L., (2015). *Columba livia* - Gmelin, 1789, *BirdLife International.*

Collias, N.E., and Collias, E.C., (1984). Nest Building and Bird Behaviour. Princeton University Press, New Jersey, pp336.

Dhandhukia, S.N. and Patel, P.K., (2012). Selection of nesting sites and nesting material in common myna (*Acridotheres tristis*) in an arban area. *International Journal of Pharmacy and Life Sciences*, 3 (8): 1897-1904

Dial, K.P., (2003). Evolution of avian locomotion modules, nesting biology, body size, development and the origin of flapping flight. *Auk*, 120: 941-952.

Gajera, N., Dave, S., M. and Dharaiya, N.A., (2009). Nesting patterns of some terrestrial birds in Danta Forest Range, northern Gujarat, India. *Journal of Threatened Taxa*, 1 (3): 170-173.

Gill**,** F.B., (2001). *Ornithology*. 2nd Edition. W.H. Freeman and Company, New York. 766 pp.

Hansell, M.H., (2000). *Bird nests and construction behaviour.* Cambridge Univ. Press, Cambridge, U.K.

Kress, W.J., Defilipps, R.A., Farr, E. and Yin Yin Kyi, (2003). *A checklist of the Trees, Shrub, Herbs and Climber of Myanmar*, Smithsonian Institution United State National Herbarium.

Kumaria, M., Anthal, A., Sahi, D.N. and Langer, S., (2016). Clutch size and Egg characteristics of Spotted Maunia, *Lonchura punctulate* in Jammu region, J and K India, *International Journal of Innovative Research in Science, Engineering and Technology*, 5 (11): 19032-19035.

Mainwaring, M.C., Hartley, I.R., Lambrechts M.M. and Deemin D.C., (2014). The design and function of birds' nests. *Ecology and Evolution*; 20(4): 3909– 3928.

Murphy, M.T., (1983). Nest success and nesting habits of Eastern kingbirds and other flycatchers. *Condor*, 85: 208-219.

Nirmala, T., (2015). Ecology and Nest-site characteristics of the Yellow-eyed Babbler *Chrysomma sinense* in the tropical forest, Tamil Nadu, India. *International Journal of Recent Scientific Research.* 11: 7322- 7330.

Rajashekara, S. and Venkatesha, M.G., (2013). On the breeding of Spotted Dove, *Streptopelia chinensis. Indian Birds*, 11 (4): 91-93.

Rao, M.S., Ojha, P.R. and Rao, R., (2013). Breeding Performance of red- Vented Bulbul (*Pycnonotus cafer)* in Rajasthan, India. *International Journal of Science and Research (IJSR)*, 2 (7): 319-322.

Raval, J.V., (2011). Morphometric Studyof Bird' Nests. *International Journal of Zoology Research*, 1 (2): 30-35.

Robson, C., (2011). *A field guide to the birds of South-East Asia*. New Holland Publisher (UK) Ltd. London, 304 pp.

Robson, C., (2015). *Helm field guides birds of South-East Asia*. New Holland Publisher (UK) Ltd. London, 304 pp.

Smythies, B.E., (1953). *The Birds of Burma*. 2nd Edition. Commander, A. M. HUGHES, O.B.E., R.N., London. 668 pp.

Smythies, B. E., (2001). *The birds of Burma*. Oliver and Boyd Ltd. Edinburgh. London. Pp. 185-188.

Summers-Smith, D., (1981). Notes on the Pegu Sparrow, *Passer flaveolus. Nat. Hist. BullL. Siam Soc*. 29: 73-84.

Tiwari, J.K. and Anupama, (2006). Nest structure variation in Common Tailorbird *Orthotomus sutorius* in Kutch, Gujarat. *Indian* Birds, 2 (1): 15.

Yeh, P.J., Hauber, M.E. and Price, T.D., (2007). Alternative nesting behaviours following colonisation of a novel environment by a passerine bird. *Oikos*, 116: 1473-1480.