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Population and conservation status of Kabaitari roosting site of Indian flying fox (*Pteropus giganteus giganteus*) (Chiroptera: Pteropodidae) in Bongaigaon District of Assam, Northeast India

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Abstract

Indian flying fox (*Pteropus giganteus giganteus*) is a frugivorous bat species found in Indian subcontinent. It is a highly economic and ecological bat species for our forest ecosystem. Current Kabaitari roosting site has been located in the southern bank of a perennial water source of 'Hathatiya River' at Bongaigaon district of Assam. Populations were counted in between 22.03.2022 and 23.03.2023. 'Direct roost count' method was followed for survey**.** The annual average population of the roosting site was calculated at 460 numbers of bats. Highest numbers of bats were seen in two *Bombax ceiba* roosting plants present in the habitat. Heights of the roosting trees were measured between 55 to 60 feets. During winter, canopy covers of both the roosting trees were observed in completely naked condition. There were other plant species in the study area such as *Anthocephalus kadamba*, *Areca catechu*, *Bambusa* sp, *Trewia nudiflora*, *Dillenia indica* and some Caesalpiniaceae trees which were also used seldom by the bat individuals for roosting purposes. Recently new earth filling activities could be observed in the roosting site by a new land lord and the site is currently in vulnerable state as new construction may come up in the site where both the roosting trees may be destroyed and the entire colony may be deserted from the area in near future! So looking at the contribution of Indian flying fox in forest regeneration and extension, it's an urgent need to start local awareness and conservation campaign to save the site from possible extirpation.

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Introduction

Bats are the only true flying mammals like our birds. There are also other mammals in the globe that have the flight skin development, like the flying lemurs, flying squirrels, flying marsupials; but their flight travel is only a short distance, downwardly, almost like a gliding jump. So, it cannot be termed as an actual flight like that of the bats (Khatun *et al.*, 2014). Bats are known to occur all over the world except the Arctic and Antarctic regions and a few isolated oceanic islands. It represents about 50% of mammalian species in tropical forests and 20% in the world. Bats have been on Earth for more than 50 million years. Currently, there are more than 1,400 species on the globe. In South Asia, 123 number of bat species have been assessed by Molur *et al.* (2002). Out of those 66 species and subspecies are available in NE India (Sinha, 1999). Recently Ali (2022) has reviewed the bat species of Assam and reported that the state of Assam has 39 numbers of confirmed bat species.

Taxonomically bats are included under the Order-Chiroptera and two suborders- Megachiroptera and Microchiroptera. Megachiropteran bats are also known as fruit bats. On the other hand, Microchiropteran bats are either Insectivorous or Carnivorous. All the Megachiropteran species of Assam and rest of the world were found to be included under a single bat family known as Pteropodidae. However, microchiropteran species of Assam were found to be distributed into five different families such as Emballonuridae, Megadermatidae, Rhinolophidae, Hipposideridae and Vespertilionidae. Till date, highest 19 species were recorded under the family-Vespertilionidae followed by Rhinolophidae with six (6) species. Rest of the families shared between 2 to 4 species (Ali, 2022).

Study of population of a species is very important to known the conservation status and habitat condition of the species in a given area. Indian flying fox is a highly economic and ecological fruit bat species since they are actively involved in seed dispersal and pollination activities (Fujita and Tuttle, 1991). Their role in forest regeneration and extension has been highly realised by the global scientific communities today. So thinking at the global perspectives, this local study has been planned to find out the population group of the fruit bat roosting site along with the current conservation status of the site which is definitely playing great role in enhancement of the local forest cover.

Materials and method

Population survey of the roosting site was conducted in between 22.03.2022 and 23.03.2023 covering a complete year. Study was mostly done with naked eyes. However a high powered Russian Binocular (*Pathiscope*, *de Luxe*; Field-10×50) was also used time to time depending on the need to locate the hiding bats. Photographs were taken with a Nikon digital camera and a high resolution smart phone. Direct Roost Count Method (Barlow, 1999) was used for population count. To know the conservation status of the site, verbal interviews were taken with the local people with special reference to the landlord of the roosting site.

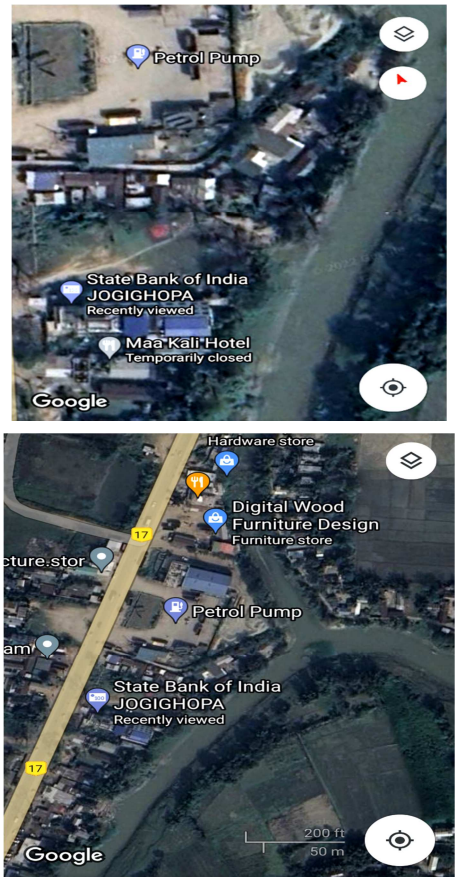

Fig. 1 (a & b). Satellite maps of the roosting site showing its surrounding areas.

The study area "Kabawaitari Roosting Site" has been found to be situated in the Bongaigaon district of Lower Brahmaputra Valley of Assam. The area is very near to National Highway No 17. Area was commercially a busy area. There were petrol pumps, SBI Branch, along with other shops nearby the study site. However the roosting trees were situated in a private land owned by Mr. Safiur Rahman. The area was covered by mostly cultivated plants with some self grown forest trees. There was a perennial water body namely Hathatiya River (*Rahman pers. Comm.*) just behind the roosting site. Roosting site was located on the southern bank of the river.

Results and discussion

On the first day of survey (22.03.2022) total population of the site was recorded at 376 number of Indian flying fox individuals. Then on 10.09.2022, it was calculated as 454 and recently on

Fig. 2a. Original roosting site during winter.

23.03.2023 the total population of the roosting site was estimated at 550 numbers. There were continuous moderate fluctuations observed in the population. Still we need the population study in the site for a complete year covering all the climatic seasons. The annual average of the roosting site was calculated at 460 numbers of Indian flying fox individuals which can be considered as a healthy population in the lower Brahmaputra valley of Assam (Ali, 2013). There were two main Roosting Trees of same tree species namely Simul/Simalu (*Bombax ceiba*). Other plant species in the study area such as *Anthocephalus kadamba* (Kadam), *Areca catechu* (Tamul/Supari), *Bambusa* sp (Bah), *Trewia nudiflora* (Velkor), *Dillenia indica* (Ou tenga) and some trees of of Caesalpiniaceae family. During summer canopy covers were found to be dense while in winter season both the roosting trees were observed in complete nude condition. Range of tree heights of the roosting trees were estimated at 55-60 feets.

Fig. 2b. Original Roosting site during summer.

Conservation status of the site

According to IUCN, Indian flying foxes are still a least concern (LC) species. However local scenarios are very different from site to site in Indian counterparts for the species. In Assam of Northeast India, a biodiversity hotspot area, bat research on Megachiroptera is still meager to know their exact status. Still as a pioneer in bat research, in Assam,

I am trying my level best to introduce this species to the global level in terms of their habitat status, site wise population and conservation to some extent. Till December last year, roosting site was undisturbed and the land was a seeming to be a single land mass.

Fig. 3. New earth filling and construction works at the roosting site (Population diminished drastically in original roosting trees).

However, recently the land has been divided into two different plots and earth filling activities has been observed just in front of the roosting site in the side of that ground which is associated with the SBI building. On the other hand, in the other part a building construction has been started. So both the original roosting trees were seems to be in danger condition for increasing fragility in the habitat condition. In a recent visit conducted in the early part of August, 2023, it has been observed that former original population groups has started to moved away from the original roosting trees and placed themselves in the nearby the satellite roosting trees. It signify that they are not feeling safe anymore in that site and looking for other possible alternative roosting trees within that micro-habitat. Thereby it could be assumed that the Kabaitari Roosting site of Indian flying fox has been at present in vulnerable state! Local awareness and conservation campaign are utmost need to save the site from possible extirpation from that area. The land owner has been motivated to look after the site and the population for their local and global benefits since they are definitely increasing seed dispersal, pollination activities at night in that area and most importantly for their indirect role in climate control by enhancing the forest cover of that area.

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