

Importance of Field Studies in Environmental Education: An Experience from Keoladeo National Park, Rajasthan

Nawin Kumar Tiwary^{1*}, Debina Moirangthem², Gurnoor Kaur²

¹Department of Environmental Studies, Indraprastha College for Women, University of Delhi

²Department of Political Science, Indraprastha College for Women, University of Delhi

Environmental education at undergraduate level is comprehensive and inter-disciplinary which draws its input and content from a variety of subjects. A large part of conceptual framework generated through classroom teaching has an important application to real life problems and scenarios. This necessitates the in-situ (on-site) training of students regarding several components and processes of environment. To develop the correct attitude towards classroom education and make connections between study and application, field work is very important for students. Field based enquiry brings students into direct contact with the nature. Students are allowed to apply their own knowledge, skills and classroom teaching to make observations, order their experiences and set their own priorities towards becoming autonomous, self-directed learners.

Field activities require application of information and skills from investigative approaches to explain natural phenomenon and occurrences, which broadens the investigators awareness and emphasize connections between ideas and practical realities. Being a group learning experience, field work also enhances the ability of students to work together to create a common meaningful understanding of the subject at hand.

A field visit undertaken by students to Keoladeo National Park, Bharatpur (Rajasthan) was particularly useful in providing necessary and delightful insight to the students regarding biodiversity, especially avian diversity, the importance of variety of habitats including wetland and various associated ecological processes. Keoladeo National Park, Bharatpur (27° 10.085'N; 77° 31.470'E) is a large marsh (~30 sq. km) situated at the confluence of

Banganga and Gambhir River. The park, which once served as a private hunting ground for the local ruler, was declared as a reserved forest area in 1967 and later upgraded to a National Park in 1981. With its formal inclusion in the protected area network, cattle grazing was completely banned inside the park in 1982, which later turned out to be an ecological disaster as the park's habitat started to deteriorate and the bird diversity was also on decline (Vijyan, 1987). In absence of the regulatory pressure of herbivory, the wetlands of Bharatpur were on a slow move towards climax communities and several weeds and tall grasses were filling the wetlands, ultimately reducing the bird habitat and food. Fortunately, with several studies pointing out this problem and with active efforts of Bombay Natural History Society (BNHS), cattle ban was lifted from the park in 1991. Since then the park has been an active breeding site for several heronry birds and also a wintering ground for large number of migratory waterfowls. This park once used to be the only known wintering site for the central population of critically endangered Siberian Crane (*Leucogeranus leucogeranus*), but the last pair was reported way back in 2002.

Keoladeo National Park is divided into a number of blocks by embankments which receives water through an intricate network of canals and a few solar powered ground-water pumps. In the marshes between these embankments, clumps of *Acacia* sp. trees growing on mounds are used by Painted Storks and other colonial waterbirds for nesting (Tiwary and Urfi, 2016). These heronries are known to have existed at this site for more than 100 years (Ali, 1953; Ali and Vijayan, 1983; Sankhala 1990). Some of the nesting species observed during our visit were Painted Stork (*Mycteria leucocephala*), Little Cormorant (*Phalacrocorax niger*), Indian Cormorant (*Phalacrocorax fuscicollis*), Great

*Corresponding author. Email: tiwarynawin@gmail.com

Cormorant (*Phalacrocorax carbo*), Intermediate Egret (*Egretta intermedia*), LE: Little Egret (*Egretta garzetta*), Indian Pond Heron (*Ardeola grayii*) and Black-headed Ibis (*Threskiornis melanocephalus*). Along with several species of resident herons, storks, darters, cormorants and egrets this park also receives large number of migratory ducks and geese. Some of the waterfowls sighted during our visit were Greylag Goose (*Anser anser*), Bar-headed Goose (*Anser indicus*), Ruddy Shelduck (*Tadorna ferruginea*), Gadwall (*Anas strepera*), Eurasian Wigeon (*Anas Penelope*), Spot-billed Duck (*Anas poecilorhyncha*), Northern Pintail (*Anas acuta*), Garganey (*Anas querquedula*) and Common Teal (*Anas crecca*).

Apart from having a rich wetland habitat, the park also has a unique mosaic of habitats including forests, grasslands and scrub woodlands. The forested area which is dominated by Kadam (*Mitragyna parvifolia*), Babul (*Acacia nilotica*) and Jamun (*Syzygium cumini*) supports a rich diversity of arboreal and woodland avifauna. During our visit we observed several woodland species like Grey Francolin (*Francolinus pondicerianus*), Indian Peafowl (*Pavo cristatus*), Eurasian Collared Dove (*Streptopelia decaocto*), Yellow-legged green Pigeon (*Treron phoenicopterus*), Laughing Dove (*Streptopelia senegalensis*), Rose-ringed Parakeet (*Psittacula krameri*), Greater coucal (*Centropus sinensis*), Ashy Prinia (*Prinia socialis*), Red whiskered Bulbul (*Pycnonotus jocosus*), Red-vented Bulbul (*Pycnonotus cafer*), Oriental Magpie-robin (*Copsychus saularis*), Indian Robin (*Saxicoloides fulicatus*) and Purple Sunbird (*Cinnyris asiaticus*). We also sighted open area species like Red-wattled Lapwing (*Vanellus indicus*), Green Bee-eater (*Merops orientalis*) and Black Drongo (*Dicrurus macrocercus*).

The Keoladeo National Park is also included in the 'Important Bird Area' network for supporting more than

20,000 individuals of around 350 species of birds (Islam and Rahmani, 2004). Some of the common herbivores sighted from the park were Sambar (*Cervus unicolor*) and Bluebull (*Boselaphus tragocamelus*). Owing to the presence of variety of habitats and enormous avifaunal diversity, Keoladeo receives large number of visitors every year which leads to a significant revenue generation from entry tickets and transportation within the park. During the financial year 2014-15, 1.35 Lakh tourists visited the park generating an approx. earning of 1.13 Crore. With an effective scientific management strategy, active involvement of researchers and people's interest, this park can continue to be, what Kailash Sankhala (1990) envisioned, as the 'Gardens of God'.

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