Project Update: April 2011

Room for expanding the global protected area network is extremely limited, especially in countries such as India where demand for food production is high. A key 21st century conservation concern is *how to manage and preserve biodiversity in human-dominated landscapes*. This project sought to address this concern by looking at *Ficus* trees and frugivores in an agricultural landscape in Assam, northeast India. *Ficus* is amongst the most important plant genera for frugivorous birds and mammals in the tropics. As keystone structures, *Ficus* trees are a year-round food source. Moreover, *Ficus* has considerable cultural and social importance. The Banyan fig (*F. benghalensis*) is the national tree of India, and several other species are sites of religious worship.

In this project, we sought to:

1. Examine patterns of frugivory in human-dominated landscapes to determine to what extent *Ficus* trees act as dispersal stepping stones for birds.
2.
3. Explore local perceptions and practices pertaining to *Ficus* trees in the agricultural landscape context.
4.
5. Integrate these strands to assess the possibility of implementing a community-based *Ficus* conservation project.

We found that rates of bird visitation and number of fruits consumed decreased as distance from remnant forest patches and land use intensity increased. As a consequence, seed dispersal declined. Green Pigeons (*Treron* spp) were the most important avian seed disperser in the landscape. Fruit-handling behaviour of birds varied with the size of *Ficus* seeds, and large-bodied species were more effective dispersers of figs with larger fruit. These larger frugivores (green pigeons, hornbills, imperial pigeons) were also more susceptible to being hunted (Fig. 1). This suggests that dispersal of seeds of large fruited *Ficus* might be at risk in the landscape.

Ficus trees function as sacred groves at a very local scale. Figs scored low in terms of economic value, but the main reason for them remaining in the landscape was because of religious attributes endowed upon them. Trees that had shrines were significantly larger than those that did not (Fig.2). However, with agricultural intensification, the number of mature *Ficus* trees declined and people cut down trees when they interfered with their daily activities.

We believe that in the future there is a need for initiating a conservation awareness programme targeting village youth. *Ficus* conservation in the region could be boosted by protecting monumental trees and starting a small-scale plantation programme through a tripartite arrangement involving local youth, community leaders and a conservation organization.

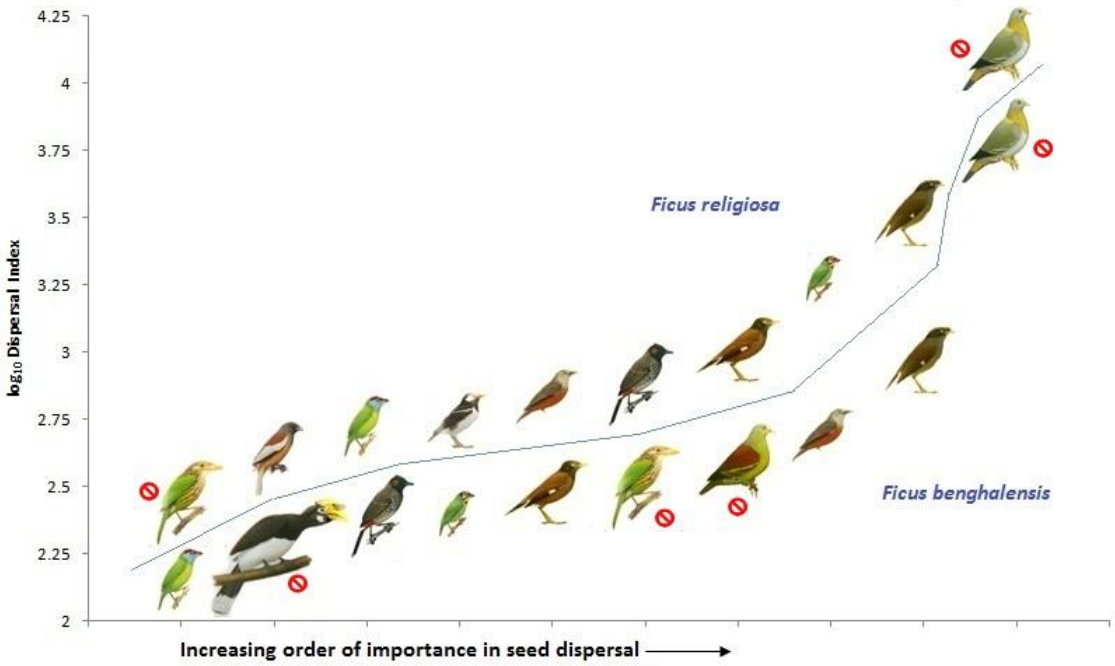

Fig. 1: Dispersal indices for the ten most important seed dispersers of *Ficus benghalensis* **(larger fruit) and** *Ficus religiosa* **(smaller fruit) in the agricultural landscape. Larger-bodied species are more important for dispersing seeds of** *Ficus benghalensis***. Red marks indicate species on which hunting pressures are locally high.**

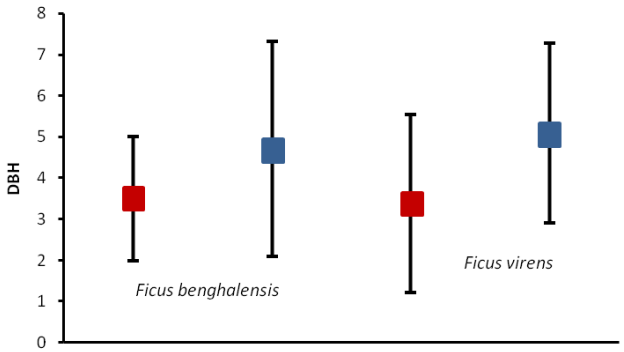

Fig. 2: Diameter at breast height (DBH) of trees that have shrines (blue) and those that do not (red). Shows that trees with shrines are larger (*P* ≤ 0.05 for both pairs).