

**Bees, Biodiversity & Forest Livelihoods in the Nilgiris Biosphere Reserve, India  
- An Opportunity for Securing Future Biodiversity, Livelihoods through Bees**

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**Introduction & Background**

The Nilgiris Biosphere Reserve (NBR) is at the tri junction of Tamil Nadu, Karnataka and Kerala in the Western Ghats in Southern India. It is the first biosphere reserve declared in India by UNESCO's Man & Biosphere Reserve Programme. What makes this zone unique is the number of endemic species, significant number of flora, fauna and diverse habitats (mountains, valleys, coasts, and plains). It is also home to a number of indigenous communities who are traditional honey collectors and beekeepers.

The Darwin Initiative Project explores the linkage between bees, biodiversity and forest livelihoods. Whether people who depend on honey and hive products for their livelihoods during a substantial part of the year have any relationship with bees? Can this be understood through science, indigenous knowledge, folklore, culture or through other means not yet known? Establishing this linkage or proving that it does not exist is crucial to forests and people in this part of the world in particular and all over tropical forests and indigenous communities in general. Securing biodiversity for the future lies in unraveling this world of bees, biodiversity and forests livelihoods as much as possible.

The UK Government funded Darwin Initiative is an initiative that has emerged from the Earth Summit in Rio in 1992. The Convention of Biological Diversity (CBD) is the principal focus of this initiative through which the following is addressed:

- The conservation of biological diversity
- The sustainable use of its components and
- The fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

The current project (June 2006 – May 2009) on Bees, Biodiversity and Forest livelihoods is a partnership between Bees *for* Development, UK University of East Anglia, School for Development Studies, UK and Keystone Foundation, India. This project seeks to elucidate the interdependencies between bees, biodiversity and forest livelihoods in the Nilgiri Biosphere Reserve (NBR) Western Ghats, India. The indigenous bees of the mountainous NBR are known to play an important role in local livelihoods, yet they have not been scientifically identified or classified, their populations and distributions are unknown, and their vital role in pollination and the maintenance of forest biodiversity has

not been studied. The project will endeavour to combine scientific data about the status of these indigenous bees and their ecology, with participatory livelihoods analysis.

## Methods & Materials

The Nilgiris Biosphere Reserve is a large area spread over 5000 square kilometers in a mountainous zone with a population of 200,000 indigenous people and 300,000 non-indigenous people who depend on forests, agriculture, plantations, tourism and other allied activities for their livelihood. After a survey of this entire region we have selected 16 sites which are representative of different land use, habitats and types of indigenous people who are forest-dependent (See Table I).

Table I

Sites	Total households	Indigenous Community
<b>Area Kotagiri</b>		
Bekkapathymund	11	Todas
Kodithenmund	12	Todas/Irulas
Thuneri	320	Badagas
<b>Area Coonoor</b>		
Marikode	7	Kurumbas
Puducad	34	Kurumbas /Irulas
Sithugunni	10	Irulas
<b>Area Sigur</b>		
Benne	51	Kattunaickens/ Chettis
Chemmanatham	44	Irulas
Siriyur	61	Kasavas/Jenu Kurumbas
<b>Area Sathyamangalam/Chamrajnagar</b>		
Ghalidimbham	90	Irulas
Geddesal	110	Irulas
Pulinjur	173	Sholigas
Bedaguli	69	Sholigas
<b>Area Nilambur</b>		
Appankavu	32	Kattunaickens
Mundakadavu	29	Kattunaickens
Mancheri	145 people	Cholanaickens

In each of these sites biodiversity and livelihood is estimated and monitored in the following manner:

1. A 1 ha plot with pan-traps fixed on different trees and at ground level to attract bees foraging. These pan traps are in different colours (yellow, blue, white) to attract bees. These pan traps are placed in 4 corners and one in the middle of the 1 ha plot and observation of foraging is done by surveying two 20 m x 10 m focal patches once a month to observe foraging. The above 16 1 ha plots are selected in areas close to village – forests and with a high chance of bee movement. This is a stationary method wherein the estimate of bee population will be from the pan traps only. Those bees that fall inside the traps will only be assessed for species type and population estimates within that area.
2. The second method to gauge population is through a landscape survey / belt transect through out the NBR. Important zones have been identified which are rich in forests and also tribal populations. Teams have spread across the region estimating bee populations. This method uses GIS to map the location of the bees, the habitat type and other principal ecological features.
3. Adjacent to the 16 sites are the honey hunter villages that also have ancestral domains and routes which they use for forest collection including hive products. The livelihood research investigates the pattern of livelihood strategies in all the 16 villages. Participatory maps have been made with villagers to show the layout of houses, the common structures – water tank, burial grounds, the place of worship, the school and the area of forest produce collection around the village. In this livelihood research we are making sure that we do not fill up questionnaires in the conventional sense – more of exploration and observation-research is used and applied to generate data that links to bees and forests.

## **Results & Discussion**

Biodiversity: The bees collected through the pan traps have been stored in the laboratory. The bees are being identified. While the honey bees belonging to genus *Apis* have been identified, the megachilids, halictids and the xylocopids are being identified up to their orders. The plants specimens (30 species) and pollen slides (104 species) are also maintained in the laboratory. The reference collection will be stored in the laboratory to explore the diversity and distribution of bee species in the Nilgiri Biosphere Reserve.

Social maps: The social maps were prepared during Oct/Nov 2006 for each village and these will be updated every six months to capture changes if any in the physical and social settings as well as infrastructure in the villages.

Livelihood methodology: Based on discussions with the team, a list of topics to be studied in each site has been developed. Of these settlement history, social structure, the things people do to make a living and their relationship with the forests are the topics that are currently being explored in depth.

## Table II Key Livelihood Themes

### **Themes**

History of the Area

Social Structure – ethnicity, socio-economic status

Occupations/ things people do to make a living

Relationship with the forest – wildlife, NTFPs

Land Use & Animal Husbandry

Culture & Religion

Policy- government (forest department etc), NGOs (includes external influence)

Institutions

Infrastructure (geography of area & natural resource distribution / climate)

WB - Family well-being (includes age/gender)

RS - Risks & uncertainties

The above questions are asked in an exploratory manner for all the 15 villages in the 16 sites. This helps in creating a mosaic of the different kind of communities and their dependence on forests including bees.

*Case Study: Benne Village*

*Community Profile with numbers:*

*Sappad - Kaatu Naicker (9)*

*Aithikunni - Mont -Setti (8)*

*Kuckadi - Mont -Setti (4)*

*Neliyankunnu - Mont -Setti (10)/ Kattunaickens (6)*

*Pampad - Mont -Setti (3)*

*Bennai mulai - Mont -Setti (8)*

*Livelihood Activity & History:*

*The Kattunaickens are involved in wage work in agricultural fields and tea estate and honey collection. Tea estates pay Rs.75 and Rs. 60 as wages per day for men and women respectively while the Chettis give Rs. 100 and Rs.50 per day to them for working in the agricultural fields. The Naickans collect *Apis dorsata*, *Apis cerana* and *Apis florea* honey. They sell it locally as well as to Kallur society. The local rate varies from Rs. 100-150 and the society gives Rs.60 while Rs. 20 is kept as deposit which is then provided as bonus during Onam. Among the Mont Chettis average landholding is 1.5 acres - coffee, paddy, pepper, tapioca are commonly grown. The few landless Chettis are wage workers. Kattunaickens go for NTFP collection. They are collecting bamboo rice, honey, edible green leaves, tubers and firewood collection. Bamboo, wood and grass is collected for house construction, fence and repair. Only few of the families collect medicinal plants. The Chettis collect or buy firewood and wood, grass etc for house and fencing.*

## **Conclusion**

The project will reach its half way mark in December 2007 i.e., after 1.5 years. Data from 16 sites of biodiversity, livelihood and case studies are coming in which are linked to bees, people and forests. GIS application for connecting the diverse data sorts, parameters are being discussed to find possible linkages and connections. 1704 wild bee colonies of *Apis dorsata*, 58 colonies of *Apis cerana* and 6 colonies of *Apis florea* have been mapped, enumerated and habitat preferences analyzed. These have been found in 26 cliffs and nesting sites in 56 tree species within the 16 sites in the Nilgiris Biosphere Reserve.

Indigenous communities, distinct habitat types, altitudinal niches that provide specific flowering, vegetation and associated bees give us a window for possible linkages and processes that go within. Communities and their livelihood strategies will assess the dependence – cultural, social and economical on forests. Bees will occupy a specific zone where habitats, supporting agriculture and forest types play a distinct role in more bee populations and thus more people-bee activity. There could be areas within the NBR which are fit to be declared as bee sanctuaries and bee gene pools given pristine vegetation that requires specific pollination mechanisms. Some of these may be proven at the end of the project through data analysis we are on the road to understanding bee

biodiversity and forests through livelihood explorations of indigenous people in the Nilgiris Biosphere Reserve in Southern India.

