

BEES

BIODIVERSITY

& FOREST livelihoods

in the Nilgiri Biosphere Reserve



THE BEES

In forests of the Nilgiri Biosphere Reserve (NBR), people harvest honey from the huge combs of *Apis dorsata*. Here, these bees are most often found nesting on cliff faces. This means that the honey hunters face precarious work, using ropes and ladders made from forest vines to climb down the cliffs, harvest honey from the combs that are often under ledges, and pulley the empty and full honey containers up and down the cliffs. The number of these *Apis dorsata* colonies is unknown. They are migratory species, yet their routes and migratory patterns are not known, at least to modern science. The communities that have depended upon honey hunting for many generations know much about these bees, and this Project seeks to learn from them.



The area is also home to *Apis cerana*, one of the cavity-nesting honey bee species. This species is managed by beekeepers of the Nilgiris in different ways, for example, the Toda people look after colonies that are nesting in tree cavities, sealing the door to a bees' nest with a stone that also declares ownership. Other communities keep *Apis cerana* in the walls of their houses, as well as in frame, top-bar and basket hives. While much of India's apiculture is these days focussed on European style beekeeping using European races of *Apis mellifera*, this exotic species is not present in NBR. There are several species of stingless bees in the area: this project will seek to identify them for science for the first time.

In this Project we are endeavouring to scientifically identify and characterise all the bee species that have economic significance for people living in NBR. This includes the honey bee and stingless bee species, and any others that we discover to be of special significance. We are also undertaking fieldwork in an endeavour to quantify the numbers of bee colonies present. During the first year of the project *Apis dorsata* colonies are being enumerated. This is challenging work and we much welcome input from other researchers in this field.



THE PEOPLE



There are 36 indigenous communities living in the NBR, and of these, 14 are involved with the collection of honey, although this is of varying significance in the livelihoods of these different communities. Twelve of the 14 indigenous communities have been classified as hunter-gatherers and it is these communities that are particularly active in honey collection. The other two communities, *Todas* and *Paniyans*, are respectively pastoralists and agriculturalists. The total population of indigenous communities is estimated to be 200,000.

For these people living within the NBR forests, a major activity is the collection of forest products. Our preliminary work has illustrated that many of these forest products are gathered for subsistence uses, including food, medicine, spiritual and housing needs. Some non-timber-forest products (NTFP) are harvested for commercial purposes and traded across South India. The high level of dependence on the forests needs to be understood better and documented. Little is known about the gender dimensions of the activities undertaken or the value, in terms of cultural, social and economic gain, of what is collected by different people. The scope of our present work exploring the forest-dependent livelihoods of indigenous people extends only to parts of the NBR within the states of Tamil Nadu and Kerala. The NBR areas within Karnataka are Wildlife Sanctuaries, and no NTFP collection is permitted in those areas.



The indigenous communities in the NBR include the *Aalu Kurumbas*, *Paalu Kurumbas*, *Jenu Kurumbas*, *Kattunaickans*, *Sholegas*, *Betta Kurumba*, *Urali Kurumba*, *Kaadu Kurumba*, *Kadars*, *Cholanaikans*, *Pathinaickens*, *Mudugas*, *Adiyans*, *Arnadans*, *Paniyans*, *Kurichiyans*, *Mullukurumbans*, *Malaivedans*, *Panjari/Badava Yeravas*, *Tani Yeravas*, *Karimpalans*, *Pathiyans*, *Malapulayans*, *Mala Kudiyas*, *Mudugas*, *Todas*, *Kotas*, *Irulas/Kasabas*, *Mala Malasar*, *Malapanikkars*, *Malamuthans*, *Thaccanaadans*, *Badagas*, *Wynaadan Chetti* and *Manthadan Chetti*.

THE ENVIRONMENT

The Nilgiris or Blue Mountains in southern India were the first internationally designated Biosphere Reserve in India, established in 1986. The Nilgiris mountains lie at the junction of the Eastern Ghats and the Western Ghats, or *Sahyadris*, the two prominent mountain ranges that run almost parallel to the coastlines of Peninsular India. The Nilgiri Biosphere Reserve is an area of 5,520 km² within the states of Karnataka (1527 km²), Kerala (1455 km²), and Tamil Nadu (2538 km²). Wayanad Wildlife Sanctuary and Mudumalai, Bandipur, Nagarhole, Mukurthi and Silent Valley National Parks are protected areas within this reserve, which also includes zones open to forestry and tourism. Because of its geographic isolation, the Western Ghats within which the NBR is located, is one of the richest centres of endemism in India. Of the 4,000 species of flowering plants found in the Western Ghats, 1,500 species are endemic. This high level of diversity and endemism in the Western Ghats has given it the status of being one of the world's biodiversity 'hot spots'. It contains all the known endemic butterflies of the Western Ghats, and of the 300 bird species recorded for the NBR, at least 14 are endemic. There are 39 species of fish, 31 species of amphibians and 60 species of reptiles endemic to the Western Ghats. Huge efforts are being made toward the protection of mammals like the Asian elephant *Elephas maximus*, tiger *Panthera tigris*, Nilgiri tahr *Hemitragus hylocrius*, Nilgiri langur *Presbytis johnii* and lion tailed macaque *Macaca silenus*.



The Reserve extends from the tropical moist forests of the windward western slopes of the Ghats, to the tropical dry forests on the leeward east slopes. Rainfall ranges from 500 mm to 7,000 mm per year. The reserve encompasses three eco-regions: the South Western Ghats moist deciduous forests, South Western Ghats montane rain forests, and South Deccan Plateau dry deciduous forests. The habitat types include montane rain forest, semi-evergreen moist forest, thorn forest and scrub, montane grassland and high-elevation, evergreen *Shola* forests.

The Project is studying and documenting the melliferous flora at each of five field sites. This involves identifying, mapping and recording the flowering vegetation visited by each of the selected bee species, with analysis of the pollen, collected both from bees and from honey samples. A reference library of pollen slides is being created. All of this research is towards elucidating the linkages between

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PROJECT FACTS

ACHIEVEMENTS DURING THE FIRST YEAR At the outset it was necessary for Keystone to build its capacity to implement the research. This involved the recruitment of additional staff, bringing skills in entomology, ecology and social science, and with many new field researchers and assistants. Five field centres have been upgraded, and are now provided with physical resources to enable the fieldwork. Keystone staff received further training on biodiversity, with a particular focus on entomology, from Simon Potts and Stuart Roberts (University of Reading) and Nicola Bradbear (Bees for Development), while Janet Seeley and Adam Pain (University of East Anglia) trained the team in approaches to social research.

Choice of case study sites was an important early task, and was undertaken by a site selection team, consisting of a pollination botanist, an ecologist, a livelihood researcher, an entomologist and a forest management specialist. They were assisted in the field by three guides – a forest department officer, a field worker from Keystone and a member of the local indigenous community from each area. After numerous field visits, 5 research locations and 16 plots, each of 1 hectare, were selected. These have been selected to capture contrasts of biogeography, the distribution and honey collecting practices of the major tribal communities, as well as practical and strategic considerations of coverage across the three Indian states (Tamil Nadu, Karnataka and Kerala) that are contained within the Nilgiri Biosphere Reserve. Training manuals on survey analysis and methods (both for biodiversity and for social research) have been prepared and distributed.

With all these preparations completed, fieldwork could begin, undertaking survey of the insects and the vegetation in each 1 hectare plot, completing additional studies of bee colony densities in the vicinity of the research plots, undertaking livelihood studies in the nearby area, assessing honey collection practices, and carefully recording and compiling all of this data.

Pratim Roy and Janet Seeley visited senior officials in forestry departments in Tamil Nadu, Karnataka and Kerala to ensure that they are fully apprised of the Project, and in May 2007, some of these personnel travelled to UK to visit and share discussions with a variety of community forestry projects.

In addition to all of this research and learning, a new 'indigenous bee resource centre' has been built in the main town in the Nilgiris, Ootacamund or 'Ooty'. This centre, now named *Shola Ridge*, was opened with the beneficial arrival of an *Apis dorsata* colony to nest on the veranda, in October 2006. This centre is for outreach, to inform people about the value of bees and biodiversity, and has proved highly popular with local schools.

In September 2007, four Keystone staff and Bees for Development presented the project to the apicultural community at the Apimondia International Apicultural Congress in Melbourne, Australia.

OUTPUTS Increased scientific and livelihood knowledge through research; strengthened capacities of key institutions; enhanced technical and professional skills through training; and increased awareness and policy engagement in India and UK through dissemination and advocacy.

DATES This is a three-year Project running from June 2006 - May 2009



BEES & BIODIVERSITY & FOREST livelihoods in the Nilgiri Biosphere Reserve

A unique Project that examines the interdependency of bees, biodiversity and forest livelihoods in the Nilgiri Biosphere Reserve, in the Western Ghats of South India.

The indigenous bees of the mountainous Nilgiri Biosphere Reserve play an important role in local livelihoods - harvesting honey from wild nesting *Apis dorsata* bees is part of the culture. However:

- The population size and distribution of these *Apis dorsata* bees is unknown
- The bees' role in pollination and the maintenance of forest biodiversity has not been studied

This Project endeavours to combine scientific data about the status of indigenous bees and their ecology, with participatory livelihoods analysis. The research is being implemented by an Indian organisation, Keystone Foundation, working in partnership with local indigenous communities and Karnataka, Kerala and Tamil Nadu Forest Departments, together with three UK-based organisations: The School of Development Studies, University of East Anglia; Bees for Development; and The Centre for Agri-Environmental Research, University of Reading.

Activities

Research New scientific knowledge of honey bees and stingless bees of Nilgiris Biosphere Reserve
New knowledge about people's livelihoods and the economic value and social role of bees within these livelihoods

Institutional capacity building Improved staff skills within well-motivated organisations: a specialist research unit within Keystone, field centres within local communities, and public service skills within State Forest Departments.

Training Improved professional skills amongst project partners concerning research design, information systems, livelihoods analysis, and governance, Convention on Biodiversity implementation, as well as generic skills in survey, design, and bee and pollination science.

Dissemination and advocacy In-country workshops, media reports, working with opinion formers and policy makers, to enable the value of bees for biodiversity to become more widely understood and appreciated



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The Convention on Biological Diversity CBD

The CBD is one of two conventions (the other being Convention on Climate Change) signed by the international community during the Earth Summit held in Rio de Janeiro in 1992. The CBD came into force in December 1993, after it had gained international support. Its three objectives represent a commitment by most nations (all except Andorra, Brunei, Holy See, Iraq, Somalia and USA) to:

- conserve biological diversity
- use biological resources sustainably
- share the benefits arising from the use of genetic resources fairly and equitably.

The CBD recognises that biodiversity is not equally distributed, and that conservation places a heavier burden on developing countries that are often rich in biodiversity, but generally poor in financial resources.



The Darwin Initiative is a grants programme that promotes biodiversity conservation and sustainable use of resources around the world. The Initiative is the UK Government's endeavour to assist countries rich in biodiversity but poor in resources with conservation of their biological diversity and implementation of the Biodiversity Convention. The Darwin Initiative is funded and administered by DEFRA, the Department for Environment, Food and Rural Affairs.