

Darwin Initiative Annual Report

Submission deadline 30 April 2008

Darwin Project Information

Project Ref Number	15/001
Project Title	Bees, biodiversity and forest livelihoods in the Nilgiri Biosphere Reserve, India
Country(ies)	India
UK Contract Holder Institution	University of East Anglia/ODG
UK Partner Institution(s)	Bees <i>for</i> Development
Host country Partner Institution(s)	Keystone Foundation
Darwin Grant Value	275,308 GBP
Start/End dates of Project	1 June 2006 – 31 May 2009
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	
Project Leader Name	Dr. Janet Seeley
Project website	http://www.uea.ac.uk/dev/beesbiodiversitylivelihoods
Author(s), date	Janet Seeley with project team 22 nd April 2008

1. Project Background

This Project seeks to elucidate the interdependencies between bees, biodiversity and forest livelihoods in the Nilgiri Biosphere Reserve (NBR), Western Ghats, India. We are identifying and classifying indigenous bee populations, mapping their distribution and studying their role in pollination and the maintenance of forest biodiversity. We are also studying the place of indigenous bees in local livelihoods (honey hunting is part of the culture of some ethnic groups in the area). We are combining scientific data about the status of these indigenous bees and their ecology, with participatory livelihoods analysis.

The project has purposively selected case study sites in order to capture contrasts of biogeography, the distribution and honey collecting practices of the major tribal groups, as well as respond to practical and strategic considerations of coverage across the three Indian states

(Tamil Nadu, Karnataka and Kerala) that are contained within the Nilgiri Biosphere Reserve. We are working in sixteen study sites that capture key differences and variability.

2. Project Partnerships

Visits to the Project area by UK collaborators have continued on a regular basis as support for the Keystone Foundation (the Indian partner). The visits focused on capacity building in entomology, ecology and social science as well as field site visits and monitoring (including the internal mid-term review in December 2007 by the whole project team). Frequent email and SKYPE contact in-between has ensured that we have stayed in close contact. We have learnt that this frequent sharing of information and interaction is vital to quality control in the project as well as good relations among the partners. Our internal mid-term review gave us an opportunity to review our partnership arrangements and look at what had worked well in terms of keeping each other informed so that we can build on those lessons through the second half of the project, particularly as analysis and writing up of results begins in earnest. We have recognised that we need to maximise our collective time reviewing the approaches and results, and have therefore sought to increase UK-staff time in India in the latter part of this reporting year where possible; this is something we will continue to do in 2008/2009.

A challenge we continue to face is in sustaining our partnership with the Forest Departments of Tamil Nadu, Karnataka and Kerala. A UK study tour focusing on CBD in April/May 2007 helped in building relationships, but staff transfers mean that the Keystone Foundation staff have to constantly work to keep senior Forestry officials informed about the research progress while field staff continue to engage with forest officers 'on the ground' to ensure their cooperation. This has been particularly difficult in Kerala because of staff changes in the Forest Department. Nevertheless, we have been moderately successful in beginning to raise awareness of the CBD agenda at the national level the Secretary, Government of India Ministry of Environment and Forests, requested a meeting with both Keystone project staff and representatives of the three State Forestry Departments in Delhi on 24 October 2007 in order to discuss how the Darwin Initiative Project principles can be extended to new policy initiatives within the Nilgiri Biosphere Reserve.

We have recognised that we require more support in-country on ecology and entomology, particularly given the resignation of the project entomologist in mid 2007 and the need to build the capacity of the full-time ecologist appointed to the project. In early 2008 links have been established with the Salim Ali School of Ecology, Pondicherry Central University, Pondicherry and the Systematic Entomology Laboratory, Department of Zoology, University of Calicut, Kerala.

3. Project progress

Output A and C: The livelihood research component of the project continues on schedule although there are concerns over the quality and depth of the collected data. General overviews for 16 villages adjacent to the sites selected have been completed. There were, however, differences in the detail in the data collected, because of differences in the skills and interests of the Research Assistants so the filling the gaps in the data has been continued up until April 2008 before beginning the collection of detailed household profiles from a sample of households in the sites. A training session on analytical writing and research methods was given in July 2007 by UK staff and individual coaching was provided during the mid-term review in December 2008 to address some of the problems that had emerged in terms of data recording as well as the agreed changes on types of information to collect. Following the mid-term review, when changes in sharing of information were agreed, transcripts of raw data from

the field have been shared with UK-based staff on a regular basis which has allowed team members in UK to provide comments and advice on data gap filling.

Output A and C: The biodiversity component that includes studies on bees and plants has progressed with plots being surveyed regularly. While sample selection in one site in Kerala has been hindered by the refusal of the Forest Department to allow collection of insect and flora samples (this is due to staff changes in the Forest Department and unwillingness of that Department to recognise the authority of the National Biodiversity Authority which has provided the Project with clearance). This has not affected other sites. The weather, particularly unseasonal wet weather during the past year, has proved to be a challenge for the field teams, but the work has been continued according to the agreed timetable.

Output B: The resource unit and small laboratory continue to function in Kotagiri, Keystone Foundation's head quarters

Output D: The bee and honey museum and education centre have attracted a number of visitors throughout the year (listed in Annex 4)

3.1 Progress towards Project Outputs

We continue to be on schedule to achieve the outputs set out in our log-frame. The output level assumptions hold true. On-going activities to achieve the outputs include: Biodiversity: The bees collected through the pan traps have been processed and stored in the laboratory. The bees are being identified to family level, with the exception of the honey bees (*Apis*), which have been identified to species. The plants specimens (20 species of bee-foraged plants) and pollen slides (108 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

The social maps, which were first prepared in Oct/Nov 2006, have been kept under review and changes in settlement noted in each site. Data on a range of topics have been collected from all households residing in the villages associated with the study sites, such as settlement history, social structure, the things people do to make a living and their relationship with the forests. While these data contain some interesting insights there is a need for more detailed information on the livelihoods/bee and biodiversity interface and attention has turned to gap filling (as noted above) before beginning the collection of detailed information from selected households in 2008/2009, to provide in-depth information on the links between bees, biodiversity and people's ways of life.

Project staff at all levels have benefited from a range of capacity building opportunities during the year including 'in-project' inputs from senior UK and Indian staff and courses available in India.

We decided to provide entomology training in India, rather than bring a small number of Keystone staff to CAER at Reading. This is because we were keen for the training to benefit a larger number of staff to guard against the loss of skills if staff left the project as we experienced with the resignation of the then project entomologist in mid-2007.

3.2 Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 total	Year 2 total	TOTAL
6A	Number of people to receive other forms	17 (project field	20	37

6B	of education/training Number of training weeks to be provided	team) 7 (entomology, social science and ecology)	5 (plus informal mentoring)	12
7	Number of (ie. different types - not volume - of material produced) training materials to be produced for use by host country	1 manual field methods for entomology 1 manual social science methods	-	1 1
8	Number of weeks to be spent by UK project staff on project work in the host country	8	7	15
15A	Number of national press releases in host country(ies)	2	2 (one for Apimondia conference in Australia and one in Bees for Development Journal)	5
15B	Number of national press releases in UK	1 (in Bees for Development Journal)		
17A	Number of dissemination networks established	1 (National Honey Tribal Network)	1(Tribal advisory Committee) Interactions with Ford Foundation project partners	2
17B	Number of dissemination networks to be enhanced/extended	2 (networking with Ford Foundation project partners)	2 (networking with Ford Foundation project partners)	2
21	Number of permanent educational/training/research facilities or organisations to be established and then continued after Darwin funding has ceased	2 (at Keystone headquarters and in Ooty)	2 (at Keystone headquarters and in Ooty)	2

22	Number of permanent field plots to be established during the project and continued after Darwin funding has ceased	16 (distributed between the sites)	16 (distributed between the 16 sites)	
23	Value of resources raised from other sources (ie. in addition to Darwin funding) for project work	£41,250	£30,405	£71,655

Table 2 Publications

Type *	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
Mimeo*	Site selection	--	http://www.uea.ac.uk/dev/beesbiodiversity/livelihoods	
Mimeo*	Internal mid-term review of the Darwin Initiative: bees, biodiversity and livelihoods in the Nilgiri Biosphere Reserve	--	http://www.uea.ac.uk/dev/beesbiodiversity/livelihoods	

* publications and other material that you have included with this report.

3.3 Progress towards the project purpose and outcomes

Progress continues to be made towards the purpose. The reference collection of bees and pollen samples are being built up. These are being maintained and taxonomically identified for the permanent bee reference collection and pollen library. The research and information on livelihoods of the people continues and will contribute to the participatory livelihood analysis component of the project. Mentoring on research methodologies has enhanced research knowledge and built capacity of local staff in generating information and maintaining records.

3.4 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

We anticipate that this project will reinforce efforts to ensure against habitat loss in the Nilgiri Biosphere Reserve for both flora and fauna. We hope that our specific focus on bees will heighten awareness of the various species of bee in NBR and elsewhere in India and the value that they have had in the past in people's lives and can continue to have, if efforts are made now to value cultural practice and sustain local knowledge. It is too early to say how much of an impact this particular project will have.

4. Monitoring, evaluation and lessons

Day to day monitoring of project activities is undertaken by a range of project staff at all levels who visit the field sites. Tracking of project progress was done, until December 2007, through the compilation of a monthly report. With increasing amounts of data being generated on a range of different areas we have recognised that these monthly reports are not adequate for tracking progress or ensuring the quality of approaches and findings. The approach has therefore changed to ensure more regular sharing of findings so that the team has more opportunity to work together to improve data quality and track emerging results.

The log-frame with its identified research outputs and purpose provides the framework for the monitoring and reviewing of the project. However, we recognised that the causalities underlying the project logframe are complex and unclear and a deductive argument is rather difficult to sustain. Accordingly in the mid term review we adopted an approach that builds on a null hypothesis – that a project output has had no effect and has limited potential impact. By phrasing the question in this way it placed the burden of proof on the project and encouraged us not to just retreat to pre-ordained indicators. The findings of that review are attached in the mid-term review report.

5. Actions taken in response to previous reviews (if applicable)

We were asked to provide additional information on 4 areas in last year's annual report:

1. An elaboration on how the research methods are actually being conducted would be helpful e.g. what does 'observation research' entail.

Detail on research methods appended in Annex 3.

2. An elaboration on the new staff hired and on why the actual amount that was spent was greater than budgeted for the equipment purchased for the 5 field centres.

New Staff hired (a full list of staff who have been involved in this project is given on pages 36 and 37 of the mid-term review report)

Entomologist:

Easwaran: had recently attained his Ph.D. in Entomology,. He had previously worked with the Salim Ali Centre for Ornithology and Natural History . He left us in mid-2007 to take up a teaching post. He continued to give short inputs to the project through the latter half of 2007, although these became increasingly sporadic. He has been replaced by:

Santhosh Shreevihar. Santhosh is a current PhD student in the Systematic Entomology Laboratory at the University of Calicut. He is an all round entomologist with a particular interest in Hymenoptera. His first visit to Keystone was in February 2008, it is proposed that he visit regularly until his PhD is completed and then work full time on a 6 month placement

Ecologist:

Sumin George: trained as an ecologist from the Salim Ali School of Ecology, Pondicherry Central University. His research study as a student was on mapping dammar bee populations in one of the field sites of Keystone's area of work.

Dr. Priya Davidar has been brought in to assist the biodiversity team. She is on the faculty of the Salim Ali School of Ecology, Pondicherry Central University, Pondicherry. She has agreed to make quarterly visits to the project and provide inputs over email/telephone.

Research Assistants:

Murugesh: has a BSc in zoology and a native of the Nilgiris. He is familiar with the upper plateau with the agriculture and tea farming practices and culture

Priya has a Masters in mathematics. She is from the local area.

Aradukuttan is an elder with the Toda, one of the tribal groups in the area. He has previously worked with the Forest Department as a watcher.

Saneesh has BA in history. He is from Kerala. He is a keen naturalist, familiar with the ecology of evergreen forests of Nilambur, one of the sites.

Mahadesh is from the Sholiga area of Karnataka in the NBR.

Overspend on equipment 2006/2007

The LCD TV was purchased for IBBRU so that visitors could, apart from the photos and exhibits, see films related to honey hunting and the NBR and also benefit from presentations made through this media.

3. In general, more quantitative information would be useful to provide an insight into the scale of some of the achievements/activities e.g. duration of specific trainings, actual estimates of number of people from indigenous communities involved in meetings at research sites, estimates of number of people visiting the bee museum in Ooty.

See mid-term review report and Annex 4

4. Although only in the first year of the project some indication of interim findings with regards to scientific and livelihood knowledge would be helpful.

Emerging findings from the livelihood studies. (see Annex 7, of the mid-term report on Site Comparisons)

- There appear to be major differences between locations in terms of the significance of honey collection in the livelihoods of people living in these locations;
- Certain factors, possibly linked, appear to contribute to a significant role of honey collection (and NTFPs) in the livelihoods of forest users including relative remoteness, maintenance of cultural practices and relative lack of market penetration;
- Conversely certain factors appear to be associated with a relatively insignificant role of honey collection in forest user livelihoods including significance of non-forest income sources, availability of public goods and the nature of the settlement

The findings on the entomology have been slow to emerge because of the lack of a qualified entomologist on the project for a number of months (see above). However, the pan trapping went well and that material has been sorted and stored pending identification. The material is easy to find and in good condition for identification work.

For botany, as noted above, 108 pollen slides have been produced and 20 plant specimens of bee foraged plants placed in the herbarium.

6. Other comments on progress not covered elsewhere

The collection of data on biodiversity (pan trapping of insects and other field studies at the 16 project sites) continued throughout the period and one full year of observations were completed by January 2008. (At one site in Kerala State, permission was not obtained to undertake the pan-trapping experiments; however, the other field observations were completed.)

The research to enumerate numbers of bee colonies of different livelihood-relevant species continued. At the Project's 16 sites, the one ha plots were too small to find numbers of bee colonies and the areas were increased to 3ha. Elsewhere in NBR, sixty 25 ha transects were searched for bee colonies. Bee colonies were found in these transects, however, there was considerable variation in the quality of fieldwork. In view of this experience and learning, it has

been planned in 2008 to count colonies only at the five project locations, more systematically within eight 50 ha areas, and to repeat, more systematically, some of 2007's 25 ha transects.

The livelihood component surveys in each site produced useful information on a range of issues related to the research topic. The level of detail required to generate information on lifestyles and livelihoods and interactions with bees and biodiversity was not available in the data collected by the research assistants up until the mid-term review in 2007. We resolved during the mid-term review to augment the data collection by taking case study households in the sites and collecting detailed life-histories of people who had a particular link to bees and biodiversity. Preparation for this began in the last quarter of 2007/2008.

7. Sustainability

Attendance at the Apimondia congress in Melbourne in September and the meeting called by the Secretary Government of India, noted above, provide examples of fora in which the work of this project has been promoted during this past year.

The continued presence of Keystone Foundation in the NBR, beyond the end of this project, provides a stability around which follow-on activities, related to this project can be built to try and ensure that gains made in dialogue with the Forest Departments, as well as engagement with local residents in the Nilgiris are not lost. There is certainly commitment to this end from Keystone.

While Keystone Foundation has expertise and knowledge relating to indigenous people and honey hunting, there remains significant scope for developing capacity to conduct rigorous science for biodiversity research. Two excellent opportunities for collaboration with local external research groups are now available which can assist capacity building as well as have significant benefits for scientific outputs.

The first group is a UKIERI (UK-India Education and Research Initiative) project, which shares broadly similar goals to the current Darwin project, which is due to commence field research in the Nilgiri Biosphere Reserve during the next few months. The aim is to investigate how environmental and anthropogenic drivers influence the spatial configuration of biodiversity (e.g. bees), and how this in turn, translates to the provisioning of key ecosystem services to humans (e.g. pollination). The UK project leader, Dr Koos Biesmeijer (Leeds University) is a long standing collaborator with the Reading University team and discussions on how the projects can complement are underway.

The second group is headed by Prof. Vasuki Belavadi (Bangalore University) who has a proven track record in assessing pollinators and pollination services in agro-ecosystems. His team are internationally recognised in the field and very pro-active in collaborating with other groups. Indeed, Prof. Belavadi plans to develop an Indian Pollinator Initiative which aims to integrate interested parties working on pollinators and pollination in India. Prof. Belavadi and Dr Simon Potts worked together at a side event at the recent CBD SBSTTA meeting 'Identifying best practices for the sustainable management of pollinator services in agriculture'.

By engaging with these groups Keystone Foundation will be able to develop new skills, benefit from sharing a common approach to pollination and livelihoods research and increase their capacity to undertake research for the Darwin project and for future projects. These groups will complement, but not compete with, ongoing work at Keystone Foundation and should benefit all involved.

We anticipate that our international workshop, to be held in Coonoor in the Nilgiris, March 27-29 2009 will provide a platform for the launch of future activities by the Indian partners which emerge from this project. We are already preparing for this event.

8. Dissemination

See above under 7.

9. Project Expenditure

Project expenditure during the reporting period (Defra Financial Year 01 April to 31 March)

Table 3

Item	Budget (please indicate which document you refer to if other than your project application)	Expenditure	Balance
Rent, rates, heating, overheads etc			
Office costs (eg postage, telephone, stationery)			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items/equipment			
Others			
Salaries (specify)			
TOTAL			

* There was a slight over spend on the costs associated with the Apimondia Congress in Melbourne in 2007.

** We were granted permission to vire funds from Media Reporting, Printing, Travel and Subsistence to Salary Costs in 2007/2008 to cover extra UK staff time required to compile the site selection report. In addition we were allowed to vire funds from Conferences/Seminars 2008/2009 to 2007/2008 (£2000) to also cover UK staff time for the bee science training that was transferred to India.

10. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2007/08

Project summary	Measurable Indicators	Progress and Achievements April 2007 - March 2008	Actions required/planned for next period
<p>Goal: <i>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</i></p> <p><i>The conservation of biological diversity,</i></p> <p><i>The sustainable use of its components, and</i></p> <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>			(do not fill not applicable)
<p>Purpose</p> <p>The interdependencies between indigenous bees, biodiversity and forest livelihoods in the Nilgiri Biosphere Reserve (NBR), Western Ghats, India elucidated, and the capacity of local researchers, indigenous people and government staff strengthened.</p>	<p><i>A reference collection of relevant indigenous bee species established.</i></p> <p><i>A reference collection of melliferous flora established.</i></p> <p><i>Analysis of links between bees, biodiversity and forest livelihoods by Yr 3.</i></p> <p>Indigenous Bee and Biodiversity Resource Unit established.</p>	<p>The the reference collections have continued to be built Training and mentoring is building capacity. The establishment of the Indigenous Bee and Biodiversity Resource Unit in the Bee museum in Ooty is continuing to provide a platform for information sharing.</p>	
<p>Output 1. Increased scientific and livelihood knowledge through research</p>	<p>Experimental protocol designed for collection and analysis of specimens and data at the 5</p>		

	<p>research sites.</p> <p>A reference collection of selected indigenous bee species established.</p> <p>Data (morphometric and genetic) to assist correct classification of indigenous bee species, (or placement within genera).</p> <p>A key for identification of bee species (using LUCID software).</p> <p>Data and analysis of bee diversity and abundance: population data for <i>Apis dorsata</i>.</p> <p><i>A catalogue and database of melliferous flora at 5 sites created (using GIS).</i></p> <p><i>Data on pollination requirement of some local crops and non-timber forest products.</i></p> <p><i>Traits analysis completed to compare data for key species collected at five sites.</i></p> <p>The role of bees in local livelihoods analysed. Market assessment by Yr 3.</p>	
--	---	--

<p>Activity 1</p> <p>1.1) Social mapping carried out</p> <p>1.2) Bees: Pantrap, foraging observation and sweeping methods used</p> <p>1.3) Melliferous plants : phenology study, pollen slides preparation</p>	<p>a) The social maps prepared during 2006 re being regularly updated. .</p> <p>b) Sixteen permanent 1ha. plots in different parts of Nilgiri Biosphere Reserve were established. The bee collection was created through samples collected at these sites. The monthly samples are taxonomically categorized and the reference collection is stored in the laboratory.</p> <p>c) 20 melliferous plant specimens have been collected and the herbarium is maintained in the laboratory. Pollen slides have been prepared for 108 species and the pollen slide library is maintained in the laboratory</p>
<p>1.4) Livelihood research undertaken</p> <p>1.5) Habitat Assessment made</p>	<p>d) Information, for example on livelihoods, settlement history, forest products and honey hunting, has been collected on households living in villages adjacent to the study sites on key themes, linked to biodiversity and livelihoods. In the last quarter of this reporting year the focus shifted to filling gaps in that data set in preparation for moving to the next stage: household case studies. Information sheets and notebooks continue to be maintained by all the research staff.</p> <p>e) The plants species diversity in 15 sites has so far been studied in detail.</p>
<p>Output 2. Strengthened capacities of key institutions</p>	<p><i>New staff and facilities provided to create the Indigenous Bee and Biodiversity Resource Unit within existing campus of Keystone in NBR, and at 5 field centres.</i></p> <p><i>Forest Dept personnel trained by Yr 3.</i></p> <p>Tribal Advisory Council trained in institutional development and local governance by end Yr 3</p>

<p>Activity 2</p> <p>2.1) Tribal Advisory Council consultations</p> <p>2.2) Indigenous Bee and Biodiversity Resource Unit set up</p> <p>2.3) capacity of existing Field Centres enhanced,</p> <p>2.4) Tribal Advisory Council enhanced</p>	<p>a) The honey and bee museum was established in October 2006. This houses the Indigenous Bee and Biodiversity Resource Unit. Information (including posters, videos, photos, books) on bees, honey collection, people and livelihoods in Nilgiri Biosphere Reserve is on display.</p> <p>b) Field staff were recruited in the first months of the project and the facilities in the field centres were renovated and equipped with computers, books and other materials.</p> <p>c) Meetings with Tribal Advisory Council members and local communities are held to discuss the project and future activities.</p>
<p>2.5) Laboratory and library established</p> <p>2.6) Support from personnel from 3 Forest Departments on CBD</p>	<p>d) The Keystone laboratory has been established with facilities for insect taxonomy, storage of bees and plants.</p> <p>e) The books related to the project have been procured and are kept at the Keystone office.</p> <p>f) A study tour on CBD took place in April 2007 for senior officials from the Forest Departments. A debriefing session was held with senior foresters who were unable to attend the tour when the team returned to India.</p>
<p>Output 3. Enhanced technical and professional skills in host country through training</p>	<p><i>4 people trained on bee science for a total three weeks in UK by end of Year 2</i></p> <p><i>4 people (3 senior staff from State Forest Department and 1 legal CBD advisor) trained for 2 weeks in UK by end Year 2</i></p> <p><i>2 persons trained at Bees for Development for a total three weeks each in UK by end of Year 2</i></p> <p><i>5 people trained for 4 weeks on livelihoods analysis and local</i></p> <p>This training took place in India, to allow more people to benefit from the transfer of skills.</p> <p>This study tour/training took place in April 2007.</p>

	<p><i>governance by UK expert by end of Year 1</i></p> <p>Supervision of research by local staff designed, implemented and analysed at five distinct ecological sites by end Year 2.</p>	
3.1) Training by UK staff to project staffs in host country		<p>Analytical writing and livelihoods analysis – July 2007 by Prof Adam Pain.</p> <p>Mentoring on all project areas by Dr Nicola Bradbear, Prof Adam Pain and Dr Janet Seeley in December 2007</p> <p>Entomology and biodiversity refresher course by Mr Stuart Roberts and Dr Nicola Bradbear in February 2008.</p>
3.2) Training and workshops in India		
Output 4. Increased awareness and policy engagement in India and UK through dissemination and advocacy	<p>Each year, 50 participants from NBR informed about the Project and its progress. Web pages for partner organisations, media reports in UK and India. Policy document prepared and peer reviewed at end of Yr 3. International environmental and development community gain appreciation of links between bees, biodiversity and livelihoods.</p>	
4.1.) Meetings with stakeholders (local people, forest department staff)		<p>Meetings continue to be held at the research sites for local people and forest field personnel. Presentations on methodologies have been made</p>

4.2) Establishment of the IBBRU at the Bee museum	to forestry officials and field staff. Methods have been explained to local people (and some people have accompanied teams in the field to see what they do). Dissemination of information about the bees and biodiversity to visitors of the museum, education sessions for children.
4.3) Media reports	<p>Leaflet produced for distribution during the Apimondia Congress in Melbourne in September 2007.</p> <p>Publicity material on the project available in Bees for Development journal to coincide with the Apimondia Congress.</p>

Annex 2 Project's full current logframe (unchanged from original log-frame)

Figure 1 Project summary	Figure 2 Measurable indicators	Figure 3 Means of verification	Figure 4 Important assumptions
<p>Goal</p> <p><i>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve:</i></p> <p><i>The conservation of biological diversity,</i></p> <p><i>The sustainable use of its components, and</i></p> <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>			
<p>Purpose</p> <p><i>The interdependencies between indigenous bees, biodiversity and forest livelihoods in the Nilgiri Biosphere Reserve (NBR), Western Ghats, India elucidated, and the capacity of local researchers, indigenous people and government staff strengthened.</i></p>	<p><i>A reference collection of relevant indigenous bee species established.</i></p> <p><i>A reference collection of melliferous flora established.</i></p> <p><i>Analysis of links between bees, biodiversity and forest livelihoods by Yr 3.</i></p> <p><i>Indigenous Bee and Biodiversity Resource Unit established.</i></p> <p><i>5 Field Centres, State Forest Depts and Tribal Advisory Council (TAC) strengthened by Yr 3.</i></p> <p><i>Partners trained in research methods, information systems, livelihoods analysis, local governance and</i></p>	<p><i>Pollen slide reference collection</i></p> <p><i>Bee reference collection</i></p> <p><i>Plant reference collection.</i></p> <p><i>Project technical reports</i></p> <p><i>Resource Unit established, and annual progress reports</i></p> <p><i>Training reports</i></p> <p><i>Event proceedings, publications, media reports and policy documents</i></p>	<p><i>Existing legislation remains favourable.</i></p> <p><i>That market forces do not undermine informal systems of regulation of resource extraction.</i></p> <p><i>Findings indicate that the current use and livelihood benefits are sustainable.</i></p> <p><i>Exotic bee species and/or associated pathogens are not introduced.</i></p> <p><i>Collaboration and co-operation</i></p>

	<i>mountain biodiversity by Yr 3 Participatory capacity assessment.</i>	<i>Report on capacity development</i>	<i>with 3 State Forest Depts sustained. Other current natural conditions prevail. Project budget estimates hold true.</i>
--	---	---------------------------------------	---

Outputs

A. Increased scientific and livelihood knowledge through research

<p><i>Characterisation and science of livelihood-relevant, indigenous bee species - their taxonomy, genetics, population, habitat, and distribution (of selected species) - studied and documented.</i></p> <p><i>Data collected on habitat and melliferous flora, mapping.</i></p> <p><i>Pollination studies in both natural forest and crops.</i></p> <p><i>Livelihood studies undertaken with indigenous people, and market and trade studies on bee products.</i></p>	<p>Experimental protocol designed for collection and analysis of specimens and data at the 5 research sites.</p> <p>A reference collection of selected indigenous bee species established.</p> <p>Data (morphometric and genetic) to assist correct classification of indigenous bee species, (or placement within genera).</p> <p>A key for identification of bee species (using LUCID software).</p> <p>Data and analysis of bee diversity and abundance: population data for <i>Apis dorsata</i>.</p> <p><i>A catalogue and database of melliferous flora at 5 sites created (using GIS).</i></p> <p><i>Data on pollination requirement of some local crops and</i></p>	<p><i>Permanent bee reference collection established.</i></p> <p><i>Key for bee identification established.</i></p> <p><i>Permanent pollen slide library established.</i></p> <p><i>Research and survey data, genetic data and reports.</i></p> <p><i>GIS maps, electronic database, and reports.</i></p> <p><i>Published documents</i></p>	<p><i>That project partners remain committed to research and capacity building, and have appropriate expertise.</i></p> <p><i>That realistic market data is accessible.</i></p>
---	--	---	---

	<p><i>non-timber forest products.</i></p> <p><i>Traits analysis completed to compare data for key species collected at five sites.</i></p> <p>The role of bees in local livelihoods analysed. Market assessment by Yr 3.</p>		
B. Strengthened capacities of key institutions			
<p><i>Indigenous Bee and Biodiversity Resource Unit established as a Regional Resource Centre for mountain communities of Western and Eastern Ghats and capacity of existing Field Centres, State Forest Depts and Tribal Advisory Council enhanced</i></p>	<p><i>New staff and facilities provided to create the Indigenous Bee and Biodiversity Resource Unit within existing campus of Keystone in NBR, and at 5 field centres.</i></p> <p><i>Forest Dept personnel trained by Yr 3.</i></p> <p><i>Tribal Advisory Council trained in institutional development and local governance by end Yr 3</i></p>	<p><i>Staff complement.</i></p> <p><i>Inventory of facilities.</i></p> <p><i>Range and number of publications distributed, enquiries answered, and web pages created/updated.</i></p> <p><i>Record of training events.</i></p>	<p><i>That the local partner organisation has commitment and capacity to develop the new Unit and associated centres.</i></p> <p><i>That State Forest Depts remain supportive to the Project</i></p>
C. Enhanced technical and professional skills in host country through training			
<p><i>Training on bee science, mountain biodiversity with respect to CBD, and information systems undertaken in UK.</i></p> <p><i>UK technical input concerning entomological research design, methodology, livelihoods analysis and local governance provided in India.</i></p>	<p><i>4 people trained on bee science for a total three weeks in UK by end of Year 2</i></p> <p><i>4 people (3 senior staff from State Forest Department and 1 legal CBD advisor) trained for 2 weeks in UK by end Year 2</i></p> <p><i>2 persons trained at Bees for Development for a total three weeks each in UK by end of Year 2</i></p> <p><i>5 people trained for 4 weeks on livelihoods analysis and local governance by UK expert by end of Year 1</i></p> <p><i>Supervision of research by local staff designed, implemented and analysed at five distinct ecological sites by end Year 2.</i></p>	<p><i>Research Progress reports.</i></p> <p><i>Back to office reports</i></p> <p><i>Certificates</i></p> <p><i>Research protocols for five sites prepared</i></p>	<p><i>That people remain in post following training in UK.</i></p>

<i>D. Increased awareness and policy engagement in India and UK through dissemination and advocacy</i>			
<p><i>Stakeholder workshops held in NBR.</i></p> <p><i>Darwin Initiative Project aims and achievements explained and promoted through various forms of media in UK and India</i></p> <p><i>Policy recommendations concerning the bees - biodiversity - livelihoods linkages developed. International conferences attended.</i></p> <p><i>International workshop on Darwin Initiative Project on Indigenous Bees, Biodiversity and Livelihoods, held in India in year 3.</i></p>	<p><i>Each year, 50 participants from NBR informed about the Project and its progress. Web pages for partner organisations, media reports in UK and India. Policy document prepared and peer reviewed at end of Yr 3. International environmental and development community gain appreciation of links between bees, biodiversity and livelihoods.</i></p>	<p><i>3 Seminar reports and documented feedback.</i></p> <p><i>Number of web site hits, number of media events and documented feedback.</i></p> <p><i>Policy documents.</i></p> <p><i>Back to office reports</i></p> <p><i>Conference proceedings.</i></p> <p><i>Workshop documents and Proceedings</i></p>	<p><i>That there remains commitment to pro-poor biodiversity policies in India and UK.</i></p> <p><i>Media reports etc. reach and effectively influence target audiences.</i></p> <p><i>Stakeholders participate fully in workshops and dissemination events.</i></p>
Activities	Activity milestones (assumptions shown above)		
Research	Yr 2: Livelihood-relevant indigenous bee species identified and classified. Yr 3: Data for bee populations, distribution and ecology in 5 sites in NBR. Catalogue and database of melliferous flora at 5 sites. Sustainable livelihood analyses, and people's biodiversity registers for indigenous communities living adjacent to 5 sites		
Institutional capacity building	Yr 1: 6 consultations with members of the TAC held on institutional development and local governance issues. Yr 1-2: Functional capacity to create the <i>Indigenous Bee and Biodiversity Resource Unit</i> within the existing campus of Keystone in NBR. Yrs 2-3: Support for personnel from 3 State Forest Depts on CBD implementation and biodiversity tools and methods Yr 3: Project research and survey implemented by 5 Field Centres		
Training	Yr 1: Scoping mission to elaborate field research. Research methodology developed for 5 sites. 5 people from partner institutions trained in sustainable livelihoods and local governance. Study tour on CBD issues and mountain biodiversity. Training manual developed on apiculture and honey processing Training for 50 people from indigenous communities living adjacent to 5 sites. Yr 2: 10 people trained in UK. Training manual on survey analysis and methods distributed. Yrs 2-3: Research by local staff designed, implemented and analysed		

	at 5 ecological sites.
Dissemination and advocacy	Yrs 1-3: Stakeholder Workshop held in NBR for Forest Dept., Village Forest Councils, CBOs, Govt, private sector 4 media reports per year provided to internet, press, radio, TV in UK and India. Attend international meetings and present papers and posters. Yr 3: Policy document prepared. Organisation of International Workshop on Darwin Initiative Project on Indigenous Bees in NBR. Publication of Workshop Proceedings, other documents and materials.