



Darwin Initiative Annual Report

Important note:

To be completed with reference to the Reporting Guidance Notes for Project Leaders: it is expected that this report will be about 10 pages in length, excluding annexes



Submission Deadline: 30 April 2013

1. Darwin Project Information

Project Reference	19-024
Project Title	Enhancing the relationship between people and pollinators in Eastern India
Host Country/ies	India
UK contract holder institution	Game & Wildlife Conservation Trust
Host country partner institutions	University of Calcutta
Other partner institutions	University of Exeter (UK)
Darwin Grant Value	£271,258
Start/end dates of project	1 April 2012 – 31 st March 2015
Reporting period (eg Apr 2012 – Mar 2013) and number (eg Annual Report 1, 2, 3)	April 2013 – Mar 2013 Annual Report 1
Project Leader name	Barbara Smith
Project website	http://cpscu.in/
Report authors, main contributors and date	Barbara Smith, ParthibaBasu, James Cresswell, John Mauremootoo, MahuaGhara.

2. Project Background

The need for the project was identified by Parthiba Basu who was concerned about a potentially impending pollinator crisis in India. This project was designed in response to this and aims to 1) increase understanding of native pollinators, their status and ecology and 2) to improve the management of pollinators and the wider agro-ecosystem in partnership with the farming community and local government. The project is located in the north eastern part of India and is centred at Calcutta University (the hub) and field stations in two regional study areas: Tripura and Odisha (Orissa) (see Appendix A1 Location Maps).

3. Project Partnerships

The partnership between the UK lead institution (Game and Wildlife Conservation Trust, GWCT) and the host country partner (University of Calcutta, UCal) has grown stronger over this first year. Barbara Smith (GWCT) and Parthiba Basu (UCal) are in regular contact principally via email more than once a week with occasional phone and Skype contact. There has also been significant personal contact, in the first 12 months of the project Barbara Smith spent 11 weeks in India (3 weeks more than allocated) with partners. Parthiba Basu spent two weeks in the UK when he met with all three UK project partners, spending time at both GWCT and Exeter University. The personal relationships are friendly and cordial.

Partner Roles

Barbara Smith is Project Leader and oversees the distribution of funds from the Darwin Initiative to project partners. She is responsible for monitoring project progress, ensuring that milestones are achieved and for reporting project progress to the funding body and direction of the CPS.

Parthiba Basu is Project Manager in India and collaborates with Barbara Smith to coordinate the project and bears overall responsibility for project management in India. Parthiba Basu has responsibility for: direction of the CPS; all staff and their management including management of field staff at field stations (although this may be delegated to the Post-doctoral project manager); management of capacity building to ensure it is effective and benefits community stakeholders; supervision of MSc students at Calcutta University; regular project progress reports. Together they are responsible for: design of experimental components of the project; design of field surveys of pollinators; analysis and dissemination of results; supervision of PhD projects; knowledge transfer events at the field sites; ensuring that knowledge transfer functions well on the ground; providing annual updates in the form of reports for the funding body; publicising the project achievements through national and international press; seeking ways to maintain the links between project partners and extending them as a legacy for the project

Additional UK partner roles

James Cresswell, University of Exeter (UEX) is Scientific Advisor to the project and is responsible for: design of experimental components of the project; overseeing the quality of academic output; supervising PhD projects; contributing to analysis and dissemination of results; academic standards and project development at the CPS; reporting on academic progress and the quality of outputs. In 2012 – 2013 he spent 2 weeks in the host country.

John Mauremootoo coordinates external taxonomic support for the project and also advises the project on all aspects of capacity building to help ensure that the approaches adopted are fully participatory. Since the project inception he has led the development of a novel PME (Project Management and Evaluation) process with the core team for the project and continues to support its implementation. In 2013 he spent one week in the host country.

Despite this formal division of labour these four individuals form the core team of this project and work together to ensure the success of the project.

The relationship between the core team is supportive and positive. UEX provided space for a three day workshop in November 2012. John Mauremootoo extended his remit to lead the development of PME for the project. GWCT has provided a secure share point system for file storage and sharing. The strengths of the partnership are twofold 1) There are friendly relations between project partners which facilitates responsive project management 2) Between them the four members of the core team have a strong networks outside the project which they draw in to benefit the project. This is evidenced in Tables 1 and 2 of Appendix 2 Networks.

However, it is recognised that despite regular contact between partners there have been insufficient regular core team meetings and this will be rectified with scheduled monthly Skype meetings. The challenge has been to balance UK capacity building input to support the project effectively with enough autonomy to enable organic growth of the project in India. The ideal balance has not yet been struck and this is a priority for the coming weeks. This will be achieved by the aforementioned regular Skype meetings and by implementing a more structured, regular, collective assessment process using standard templates generated as part of PME. This approach is for the benefit of all partners and is the result of a collective decision making process.

In the first year of the project the UK lead institution GWCT has made links with 'boundary partners' in the UK and India (Table 2) with potential for collaboration. These relationships are developing positively and we are optimistic that these will lead to actions with measureable outcomes.

Other Collaboration:

The CBD Focal point in India is Ministry of Environment & Forests. Although they had supported the program at project application phase, we have not yet shared our outcomes with them. We plan to involve officials from MoEF in future meetings and workshops at the CPS when we have baseline data to present. The data we collect will provide information to a range of bodies that have an obligation under the CBD (especially the Odisha (Orissa) and Tripura State Governments) but we are not in a position to provide databases at this stage of the project. However we have a built a network though which we will be able to disseminate the

information. In the last year we have collaborated with a number of institutions or individuals in the host country (See Appendix 2 A2 Networks; Tables 1 and 2) and Internationally (Table 2). We are currently in contact with Under the Mango Tree, an organisation working with beekeepers in Gujarat.

4. Project Progress

Photographs in Appendix 3 'CPS Activities in snapshots'.

Establish Centre for Pollination Studies

The Darwin Initiative-branded Centre for Pollinator Studies (CPS) has been launched. We intend that this will be a hub for evidence-based good practice, the development of which will be supported by essential expertise from the UK but which will become integrated into Calcutta University and be self-sustaining at the project end. The physical space for the CPS has been formally handed over to the project (see Appendix *) and it has 26 capital items installed (See Appendix 4 Capital items). The next stage is to develop this as a vibrant centre of studies where visitors can be welcomed.

Staff are in place. One Post-doctoral Project Manager and two Junior Research Fellows (JRF) were appointed. In addition 4 rural field advisors have been appointed but the structure of senior regional staff has been adjusted for the reality of field conditions and there are no longer two Rural advisors, the posts having been split (see 'Human Resources below'). The JRF are following PhD programmes. A third PhD student has brought an independent Fellowship to the CPS and is supervised alongside the existing JRFs as part of the team.

Staff appointment letters are located in Appendix 5 'Appointment letters'.

Establish regional field stations

Two field stations have been established and laboratories are available to students in both regions. In Odisha the field laboratory is established within the CPS field station. In Tripura the Department of Agriculture provided laboratory space which was refurbished by CPS staff and is now used by both CPS staff and Dept. of Agriculture field staff. This facilitates good relationships and communication between the staff of CPS and the Dept. of Agriculture.

From April long-term monitoring is being carried out in 6 villages in Odisha. Establishing field sites in Odisha was considerably more difficult than in Tripura where we had the direct involvement of the state government. Odisha is less politically cohesive and we will identify remaining sites using a newly established network of farmer co-ordinators.

In Tripura CPS staff have been regularly interacting with the local farming community via the Dept, of Agriculture. A farmer training program and festival were scheduled in February 2013 but had to be deferred due to political unrest during a general election declared in the state. This training will be re-scheduled for the latter half of 2013 in collaboration with the Dept. of Agriculture at a time they consider appropriate in the farming calendar. Long-term monitoring is being carried out in Tripura at 15 sites (5 sites at each node of intensification).

The CPS organised two training programmes in Odisha (Orissa). One was in Ashoknala (a low intensity cropping area) and another in Remuna (an intermediate intensity cropping area). The two programmes were attended from the close by villages (see Appendix 2 Tables 3 and 4 Farmer Contacts and Appendix 3). CPS also participated in two farmer festivals organized by the Department of Agriculture of Govt. of Odisha. These events together trained approximately 200 farmers. During the training programmes at farmer festivals, the farmers were trained in long-term monitoring procedures such as pan trapping and also in non-pesticidal management of vegetable crops (using pheromone traps).

Letters of cooperation between local administrations are located in Appendix 6 'Collaboration and Administration'. Photographs are available in Appendix 3. More photographic evidence available on request. 'Flip book' used by RF as discussion point with farmers is located in Appendix 7 'Educational resource 1'.

Scientific evaluation by James Cresswell (University of Exeter)

The strategic goal of building local capacity by developing a small cadre of expert staff for the CPS 'hub-and-field stations' model is beginning to be realized. Both research fellows (RFs) are registered in the Zoology PhD programme at the University of Calcutta and they have each recently presented pilot data and an annual progress report. The pilot studies demonstrate that both RFs understand the intended aims of the research, which indicates the success of their initial training. In addition, both RFs have successfully developed the required field infrastructure to support their research (in one case, experimental gardens of a model crop; and in the other a series of permanent transects in a relatively large number of specified sites). However, the pilot work also indicates that further training is required. In one case (RF Chatterjee), the current obstacle is technical and requires refining the technique of making microscope slide preparations to meet the demands of the study system. In the other (RF Chakraborty), taxonomic support is required to better identify the pollinating insects that are being recorded. Despite the fact that the foundation of field infrastructure took up a substantial portion of 2012, more progress was expected by the RFs and the limiting factor is the infrequency of advice and training. In future, we will implement frequent and recorded supervision from both UEx (Cresswell) and UCal(Basu), which is monitored centrally (Smith).

The strategic aim of establishing long term monitoring of pollinators has made some progress. Monitoring sites have been established (in both Orissa and Tripura) and a recording protocol has been developed (Appendix 8 'Project Protocols'). The protocol has been implemented but the data captured was sparse. Again, there is evidence of a sound foundation, but progress is less than expected. In future, we will replace the Postdoctoral Project Manager (PDPM Ghara) and implement frequent and recorded supervision of the new PDPM from UCal (Basu), which is monitored centrally (Smith).

Human Resources and Management by Barbara Smith and Parthiba Basu.

The Post-doctoral Project Manager (Mahua Ghara) has been managing the day- to -day activities with only minimal contact with the UK team and has recently indicated that she plans to resign from the post. The core team feel that there is room to maximise the value of this post to the project whilst also benefiting the post-holder. The team would like to use this opportunity to restructure. In the light of Mahua's resignation the project team will review the post and its management using the PME process that is now in place. It is likely that there will be some adjustment in management structure around this post. This post will be advertised in May, 2013.

Originally D.C. Pal, a retired official in the Department of Agriculture in Govt. Of Odisha was appointed as Rural Advisor but he resigned in November, 2012 having been offered a new government post (Appendix 5 Appointment letters). On reflection, the political structure of Odisha does not lend itself to central organisation and we would like to establish a decentralised model of rural advisory for more effective intervention. Instead of employing one senior person, we have identified one person at each node of the agricultural intensification gradient (a total of 3 village advisors / coordinators in the Odisha project area). We have also identified a liaison person in the project area who will coordinate among the three advisors. The nodal advisor/coordinators were identified during the farmers' training programmes and were nominated by the villagers. These four posts are equivalent (in cost) to one Rural Advisor post.

Project and personal progress by Mahua Ghara (30 June 2012 to 29 April 2013)¹

My first activity at CPS was a visit to Orissa and Tripura; these are the chosen study sites for the project. Over the last one year, I have been involved in standardising as well as implementing the protocol for long-term monitoring of pollinator diversity in the two Eastern states of India. The field sites for long-term monitoring have been finalised; at each intensification gradient in Tripura we have five sites for sample collection; in Orissa we have fewer than five sites per agricultural intensification. The sampling method (focal observations, transect walk, sweeping) was customised for the project along with standardisation of raw materials for sampling, e.g. bowls, paints, data sheets, trap holders. (Appendix 8 'Project protocols'). Standardisation was followed by training of local people (field assistants and farmers) to enable them to independently assess the pollinator diversity in their crop field.

¹Submitted by Dr. MahuaGhara. Email: mahuaghara@gmail.com

The trainings have been successful. We are in the process of entering the data for the observations taken. The pan trap samples are being sorted by the student volunteers into respective orders. I am also involved in developing a simpler photograph based taxonomic key easily understandable by non-specialised student volunteers. As part of the awareness material, a calendar and some pocket guides are in the synthesis phase. Necessary contacts with officers from the department of agriculture as well as with the farmers have also been established.

Other activities I was involved in are as follows:

1. Setting up of CPS office, field stations at Orissa and Tripura.
2. Training MSc students which included visits to field sites, writing up short-term projects, and discussion on a regular basis on progress of work.
3. Interaction with the PhD students about their thesis questions.
4. Helping in purchase of equipment for CPS, which includes microscopes, GPS, weather station etc.
5. Maintenance and identification of insects collected in pan-traps. MSc students are currently being trained to sort the insects into their respective orders.
6. Setting up of trap nest for Carpenter bees as a first step towards starting experiments with these bees. Traps have to be modified due to zero occupancy.

4.1 Progress in carrying out project activities

There were primary four outputs identified under which activities took place.

1) *Monitoring framework for pollinators:* Project start-up was prompt, all capital items have been purchased as required (Activity 1.1) and partner meetings were carried out at the project start and in November 2012 (1.2). The Field Assistants have been trained in pollinator survey, they are now relatively competent and together with Research Fellows (RF) have begun to train farmers (2.2, 2.3). This is now one of the priorities for the Rural Advisors who will be taking over the co-ordination in the regions. The monitoring framework requires some tweaking but overall there has been successful implementation of the activities.

2) *Base-line information regarding pollinator diversity gathered:* A database for long term data has been established, transects have been set-up and data collection has been collected (activities 3.1,3.2, 6.1) . It took a significant amount of time to identify suitable transects. In Tripura there is a full set of 15 transects. In Odisha six transects have been established and more are to be identified in collaboration with a newly established farmer network. The cultural and political background in Odisha resulted in a change in the way we implemented the project and we are currently building a more devolved structure for farmer engagement. This has delayed setting up transects although we remain on track. Research Fellows have been trained in long-term monitoring methods (2.3) and training in data management is the next priority (action BS). Staff in the CPS have received training in experimental biology from JC and there is a taxonomy workshop planned for September (2.4). The research questions have been refined and the experimental work initiated by Research Fellows (RFs) (4.1, 4.2) with input from the core team including MG post-doc RF. This has been a slower process than we hoped as RFs were heavily engaged in setting up the long-term monitoring transects. However, the RFs now have methodology in place and have begun to collect data. They have set-up their own individual databases (6.2) but require further training to improve these (6.2). Three MSc students have been trained and are contributing to the research output of the CPS (2.1), the students are very motivated, produced a poster on their project and are delivering well.

3) *CPS and satellite field centres established:* This output has been delivered - the CPS at Calcutta University is now equipped and functioning. There was some delay opening the centre while the new centre for Modern Biology was built. Both satellite centres were identified and set-up in a timely fashion and are now in operation.

4) *Local engagement and increased capacity among farmers to manage pollinator populations:* Annual celebrations have been held at two locations (Activity 7.1) however, there remains one to be held in Odisha and in Tripura the window for these events was missed due to political unrest during an election campaign (we were asked to avoid the area during this time). A new date is to be identified in collaboration with the Dept. of Agriculture. The rural advisors are now in place (5.1). This took longer than hoped, the original idea to engage a single person to manage whole regions proved impractical and we have devised a different approach in each area. Feedback sessions with farmers took place at the celebrations that were held (7.2) and there has been good progress in awareness raising and network building with farmers. We have not held workshops for children (2.5) as yet. We feel that the priority is ensuring the project framework is in place. These will be held in 2014.

4.2 Progress towards project outputs

1) *Monitoring framework for pollinators established:*

The infrastructure for the monitoring framework is in place, including staff. Furthermore we have good engagement with farmers, farmers are very willing for us to set-up experimental work on their land. We have carried out basic training with a large number (about 150 - 200) and are currently identifying key people to train to a higher level. There is a good level of local enthusiasm and the assumption of local engagement is currently met. CPS staff have a good relationship with farmers. However, we have not met one of our assumptions i.e. '*Research Fellows remain enthusiastic and in post*' as our Post-doctoral Project Manager Mahua Ghara has decided to resign. This is disappointing for us. BS carried out an exit interview with her and we believe we have identified the key reasons for her resignation. This will be revisited in a team reflection workshop during the recruitment process for the new Post-doc manager and a new management approach will be implemented to ensure the new member of staff remains enthused.

Although there has been something of a learning curve, we have no reason to believe we won't be able to achieve this output as the basic framework remains and we are meeting the challenges.

Evidences: Staff appointment letters (Appendix 5); photographic evidence of experimental sites and farmer training (Appendices 3 and 7);

Base-line information regarding pollinator diversity gathered:

The collection of data is underway. The long-term monitoring transects are well established in Tripura, the methodology has been refined and the surveys are underway. In Orissa a subset of transects have been established and there is an actionable plan to establish another nine. Training of CPS staff is on track and although it has been a slower start than we would have hoped we remain confident that the base-line information gathered will be of good quality by the end of 2013. The RFs are following PhD programmes that have been developed with the core team and have collected some data, the quality of which was assessed in section 4. The databases will be made public at the project end and are currently being populated. Templates have been shared between the project partners.

Evidences: Long-term monitoring, PhD and MSc protocols, MSc timetable of works (Appendix 8). Photographic evidence of sampling (Appendix 3). There are no academic papers as there is currently insufficient data to publish.

2) *CPS and satellite field centres established acting as data collection centres and advice and outreach to local farming community.*

The infrastructure has been achieved in that there is space identified and now set-up for the CPS and the field stations and staff have been appointed. Databases are shared and stored securely on the CPS Share point. At the moment farmers are aware of the project and will attend events close to the villages but do not see the satellite field stations as advice centres. In 2014 we plan to initiate 'clinics' (at the field stations) for farmers with pollinator or pest queries but this will not be enacted until the elements we are currently focussed on are

satisfactorily completed. For these Centres to be sustainable in the long-term we will need to identify independent funding. We have identified some potential funding sources and have collectively decided that the end of 2013 is a target for new funding applications. Data is being collected by RF and stored at the CPS.

Evidences: Official sanction of the CPS space in the Centre for Modern Biology at Calcutta University (Appendix 6); agreement with local administrators in the regions (Appendix 6); photographic evidence of CPS and field stations (Appendix 3); collaborators details (Appendix 2); reviewers access to the CPS share point available on request.

3) *Local engagement and increased capacity among farmers to manage pollinator populations:*

There has been an excellent start to local engagement initiatives. In both areas there is enthusiasm on the part of farmers, local government and NGOs to be involved. The two 'Farmer Festivals' were well attended. We will build on this with an adjusted approach to rural advice which has now been tailored to meet local needs. At the moment the assumption that local communities remain receptive to project initiatives holds. The challenge will be to ensure that this is maintained over the project life-time and beyond. We expect that this will depend largely on the quality and utility of advice farmers receive and we intend to ensure that the training and advice is responsive to farmer needs.

Evidences: Photographic evidence of farmer involvement (Appendix 3), letters of support from local govt. and NGOs (Appendix 6).

4.3 Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 Total	Total planned during the project
Established codes			
Training Measures			
1a	Number of people to submit PhD thesis	0	2
1b	Number of PhD qualifications obtained	0	0
2	Number of Masters qualifications obtained	3 training – not yet graduated	9 (3 each year)
3	Number of other qualifications obtained		
4a	Number of undergraduate students receiving training		
4b	Number of training weeks provided to undergraduate students		
4c	Number of postgraduate students receiving training (not 1-3 above)	5	3 each year
4d	Number of training weeks for postgraduate students	24	36 (12 weeks each year). Students continue to be involved in field projects post training.
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification(ie not categories 1-4 above)	4 field assistants	2
6a	Number of people receiving other forms of short-term education/training (ie not categories 1-5)	150 farmers	36
6b	Number of training weeks not leading to formal qualification	4	4

Code No.	Description	Year 1 Total	Total planned during the project
7	Number of types of training materials produced for use by host country(s)	3	4
	Research Measures		
8	Number of weeks spent by UK project staff on project work in host country(s)	14 weeks	11 weeks per year
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	Not yet done	2
10	Number of formal documents produced to assist work related to species identification, classification and recording.	1 in pre-press form. To be published this year.	4 in 3 languages
11a	Number of papers published or accepted for publication in peer reviewed journals	1	3 in three years
11b	Number of papers published or accepted for publication elsewhere	1	6 in three years
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	1 LTM	2
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country		
13a	Number of species reference collections established and handed over to host country(s)	1 established	2 in three years
13b	Number of species reference collections enhanced and handed over to host country(s)	0	2 in three years
	Dissemination Measures		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	None so far	2 (1 in Uk 1 in India) over three years
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	2	4 in 3 years
15a	Number of national press releases or publicity articles in host country(s)	0	3 over 3 years
15b	Number of local press releases or publicity articles in host country(s)	1 in Orissa	3 over 3 years
15c	Number of national press releases or publicity articles in UK	1	3 over 3 years
15d	Number of local press releases or publicity articles in UK	1	3 over 3 years
16a	Number of issues of newsletters produced in the host country(s)	Not achieved.	1 per Qtr.
16b	Estimated circulation of each newsletter in the host country(s)		
16c	Estimated circulation of each newsletter in the UK		
17a	Number of dissemination networks established	1	1

Code No.	Description	Year 1 Total	Total planned during the project
17b	Number of dissemination networks enhanced or extended	0	1
18a	Number of national TV programmes/features in host country(s)	0	2
18b	Number of national TV programme/features in the UK		1
18c	Number of local TV programme/features in host country	1 to be telecast in May, 2013 PB and BS	3
18d	Number of local TV programme features in the UK		
19a	Number of national radio interviews/features in host country(s)		1
19b	Number of national radio interviews/features in the UK	Not achieved	2
19c	Number of local radio interviews/features in host country (s)	1 PB in All India Radio	2
19d	Number of local radio interviews/features in the UK		
	Physical Measures		
20	Estimated value (£s) of physical assets handed over to host country(s)	£ 9500	£9500
21	Number of permanent educational/training/research facilities or organisation established	1 CPS 2 field stations	1 CPS established 2 field stations as temporary training and facilitation centres
22	Number of permanent field plots established	7 field plots apart from 24 LTM plots	At least 11
23	Value of additional resources raised for project	Grant from Govt of India for creating dissemination materials worth £11026	£114,477 in three years
New - Project specific measures	Rural Advisory		Rural Advisory in Odisha restructured without any additional cost. Instead of one Rural Advisor, the out lay is divided between three advisors at each node of the intensification gradient and another person to liaison between them. This seems practicable due to the ground socio-political situation.

Table 2 Publications

Type (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
Scientific Journal	Cresswell, J.E., Thompson, H.M. (2012). Comment on "A common pesticide decreases foraging success and survival in honey bees".	<i>Science</i> , 337(6101).	http://www.ncbi.nlm.nih.gov/pubmed/22997307	0
Member's magazine 'Gamewise' (Circulation 22,000)	B Smith, 'Creating a Buzz in India' 2012*	Game & Wildlife Conservation Trust	Game & Wildlife Conservation Trust _____ Appendix 9	0
Newsletter	B Smith, 'Enhancing the relationship between people and pollinators in eastern India'	Darwin Initiative	http://darwin.defra.gov.uk/newsletter/Darwin%20News%202012-07.pdf	0
Newspaper	Press release 11_11_2012*	Littlehampton Gazette	Appendix 10	0

4.4 Progress towards the project purpose and outcomes

Purpose: To improve national and local understanding of the status of native pollinators, their ecology and their management for the benefit of local farming communities and the protection of the agro-ecosystem in partnership with Calcutta University, local government and local civil society organisations.

We have made progress on the provision of information about pollinator distribution by setting up long-term monitoring in both regions, little information is available as we are at the beginning of this process. There is good evidence however that the data will be available and that the work is in progress. By 2014 base-line data will be available for analysis and will be disseminated to local partners. There is currently a team of surveyors and advisors in each area and these teams will grow, facilitated by some capacity building from the core team and RF. Already the individuals have built up networks in the local communities. The basic infrastructure is in place and has been modified for local realities. The good relationship between the Darwin team and the local administration and communities means that we have potential to affect a positive impact on the restoration / protection of the agro-ecosystem thereby benefitting local farming communities. Local field assistants are available and are enthusiastically undertaking training with RF. The purpose level assumptions hold. We suspended work in Tripura during elections but this was only a precautionary action on the request of the local administration and in the event there was little significant social unrest. Overall the means of verification seem reasonable although we will be re-visiting our Logframe as part of our on-going PME (see section 7).

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

The extension work and training is designed to encourage farmers to think about their farming approach in relation to biodiversity and we hope it will foster a positive attitude to our work as the programme develops. The base-line data we collect will provide suitable comparison data for the effect of our interventions and in collaboration with the farmers we will test them (enriched native flora and pollinator friendly farming practices). The impact on biodiversity may be difficult to measure within the life-time of the project but a measure of sustainable use should be achievable. In both states the project team has been in close contact with the farming community and has held a series of meetings explaining the project goals. Training programs were organised in Odisha to orient farmers in long-term monitoring of pollinators and the impact of non-pesticidal management of crop pests. Pheromone traps and sticky traps have been distributed both in Odisha and Tripura as non-pesticidal management tools. Farmers perceive the harmful impact chemical pesticides may have on biodiversity and have started using the pheromone traps and sticky traps. Farmers are happy with the effectiveness of the traps supplied to them and this may encourage them to consider other interventions. The biodiversity benefits of improved management will benefit all farmers in the area though improved yields and an enriched environment.

5. Monitoring, evaluation and lessons

A comprehensive results-based planning, monitoring and evaluation (PME) system has been developed by adapting the project logframe using elements of Outcome Mapping (Earl et al 2001) and Action Learning (Aarnaoudse et al. 2011).

A series of templates have been produced to assist the project team in the monitoring of inputs, activities, outputs, outcomes and progress towards outcomes (See Appendix 11CPS PME system and Appendix 12 CPS templates). The system was developed by the core project team in November 2012 and is currently being implemented. However, it is not yet fully operational as the team members have not been trained in its use. A PME training will be conducted in 2013 to increase understanding and support for PME in the project team. Ideally this work would have been undertaken earlier in the project but this has been developed during the life of the project and so was unavailable to us from the start.

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

N/A

7. Other comments on progress not covered elsewhere

During this process of review we have looked closely at the current Logframe and are considering some adjustments. It is our intention to re-visit the Logframe in the PME process and any adjustments will be submitted to LTS for consideration.

Although our press release was only taken up by the Littlehampton Gazette, this did bring us into contact with 'Under the Mango Tree', an NGO in Gujarat. A colleague of theirs saw it and passed it on.

The MSc students have been very enthusiastic and produced good work. Their report is appended. (Appendix 13 MSC-report).

Barbara Smith has presented the project to: The British Ecological Society Agricultural Ecology Specialist Interest group at Charles Darwin House in November, 2012; Royal Society INDIA-UK Seminar Kerala January 2013

8. Sustainability

The project has received local attention. The Vice Chancellor of the University of Calcutta mentioned this project as a significant development during his annual convocation address in 2012 and has since mentioned it in addresses to other Universities.. Parthiba Basu was interviewed by a local TV channel (*24 Ghanta*) wherein he explained the objectives of the project. Reports of Farmers' training cum festival in Odisha was published in local newspapers. Parthiba Basu also attended and delivered lectures on the project objectives in 2 Farmer Festivals organized by the Department of Agriculture, Govt. of Odisha. There is a short-documentary in production for the project, financed by the Dept. of Science and Technology (India). A news item

The exit strategy will be different for Tripura and Odisha. In Tripura, the government is keen to learn from the project outcomes and will implement it as departmental program following the project completion (as evidenced in a letter from the Joint Director of Agriculture Baharul Islam (see Appendix 6 'CPS Collaboration and administration') . In Odisha, the post project dissemination will be mainly through the local NGOs and community organizations like the Farmers' Association, The Farmers' Association has been helping us in our long term monitoring and strongly endorses the project objective. The National Secretary of the organization had visited the project area and has played pivotal role in mobilizing the local chapter of the organization.

9. Dissemination

Two training programs for farmers were organized this year where they were appraised about the project goal and were also trained in long term monitoring of pollinators. In Tripura the government is keen incorporate the project elements into their extension program. The Odisha chapter of the All India Farmers' Association has been providing valuable support in mobilizing farming community in the project area and are partners in dissemination activities. The District agriculture directorate in Balasore has been very supportive and have been providing logistic support. Dr. Parthiba Basu has participated in a Farmers' fair organized by the directorate and have delivered lecture. In both Tripura and Odisha the dissemination activities will continue even after the project finishes. Funding to support the continuation of advice from the two rural advice centres will be identified and the application process started in 2014.

Masters students were also trained in pollination biology and they have been involved in short field projects. Hopefully some of them will take up pollination biology as their doctoral dissertation topic.

10. Project Expenditure

The accounts from the host country were inspected at GWCT and a letter confirming that in the opinion of the Head of Finance the accounts have been collated correctly and accurately is appended (Appendix 15 CPS Accounts). Working from Budget '1662 Round 18 Budget - GWCT_24_10_changed 23_7_12' (attached)

Table 3 project expenditure during the reporting period (1 April 2012 – 31 March 2013)

Item	Budget	Expenditure	Variance/ Comments
Barbara Smith James Cresswell Mahua Ghara Arnob Chaterjee Orissa rural advisor(actual and ad hoc appointments) Tripura Rural Advisor Field assistants and labourers			3852 Tripura Advisor (now funded by Tripura govt.) shifted to fieldwork travel and subsistence; Because of teething problems with establishing staffing at the rural centres, the host country partners used casual labour while permanent staff were identified. Also recruitment fees paid (LTM approved the latter)

Item	Budget	Expenditure	Variance/ Comments
Casual hiring of field assistants, labourers, carpenters and drivers etc			Balance amount of 1109GBP for currency conversion issues to be used as contingency for occasions when bank rates are unfavourable.
Overhead costs GWCT University of Exeter University of Calcutta Office Rental, heating at field stations			
Travel and subsistence Host country UK National travel UK International Travel			Tripura rural advisor salary of 3852 shifted to host country Fieldwork travel & Subsistence. Approved LTS. Because I was invited to a Royal Society Workshop in Kerala in March, just before the end of the financial year I opted to make this my Spring visit. This put me over budget but was of great benefit to our project as I made excellent contacts. LTS aware.
Operating costs host country Operating costs UK (Conferences)			Includes fieldwork operating cost and cost incurred for farmers' festivals and meetings held on numerous occasions.
Capital items/equipment (specify)			Computers and laptops 816.82; Refrigerator for field station 133.24; Garmin GPS 208.55 Epson printer, HP printer, Seagate HDD 114.37; Light trap and aerial insect trap 203.75; Laboratory freezer 160.83; Binocular microscope with eye piece 571.78; Pen drive etc.16.78; Weather meter 251.85 Microscope DSS 4204.32; 3D microscope 389.54; Magnetic stirrer 171.63 Micropipette 158.51; Generator 574.71; Vortex shaker 92.76; Micro-microscope 52.18; Hot air oven 406.01; Computer 547.99; Laptop 394.25; Refractometer 224.40 From Taxonomy budget, £200 approved LTS
Others: Consultancy John Mauremootoo Consulting Taxonomy and extension advice John Mauremootoo Taxonomy Project coordination Host Country			2250 Transferred from Taxonomy budget. Approved LTS. Carryforward approved LTS
Others Consumables			Chemicals, glassware, stationary, consumable items.
TOTAL	92274	87570	3810 carry forward, 1109 surplus due to exchange rates but some overspend in

Item	Budget	Expenditure	Variance/ Comments
			UK travel (just under 10%).

Highlight any agreed changes to the budget and explain any variation in expenditure where this is +/- 10% of the budget. Have these changes been discussed with and approved by LTS?

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

I agree for LTS and the Darwin Secretariat to publish the content of this section (please leave this line in to indicate your agreement to use any material you provide here)

A major success of our project has been to establish an excellent relationship with the Joint Director of Agriculture in the government of Tripura, Dr Baharul Islam. This relationship has two important benefits. First, the Joint Director's endorsement has enabled us to establish government officials as 'rural advisors' to the project. The advisors facilitate our practical outreach by establishing contacts with farmers, helping to organise training workshops and festivals, and making periodic visits to ensure that farmers are correctly employing their training (e.g. by regular pan trapping of insects in their fields). The second benefit is that the Joint Director is enthusiastic to spread the project's usable outputs of policy and practice throughout the Tripura region.

A second success has been the recruitment of an additional research fellow, Supratim Laha, for a self-funded PhD programme in the Centre for Pollination Studies at the University of Calcutta. RF Laha's project is to provide a scientific basis for a seed mix that can be sown by farmers to improve the ecosystem services of pollination and pest control. Specifically, RF Laha will identify readily grown native plants whose flowers best support pollinators and whose foliage harbours natural predators of principal insect crop pests. The seed mix could become an important usable output from our project.

Whereas the above achievements provide added value, we are also pleased to have formally founded the base for the Centre for Pollination Studies with the full support of the University of Calcutta and to have established a laboratory/field station in each of our target regions, Tripura and Odisha (Orissa).

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2012-2013

Project summary	Measurable Indicators	Progress and Achievements April 2012 - March 2013	Actions required/planned for next period
<p>Goal: 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</p> <ul style="list-style-type: none"> ⇒ The conservation of biological diversity, ⇒ The sustainable use of its components, and ⇒ The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources 		<p>(report on any contribution towards positive impact on biodiversity or positive changes in the conditions of human communities associated with biodiversity eg steps towards sustainable use or equitable sharing of costs or benefits)</p>	
<p>Purpose To improve national and local understanding of the status of native pollinators, their ecology and their management for the benefit of local farming communities and the protection of the agro-ecosystem in partnership with Calcutta University, local government and local civil society organisations.</p>	<p>Provision of information about pollinator distribution.</p> <p>Improved understanding of native pollinator ecology integrated with information on pollinator-dependent crops' pollination.</p> <p>Local people engaged and convinced about need to maintain a healthy pollinator population through conservation of healthy habitat.</p>	<p>Long term monitoring (LTM) protocols established, fine-tuned and set up in Tripura and Odisha</p> <p>Research students trained in sampling and monitoring. Experimental protocols in place. Field staff trained by RF and Post-doctoral RF. Field keys developed (in process) for farmers and field staff.</p>	<ol style="list-style-type: none"> 1. Long term monitoring to continue. 2. Better understanding of the Plant pollinator network along the agricultural intensification gradient. 3. Farmers taking over long term monitoring with only minimal supervision from CPS staff.
<p>Output 1. . Monitoring framework for pollinators established.</p>	<ol style="list-style-type: none"> 1. a1 Post-doctoral level Project Manager 2 senior level Research Fellows trained in pollinator survey and ecology, data management and analysis. 	<p>Post-doctoral Project Manager appointed. Two Research Fellows appointed. All were trained in pollinator survey, data entry, sample preservation and they have been working from the field stations in two states (Evaluation report by James Cresswell in Section 4). Training in pollination biology given by JC April 2012 (See Appendix 14 Teaching material)</p> <p>Training for research staff on long term monitoring, database structure</p> <ol style="list-style-type: none"> a. Research staff along with field staff sorting and building up sample repository b. Research staff maintaining databases c. Research staff pursuing their respective research projects (reports of research staff in appendix) 	

Project summary	Measurable Indicators	Progress and Achievements April 2012 - March 2013	Actions required/planned for next period
	1. b 4 Field assistants trained in pollinator survey and basic data-entry.	4 field assistants in place, trained in pollinator survey and basic data-entry. Trained by RF. Rural advisory in Tripura in place and been providing necessary logistic support including laboratory space in governmental laboratory (Appendix 6). Additional advisory staff provided by Tripura Government (Appendix 6). Orissa rural advisory being decentralized due to resignation of appointed Rural advisor, subsequent unavailability of suitable senior person and ground realities (distant study nodes make it difficult for a single person to provide effective services).	
	1. c A minimum of 36 enthusiastic members of the local farming community trained in simple survey techniques to enthuse and engage the local community.	150 farmers trained at 'Farmer festivals' in simple survey techniques (Pan trapping).	
	1. d A network of fixed points and / transects for pollinators at each location in place.	A network of fixed point transects have been set up. Research staff set up long term monitoring sites in Tripura and Orissa.	
Output 2. Baseline information	a. Base-line information regarding pollinator diversity in the east Indian states of Orissa and Tripura	Database of base-line information established and data currently being processed and entered.	
	b. Assessment of key pollinator species and determination of their ecological requirements.	Experimental work on crop pollinators and the ecology of key pollinator underway (PhD Arnob Chatterjee). Experimental work on plant pollinator networks underway (PhD Pushan Chakraborty) (Scientific evaluation Section 4).	
Activity 1.2 Farmers' awareness cum training camps on long term monitoring and importance of pollination in agro-ecosystem			
Output 3. CPS and satellite field centres established. CPS acting as a hub for pollination ecology in Eastern India and the field centres acting as data collection centres and advice and outreach to local farming community.	a. CPS integrated into the Centre for Modern Biology at Calcutta University.	Formal communication from Calcutta University integrating CPS into Centre for Modern Biology and photographs in Appendix.	
	b. Future funding for field centres established.	Funding for field stations not yet secured from Govt. of India. Fund waited from Department of Science & Technology, Govt. of India.	
Output 4. Local engagement and increased capacity among farmers to manage pollinator population.	a. Functioning advice service at CPS field centres established.	Two 'Farmer Festivals' organized in Orissa (Appendix 3)	
	b. Advisors employed and trained.	The new advisors are in the process of being trained.	

Annex 2 Project's full current logframe

The project logframe remains unchanged from the original application. We plan to revisit it as part of the PME process.

Annex 3 Onwards – supplementary material (optional but encouraged as evidence of project achievement)

This may include outputs of the project, but need not necessarily include all project documentation. For example, the abstract of a conference would be adequate, as would be a summary of a thesis rather than the full document. If we feel that reviewing the full document would be useful, we will contact you again to ask for it to be submitted.

It is important, however, that you include enough evidence of project achievement to allow reassurance that the project is continuing to work towards its objectives. Evidence can be provided in many formats (photos, copies of presentations/press releases/press cuttings, publications, minutes of meetings, reports, questionnaires, reports etc) and you should ensure you include some of these materials to support the annual report text.

Checklist for submission

	Check
Is the report less than 5MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	
Is your report more than 5MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line.	
Have you included means of verification? You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	
Have you involved your partners in preparation of the report and named the main contributors	
Have you completed the Project Expenditure table fully?	
Do not include claim forms or other communications with this report.	