Darwin Initiative – Final Report

Darwin project information

Project Reference	16-007
Project Title	Building Capacities for Mitigating Human-Elephant Conflicts in Assam, India
Host country(ies)	India
UK Contract Holder Institution	North of England Zoological Society (Chester Zoo)
Host Country Partner Institution(s)	EcoSystems-India
Darwin Grant Value	
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Project Leader Name	Alexandra Zimmermann
Project Website	www.assamhaathiproject.org
Report Authors and date	A. Zimmermann, N. Hazarika, S. Wilson, T. Davies

1 Project Background

Assam in northeast India is considered a high-priority area for elephant conservation because the Himalayan foothill forests provide one of the largest remaining habitats which, however, is under acute threat from deforestation and among the most severe hotspots of human-elephant conflict in the world. This conflict has become an annual occurrence resulting not only in loss of crops, but also destruction of houses and loss of human lives, and in turn, retaliation against elephants. The main aim and achievement of this project has been to reduce this conflict in two of the worst-affected areas (Sonitpur and Goalpara districts), in order to stabilize local people's tolerance of wildlife and willingness to participate in conservation.

2 Project support to the Convention on Biological Diversity (CBD)

The work of this project aligned with two main objectives of the CBD, particularly Article 8: to conserve biological diversity (elephants and their habitat), and to share the benefits of biodiversity equitably (reducing the costs and risks of living with elephants). The CBD national focal point, Ministry of Environment and Forests (MoEF)'s *Project Elephant* was established in 1991 to develop strategies to conserve the elephant and its habitat, with particular emphasis on mitigation of human-elephant conflicts. The state (Assam) Forest Department's efforts to reduce conflict are governed by MoEF Project Elephant guidelines and our project has complemented the local FD's efforts to reduce human-elephant conflict (HEC). The project has provided: (1) training to the Department in use of deterrents, (2) inputs for state action plan on HEC mitigation and (3) services as resource persons for the Department's HEC-related awareness programmes.

3 Project Partnerships

A pre-Darwin pilot phase of this project laid the foundation for a good relationship between the North of England Zoological Society (NEZS) and EcoSystems-India (ESI), the host country partner. An MOU was signed in this early phase. The emerging partnership was then strengthened and secured by the Darwin Initiative support.

In this project, NEZS managed the overall strategic vision and provided human-wildlife conflict research expertise, scientific advice, GIS skills, marketing, and was responsible for financial control and liaison with media and scientists. ESI provided expertise in community-based conservation and was responsible for the recruitment and supervision of field staff, monitoring of workplans, management of local finances, purchase of equipment, collaboration with additional partners in India and liaison with like-minded projects in Asia, and the dissemination of outputs and contact with media within India.

The partnership became a great success for three reasons: 1) each partner was allowed to take leadership in the type of work they do best, 2 the two project co-leaders (A. Zimmermann in the UK and N. Hazarika in India) and their respective teams developed an excellent working relationship, and 3) the support from the Darwin Initiative provided financial security and instilled confidence through its feedback and encouragement.

As a result, the two institutions were very keen to continue to work together beyond this grant, and were delighted to have been successful in securing Post-Project funding, which begins in October 2010.

NEZS and ESI realised that certain aims would be better achieved by enlisting the input of further partners in the host country. While NEZS and ESI masterminded the project overall, we sought advice and technical guidance from the following additional partners:

The Pygmy Hog Conservation Programme (partner in Darwin Project 15-017) provided technical skills and advice for electric fencing, solar-power solutions, construction and maintenance. They also took part in many of our project meetings and provided valuable feedback and ideas.

The Centre for Environmental Education (partner in Darwin Project 06-017) advised our project on all education work, helping us to produce training materials and run workshops. Their regional experience helped ensure quality control in the educational components of this project and wide dissemination across the region.

Rashtriya Gram Vikas Nidhi (RGVN) is a national rural development organisation engaged in extending micro-credit to communities for the promotion of alternative sources of income. RGVN advised the communities we worked with in how to access micro-credits, for the sustainable livelihoods component of this project.

The Energy and Resources Institute (TERI) is a national research institute specializing in sustainable solutions in the fields of energy and environment. TERI assisted our project with training workshops on sustainable methods of agriculture and cultivation of alternative cash crops, including chilli.

The Department of Agriculture, Government of Assam, is a state agency with the primary responsibility of formulating and implementing policies and programs for achieving agricultural growth through optimum utilization of agricultural resources. Through its agricultural extension services, the Department assisted us with training workshops for the farmers in our project areas.

The Animal Husbandry and Veterinary Department, Government of Assam, aims to build the capacity of livestock farmers and generate employment through capacity-building, facilitated through associations with NGOs. The Department helped the project conduct training events in sustainable livestock-rearing and income generation.

The involvement of local partners in the capacity building activities (livelihood, environment education, micro credit) proved to be a mutually beneficial exercise. While the project was able to harness the expertise and advice of the resource partners, they in turn took this opportunity to fulfil their organizational mandate of extending services to rural community members.

The project, which is known locally as the "Assam Haathi Project", grew to be known and respected very quickly in Assam. This is because our strategy was to focus on the very specific (and very high-profile) issue of human-elephant conflict. As a result we became known locally as experts in the topic and gained respect among peer organisations, which then gave us the necessary platform from which to attempt to take on the leadership needed for future objectives: a) a major scaling-up of efforts (to follow in our Post-Project phase) and b) to initiate a larger collaborative effort for elephant conservation in the region (described in section 4.3)

4 Project Achievements

The project's achievements at the higher level are set out in the logical framework, the results of which are described in Annex 1.

4.1 Impact: achievement of positive impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

Mitigating human-elephant conflict is a short-term measure, but one which is the essential first step towards long-term conservation of elephants and their habitats. Unresolved conflicts are a considerable obstacle to larger conservation efforts. The aim of this project has been to focus on addressing conflicts, therefore the impact of this work needs to be assessed within these aims, rather than what larger effect on biodiversity in the region we may have had.

Measuring impact in conservation (as opposed to activities) is inherently difficult, in particular because the effects on species or habitats usually take longer to emerge than a typical project duration. In 2004 the project leader was part of a team that proposed a method for measuring impact (Mace *et al* 2007 in "*Zoos in the 21st Century*" Eds. A. Zimmermann et al. Cambridge University Press) in which impact was scored by measuring *Importance x Volume x Effect.* Although imperfect, this approach is one possibly useful way to comment on the project's impact.

Importance: our project worked in one of the world's worst areas of human-wildlife conflict (in terms of extent and severity of damage and loss of lives), and within that area (Assam) we focussed on the two worst-affected districts, as suggested to us by the Forest Department at the outset of the project. In the communities affected there were injuries and deaths from elephants, fatal retaliation against elephants (electrocution, poisoning etc), extensive loss of crops, a lack of alternative income sources, destruction of houses and property, and unhelpful habits (e.g. brewing alcohol). Under such serious circumstances, any attempts at larger-scale elephant conservation (e.g. habitat restoration) would have been impossible. By mitigating the worst of the conflict and providing a methodological model for other regions, this project has therefore opened a door for long-term and landscape-scale conservation efforts.

Volume: the number of villages we worked with was small, limited by the number of people we could train as field staff to work with communities in situ. However, we had expected the work with focal villages to expand on its own to neighbouring communities. In total we were able to help 11 communities directly (project villages), 26 indirectly (neighbouring villages) and distribute copies of our self-help book to hundreds of households. Through our training events

and workshops on alternative livelihoods we were able to provide assistance to around 300 people.

Effect: the short-term effects of our project are evident in the data we gathered on depredation, damage, and attitudes. The extent of crop-raiding and damage to property has decreased considerably in both our study sites, and there were no further injuries and deaths in our project villages (see also details in section 4.3)

Therefore this project has had sufficient impact in its three-year term to have made it worthwhile in terms of effort and cost-benefit, and certainly worth continuing through its Post Project phase, where it is set to achieve even greater impact and legacy.

4.2 Outcomes: achievement of the project purpose and outcomes

This project's purpose was "to facilitate the conservation of elephants by mitigating HEC in Assam through: 1) capacity building to protect communities from elephants, 2) fostering knowledge and tolerance of elephants, and 3) studying the spatial patterns of elephant herds for land-use strategies & local implementation of the CBD".

The project has achieved good progress towards these goals. The capacity of communities to protect themselves from elephants has increased dramatically, and linked to this, attitudes about the conflict have become more positive. Our data (currently being analysed for publication) suggest, for example, that in both the project focal villages and the neighbouring villages, people feel that the conflict situation has "improved", and that they are now "more able" to deal with depredation than before. This is not the case in our control observations in villages elsewhere that did not receive help from our project – in these villages, people feel the situation has "deteriorated" and that they are "less able" to cope.

One other important indicator of success is the interest that the project has generated in surrounding communities. We focussed our efforts on a small number of "project villages" hoping that this would lead to curiosity and a "copycat" effect among neighbouring communities. Training and information workshops were made open to neighbouring villages, and were well attended. This effect of influencing neighbours is the reason we exceeded our targets (under the output code 6A, see Annex 4). We plan on continuing this very cost-effective self-replication strategy in the Post Project.

4.3 Outputs (and activities)

Output 1: Capacity to manage crop raiding: Our project has considerably increased the capacity of local people to defend their property and crops. We have 37 villages (11 project villages and 26 neighbouring ones) actively participating in crop-protection trials, with 8 field assistants trained in crop protection methods and >150 community members trained by field assistants. The response of the neighbouring communities to the use of mitigation methods was overwhelming with about 40 people being trained by trainees of the project. As a result, in Goalpara almost all villages in our study area are aware and employ deterrents and barriers promoted by us. In addition, on request, training was provided to Army personnel and the Department frontline staff in use of deterrents/barriers such as trip wire, chilli fencing, and chilli smoke.

In Sonitpur district we have observed a decrease in crop damage from 113ha in 2006 to 25ha in 2009 and reduced elephant deaths to zero within our project village areas. In Goalpara district we have observed a decrease in property damage from 1.5 buildings damaged per incident to 0.07. Knowledge of crop-protection methods has also greatly increased amongst our study areas, and the skills are being passed on to others. We also translated compensation guidelines into local language and prepared a format for the application process for elephant damage victims. These were distributed in Sonitpur and Goalpara. Project staff also assist villagers with recording evidence and notes when needed.

Output 3: Supplementary livelihoods: We held 25 workshops about alternative livelihoods and income generation, as a step towards helping families offset the economic risks and losses of tolerating elephants in their environment. These events included training on cash crop cultivation (chilli, ginger, pepper, turmeric) and better animal husbandry practices. Over 20 Self

Help Groups (SHGs) acquired new skills in micro-enterprise development such as jute handicrafts, food processing, incense stick making, and book keeping. As a result of our training events, around 300 people are now engaged in various supplementary livelihood activities.

Output 4: Education & information: Public awareness meetings and demos on elephant depredation issues were organized regularly and invitations extended frequently to non-project villages to visit our project sites. Field staff members were often invited by villages further afield to provide advice and assistance. We produced a self-help handbook called "*Living with Elephants in Assam*" to assist communities, as we did not have the staff capacity to meet the demand for help. The full-colour handbook is available in Assamese and English versions and has been distributed to villages, libraries and schools. We also carried out a survey before and after dissemination of this handbook, to assess the relative cost-benefits of three levels of outreach effort (direct assistance to villages, indirect assistance via neighbouring villages, and no assistance but provision of self-help handbook only). We are currently analysing the data for publication.

Output 5: Research: We have been modeling the spatial and temporal patterns of conflicts in an attempt to produce a predictive model of depredation. We have also assessed the effectiveness of the crop protection methods and working on a detailed study of elephant foraging habits to determine whether there are any physiological or nutritional drivers for elephants to raid crops. Our research topics are described in more detail in section 4.5. We are in the process of producing 5 papers for peer-reviewed journals; have published 6 articles in various magazines (see Annex 5 for a list of publications) and been featured in local news articles around 10 times

Output 2: Alliance for collaboration: We hoped to create an alliance of organisations working on elephant conservation in Assam. We attempted this first at the very beginning of the project but the effort didn't set roots, so we tried again at the very end of the project, and this time, succeeded. This was probably because after three years we had become better known and respected for our work. So, in the last month of the project, we invited all organisations working on elephant conservation in Assam to a consultation meeting, and succeeded in creating the *Northeast India Elephant Conservation Alliance* (www.nieca.org) currently made up of 13 local NGOs. As the initiators of the idea, the other NGOs voted us as the leaders of this initiative for its first term, with our project manager (N. Hazarika) as the alliance coordinator. The objectives of the alliance are: 1) to join combine experiences and skills for the conservation of elephants in Northeast India, 2) to share information, ideas and know-how to enhance our collective capacity towards successful elephant conservation, and 3) to prevent duplication of efforts or unnecessary trial-and-error where the experience of others can be applied.

Output 6: Long-term planning: At the outset of the project we thought that one ought to end with some form of strategy document. It became clear over the course of the project that this would be merely a time-consuming paper exercise, and that local fellow conservation scientists were tired of being asked to attend workshops to produce strategy documents that appear never to be implemented. After some thought, we decided not to go down this document route but instead try to think of a more interactive approach to long-term solutions.

The threats facing the future of elephant in northeast India are diverse and complex, and too challenging for one organisation to tackle on its own. Documents and goodwill alone will not improve the situation, what is required is either a superproject of immense ambitions and funding scales, or a coordinated joint effort of many organisations and stakeholders working together towards a common goal. The alliance we have created is an attempt at the latter. We will be leading this over the next three years and throughout our Post Project phase and hope to see it become established and effective. The benefits of this approach are: 1) Collectively, through an organised framework such as this alliance, member organisations can begin to tackle even the more challenging issues of elephant conservation – those that are too daunting or complex for one organisation to pursue alone, 2) The organisations can pool together their skills and experiences, sharing information on best practice and providing advice, input or technical help to each other as needed, and in turn, make progress on objectives more quickly, and 3) The organisations can act as a joint voice when needed, on issues where the opinion of several is more effective than one alone

Setbacks & Challenges: The project suffered two considerable setbacks, first when our field team leader Dibakar Baruah died in a road accident near his home. Dibakar had been a true asset to the project through his dedication, meticulous work and the respect he drew from the communities he worked with. The same year, there was also catastrophic flooding (in several regions of India). The communities in our study area in Sonitpur suffered severe losses, and our field office too was flooded eight times, with some damage to computers and facilities. Transport to our field work areas was very restricted and of course humanitarian concerns had to take priority for a while.

4.4 Project standard measures and publications

Please see Annex 4 for standard measures and Annex 5 for publications.

4.5 Technical and Scientific achievements and co-operation

Much research was carried out as part of this project - some planned at the outset and some opportunistically as observations lead to new ideas along the way. All research was carried out jointly by UK and India project staff, and some involved MSc students. All data are open-access to project staff and all publications are multi-author, acknowledging the person who did the most work (method design, data analysis and paper-writing) as the first author and all others with active input (conceptual, logistic, or field work) as co-authors. The general oversight and quality control was the task of the Project Leader. The research projects were:

1) Monitoring of elephant movements and spatial patterns of conflict

Essential in any human-wildlife conflict mitigation is an understanding of the spatial and temporal patterns of conflict incidences: where, when and under what circumstances depredations and retaliations occur. Our most fundamental research in this project therefore has been a study of the movements of elephants through the study area.

It was very important that the monitoring of elephants would involve local people – so that both they and we could understand existing patterns better – the first step to stabilizing a situation. Instead of pursuing the scientifically tempting and data-rich but expensive route of using telemetry to track elephants, we used only local manpower. Men from the affected villagers were hired as "elephant monitors", trained in how to identify individual elephants and use GPS units. They then each monitored a given area of the project area map, recording any elephant presences, movements and incidences. Whenever elephants moved out of their monitoring area into the next, they would inform the next monitor, so that the entire study area was covered.

From a sustainability perspective, this method proved to work well in terms of its aim to involve, inform and empower the locals – these monitors gained tremendous insight and a new appreciation for the animals and will continue to pass on this experience to others. It was also very cheap (the cost of remuneration for the monitors and a few GPS units). From a scientific perspective, this method is inferior as it is more open to human error and less data-rich, but on the other hand, it is not donor-dependent, easy to replicate, and much more sustainable in places where community participation is a priority. The first year of data collection had to be considered just a "training year" with too many gaps to be useable in our analyses. This took place in the pre-Darwin pilot phase of our work, so in fact all of the data collected during the Darwin project were useable and we are now just finishing the last of the analyses.

Our project officer Scott Wilson, an expert in GIS, has built a substantial geodatabase over the course of the project and is presently completing spatial analysis and modelling of the elephant movements we have recorded in the both study sites. Key findings include the identification of conflict hotspots, preferred elephant travel routes, and a striking correlation between crop-raiding intensity and proximity to refuge areas such as forest patches and tea plantations. These findings are very helpful for long-term strategic planning. A paper is nearly finished an will be submitted to a peer-reviewed journal in the next few weeks.

2) Evaluation of effects of elephant depredation prevention methods

During the course of the project we tried a number of methods (both deterrents and barriers) for keeping elephants away from crops and houses. These included: chilli smoke, chilli grease on

rope fencing, electric fencing, trip-wire alarms, spotlights, and also watch towers for better vigilance. Careful records were kept in the hope that we could later evaluate which methods were most successful. Generally in human-wildlife conflict mitigation, evaluations of the efficacy of depredation methods are difficult because the effects are so easily biased by external factors (climate variations, interference, etc).

We found spotlights and fences to be highly effective at preventing crop damage by elephants when used in isolation, but when used in conjunction with a lot of noise their efficacy was compromised. In cases where crop-raiding had already begun, only spotlights were found to reduce the extent of damage. Our research assistant Tammy Davies carried out the data analysis and wrote the paper which is in press with *Conservation Letters*.

3) Handbook Evaluation

We produced a self-help handbook for villagers to use as a reference manual on how to use various methods of crop protection. This provided an opportunity to assess the relative cost-benefit of this kind of passive outreach versus the more labour-intensive active outreach of working with communities *in situ*. We wanted to measure any effects on three things - knowledge, attitudes and capacity - before and after dissemination of the handbook, in three different" categories" of villages – our "project villages", the neighbouring villages, and a selection of villages elsewhere which receive no active outreach from anyone. The applied research question is which combination of active work and passive education material yields the highest cost-benefit when needing to tackle human-wildlife conflict across a large area. The results may be of general interest to those working on this topic, and of very specific use to our Darwin Post Project strategy. Data collection has been completed and analysis is underway. The project leader A Zimmermann will prepare a paper over the next few months, aiming for submission to a peer-reviewed journal in early 2011.

4) The effects of kunki drives as an HEC control method

A kunki (or koonki) is a tamed elephant trained specifically for the capture of wild elephants, which is done in a chasing and herding manner under the command of mahouts. In the last few years, kunkies have been used (by others) in the Sonitpur district as a method to drive away crop-raiding elephants. It appears that this method in some cases causes more damage than good (trampling of crops by both wild and kunki elephants during the mayhem of the chase). We are also concerned that this chasing of elephants causes the wild herds to split up and lose each other, leading to considerable stress, which may later develop into dangerous direct aggression towards people (as has been observed in Africa and West Bengal). We have carried out an interview survey on opinions about this method with villagers, mahouts and officials and are presently analysing spatial patterns of herd sizes and crop damage before and after kunki chases. Data collection has been completed and analysis is underway. The project leader will prepare a paper in early 2011 for submission to a peer-reviewed journal.

5) Threshold levels of forest loss and HEC incidences

An interesting research question arose over the course of the project: does human-elephant conflict increase gradually as forest cover decreases, or is there a threshold or "tipping point" of forest loss at which conflict escalates suddenly. Knowing the answer to this could be useful for future forest protection policies. We had an opportunity to investigate this by suggesting it as an MSc research project for an American student at Oxford, Laura Chartier. She did a particularly excellent job, using a combination of GIS analyses of historical land cover images and field questionnaires with village elders, and concluded that HEC does not increase gradually, but that is indeed linked to a marked "tipping point" of forest loss. The resultant paper has just been finished and about to be submitted to *Oryx*.

6) Human-elephant conflict and optimal foraging by elephants.

An applied research question has been on our minds since the start of the project: why would wild elephants leave the relative safety of the forest each year and venture into human-dominated landscape to feed on crops, despite the considerable harassment they received in return, which particularly for herds with calves, is very risky. From a behavioural ecology point of view this could be simply a matter of optimal foraging – that the quality and/or quantity of food obtained is worth the risk and effort. Hence we wanted to know what nutritional components may or may not be influencing the elephants' foraging decisions. Perhaps the

available forage in the forest is extremely poor at certain times of the year, or there are certain mineral deficiencies driving the elephants to feed away from safety.

The project leader and Chester Zoo's Nutritionist, Andrea Fidgett, devised a research project to investigate these questions. Background research was carried out with the help of an intern (J. Caine) and our research assistant (T. Davies), and for the data collection we teamed up with an MSc student in Assam, Bidyut Das, who is developing part of this work for his thesis.

Initially, we had in mind to collect data for one year (to cover all season), but we have recently decided to continue the data collection for a second year in order to strengthen the analyses and reduce bias in the data. Hence this work continues at present in data collection phase and will probably be completed by late 2011, during the Post Project phase.

Conferences

Members of the project team attended around 10 scientific conferences between 2007-2010, where preliminary results of some of the above research, and/or general presentations about the project concept and approach were given. All powerpoints and posters showed the Darwin logo and talks specifically pointed out the Darwin grant funding the work.

4.6 Capacity building

Capacity building has been the central theme of this project and has benefited institutions, staff, students, and communities. For the two main partner organisations, the project has become their flagship conservation programme. The UK partner, Chester Zoo/NEZS, has built its own capacity to be an effective project partner, while the host country partner, EcoSystems-India has been able to build a strong foundation from which to plan for further conservation activities.

The most significant effect has been on the field staff in India. The field team coordinators, assistants and monitors have acquired an excellent range and variety of skills. Field-based project staff and helpers are now adept at using GPS and digital cameras, are well versed in participatory rural appraisal methods, and can independently collect data on elephant movements and incidences, and record these into the computer database. Working closely with the other partners, the staff have been able acquire additional skills in organising community events and dealing with public relations. Additional skills such as book keeping, installation and maintenance of equipment and driving motorcycles were also attained. The India staff have had many opportunities to attend international conferences and network with various global organisations working on elephant conservation. Visits to Chester Zoo have provided training in data quality control, GIS mapping, survey design methods, and experience in cross-cultural collaboration and overseas travel.

9 Assamese staff spent a total of 18 weeks in UK (project manager, advisors, field team leaders, field assistants). 5 UK staff total spent a total of 17 weeks in India (project leader, project officer, research assistant, head of division, nutrition research advisor). 6 students collaborated with our project: 4 Indian (of which 1 Assamese) and 1 American, all studying for their MScs at Oxford University, and 1 Assamese studying for his MSc at Guwahati University in Assam.

The communities that the project worked with, as well as a number of surrounding villages, have benefited tremendously from the project, acquiring skills and knowledge including: how to protect their crops and houses from elephants, how to grow a variety of cash crops and how to apply crafts and existing skills into products for additional income, how to grow and use chilli as an elephant deterrent and a cash crop (a video demonstration of this was also made, which is available on youtube (http://www.youtube.com/watch?v=ManoapcEg6g), and how to apply for compensation for elephant damage (a help sheet on this was prepared and distributed to around 1000 households).

4.7 Sustainability and Legacy

As anticipated at the outset, this project is leaving a legacy by:

1) Making a real difference to the mitigation of a long-standing conservation conflict which is one of the highest priorities for people and government in the region (via our community outreach work, capacity building, practical measures for crop protection and assistance with livelihoods)

2) Having become a model project, training key people and giving inspirations to others do pursue similar work in other areas (through an open approach emphasising benefit sharing and exchange of information through the frameworks that the project has constructed). A number of organisations in other parts India, and even SE Asia and Africa, have contacted us for advice and idea-sharing.

3) Through its collaborative framework, attracting more talent and international attention for conservation and sustainable development expertise into the region (many graduate students contacted us, and we have fostered links with experts from other parts of the world).

4) Creating a succession of training and capacity building in a variety of areas, from sustainable livelihoods (thereby also connecting poverty alleviation with conservation) to research skills.

5) Leaving, on exit, an established collaborative framework for NGOs to work together to begin to tackle the daunting long-term elephant conservation tasks such as habitat protection (via the creation and leadership of the Northeast India Elephant Conservation Alliance).

Our work will now continue through the Darwin Post Project grant, in which we will scale-up our efforts and build on the lessons, experiences and partnerships gained in this project, and expand our work to the whole state of Assam. The Post Project will continue to work with villages to protect crops and houses, while increasing the extent and level of work for sustainable livelihoods – assisting especially those households below the poverty line with new income generation. Furthermore, we will add a new element of demonstrating the possibility of community-based re-forestation and reduced use of firewood, and carry out more extensive education activities, as well as an Assam-wide survey to document the patterns of human-elephant conflict across the state.

5 Lessons learned, dissemination and communication

The lessons learned were manifold and the experience gained tremendous. We pursued only low-tech, low-cost methods in this project, thinking that this would be the more participatory and sustainable approach, and this proved to be true.

Local knowledge of political, cultural and economic dynamics were key, in particular in gaining the initial trust and participation of communities. Careful selection of communities to focus our efforts on helped establish the project firmly. Early "quick win" mitigation methods were used to gain initial interest and buy-in from communities, allowed more experimental or slower-return measures to follow. The employment and training of staff from local villages was also invaluable in promoting the project within communities and achieving an sense of empowerment within villages. The low-cost nature of the mitigation methods also made them easily replicable, allowing neighbouring villages to copy ideas and therefore extending the impact of our efforts.

The communities in the areas we worked came to know the project by word of mouth and by receiving copies of our "*Living with Elephants in Assam*" handbook. Information of scientific and conservation practice interest was disseminated via talks and posters at conferences, workshops, publications, our project website, and meetings and communications with colleagues and peers.

Chester Zoo receives over 1.3 million visitors each year, and the first exhibit visitors encounter is the elephant enclosure, in which we have signs about the project, with pictures and the Darwin logo. When the enclosure was renovated a few years ago, it was themed as the "Elephants of the Asian Forests" exhibit, specifically using this project as the inspiration for conservation messages to the public. The Assam project is the zoo's flagship conservation programme and generates the most interest from visitors and the media. The zoo has a

professional media and PR department, which allows us to pursue promotion and awareness opportunities.

The project has been featured heavily in internal and external literature, talks to zoo members, staff and visitors and on the zoo's website, and has its own website, www.assamhaathiproject.com The project is also well-known within the wider zoo community (featured at zoo conferences etc) and in 2008 won the British and Irish Association of Zoos and Aquariums (BIAZA) Best Conservation Project award.

We were approached many times by various filming companies and broadcasters, including BBC and National Geographic, and took part in one documentary made by an independent filmmaker for Animal Planet on Discovery Channel. The original plan was for this documentary to feature our project exclusively, and so the project leader, project manager and field staff spent considerable effort assisting the film crew. Unfortunately, the TV channel later decided to change the slant of the programme, showing only the conflict problem but not the solutions provided by project like ours. Footage from our week of filming together was included, but to our great disappointment the project was not named or described.

The dissemination of information, materials and promotion will continue during our Darwin post project phase (Oct 2010 – Sep 2012).

5.1 Darwin identity

This project was distinctly a Darwin project, as the Darwin Initiative was the sole outside funder (in addition to the matching input from NEZS). As we considered Darwin 'branding' of great benefit to the project and the reputation of the organisations, we displayed the Darwin logo on all appropriate visual material (e.g. leaflets, the handbook, workshop banners, the project website at www.assamhaathiproject.org, signs at the zoo, etc) and mentioned the Darwin Initiative in all publications (press and scientific). We even put a Darwin sticker onto a vehicle that NEZS bought for the project from other (non-Darwin) funds (because the vehicle is being used for a Darwin project).

In Chester Zoo we have signs in the elephant exhibit describing the work of the project, which show the Darwin logo. These are seen by most of the 1.3 million visitors per year, as almost all venture into this exhibit during their visit. In the host country, the Darwin Initiative is familiar to those organisations that have international partners or larger projects, and is highly regarded.

6 Monitoring and evaluation

In order to monitor and evaluate the activities of the project, we recorded observations and collected data on the conflict situation in our project sites at the start of the project and throughout our activities. These data include spatial information (movements of herds, locations of depredations) and observations of community capacity, knowledge and attitudes.

The indicators of the logframe were used as a reference point to check progress when producing half yearly and annual reports for the Darwin Initiative. In addition to actual measurable data, we also noted informal indications of whether our project was successful – for example the extent of surplus demand for assistance by neighbouring communities, and the number of requests for training and advice by peer organisations.

The most helpful M&E activity was the Mid-Term Review, where the reviewer from the Darwin Initiative travelled to Assam to see the project first hand and provided very helpful suggestions. This effort was very much appreciated, as it was helpful to hear a constructive external point of view. The recommendations from the MTR, and our responses to these, are described in section 5.2.

6.1 Actions taken in response to annual report reviews

The reviews of our annual reports and the Mid Term Review, were studied together with the host country partner. The comments received in Annual Report Reviews were minor queries that were addressed during the course of the project. The Mid-Term Review provided recommendations, most of which could be implemented, or have been planned into the Post Project.

Recommendation: "Strengthen and deepen the local partnerships in strategic ways over the remainder of the project to enhance sustainability": The creation of the alliance has already strengthened our partnerships, and in the Post Project we will work with even more local partners, which means deepening the partnerships because the larger scope of the new project will require more input from them.

Recommendation: "Reconsider what exactly output 2 [the creation of a forum or alliance] is trying to achieve and how is might be best sustained in the long-term". As described in section 4.3, the alliance is an experimental approach to developing long-term conservation measures for elephants in Assam, as well as a much-needed forum for the exchange of information and advice, to increase collaboration and reduce duplication of efforts and inefficient trial-and-error approaches.

Recommendation: "Consider instituting a 1-2 day annual 'symposium' or similar event that may be more effective and sustainable than maintaining a network to stimulate shared leaning": After much consideration we did not go for the symposium approach, because there have been quite a few of these in Assam lately (by NGOs and by government) and the stakeholders were becoming cynical about such events. Instead, we held a 1-day open forum for the creation of the alliance.

Recommendation: "Document the financial and human cost of HEC to local communities": This was beyond our available staff time during the main project (we were already working on six other research projects) but this is now underway for the Post Project. We have teamed up with an Assamese PhD student at Oxford who is doing his thesis on the social geography of elephants-people relationships, and who will focus on this topic for one of this thesis chapters. The detailed methodology has already been worked out and the research is about to start.

Recommendation: "Include individual community leaders representative of communities suffering elephant conflict": Community leaders have always been involved in our work with the villages, so this recommendation has reminded us of the importance of this.

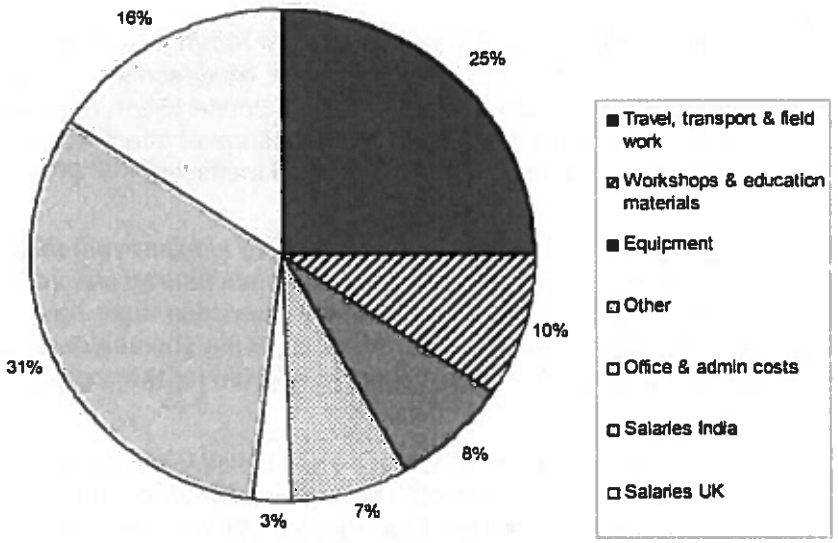
Recommendation: "Take a more institutional capacity building approach during the remainder of the programme focusing on Self Help Groups and NGOs": We did this by increasing our efforts with practical workshops and training sessions for alternative livelihoods. More extensive work along these lines is planned for the Post Project.

Recommendation: "Where appropriate transition project interventions into small businesses as part of a service supply chain for enhanced sustainability": We didn't have the background knowledge an skill base to do this, so we're now looking into this suggestion via our new partners for the livelihoods component in the Post Project.

7 Finance and administration

7.1 Project expenditure

The project budget was £179,750. 81% of the budget was spent in India. Of the remaining 19% spent in the UK, most (85%) was used for one full-time research assistant salary, the remainder for miscellaneous costs such as remote sensing data, UK travel and research materials. The chart below shows how the grant was spent as a breakdown of categories. Detailed expenditure tables have been provided to the Darwin Initiative throughout the project period via the standard claim procedures.



7.2 Additional funds or in-kind contributions secured

In addition to matched funding and in-kind contributions from NEZS we did not actively seek any other funding, as the Darwin grant was sufficient. We received a donation of £1000 from the Discovery Channel for our input into the documentary filmed at our project sites and some small donations (a few hundred pounds) from zoo visitors. These donations were allocated towards village assistance costs in Assam.

In India there were also some in-kind contributions: the host country partner EcoSystems-India (ESI) contributed additional staff time (the project manager and several team members put in an extra 2-5 man days every month) and ESI provided the use of vehicles, infrastructure, and assistance for visitors.

Most importantly, the communities contributed in kind and in small funds as well. They contributed materials such as wooden posts, and many hours of labour, towards tasks such as constructing fences. Although the project could have paid for these, their contributions instilled a sense of ownership and responsibility. The villages also now maintain their own small fund for maintenance costs and repairs of fences etc.

7.3 Value of DI funding

The Darwin support has made this project a much better project than it otherwise would have been. This is because the Darwin format provides a solid structure, demands accountability, and provides helpful feedback. The Darwin funding has made this project not only possible, but successful. It has given us three years of worry-free time to concentrate entirely on the task at hand and achieve results. The funds and structure together have been a receipe for much more rapid progress and enabled the project to achieve its aims and lead to a greater impact. The Darwin reputation has also given the project and the two lead institutions (Chester Zoo and EcoSystems-India) extra credibility, helpful for pursuing similar work in the future.

Damage by elephants

Elephant killed in retaliation

Elephant identification training

Elephant tracking training

Incense stick making workshop

Livelihoods session with women

Sharing results

Demonstrating methods

Annex 1 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements June 2007 – May 2010	Actions required/planned for next period
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 • 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			
Purpose To facilitate the conservation of elephants by mitigating HEC in Assam through: 1) capacity building to protect communities from elephants, 2) fostering knowledge and tolerance of elephants, and 3) studying the spatial patterns of elephant herds for land-use strategies & local implementation of the CBD	Improved capacity of communities to protect crops & property from elephants. Positive attitudinal change from passive to more pro-active participation. Increased understanding of HEC patterns and causes. Improved information about elephants' movements. Increased collaboration among stakeholders. Overall decrease in HEC (both human & elephant losses).	The project's purpose has been fulfilled, all outputs have been achieved. Details below.	
Output 1. Capacity of focal community members to develop, maintain and adapt elephant damage control measures.	a) 8 villages actively participating in crop/house protection trials by yr 1 b) 2 people/village trained and able to train others by yr 2. c) all field staff able to collect monitoring data to scientific standard by yr 1 d) 60% or more reduction in HEC incidences by year 3.	a) the project worked with 11 villages directly, plus 26 neighbouring villages indirectly. b) 40 villages benefited from our training activities. Many of these actively sought assistance after observing successes at the main villages with which we worked. c) all field staff were trained by the end of year 1 and were able to collect and compile monitoring data to a reliable, scientific, standard. d) 73% average reduction of crop and building damage in 'project villages' (i.e. those we worked with directly) (preliminary data, detailed analyses in prep). In the two districts as a whole (ie not only the project villages) depredation was reduced on average by 38%. In our project villages there were no deaths or injuries to people or elephants. In other parts of the two districts where we did not work, however, some injuries and deaths of both people and elephants did occur.	

Activity 1.1 Community-based crop/house protection trials and training activities (Design HEC rapid assessment protocol and collect baseline data for each site. Hands-on training to construct trip wires, chilli-grease fences, etc, specific to each village. Monitor crop-raiding attempts, analyse results, adapt/improve deterrent methods, hold participatory evaluation discussions)		These activities have all been completed and will be replicated in new areas of Assam during the forthcoming Post Project. Communities have been an integral part of the complete mitigation process from initial planning to implementation and maintenance. Over 100 villagers in total have received training in mitigation techniques. Mitigation logs have also been used throughout to record incidences and effects of interventions. Regular participatory evaluation with villagers has also helped assess which measures are deemed most useful/successful by the villagers. Communities where mitigation has been successful have been very keen to take part in more experimental techniques (and the monitoring of these).
Output 2. Creation of a forum or alliance of local NGOs and FD working on HEC issues in the region	a) proposal agreed with local NGOs/FD by end yr 1 b) meeting with participants to agree communication methods and field exchanges in yr 1	a) a successful relationship with relevant government officials has been essential to help facilitate this project. b) we have initiated the formation of an alliance of conservation organisations/groups in Assam and created the Northeast India Elephant Conservation Alliance (www.nieca.org).
Output 3. Improved community attitudes and interest in reducing dependency on subsistence crops	a) participation in supplementary livelihoods initiatives, e.g. cash crop cultivation by yr 2 b) positive attitudinal change in 60% of community by yr 3.	a) several villages are experimenting with alternative and elephant unpalatable crops. Many villagers have received high cash return from growing chilli, which is encouraging other farmers to trial this crop also. b) there has been a positive shift in attitudes among the 'project villages' and the neighbouring villages. See section 4.2 for details.
Output 4: Education materials, and workshops on conservation and HEC mitigation, as well as media support of the project	2. a) HEC mitigation handbook produced and distributed to communities by end yr 1. b) workshops held in different communities annually – yr 1-3 b) 5 or more features in local media by yr	a) the handbook has been produced in English and Assamese, and has been distributed to >45 villages across both study sites. b) many well-attended workshops have been held throughout the project years. These have covered a variety of themes and have been aimed at various audiences varying from farmers to students. c) The project received a good level of media interest (see also section 5 and Annex 4).
Activity 4.1. Resource and educational materials, socio-economic monitoring, communication (Research and produce handbook on HEC practical advice, distribute and initiate follow-up conversations with communities. Conduct annual workshops in village. Collect data on socio-economics and attitudes: achieved. Initiate HEC forum, propose structure for communication)		Our handbook was distributed widely and a before-and-after evaluation study carried out to observe its effect. The results are in preparation for publication. Annual workshops were conducted and data on socio-economics and attitudes collected for all project villages. Six workshops on elephant depredation and six on alternative livelihoods were conducted. A forum (the NIECA) has been created, with background documents, an agreed

		governance structure, and a website.
Output 5: Information about regional elephant movement patterns and conflict hotspots, past and present, in relation to socio-economic activities, landcover and mitigation measures	a) standardized HEC rapid assessment protocol designed and in use by yr 1 b) GIS database of elephant spatial information by yr 2 c) spatial and temporal analysis of elephant movements by yr 3 d) compilation of HEC history from FD records & interviews with villagers yr 2 e) Postgraduate opportunity for an Indian student to investigate the spatial and behavioural needs of elephants by end yr 1	a) Field staff training ensured consistency in the methods used to collect data, using prepared protocols. b) a geodatabase was used to store these data and facilitate GIS analyses. The database was designed so that data could be directly entered by field staff in a standardised way and in the correct format. c) Spatial and temporal analysis of depredation patterns and elephant movements is in preparation (see section 4.5 for details) d) Forest Department records were collected, digitised and have allowed a historic comparison of conflict patterns e) We created an opportunity for an Assamese MSc student to obtain his degree by working with us in the nutritional analysis of crop-raiding (see section 4.5 for details)
Activity 5.1. Elephant research, GIS mapping, spatial analysis and recommendations (Review elephant research methods from pilot work.. Analyse elephant movements, HEC, land cover, nutrition of crops vs forage.GIS maps & spatial analysis and publish results. Produce report with land-use management recommendations. Identify project follow-up needs.		These activities have all been completed and papers on the results are in press or about to be submitted to peer-reviewed journals. Results from our were presented to the government at workshops to which project personnel were invited. The Post Project builds on some of the research results.
Output 6: Land-use strategy for elephant conservation in the long term	a) elephant research results provide insights into land-use strategy options by yr 2 b) alliance works together in joint initiative to address elephant habitat protection actions in yr 2-3	The alliance (NIECA) has identified four key issues to focus on as a first joint step towards the long-term conservation of elephants.

Annex 2 Project's final logframe, including criteria and indicators

Logical Framework

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal: 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 the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilisation of genetic resources			
Purpose To facilitate the conservation of elephants by mitigating HEC in Assam through: 1) capacity building to protect communities from elephants, 2) fostering knowledge and tolerance of elephants, and 3) studying the spatial patterns of elephant herds for land-use strategies & local implementation of the CBD	Improved capacity of communities to protect crops & property from elephants. Positive attitudinal change from passive to more pro-active participation. Increased understanding of HEC patterns and causes. Improved information about elephants' movements. Increased collaboration among stakeholders. Overall decrease in HEC (both human & elephant losses).	Monitoring of communities' implementation of methods demonstrated. Sociological appraisals to measure changes in attitudes and perceptions. Feedback from communities regarding usefulness of educational material and workshops. Extent of participation by other local groups in HEC forum. Data, reports, GIS, analyses & publications. Surveys to examine change in HEC incidences.	Continued support, collaboration and interest of the communities to participate in the project's activities. Continued support from Forest Department and other local NGOs.
Outputs			
1) Capacity of focal community members to develop, maintain and adapt elephant damage control measures.	a) 8 villages actively participating in crop/house protection trials by yr 1 b) 2 people/village trained and able to train others by yr 2. c) all field staff able to collect monitoring data to scientific standard by yr 1 d) 60% or more reduction in HEC incidences by year 3.	Log of trials and their effects recorded in each village. Training reports and evaluation Monitoring data compiled and analysed to determine effects of interventions	Communities willing to learn and apply crop protection methods, and carry out trials, using provided materials for such purpose only. *HEC mitigation techniques implemented correctly as demonstrated*
2) Creation of a forum or alliance of local NGOs and FD working on HEC issues in the region	a) proposal agreed with local NGOs/FD by end yr 1 b) meeting with participants to agree communication methods and field exchanges in yr 1	Document outlining the objectives of the forum and regular written reports of collaborations and communications that ensue	Other local NGOs and FD willing to collaborate as per letters of intent (to follow in Stage 2).
3) Improved community attitudes and interest in reducing dependency on subsistence crops	a) participation in supplementary livelihoods initiatives, e.g. cash crop cultivation by yr 2 b) positive attitudinal change in 60% of community by yr 3.	Semi-structured interviews to measure knowledge and attitudes at project intervals. Cash crop cultivation training session reports	Community members willing to adapt practices and learn about conservation, and willing to experiment with growing alternative crops
4) Education materials, and workshops on conservation and HEC mitigation, as well as media support of the project	a) HEC mitigation handbook produced and distributed to communities by end yr 1. b) workshops held in different communities annually – yr 1-3 b) 5 or more features in local media by yr 2.	Field staff reports of villagers' feedback on handbook and workshops. Visits to neighbouring communities show whether the training is implemented.	Communities willing to receive advice and help provided by handbook and attend workshops. Media is interested to disseminate the information offered by the project
5) Information about	a) standardized HEC rapid	Production of maps,	Visual tracking method

regional elephant movement patterns and conflict hotspots, past and present, in relation to socio-economic activities, landcover and mitigation measures	assessment protocol designed and in use by yr 1 b) GIS database of elephant spatial information by yr 2 c) spatial and temporal analysis of elephant movements by yr 3 d) compilation of HEC history from FD records & interviews with villagers by yr 2 e) Postgraduate opportunity for an Indian student to investigate the spatial and behavioural needs of elephants by end yr 1	results in reports and publications. Summary report of historical HEC data. All incidences of crop-raiding, building damage, human injury/death or killings of elephants occurring during project recorded. Student research project and products Structured exchange with a UK university for the student	elephants is sufficiently accurate for the study objectives. Field assistants collect data according to procedures taught; competent use of GPS as per training FD provides historical data. Availability of a good Assamese (or other Indian) candidate to carry out the research
* 6) land-use strategy for elephant conservation in the long -term	a) elephant research results provide insights into land-use strategy options by yr 2 b) alliance works together in joint initiative to address elephant habitat protection actions in yr 2-3	Elephant conservation management plan, data and recommendations produced and discussed with government	Alliance works successfully and is able to develop ideas and plans for long-term strategy
Activities 1) Community-based crop/house protection trials and training activities	Activity milestones (summary of project implementation timetable) Design HEC rapid assessment protocol and collect baseline data for each site (yr 1). Hands-on training to construct trip wires, chilli-grease fences, etc, specific to each village (yr1). Monitor crop-raiding attempts, analyse results, adapt/improve deterrent methods, hold participatory evaluation discussions (yrs 2-3).		Assumptions Elephants continue, as in previous years, to crop-raid in the areas where trials are prepared
2) Resource and educational materials, socio-economic monitoring, communication	Research and produce handbook on HEC practical advice, distribute and initiate follow-up conversations with communities (yr 1-2). Conduct annual workshops in villages, (yr 1-3) Collect data on socio-economics and attitudes (yrs 1-3). Initiate HEC forum, propose structure for communication (yr 2)		Community members come to workshops and use the handbook provided.
3) Elephant research, GIS mapping, spatial analysis and recommendations	Review elephant research methods from pilot work (yr1). Analyse elephant movements, HEC, land cover, nutrition of crops vs forage (yr 2-3), GIS maps & spatial analysis (yr 2-3), publish results (yr 3). Produce report with land-use management recommendations (yr 3). Identify project follow-up needs (yr 3).		Visual tracking and other methods developed continues to be the most feasible and appropriate approach.

Annex 3 Project contribution to Articles under the CBD

Project Contribution to Articles under the Convention on Biological Diversity

Article No./Title	Project %	Article Description
6. General Measures for Conservation & Sustainable Use	5%	Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	25%	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.
8. In-situ Conservation	5%	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation	-	Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity	5%	Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures	15%	Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training	30%	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
13. Public Education and Awareness	10%	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts	-	Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources	-	Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair

Article No./Title	Project %	Article Description
		and equitable way of results and benefits.
16. Access to and Transfer of Technology	-	Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information	5%	Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol	-	Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Other Contribution	-	Smaller contributions (eg of 5%) or less should be summed and included here.
Total %	100%	Check % = total 100

Annex 4 Standard Measures

Code	Description	Totals (plus additional detail as required)
Training Measures		
2	1 MSc qualification by Assamese project staff member, with a research project closely linked to the project's aims	1 (project completed, degree imminent)
6A	8 field assistants trained in elephant deterrent and protection methods	8
6A	50 community members in turn trained by field assistants	>150
6A	At least 20 community members participating in pilot sustainable livelihoods initiatives	300 Training workshops for making incense sticks and food processing greatly increased the number expected to participate in alternative livelihoods.
6A	At least 8 villages actively participating in crop/house protection trials	11 project villages plus 26 neighbouring villages
6A	2 or more neighbouring communities informally trained by trainees of the project	40 Especially within the last year target increased dramatically - all villages within our two study areas ended up being able to employ some crop protection methods.
7	Standardized questionnaire survey, protocol and data entry sheets	Done 3
8	30 or more weeks by UK staff in host country for field work	17 weeks of 6 UK staff in India 18 weeks of 9 India staff in UK
9	HEC management recommendations and long-term strategy plan for Forest Department	Northeast India Elephant Conservation Alliance (NIECA) is taking this task forward and working together on long-term topics.
10	1 manual for elephant crop-raiding protection	1 manual published (in 2 languages)
11A+B	4 papers in peer reviewed journals in print and submitted	2 papers in editor-reviewed journals published, 2 papers in peer-reviewed in press, 3 papers nearly to be submitted shortly
12B	Comprehensive GIS database on elephant movements, spatial and statistical analysis	Done
14A	6 workshops on HEC management, 6 workshops on livelihoods	25 Demand for workshops exceeded our target, so we provided extra to communities and self-help groups
14B	Participation in 3 or 4 international conferences by key project staff (UK and India)	9
15A,B,C,D	6 local or national press releases in India and UK	4 press releases, leading to 20+ news articles in UK and India
16B,C+D 18	4 local and/or national TV features in India and UK	7 expressions of interest for documentaries from BBC, National Geographic and independent firms, but only 1 actually materialized – for Animal Planet / Discovery Channel.
17A	One collaboration network established	Done (Northeast India Elephant Conservation Alliance)

Code	Description	Totals (plus additional detail as required)
18C+D 19	3 local radio interviews or mentions in India and/or UK	2
22	8 field plot and demonstration sites	5
Other Measures used by the project and not currently including in DI standard measures		
other	log of trials and their effects recorded in each village.	done
other	Interpretation at Chester Zoo featuring the work as a Darwin Project to 1.3 million visitors per year	done
other	1 Assamese student undertaking PhD-level research closely linked with the project	Not achieved despite several attempts 2 serious candidates were identified, supervisors in India and UK were committed to this, but neither candidate took up the opportunity.
other	2 people/village trained and able to train others	100 All villages within our two study areas have someone who knows how to employ crop protection methods
other	Monitoring data compiled and analysed to determine effects of interventions	Completed, paper written and submitted to *Conservation Letters*
other	GIS data and maps of elephant dynamics in project areas.	Data analysis completed and paper draft written, undergoing polishing submitted soon to *Conservation Biology*
other	A significant (measurable) reduction of human-elephant conflicts (HEC) in project villages	Reduction of HEC by 77% in one study site. Deaths of elephants and people reduced to zero in and around our project villages.

Annex 5 Publications

Type * (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
Article	Zimmermann, A. (2008). Triumph and Tragedy for the Assam Haathi Project. **Z Magazine**. Spring 2008. 18-19.	Chester Zoo, UK	www.chesterzoo.org or PDF from Project Leader	in kind
*Article	Davies, T.E., Hazarika, N., Wilson, S. & Zimmermann, A. (2010). Living with elephants in Assam. ***Lifelines***. BIAZA. British and Irish Association of Zoos and Aquariums. 14-15.	BIAZA, UK	http://www.biaza.org.uk/resources/library/images/LIFELINES%20No%20107.pdf or PDF from Project Leader	none
Article	Davies, T. 2009. Living with elephants. ***Z Magazine***. 20-21.	Chester Zoo, UK	www.chesterzoo.org or PDF from Project Leader.	in kind
*Article	Davies, T.E., Zimmermann, A., Wilson, S., Hazarika, N. and Chakrabarty, J. (2009). Living with elephants in Assam: a community-based approach to conservation. ***Ratel***. Association of British and Irish Wild Animal Keepers. 36 (2): 9-13.	Association of British and Irish Wild Animal Keepers, UK	abwak-publications@hotmail.com www.abwak.co.uk/Ratel.htm or PDF from Project Leader	None
*Article	Chartier, L. (2010) Working towards coexistence. ***Chaco magazine***. 32-33	Chaco USA	PDF from Author or from Project Leader.	None
*Article	Chartier, L. (submitted). Without the Forest? Human-Elephant Conflict in Assam. ***Sanctuary Asia.***	Sanctuary Asia, India	PDF from Author or from Project Leader.	None
Handbook	Wilson, S., A. Zimmermann, N. Hazarika, J. Chakrabarty, P. Mitra, D.J. Das, B. Hazarika, L. K. Nath, M. Narayanan, D. Barua, P.J. Deka, A. Baruah, & G Narayan. (2009). ***Living with Elephants in Assam.*** EcoSystems-India and North of England Zoological Society. Guwahati, Assam, India. Assam Haathi Project. 58pp. Shailesh Art Print, Guwahati, India.	Sailesh Art Print, Assam, India.	www.assamhaathiproject.org www.peopleandwildlife.org.uk www.chesterzoo.org www.nieca.org	Approx £350
Brochure	Assam Haathi Project	Chester Zoo, UK	www.assamhaathiproject.com	none
*Paper	Zimmermann, A., Davies, T.E., Hazarika, N., Wilson, S., Chakrabarty, J., Hazarika, B. & Das, DJ. (2009). Community-based human-elephant conflict management in Assam. ***Gajah***. IUCN SSC Asian Elephant Specialist Group. 30: 34-40.	IUCN SSC Asian Elephant Specialist Group	http://www.asesg.org/gajah or PDF from first author	none
Paper	Davies, T.E., Wilson, S., Hazarika, N., Chakrabarty, J.,	Accepted by *Conservatio*		none

	Das, D., Hodgson, D.J., & Zimmermann, A. (in press) Assessing the effectiveness of intervention methods against crop-raiding elephants in Assam, India.	*n Letters*		
Paper	Wilson, S., Zimmermann, A., Davies, T.E., Hazarika, N., Chakrabarty, J. & Das, DJ. (in prep) Spatial Analysis of Human-Elephant Conflict and Elephant Landscape Use in Assam, India.	to be submitted to *Conservation Biology* shortly		none
Paper	Zimmermann, A., Davies, T.E., Hazarika, N., Wilson, S., Hazarika, B., Das, D.J. (in prep). Are elephant drives effective in human-elephant conflict mitigation?	to be submitted to soon		none
Paper	Zimmermann, A., Davies, T.E., Wilson, S. & Hazarika, N. Hazarika, B., Das, D.J., Chakrabarty, J. (in prep) Evaluation of a self-help manual as a tool in human-elephant conflict management.	to be submitted soon		none
Paper	Chartier, L. *et al.* Human-elephant conflict and habitat loss in Assam (title to be finalized)	to be submitted to *Oryx*		none
Website	Project website: www.assamhaathiproject.org created by A Zimmermann, R Pedley, T Davies, S Wilson & N Hazarika	Chester Zoo, UK	www.assamhaathiproject.org	In kind, staff time
Website	Alliance website: www.nieca.org created by T Davies	Chester Zoo, UK	www.nieca.org	In kind, staff time

*New items since last report, of which copies PDF copies are attached with this report

Annex 6 Darwin Contacts

Ref No	16-007
Project Title	Building Capacities for Human-Elephant Conflict Mitigation in Assam
UK Leader Details	
Name	Alexandra Zimmermann
Role within Darwin Project	Project Leader
Address	Conservation Department North of England Zoological Society (Chester Zoo) Chester CH2 1LH
Phone	
Fax	
Email	
Other UK Contact (if relevant)	
Name	Scott Wilson
Role within Darwin Project	Project Officer
Address	Conservation Department North of England Zoological Society (Chester Zoo) Chester CH2 1LH
Phone	
Fax	
Email	
Partner 1	
Name	Nandita Hazarika
Organisation	EcoSystems-India
Role within Darwin Project	Project Manager, Assam
Address	NE Centre, 2D Nirvana Enclave Basisthapur Lane 3, Beltola Guwahati 781028, Assam, India
Phone	
Fax	
Email	
Partner 2 (if relevant)	
Name	
Organisation	
Role within Darwin Project	
Address	
Fax	
Email	