Darwin Initiative – Final Report

*(To be completed with reference to the Reporting Guidance Notes for Project Leaders (http://darwin.defra.gov.uk/resources/reporting/) - it is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)*

Darwin project information

Project Reference	15/014
Project Title	Managing wetlands for sustainable livelihoods at Koshi Tappu, Nepal
Host country(ies)	Nepal
UK Contract Holder Institution	Wildfowl & Wetlands Trust
UK Partner Institution(s)	Institute of Fisheries, University of Stirling; CABI Bioscience
Host Country Partner Institution(s)	Bird Conservation Nepal; Tribhuvan University; Koshi Camp
Darwin Grant Value	£198,835.27
Start/End dates of Project	1/10/06-30/09/09
Project Leader Name	Dr Seb Buckton
Project Website	http://www.wwt.org.uk/text/511/koshi_tappu_nepal.html
Report Author(s) and date	Seb Buckton, Bhagwan Dahal, Ravi Pandit, Hum Gurung, Madhav Shrestha, Hem Sagar Baral, January 2010

1 Project Background

Koshi Tappu Wildlife Reserve is a globally important wetland in lowland south-east Nepal. Human resource use puts immense pressure on the reserve. This project aimed to assist local communities in managing buffer zone wetlands sustainably, obtaining sufficient livelihood without compromising ecological integrity. We built capacity in local communities and organisations, developed guidelines for sustainable fisheries and sustainable wetland management, and delivered a number of community drop-in centres for information exchange. The outstanding achievement of the project was the delivery of tangible benefits to the most disadvantaged and resource-dependent communities around Koshi, through developing alternative livelihood approaches that addressed people's real needs.

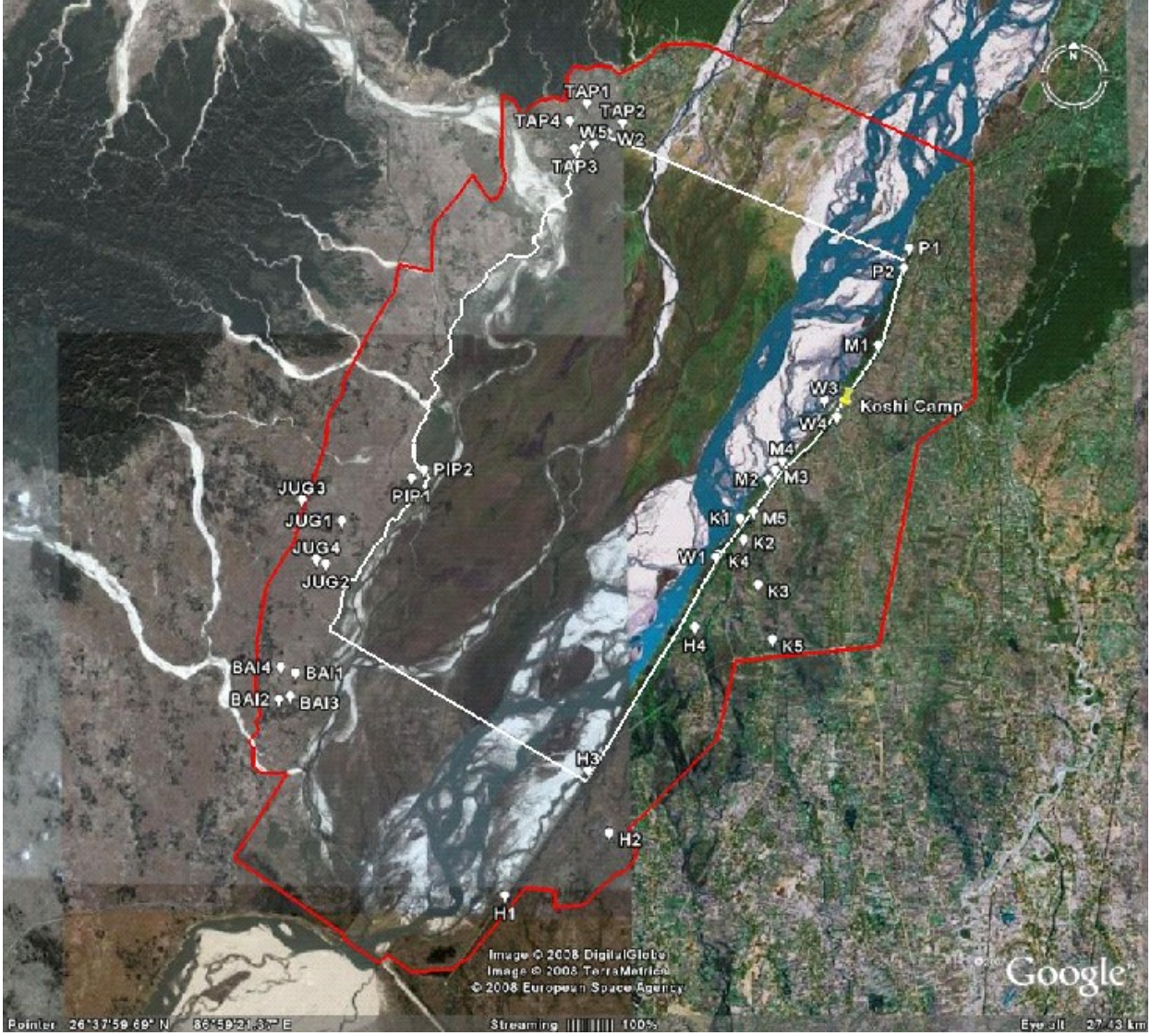


Figure 1. Koshi Tappu Wildlife Reserve and Buffer Zone showing location of field sites

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

As host country partner, Bird Conservation Nepal has worked closely with the Ministry of Forests and Soil Conservation, CBD Focal Point, on a variety of biodiversity conservation issues, throughout the course of the project. This mainly related to the implementation of the Nepal Biodiversity Strategy and Implementation Plan (NBSIP). Besides working with the CBD focal ministry, BCN has been working with the Department of National Parks and Wildlife Conservation (Ramsar focal point) on the conservation and sustainable use of wetlands in Nepal.

BCN has been actively participating in local and national workshops, symposia and interaction programmes on bird species related policies and plans and in recent months has successfully contributed to the endorsement of the Vulture Conservation Action Plan, Grassland Management Plan and Sustainable Wetlands Management Guideline. This apart, we have supported them on capacity building for implementing the CBD Programme of Work on Protected Areas. The government has now planned to review the implementation of the NBSIP and update the same for 2011-2015. The updates will be done by taking into account the need to synergize biodiversity conservation issues with other conventions, as well as by addressing the areas of livelihoods, sustainable development, poverty reduction, climate change, biosafety protocol, etc. BCN has found its niche to facilitate the consultative processes.

In all these interactions with the CBD (as well as Ramsar) focal points, BCN drew on experiences from the Darwin-funded project at Koshi.

The project assisted Nepal in achieving its aims as set out in National Biodiversity Plan and Wetland Plans. The project contributed especially to article 8 (In-site conservation), particularly in relation to establishing guidelines for management, managing areas adjacent to protected areas, controlling spread of alien species, ensuring compatibility between sustainable use of resources and their conservation, and protecting traditional lifestyles and knowledge on biological resources. The project also contributed to Article 10 (Sustainable use of components of biological diversity) by helping to protect sustainable customary uses of biodiversity, and supporting local populations in implementing remedial actions. Article 13 (Public education and awareness) was supported by promoting the understanding of the importance to conserve biological diversity, propagating these measures through the media.

The project has also helped Nepal achieve the goals set out under the provisional framework for the 2010 Biodiversity Target i.e. to significantly reduce the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth. The specific goals that this project has helped with are: Goal 4: promote sustainable use and consumption; Goal 5: pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced; Goal 8: maintain capacity of ecosystems to deliver goods and services and support livelihoods; Goal 9: maintain socio-cultural diversity of indigenous and local communities.

3 Project Partnerships

Bird Conservation Nepal (BCN) is the primary host country partner. Whilst WWT was responsible for the overall design and direction of the project, BCN were responsible for the day to day management of the project activities within Nepal, with WWT and other UK and Nepali partners providing guidance and advice on specific elements of project delivery. The BCN project team comprised up to six members of staff over the course of the project, whilst a total of five staff from WWT have contributed.

The partnership for this project began when BCN identified a need for expertise from WWT to help address conservation issues at Koshi Tappu, an Important Bird Area in which BCN has significant interest. The partnership began on a sound footing as both the project leader (Seb Buckton) and the then CEO of BCN (Hem Sagar Baral) had worked together both on a previous Darwin project and on other biodiversity conservation work in Nepal. Lines of communication were therefore good to begin with. This was formalised in an MoU between WWT and BCN at the beginning of the project.

The development of the project drew on BCN's understanding of the conservation priorities within Nepal, and the project was designed accordingly. This led to a focus on buffer zone activities, as this related strongly to Nepali policy on buffer zone management, whilst we also drew on the National Wetlands Policy to focus the wetland issues that should be prioritised under the project.

Additional partners then presented themselves: as a significant eco-tourism operator in the area, Koshi Camp provided logistical support as well as a good understanding of issues relevant to people living in the buffer zone (the camp is located close to a village within the buffer zone). A project scoping award from Darwin enabled BCN and WWT to do some initial work to gain a better understanding of the conservation issues at Koshi. Given the dependence of many local people on fish for a livelihood, and the impact of fishing on the biodiversity of the site, it was clear that fisheries expertise would be critical. A UK institution (Stirling University Institute of Aquaculture) was then brought on board, and their strong links with the Institute of Agriculture and Animal Science (IAAS) of Tribhuvan University led to them also being brought into the partnership.

The scoping project also led to IUCN-Nepal being invited to the partnership, primarily as a result of the expected implementation of a UNDP-GEF funded project to be managed by IUCN-Nepal, that was intending to use KTWR as a demonstration site. Due to delays in implementing this project, it was agreed between WWT and IUCN-Nepal that it was not appropriate to have a formal partnership regarding the Darwin project, as IUCN-Nepal were not carrying out any activities at KTWR. This UNDP-GEF funded project finally began implementation in 2009, but

without IUCN-Nepal involvement. The person now appointed as national programme manager (Top Bahadur Khatri) is well known to our project team, as he was previously the National Programme Manager of the Participatory Conservation Programme (PCP-II), a UNDP-funded programme of participatory conservation activities under the auspices of the Nepal government's Department of National Parks and Wildlife Conservation, which had carried out many activities in the buffer zone at Koshi. Unfortunately it ceased activities at the end of December 2006 due to the cessation of funding, however Top had provided much useful comment on our project, and PCP staff based at Koshi Tappu were involved in the carrying out of Participatory Rural Appraisals in December 2006.

The partnership and project implementation

The project leader from WWT (Seb Buckton) was responsible for the delivery of project outputs on time and within budget, and was responsible for all reporting to the Darwin Initiative. He also supervised the planning of project activities, and visited Nepal seven times during the project. Other WWT staff provided technical advice on ecohydrological assessment, economic benefits of different livelihood activities, community learning and Communications, Education and Public Awareness (CEPA) elements of the project.

During each project visit, a work plan for the following 3-6 months was discussed and agreed with the BCN Darwin Project Officer (DPO- Bhagwan Dahal) and project co-ordinator (Ishana Thapa). This was also discussed with the Chief Executive (Hem Sagar Baral, until he left BCN in February 2009) or the Executive Officer (Deependra Joshi, who was appointed in late 2008) of BCN. Most recently, the new CEO of BCN (Hum Gurung) has also provided input into project plans. During each visit, a few days were spent at Koshi visiting project activity sites, reviewing progress and discussing future plans. There were also opportunities for discussing project activities with local wetland users, and other stakeholders such as the warden of the KTWR and officials from the BZMC. Time was also spent in Kathmandu, discussing project issues with BCN staff based there, and visiting other organisations based in the capital as appropriate. Some time was also normally spent discussing other BCN projects, where WWT has relevant expertise.

The role of the DPO was to oversee the day-to-day operation of project activities, and he was based at Koshi Tappu throughout the project. Up to three additional staff worked under the project officer. The Education Officer (Ravi Shankar Pandit) worked full time for the last 18 months of the project and took forward many of the awareness-raising and learning activities under the project. The Participatory Biodiversity Monitoring Officer (Dibesh Kumar Chaudhary) was employed for nine months until the end of November 2008. He progressed participatory biodiversity monitoring activities, including organising a participatory biodiversity workshop for local wetland resource users. The project assistant (Ram Balak) worked full time for the last 18 months of the project, to support the DPO and other field staff in various elements of the project.

Ishana Thapa, the BCN project co-ordinator, was based in Kathmandu. Her role was to line-manage the DPO and oversee the central management of contracts, and finances. She was also able to liaise with Kathmandu-based organisations over any project matters. The BCN Finance Officer (Pratikchha Srivastava) monitored project expenditure and liaised with the Project Leader and Project Co-ordinator over reporting and invoicing. Hem Sagar Baral (BCN Chief Executive until February 2009) has acted as a project advisor throughout the whole project, and continued to do so even since he left BCN. He was also instrumental in developing the project proposal with WWT.

UK partners

UK partners have primarily acted as consultants to the project, although the strategic objectives of each organisation were progressed by the project: invasive species are a major theme under the CABI mission and this project was an important component of CABI's strategy for this theme in Asia, particularly in relation to developing partnerships in the UK and in Nepal. The project built on Stirling University Institute of Aquaculture's previous experience in wetland environments. Stirling has an Asia-Link (EU) project with IAAS and their inclusion in this project further strengthened this linkage. A Darwin Fellowship awarded for Chudamani Pandey also

strengthening this relationship and built capacity that would not have happened without the Koshi project partnership. The Koshi project also helped Stirling to improve understanding of fisheries issues on a regional scale. Stirling has worked with CABI before on compendium developments and other areas. Working with WWT on the conservation public awareness agenda provided Stirling with valuable learning and partnership opportunities.

Sean Murphy (CABI) and Anton Immink (Stirling University) provided input to the development and implementation of project work over the course of the project. Both visited Koshi on several occasions during the project, both as part of a visit by all project partners in October/November 2007, and separately at other times. They led on their respective work areas (invasive plants and fisheries), working with and training Nepali project staff and other partners to carry out surveys, use the information to develop plans and suggest methods of implementation of plans. Sean visited in March/April 2008 and established a monitoring programme to assess distribution of invasive plants in the wildlife reserve and buffer zone. Training in methods was undertaken as part of this trip. Anton visited in August 2008, to visit the demonstration ponds and discuss progress with fishpond managers. He also visited a nearby hatchery to discuss fish supply and demand with reference to the provision of improved facilities within the KTWR Buffer Zone as part of the Darwin project. This work helped inform the development of the fisheries management plan. All partners have provided input into project reports and written outputs throughout the course of the project.

4 Project Achievements

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

The overall goal of the project focuses on moving from a situation of unsustainable to sustainable use, and to increase the benefits to local people stemming from the conservation of biodiversity at KTWR.

Although measuring progress towards this goal is likely to be required beyond the term of the project to demonstrate an impact, we have established a baseline against which socio-economic change can be measured by a second survey carried out at the end of the project. More detail is provided regarding this in section 4.2 below.

The major benefits of the project in terms of impact on biodiversity are raising awareness of the benefits of biodiversity conservation to people's livelihoods, and the provision of management advice that enables people to realise these benefits in a sustainable way. These positive impacts will arise from a) a more positive attitude of buffer zone inhabitants to the existence of the reserve and respect for its rules and regulations b) livelihoods that are more diverse and therefore resilient to change, resulting in a reduced need to exploit resources unsustainably in times of hardship; and c) management and resource use practices that aim to enhance the status of the biodiversity that people's livelihoods depend on.

There are a number of specific elements of biodiversity that our project is likely to have a positive impact on.

- The reserve was originally established to protect Nepal's last remaining wild Water Buffalos. However, wild water buffalo, as well as other wildlife found in the reserve, are frequently cited as responsible for damage to people and/or property adjacent to the reserve. In the resulting atmosphere of antipathy towards the reserve and the wildlife it supports, local people are much more likely to be unconcerned about actions which might have negative impacts on the population of buffalo and other wildlife at the site (e.g. grazing their own domestic buffalo within the reserve, with the associated dangers of genetic dilution, persecution of other wildlife). Demonstrating benefits accruing to local people from the biodiversity of the reserve and its conservation will reduce these feelings of antipathy.
- The current reliance on fish as a source of income means that when fish are hard to come by, increasingly destructive fishing methods may be employed, including

indiscriminate gill-net fishing, as well as the use of poisons and explosives, with negative impacts on wetland biodiversity as a whole. Providing secure alternatives to fishing as a livelihood reduces the reliance only on wild fish and allows people to earn income from activities that are more sustainable, so that lean periods are reduced.

- Management guidelines produced by this project encourage actions that have positive impacts on biodiversity. For example, introducing a fishing season would have positive impacts on the fish biodiversity of the reserve, as well as reducing disturbance to a variety of other wildlife; encouraging the removal of water hyacinth for compost production reduces the negative impact of this plant on water bodies.

Social impacts

Our interventions have made a substantial contribution to improving the livelihoods of the local indigenous communities of the Koshi Tappu buffer zone. For instance, the *Malaha* community (an indigenous fishing people) solely depend on capturing fish from the river, which is their only source of income. The project has provided fish ponds to households aimed at encouraging them towards more sustainable living, generating income and reducing pressure on the river ecosystem. The communities have been sustainably earning from fish farming and undertake the management responsibility on their own. The project has made substantial ground in improving livelihoods of such marginalized groups, particularly wetland dependent communities. Obtaining a reasonable income for fishing communities from aquaculture practices in the buffer zone was one the main elements in the promotion of livelihoods for those people. Positive social impacts for fishing communities came from providing working space and knowledge on fish farming to support livelihoods especially during periods of lean fishing, and by providing a better understanding of sustainable fishing. As well as best practices in aquaculture within the buffer zone, we also provided improved knowledge of advanced mat production using *Typha* stems, and replacement of chemical fertilizer with an organic one using composted water hyacinth. These are activities that appear to have made a considerable impact on the communities we have worked with. Additionally, use of charcoal briquettes as an alternative source of energy has motivated local communities to reduce use of fire wood. Such activities increase understanding of sustainable use of natural resources within local communities.

Indigenous communities of KTWR are very interested in biodiversity conservation of the reserve. The project has built capacity in local civil societies, community user groups, the reserve HQ staff as well as project staff, in various sustainable ways of using natural resources. The project paved the way for local communities to be leaders in resource management within KTWR. This information has been shared by local communities through different media and newsletters of the local civil societies. The capacity of the buffer zone management committee has been strengthened. A growing number of user committees have developed their negotiation and entrepreneurial skills to protect their traditional rights over natural resources. Imposition and conflict are now giving way to understanding and reconciliation, protecting biodiversity and culture. More and more indigenous people participate in the decision-making process and have occupied influential positions in Koshi Tappu. Local communities have been actively involved in every stage of programme implementation by using a bottom-up planning approach.

4.2 Outcomes: achievement of the project purpose and outcomes

Local communities around KTWR manage buffer zone wetlands sustainably, obtaining sufficient livelihood without compromising ecological integrity of buffer zone and KTWR.

Indicators: Increased wetland-related income and employment opportunities in the buffer zone; reduced encroachment and illegal use of KTWR.

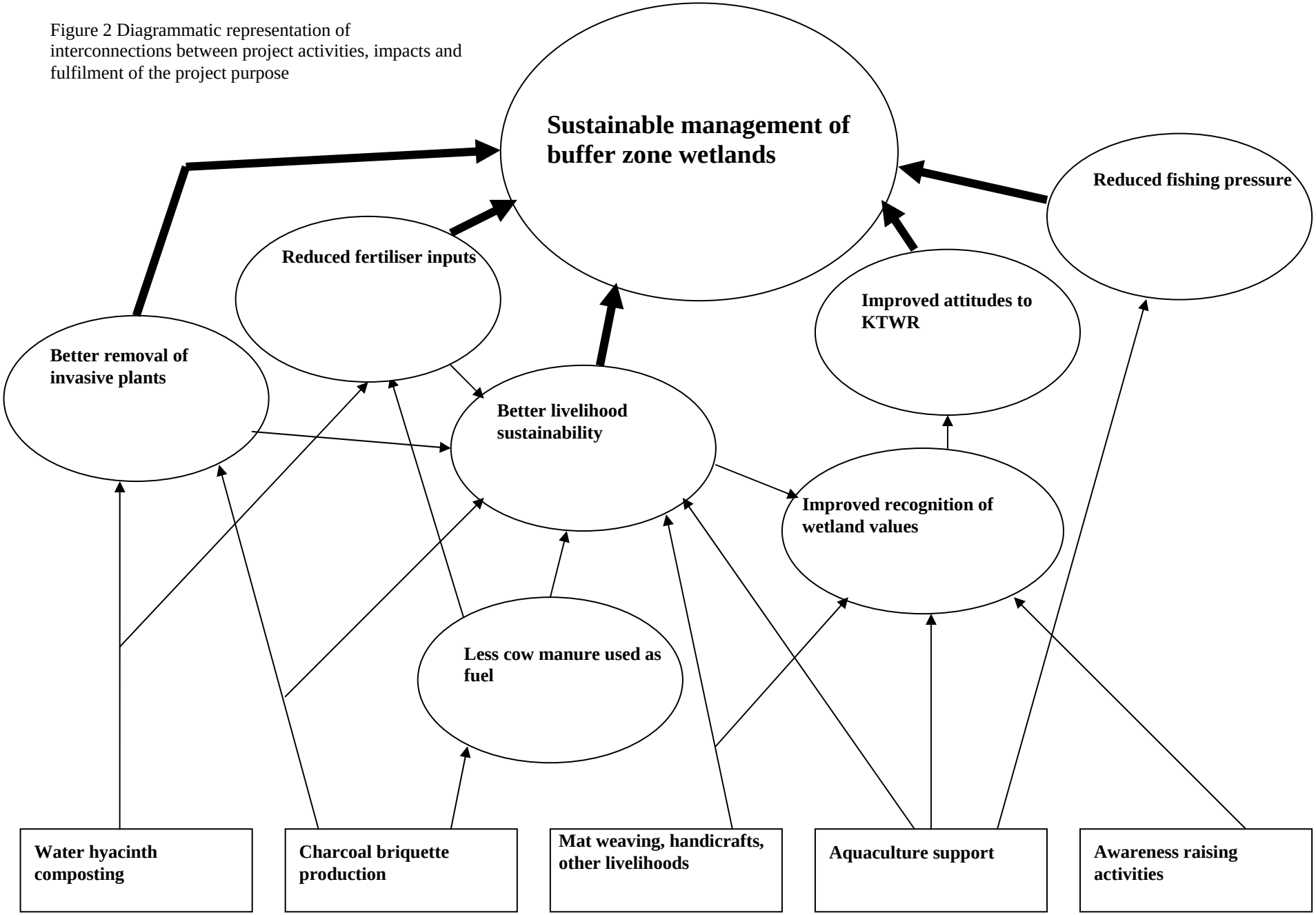
Means of verification: KTWR reports; BZMC reports; DDC reports; household surveys; MSC surveys.

We have enhanced opportunities for wetland related income and employment amongst our target groups in the buffer zone, by building capacity (through provision of investment and training) in local wetland user groups in fish farming, and other livelihood options (mat weaving, handicraft production and charcoal briquette production). We have also supported people's livelihoods through provision of training and investment in water hyacinth compost production, which reduces the need for expenditure on chemical fertiliser. The availability of charcoal briquettes locally will also support livelihoods in providing a cheaper option than firewood, and by reducing the need for burning cow dung, which instead can be used as a manure for growing crops.

The interconnections between project activities, impacts and fulfilment of the project purpose is explained diagrammatically in Figure 2.

The Means of Verification of the project purpose indicators as set out in the project logframe have been difficult to obtain. The intention was that wetland-related income and reduced encroachment into KTWR would be assessed through reporting on the progress of the KTWR Management Plan for 2004-2008, as these relate to objectives set out under that plan. It was also intended that the official body to oversee activities in the buffer zone (the BZMC) would also report against these measures. However, it has become apparent that there are insufficient resources available to either body to enable them to monitor and report on these measures themselves, and regular reporting on progress towards the Management Plan objectives is minimal. Reduced encroachment and illegal use of KTWR in particular is hard to measure in the absence of official reports. To build their capacity sufficiently would place a high demand on project resources. Furthermore, recent severe flooding that displaced many thousands of people has resulted in major encroachment into the reserve and harvesting of natural resources (see under Section 6 below). DDC reports are produced, but largely only describe the activities undertaken by projects being carried out in the district, rather than measuring their impact. Therefore, we have focussed on devising more practical means of verifying these indicators.

Figure 2 Diagrammatic representation of interconnections between project activities, impacts and fulfilment of the project purpose



Household surveys were carried out in the last month of the project, repeating the methodology used in the first year. We re-visited 56 of the 60 households surveyed in 2006 to determine any changes in use of resources, sources of income and expenditure, etc. Some key results are presented in Table 1. There was a considerable change in various features of income and expenditure between 2006 and 2009. There appeared to be a decrease in the proportion of income coming from fish sales, and indeed in the number of people selling fish. This may have been a consequence of changes in access to fishing grounds following the flood of 2008, as well as changes in the hydrology of the area (resulting in some previously wet areas becoming drier). Income from thatch grass sales and driftwood sales was non-existent in 2009 (due to changes in access to these resources after the 2008 flood). The value of most items of expenditure increased substantially between 2006 and 2009, but income generally increased to balance this.

However, many of these changes were not uniform across all households. Of the 56 resurveyed households, 40 had been involved in one or more project activity whilst 16 households had not. Comparing households that were beneficiaries of project activity with those that had not been directly involved suggested some differences between these groups. Generally beneficiaries fish more, reflecting the likelihood that we have engaged especially with fishing communities. Beneficiaries also sell more fish, but both groups experienced declines in the amount of fish sold between 2006 and 2009. Fish sales (in kg) of beneficiaries dropped to a third of the 2006 level, but that of non-beneficiaries dropped to a quarter of that level. Beneficiaries generally achieved a higher price than non-beneficiaries for fish in 2009, whilst in 2006 the prices were similar. Overall income from fish sales dropped for non-beneficiaries, but increased for beneficiaries. The proportion of income coming from fish fell for both groups, but less so for beneficiaries. Income from mat weaving rose for both non beneficiaries and beneficiaries, but by more for beneficiaries, for whom it nearly doubled, compared to an increase of a third for non-beneficiaries. Total wetland value for beneficiaries went up between 2006 and 2009, whilst that for non-beneficiaries went down. A greater proportion of income came from fish and wetlands, and reduction in this between years was less for beneficiaries than non-beneficiaries. Both groups saw a large increase in income from labouring, but this increase was greater in non-beneficiaries. The amount saved per year increased for both groups, but by more in beneficiaries group – from a level well below non-beneficiaries in 2006 to a level on a par with them in 2009.

A greater proportion of beneficiaries showed an increase in the proportion of income coming from wetland sources, and an increase in the total value of those wetland resources, compared to those who were not project beneficiaries (Table 2). Both beneficiaries and non-beneficiaries showed similar proportions for changes in expenditure and total annual savings.

Table 1. Mean values for various measures of income and expenditure for beneficiary and non-beneficiary households in 2006 and 2009

	Non-beneficiaries (n=20)		Beneficiaries (n=44)	
	2006	2009	2006	2009
FISHING INCOME				
Fishing days	191.55	65.60	278.27	168.09
Annual fish eaten (kg)	21.75	51.60	24.74	48.89
Annual fish sold (kg)	281.64	58.05	446.15	175.83
Market price for fish (NRP)	69.69	120.00	70.50	186.36
Value of fish eaten (NRP)	1,526.25	6,180.00	1,732.20	9,068.18
Income from fish sale (NRP)	20,075.76	11,610.00	31,159.76	35,165.91
Total value of fish (NRP)	**21,602.01**	**17,790.00**	**32,891.96**	**44,234.09**
Income from fish sale as % of total fish value	92.01	25.33	94.22	57.94
OTHER INCOME				
Income from mat (NRP)	2,235.00	3,645.00	5,721.13	10,788.86
Income from fish trading (NRP)	0.00	0.00	0.00	9,381.82
Income from rice sales (NRP)	0.00	4,260.00	0.00	454.55
Income from veg and other products sales (NRP)	0.00	2,700.00	0.00	68.18
Income from thatch (NRP)	2,500.00	0.00	2,215.00	0.00
Income from fuelwood (NRP)	5,093.75	0.00	2,762.50	0.00
Income from labouring (NRP)	23,177.50	60,555.00	10,335.38	27,762.50
TOTAL INCOME (NRP)	**54,608.26**	**82,770.00**	**53,925.96**	**83,621.82**
Total wetland value (NRP)	31,430.76	21,435.00	43,590.59	55,022.95
% of income from fish (incl. fish eaten)	39.51	20.11	62.57	53.21
% of income from fish (excl fish eaten)	36.70	12.71	59.33	41.80
% of income from wetland resources	58.06	25.39	82.04	69.32
EXPENDITURE				
Food	42,240.63	59,260.25	44,464.63	61,441.70
Kerosene	1,590.00	2,286.00	1,590.00	2,912.73
Clothes	3,518.75	7,925.00	3,606.25	6,090.91
TOTAL EXPENDITURE	**47,349.38**	**69,471.25**	**49,660.88**	**70,445.34**
ANNUAL SAVINGS	**7,258.89**	**13,298.75**	**4,265.09**	**13,176.48**

Table 2. The proportion of beneficiary and non-beneficiary households reporting increases and decreases in measures of income and expenditure between 2006 and 2009

	Non-beneficaries		Beneficiaries	
	% of households showing increase	% of households showing decrease	% of households showing increase	% of households showing decrease
Total wetland value	18.75	81.25	60	40
% of income from wetland	12.5	87.5	32.5	67.5
Total expenditure	87.5	12.5	85	15
Saving	50	50	50	50

Whilst the repeat household surveys did not provide conclusive evidence that all of the livelihood activities promoted were adopted widely and resulted in increased diversity of income, we also specifically revisited a sample of those who received mat weaving training. This enabled us to find out whether they are still weaving mats, but also whether they are selling mats and earning income from it. Data collected suggest that significant income potential has been provided through this activity (Table 3). Additionally, interviews with recipients of training suggest that even if they are not selling mats to earn an income, they are making mats for there own household use, where previously they would have to have bought them.

Table 3: Assessment of mat weaving training amongst a) *Malaha* households and b) *Musahar* households in Madhuban.

a)

Name	Before Training		After Training	
	Mats produced per week	Selling price per mat	Mats produced per week	Selling price per mat
Rekha Devi Bahardar	0	0	2-3	175/mat
Radha Devi Bahardar	0	0	1-2	175/mat
Dolti Devi Bahardar	0	0	2	175/mat
Buchiya Devi Bahardar	0	0	2	175/mat
Shanti Devi Bahardar	0	0	2-3	160/mat
Budur Devi Bahardar	0	0	1-2	160/mat
Phuliya Devi Bahardar	0	0	1-2	160/mat
Gudiya Devi Bahardar	0	0	1-2	160/mat

b)

Name	Before Training		After Training	
	Mats produced per week	Selling price per mat	Mats produced per week	Selling price per mat
Kamala Devi Risidev	0	0	3-4	150/mat
Janani Devi Risidev	0	0	3	150/mat
Parmila Devi Risidev	0	0	3	150/mat
Sukuni Devi Risidev	0	0	3	150/mat
Lalo Devi Risidev	0	0	2-3	150/mat
Rupani Devi Risidev	0	0	3	150/mat
Lila Devi Risidev	0	0	3	150/mat
Kunti Devi Risidev	0	0	3	150/mat
Tara Devi Risidev	0	0	3	150/mat

Project staff have also been collecting stories from members of the project target communities. These provide a somewhat subjective measure of impact but the views of wetland resource users is critical to the success of this project, not only in their attitude towards the values that conservation of wetland resources can bring them, but also in their attitude towards the reserve and its rules and regulations. We have now collected a number of stories from local people through various interviews and during various project activities, and a representative selection of these is provided in Annex 7.

In general, we believe that these stories represent a true impact on the lives of people living around Koshi who depend on wetlands for their livelihoods.

4.3 Outputs (and activities)

Output 1. Personnel trained and capacity built in local organisations and community groups.

Indicator: 105 people trained in alternative livelihoods, participatory biodiversity surveys, sustainable wetland management, and community learning and education

Means of verification: Attendance records, training assessment forms.

The project exceeded the indicator used to assess delivery of this output. A total of 418 people, the majority of whom are members of local wetland resource user groups established by the BZMC, received training in one or more of the livelihood support activities developed during the project. Increasingly, training events involved previous recipients of training in delivery of the training, suggesting that capacity has been built amongst local wetland user groups.

In addition to livelihoods training, capacity to deliver training locally was enhanced by provision of training in facilitation of livelihoods training events. The chairpersons of ten Buffer Zone Management Units were the recipients.

Output 2. Sustainable wetland management promoted using wetland management guidelines for sustainable livelihoods

Indicator: Awareness raised of 2000 families in wetland values and sustainable wetland management practices; action to improve wetland related income of 20 households of target group

Means of verification: Field and desk survey reports; reviews/feedback on guidelines; Community Action Plan monitoring and evaluation.

The Wetland Management Guidelines have now been produced and adopted by the Department of National Parks and Wildlife Conservation (see Annex 8). Sustainable wetland management factsheets about five specific livelihood activities have been produced and 2000 copies of each have been distributed amongst Buffer Zone residents.

The evaluation of the impact of the Madhuban drop-in centre provides some data that can be used to measure the likely overall impact on awareness of wetland values and sustainable wetland management practices (Table 4). This survey interviewed 100 people before and after they had visited the drop-in centre at Madhuban, and assessed their awareness of 15 different issues related to sustainable wetland management at Koshi. After visiting the centre, between 90 and 100 visitors demonstrated good, very good or excellent awareness of each of the 15 issues, compared to between 7 and 71 before visiting the centre. Averaged over all 15 issues, 67 more people had good, very good or excellent awareness of the issues after visiting than before.

Using the visitation records, between 83 and 333 more people visited a centre immediately after the information was refreshed than the baseline average for the rest of the month. Taking only the month with the highest number of additional visitors for each centre, assuming only these additional visitors viewed the information displayed, and assuming that 67% of these additional visitors are likely to have had their awareness of these issues improved, we estimate that a minimum of around 740 people would have been positively impacted by visiting drop-in centres. Added to the likely impact of training approximately 450 local people in wetland related livelihood activities, in events that incorporate awareness raising activities, we are likely to be on course to meet this indicator.

An Action Plan Committee (APC) evaluation workshop was held in December 2008, with the support of Darwin project staff. The APC discussed the different livelihood activities that have been promoted under the project and evaluated each one. The view was that they had been successful in addressing the issues raised in the Community Action Plan, and that local institutions had benefited as a result. The APC also discussed the various conservation awareness activities undertaken, including establishment of drop in centres, and use of guided

walks, relay races, and musical chairs games. They were considered to be an important means of communicating to local people about the importance of wetland conservation. The committee requested the project to continue such activities throughout the buffer zone.

Table 4. Number of people visiting drop in centres in first week after information display in addition to baseline average for the rest of the month, and calculation of numbers of people likely to have had their awareness of sustainable wetland management raised.

	Madhuban	Sukrabare	Prakashpur	Tapeswori	
Oct	83	197	N/A	N/A	
Nov	183	150	N/A	262	
Dec	217	150	217	258	
Jan	150	100	217	193	
Feb	333	183	247	238	
Mar	183	150	311	214	
Mean	192	155	248	233	
Maximum	333	197	311	262	
67% with increased awareness					**Total**
Mean	128	104	166	156	**555**
Maximum	223	132	209	175	**739**

Output 3. Sustainable Fisheries Management Plan developed and promoted

Indicator: Management plan peer-reviewed, published, disseminated and interpreted for local use; 1000 copies produced and distributed by Yr 3; fish hatchery/nursery operating Yr 3.

Means of verification: KTWR reserve reports, BZMC reports, Reviews/feedback on manual

A sustainable fisheries management plan has been produced and incorporated as a key component of the Wetland Management Guidelines, which have been adopted by DNPWC. This document is currently in production by BCN. BCN will discuss the implications of the plan with the DNPWC, and discuss how to engage with the necessary stakeholders nationally and locally to ensure the recommendations can be implemented. This is likely to require work beyond the course of this project, as some of the fisheries management plan relates to wider management of the Koshi river both upstream and downstream of the reserve, which lies outside the remit of the DNPWC, so wider stakeholder consultation will be required.

Dissemination of the fisheries recommendations amongst local wetland resource users will be undertaken by BCN using a summary document once the Wetland Management Guidelines are produced. Part of the plan has also been promoted through production of the fish farming fact sheet, of which 2000 copies have been circulated amongst local resources users through the Buffer Zone Management Council and through the drop-in centres established under this project. Further promotion of sustainable fisheries management comes through the production of a booklet describing the fish species found at Koshi.

Construction of the fish nursery has been completed as specified in Master Plan produced in 2008. This set out the background, information on site selection, and a budget for construction and operation. A co-operative management system has been devised to ensure benefits from the operation of the nursery are realised by local wetland dependent groups.

Output 4. Darwin Centre for Wetland Management for Sustainable Livelihoods established

Indicator: Training and education facilities providing information and advice on wetland management and interpretation for local and non-local visitors designed with local people and project partner advice, opened by Yr 3.

Means of verification: Operation plan for 5 years; visitor records.

As described in the 2nd Annual Report, the original intention to establish a 'Darwin Centre' within the grounds of Koshi Camp, was modified to ensure that the project provided an information resource for local people that helps them to obtain sustainable livelihoods from wetland resources. Providing this at Koshi Camp would have been impractical.

As the primary audience for the management advice we have produced are people living in the buffer zone, who are spread over a wide area, with poor transport infrastructure (particularly on the western side of the reserve), four 'drop-in' centres have been established spread throughout the buffer zone. These are attached to existing businesses (tea-shops), to enhance their sustainability. Linking them to locations where local people already go will enhance their impact. Most importantly, they need to be viewed as resource centres – where there is information and advice that is of use to people to enable them to manage their livelihoods more sustainably.

All four drop-in centres have been recording numbers of customers coming to each tea-shop during the period of their establishment (Table 4). Although no baseline was available prior to establishment, the records show peaks in customer numbers at the beginning of each 4 week period when the content of the interpretation at the centre is changed.

The operational plan for 5 years for the drop in centres comprise agreements with small local community-based organisations (CBOs), and the establishment of small funds. We established an agreement with a CBO at Tapeswori (the Centre for Environment Protection), which was formed following the provision of charcoal briquette production through the Darwin project. They will use a small portion of the profits made from briquette sales to establish a fund which will be used to manage the information provided through their local drop-in centre. The project supported this organisation by making a contribution to this fund. In the eastern Buffer Zone, another CBO, the Koshi Development Foundation (KODEF), has established a similar fund, which the project has also contributed to. KODEF has delivered a training event to establish charcoal briquette production in the eastern Buffer Zone, with project support. The intention is to again use a small proportion of the profit from resulting sales of briquettes to support the drop-in centres in the eastern Buffer Zone.

4.4 Project standard measures and publications

Project standard and measures and publications are provided in Annex 4 and 5.

4.5 Technical and Scientific achievements and co-operation

The Koshi project has included research into socio-economics of wetland resources use in the area, and assessments of the potential impact of project activities. We have also attempted to relate some of the socio economic aspects of the work with elements biodiversity. Much of this work has been presented in the outputs of the project, especially in the Wetland Management Guidelines.

Research activities have been led by elements of the UK partnership, and involved training of local staff in the methodologies to be used. Further details are available in the various annexes provided in project reports during the course of the project.

4.6 Capacity building

Capacity building activities were an inherent part of delivery of one of outputs 1, so this is mainly addressed under section 4.3 above. Other capacity building activities are described here.

Staff from the host country partners received on-the-job training directly through involvement with UK partners and indirectly through distance communication. Since the Darwin Koshi project was the first opportunity many of the host country staff had had to experience such a project, capacity was built in how to implement and manage projects of this size, following an impact-based approach.

Mr. Bhagwan Raj Dahal, Darwin Project Officer attended two International seminars on wetlands and management during the project: Managing Wetlands for Sustainable Development in Thailand in 2008, and the Asian Wetland Symposium, in Hanoi, Vietnam in 2009, at both of which he presented a paper presented a paper on results from the project. Additionally, Bhagwan attended the International Training of Trainers on Wetland Management and Multi-stakeholder Processes in The Netherlands. Ishana Thapa, Darwin Project Co-ordinator and Conservation Officer at Bird Conservation Nepal, attended the Durrell Endangered Species Management Graduate Certificate (DESMAN) course 2009, with partial support from Darwin funds to cover travel costs. The host country partner believe that these trainings events are of great importance for delivering conservation work in Nepal.

Bhagwan Dahal researched and organised a small training event for his project staff (Ravi Sankar Pandit, Ram Ballak and Dibesh Chaudhary) on social mobilisation. The training involved discussing methods used to mobilize communities, staff attitudes towards different communities, and how to build confidence in communities to ensure the continuation of relevant activities after project completion. This training has informed how the project team worked in the remainder of the project, but also has led to one of the project staff Ravi Pandit, asking to remain at Koshi to continue project activities through the support of WWT to BCN to maintain and office there.

There was also logistical capacity built during the project. The provision of power invertors for the BCN office staff using Darwin Initiative funds enabled a much improved ability to develop and deliver project work, as Nepal was suffering (and continues to suffer) from crippling electricity shortages that at times results in only 8 hours electricity available over any 24 hour period.

The Darwin project also supported the development of management systems within the host country partner to enable proper organization of resources including mobilization of human resources.

Koshi has been used as a demonstration site by BCN and many people have visited to learn directly how Koshi people have benefited through the Darwin project activities. The successful model of the Koshi project is being replicated at Jagadishpur reservoir, a Ramsar site in central Nepal, whilst representatives of communities from Ilam, Panchther and Kapilbastu visited Koshi to learn about the livelihood approaches that the project was implementing. They learned how such a project can make an impact, and helped them to replicate it in their own area. In this context, the project has built capacity not only around Koshi, but beyond both to the east and west.

Amongst other project partners, key officials of organisations such as the Koshi Tappu Wildlife Reserve Office and Buffer Zone Management Committee (BZMC) have received park management and buffer zone management training conducted at the national level. The Chairperson of the BZMC Mrs. Renu Shah has been provided with support for three years to participate in the annual warden's conference held in Kaski, Chitwan and Nuwakot districts in 2006, 2007 and 2009. BCN has created an enabling environment for the conservation and sustainable use of wetlands in the project site. The fact that the national and local agencies work in close coordination with the warden's office primarily facilitated by BCN amply demonstrates the harmonious relationships of all the partner institutions in Koshi Tappu Wildlife Reserve.

The project helped build capacity in the Aquaculture department of IAAS by providing MSc training to one Masters student (Chudamani Pandey) in Wetland management at Stirling

University project supported by a Darwin Fellowship via Stirling University. The project has also led to improvements in the TU course in biodiversity at the Environmental Science department of Institute of Agriculture and Animal Science (IAAS). This project resulted in a good relationship between BCN Nepal and IAAS to work together in future.

A local government fisheries officer (Pramod Rijal) completed a Masters thesis based on the Koshi project, studying the role of fisheries and aquaculture in livelihoods in the Koshi Tappu Buffer Zone. Following the completion of Pramod's thesis, he maintained close links with the project in his role as Fisheries Development Officer for Sunsari District, and provided advice and input to the fish pond management training, as well as to planning for the building of a local fish nursery supported by the project.

The capacity of the UK lead institution as an effective project partner has also been improved during the course of the project. The project leader attended a workshop on participatory conservation organised at WWT Slimbridge, which was also attended by other WWT staff members. The community-based nature of this project has led to development of new work areas at WWT, and has resulted in community consideration being incorporated into a range of other species and habitat-focussed work.

4.7 Sustainability and Legacy

Aquaculture expansion within the buffer zone of Koshi Tappu through the establishment of a fish nursery managed by the fishing communities is an outstanding achievement of the project that is likely to endure. The nursery will reduce the need to import of fish fry from India and local people will have easy access to fry locally through the establishment of this cooperative.

Provision of fish-ponds to local fishing communities through leasing disused ponds is also likely to endure, given the evidence that both groups who participated in this activity have independently extended their holding to enable better returns to result from fish-farming. Previously, barriers existed which prevented these people to adopt fish farming practices, including lack of knowledge of aquaculture and lack of opportunity to learn. Now the context has been changed and traditional fishermen have received substantial training on fish farm management. Although there is some risk in terms of return on investment from fish farming, the perception is that farmers can harvest fish at any time because of the high demand. Additionally, we have established links between the fish farming communities and District Agriculture Office, Koshi Tappu Wildlife Reserve and the Buffer Zone Management Committee, which can help provide technical support. There is now a strong commitment amongst fish-dependent communities to continue fish farm management established under the project.

The better understanding of wise use of wetland resources among the wetland dependent communities has also been a milestone for the sustainable conservation of wetlands around Koshi. The provision of drop-in centres has been popular with local people, but also crucially with the owners of the businesses which house the information points, who have seen improved business as a result of these centres. Thus there is incentive to keep these points going after the project finishes. Two local CBOs, the Koshi Development Foundation and the Environment Protection Organization will take the lead in continuing operation of the drop in centre using profits from bio-briquette sales.

The endurance of the fish nursery, drop-in centres and fisheries cooperatives is further enhanced by the Buffer Zone Management Committee taking full stewardship of these initiatives.

Thus there is good potential for the activities of local resource users to sustain project outcomes beyond the end of the project, through grassroots activities. However, there is also the need for the KTWR Management Authority to build some of the these solutions into its own management strategies for the site. As such, the revision of the KTWR Management Plan is an ideal opportunity to embed project outputs into the management prescription for the site. The Wetland Management Guidelines (incorporating sustainable fisheries management plan) have now been adopted by the DWNPC following liaison between DNWPC and BCN. The document will be launched by DNPWC on World Wetlands Day (February 2nd) 2010 and will then have official recognition within the DWNPC management plan for Koshi Tappu.

What will happen to project staff and resources after the project ends?

The project staff will be retained and absorbed for other initiatives related to wetland and species conservation. To this end, we have already decided to maintain our office in Koshi Tappu for three years and renewed the staff contracts. This has been possible due to a commitment by WWT to provide some support for office and staff costs for three years. The current task of the partners is to replicate this success model to other marginalized area where resources are exhausted.

All partners are likely to keep in touch, both to further support conservation activities at Koshi Tappu, but also in developing other initiatives.

5 Lessons learned, dissemination and communication

Key lessons

One of the key lessons learned from this project was the importance of identifying the correct target groups for this sort of livelihoods based project. Real engagement with those people, seeking their input into project design and implementation, has led to better results.

It transpired that this approach was particularly critical here, because political upheaval in Nepal during the project period, was particularly pronounced in the Koshi area. It was only because of the good relations that the project had with local communities that enabled the project activities to continue during this period. At least one other conservation initiative in the area was forced to cease operations during this time.

Information dissemination and application

Promoting sustainable wetland management involved a range of awareness-raising activities, that were informed by the project results. The learning needs assessment presented in the 2nd Annual Report, and the Community Learning Plan presented in the third Annual report described the target audiences and a number of opportunities for dissemination.

In both 2008 and 2009, the Bird Festival celebrated at KTWR on World Wetlands Day was used to raise awareness of the importance of Koshi wetland habitats. We organised school based conservation awareness activities, including a wetland-themed musical chairs game.

The project produced two newsletter (3000 Nepali and 1000 English), circulated to schools, government bodies, CBOs and local conservation NGOs.

Dissemination of project activities and outputs was carried out through various local media. In order to highlight the importance of Koshi Tappu and its wetlands among local people, the project aired issues surrounding wetlands and their sustainable management at Koshi, through a local FM radio station 'Saptakoshi FM', in partnership with the District Development Committee and other stakeholders at Koshi. The programme was aired weekly for half an hour. No such programming existed before.

Dissemination of the guidelines for wetland management has been through the drop-in centres established in 2008/09. Fact sheets have been produced to set out information on a variety of livelihood activities that have been successfully trialled under the project.

A documentary film has been produced using a local filmmaker, describing how people depend on wetlands at Koshi and how local people have been involved in project activities. It also shows the impact they have made on people's livelihoods. The film has been shown to local people around the KTWR Buffer Zone.

Additionally, the DPO coordinated a group of Nepali journalists who visited the project sites, to encourage dissemination of project related material in the print and electronic media. As a result, several local and national newspapers gave good coverage of the project activities and their impact on the livelihoods of local communities.

Dissemination activities locally will continue beyond the project term as local organisations have committed to continue the use of drop-in centres to disseminate information. The project has also established good links with KTWR, the District Agriculture Office, the BZMC and DDC, and these organizations can continue to support dissemination activities through their existing dissemination networks. BCN will continue to disseminate information regarding conservation and sustainable management of wetlands at Koshi under its remit for promoting conservation of Nepal's protected areas.

WWT and BCN have signed an MoU to continue activities at Koshi Tappu with some small financial support from WWT. This will include continuing to update information in drop-in centres. WWT will also continue to disseminate project findings and outputs both in papers written to be submitted for peer-review and in popular articles in WWT publications. The on-going relationship between WWT and BCN will ensure that dissemination will continue.

5.1 Darwin identity

All project related materials, presentations, articles etc. bore the Darwin logo or made mention of the support provided by the Darwin Initiative. Project newsletters circulated around Koshi as well as within Nepal and beyond, displayed the Darwin logo prominently and also provided some text to describe the Darwin Initiative. Magazine articles in WWT's member magazine (reaching more than 180,000 people) specifically referred to Darwin support. An article in Green Places magazine in summer 2009 made reference to Darwin Initiative support. The project also received publicity in PCLG news, an electronic newsletter circulated by The Poverty and Conservation Learning Group, an initiative facilitated by the International Institute for Environment and Development (IIED). The project received recognition in the CIWEM World of Difference awards, where it was specially commended and good publicity resulted from this. The drop-in information centres around Koshi have materials which all bear the Darwin logo. T-shirts and baseball caps were also produced to promoted wetland conservation at Koshi which also bore the Darwin logo.

The DI supported project at Koshi had a distinct identity both within BCN and within Nepal. Although BCN, as the BirdLife partner in Nepal, have an on-going association with Koshi Tappu (as an Important Bird Area), most of these activities are occasional, such as organising the annual waterbird count. The DI project and the Initiative as a whole has been appreciated by the conservation community in Nepal as it has aptly demonstrated that livelihoods of the local wetland dependent communities can be improved through targeted objectives. This approach is well established in Nepal.

The host country has gained a wider understanding of Darwin Initiative and all the conservation partners (Department of National Parks and Wildlife Conservation, WWF Nepal, IUCN Nepal, UNDP/GEF funded wetland project, Care Nepal, ICIMOD and National Trust for Nature Conservation) are familiar with this initiative.

6 Monitoring and evaluation

As outlined in section 4.3, an Action Plan Committee (APC) evaluation workshop was held in December 2008. Other means of evaluating impact of project outputs are also set out under Section 4.3

Other internal monitoring and evaluation using the project key milestones and measurable outputs involved regular communication amongst project partners. This drew partly on the communications held between project staff and stakeholders and resulted in the refining of project activities over the course of the project. For instance, the revised plans for the Darwin Information Centre, and the focus of the fish rearing facility as a nursery rather than hatchery. This led to some changes to the log frame, which was revised in March 2008 and approved by Darwin in April 2008. These constituted a change to the wording of the project purpose to better reflect what the project was aiming to achieve. There were no changes to outputs, but some alterations to indicators.

As the project was dependent for success largely on the goodwill of the beneficiaries, and on the facilitation by the Buffer Zone Management Council, this ensured that there was continuous monitoring and evaluation through ongoing informal communication between local communities and project partners (local NGOs, KTWR, Buffer Zone Management Committee, DDCs, District Agricultural Offices, etc.). There has also been formal evaluation of many of the project activities through the various training events held during the project.

Baseline data collected to aid this evaluation have been described in section 4.3.

6.1 Actions taken in response to annual report reviews

A number of issues were raised by the reviewer of the 1st Annual Review, and these were addressed in a response to the review provided in June 2007.

The review of the 2nd Annual Report identified some queries that required a response with submission of the half-year report produced in October 2008. This was completed and submitted to ECTF.

The review of the 3rd Annual Report raised some queries, all but one of which were to be addressed in the Final Report. These are addressed below:

1 What can be said about the extent to which those who have been trained are applying what they have learned?
The extent to which this can be measured varies depending on the nature of the training. We have provided some evidence that people receiving mat weaving training continue to use these skills to generate income, or provide themselves with a product that otherwise they would have to buy. Similarly, those receiving fish farming training have expanded their holdings and therefore continue to apply the results of their training. Reports from those involved in community forestry suggest that those receiving participatory biodiversity monitoring training take their role seriously and make strenuous efforts to protect the biodiversity their areas of forest support. Local stakeholders who have received training in facilitating training events have subsequently organized such events, but their ability to do this is constrained by the availability of resources. Generally, the positive feedback gathered from the project beneficiaries suggests most are keen to continue applying what they have learned.
2 Can some "broad-brush" comments be made about comparative strengths, weaknesses, limiting factors, tradeoffs and expected relative scale of uptake of the different livelihoods options?
Generally, the range of livelihoods available to the poorest most resource-dependent people living around Koshi are limited: fishing and labouring are the mainstays for most. Many of the options we have promoted are likely to have been considered additional sources of income, rather than replacing existing sources. E.g. it is apparent that many of those receiving fisheries training still carry out fishing activities outside of their fishponds. However, although it will be some time before capture fishing is significantly reduced at Koshi, the recognition of local fisher people that good returns can be made from fish farming (as well as other livelihood options) is a step in the right direction. These options are especially important in providing alternatives should income from other sources reduce – as has happened in some cases due to the flood event at Koshi in 2008. Fish farming is clearly the most profitable of the options (per unit of labour input), but as pointed out in the wetland management guidelines, growing Typha for mat production is potentially the most lucrative per unit area of land (in fact more profitable than crop growing). However, there appears to be a resistance to widescale uptake of mat weaving as the major source of income as Typha is not viewed as a valuable commodity – you cannot eat it. Mat weaving is likely to be a useful source of secondary income, and could be taken up widely given additional training opportunities. Briquette production offers multiple benefits. For those producing briquettes these include

potential profit from briquette sales, but the machinery to make them is expensive and this opportunity will not be available to many. However, there are benefits to even the poorest because they are cheaper to buy than firewood.

Water hyacinth composting has been very well received by those involved. However, they have mostly been landed people who harvest the water hyacinth from ponds close to their homes and use the compost on their own land on which they grow crops. There could be benefits for more people but this would require establishing compost production businesses that take the water hyacinth from waterbodies more widely and compost it at centralized locations to then sell to farmers. The training so far delivered has been in piloting the development of the compost, and any further development would require more external input of skills and resources.

3 Fuller treatment of the project's legacy in the process for revising the reserve management plan.

As the project drew to a close, concerted efforts were made to engage with the Department of National Parks and Wildlife Conservation over the revision of the reserve management plan. The Darwin project officer was subsequently invited to a workshop during the MP revision process and inputted into its development. However, more importantly, the Wetland Management Guidelines produced as a output of this project were distributed to DNPWC, and DNPWC have now agreed to incorporate these guidelines into the management prescriptions for the site. The document is currently in production in Kathmandu, and a copy will be forwarded to DI once available, but for now the foreword is appended as Annex 8.

This is a significant result for the project, as it gives the park management authority, who are also closely linked to the Buffer Zone Committees, a clear remit to take these recommendations forward.

4 Several questions for clarification concerning the use of briquette income for interpretation materials, under 4.1 and 4.2 below.

Two CBOs formed during the course of the project (though not necessarily as a result of it) have developed plans to use a small portion of the profits made from briquette sales to establish a fund which will be used to manage the information provided through their local drop-in centre. The CBOs were effectively recipients of training in briquette production, and were provided with the necessary equipment and training to produce these briquettes. Both organisations have taken on a remit of environmental protection and therefore have a commitment to maintaining the drop-in centres as a good means of engaging with local communities over environmental issues that are of concerns to people's livelihoods. Thus their willingness to cede a small proportion of profits from briquette sales to this end can be taken as an indication of their confidence in the utility of the drop-in centres.

The profit margin mentioned was 1 rupee per briquette (which are expected to cost less than 10 rupees to buy). One of the CBOs has developed a business relationship that may result in sales of briquettes more widely than just around Koshi. So there appears to be real business interest in this commodity, and because the means of production are currently owned by community-based organisations it is anticipated that the profits from this business development will find their way to those communities.

5 To what extent do the project's outcomes go beyond a pilot proof of concept, into achieving a net real shift in the sustainability of livelihoods activities in the area? This is a question both about the expected magnitude of uptake and about the substitution for less sustainable activities.

Our project has involved over 400 local residents, many of whom will be directly dependent on wetland resources for their livelihoods. However, the population living adjacent to the reserve approaches 100,000 (although the precise figure is unclear) and of course it has not been possible to work closely with all these people. The population locally also is very diverse, from the poorest landless to relatively wealthy landowners and farmers.

The livelihood options we have promoted are only likely to be taken up by those most

dependent on natural resources. Most of those who are not so dependent would see these activities as below their social status.

Our project has provided proof of concept, and this has the potential to be of great importance. Many conservation activities have been undertaken around Koshi, especially to promote community fisheries but several of these have failed in the long term. Results so far from our project suggest that our approach is likely to be more successful, and this has been recognised already by other initiative in the area. .

6 How much can be done in the time remaining (eg by interview methods) to fill the gap in measurement of the indicator concerning reduced encroachment on and illegal use of the reserve?

Addressed in previous response to DI.

The issues of encroachment and illegal use has been almost impossible to assess due to the impacts of the flood in 2008. Initially this resulted in almost complete collapse of authority in the area and widespread disregard of reserve regulations. Subsequently, many activities that were previously allowed were suspended, e.g. no thatch grass was collected in 2009, and no drift wood collected. People will be reluctant to admit to carrying out illegal activity in interviews, so until regular patrolling and recording of incidents is introduced measuring such an indicator will be problematic.

7 Concerning invasives, questions in section 8 about surveillance and response options, and assurances on the effect of giving a use value to water hyacinth.

Mikania is the invasive plant causing greatest concern at Koshi currently (at least by reserve management authorities, not necessarily by local people). The potential negative impacts on biodiversity are considerable. Our project has not attempted to determine wider methods of control, as this is the subject of work that CABI are doing with the Indian and Nepali governments – biological control is likely to be the best option but research is on-going. Our project aimed to assess how much of a problem different invasive as barriers to obtaining sustainable livelihoods. Mikania is less often mentioned as a serious problem in this regard – whereas water hyacinth is commonly mentioned.

However, we have looked at potential ways in which Mikania might be being spread, and the movement of the plant after clearing to be used as animal fodder is potential route for this. The invasive issues are set out in the Report on the Invasive Alien Weeds Issue, Koshi Tappu, included with the 2nd Annual report.

Water hyacinth is ubiquitous around Koshi, and as in many areas is unlikely ever to be eradicated. It transfers easily between waterbodies at times of flood, and many waterbodies are linked by canals, ditches and streams. It is routinely cleared from active fish ponds but quickly builds up on ponds that are not actively managed. Without very wide scale compost production facilities, it is unlikely that we will ever reach the situation that water hyacinth becomes in short supply and their becomes an incentive to encourage its growth.

7 Finance and administration

7.1 Project expenditure

Item	Budget	Expenditure	Variance
Salaries (specify by individual) **Seb Buckton – Project Leader** Matt Simpson – WWT Technical advisor **Malcolm Whitehead – Community Learning** **Emma Alesworth – Centre Development** **Rob McInnes – WWT Technical advisor** Sean Murphy – CABI Invasive species advisor Anton Immink – Stirling Fisheries advisor Bhagwan Dahal – BCN Darwin Project Officer Ishana Thapa – BCN Project Co-ordinator **Ravi Pandit –Education Officer** **Ram Balak –Assistant Project Officer** **Dibesh Chaudhary –PAMEB Officer** **Project Assistants (x4)** Madhav Shrestha – TU-Fisheries advisor KTWR warden (various holders of post) **DNPWC officer** **Pramod Rijal – fisheries booklet** **Mahendra Mukhiya - Nursery manager** **IUCN Officer** Sub-total			
Rent, rates, heating, overheads etc			
Office costs (eg postage, telephone, stationery)			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items/equipment (specify) **Darwin centre enhancement** Fish hatchery Fish pond construction Computing equipment Ecological survey equipment			
Others (specify) Participatory wetland valuation workshop			

Participatory biodiversity monitoring w/s Wetland management training Community learning/centre dev w/s Project evaluation workshop Seed money for biodiversity monitoring Water quality sampling Invasive species management action Translation costs Appointment costs Audit costs			
TOTAL			

The only budget line varying by more than 10% relates to expenditure on the Darwin Centre. This came about due to an underspend of £6,873 in 2006/07, resulting from the cancellation of a major project activity in March 2007, due to political instability in Nepal. This underspend related primarily to travel and subsistence expenditure, and was approved by DEFRA, with the amount deferred to 2008/09. Some of this was subsequently used to develop drop-in information centres, rather than the single Darwin Centre originally envisaged (as explained in Section 4.3 above).

Other changes (which did not result in >10% variance between budget lines) were all agreed with DEFRA, as follows:

WWT staff changes

- Malcolm Whitehead, who was responsible for the Community Learning elements of the project, left WWT in 2008.
- Emma Alesworth was responsible for Developing the Darwin Centre. Her experience lies in designing and developing wetland visitor centres. However since the nature of this output was changed Emma's role became redundant.
- Seb Buckton picked up on most areas of this work, overseeing the implementation of the learning plan that Malcolm developed and overseeing the development of the one-stop shops.
- Rob McInnes at WWT also picked up on some of the technical elements of the project to help with the workload, specifically advising on the implementation of eco-hydrological surveys and water quality surveys. However, he left WWT in 2008. His input into the project was taken up partly by Seb Buckton and partly by Matthew Simpson. Matthew also oversaw the production of a GIS map of Koshi Tappu using satellite and aerial photos which will be used to assess habitat extent both within the reserve and in the buffer zone.

BCN staff changes

- Following the visit of UK staff in October/November 2007 we identified three posts that were needed to support project activities – a project assistant and education officer (both full time until the project ends) and a participatory biodiversity assistant (full time for 9 months).
- Funding for these posts was reallocated from the casual project assistants budget, and the budget to support salary of an advisor from IUCN Nepal (which was available for reasons provided in the 1st Annual report). Funding has also came from the budgeted support for salary of a DNPWC project advisor – although project team

members have liaised with DNPWC over several aspects of the project, this has not yet required financial support in terms of salary.

- The new fish nursery currently being constructed requires a nursery manager to be appointed, so salary for this person for one year was also expended at the beginning of 2009. In subsequent years, his salary will be met by profits generated by the nursery.
- Audit fees were higher this year than previous. Due to the project underspend this increased amount was approved by DEFRA.

7.2 Additional funds or in-kind contributions secured

Beyond the in-kind contributions specific in the original project document, few additional funds were secured. An application was submitted to the Big Lottery International Communities fund to broaden the impact of some of the livelihoods work, but unfortunately this was not successful.

Some of the travel costs for partner visits to Koshi were covered by the respective partners in addition to those set out in the original project document. Most of the air fare for Sean Murphy's visit in 2008 was covered by CABI, whilst some of Anton Immink's trip costs in 2008 were covered by Stirling University.

A donation of £50 was received by WWT to support BCN's work at Koshi.

7.3 Value of DI funding

The conservation issues at Koshi Tappu are complex. Over the years, considerable resources have been put into carrying out a range of conservation activities in and around Koshi, but the real value in DI funding came from the ability to carry out research during the initial phase of the project to gain a thorough understanding of the socio-economic setting. This enabled the identification of key project beneficiaries and also enabled the project to engage well with these people and involve them in developing and implementing project activities. Whilst other funders may have been willing to support individual elements of the project, the combination of research, capacity building and livelihood development for conservation is a unique ability of DI projects. The project delivered by the partnership would not have been possible without this support.

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

Project summary	Measurable Indicators	Progress and Achievements	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		Project activities have raised awareness of values of wetland biodiversity to livelihoods Training and capacity building has promoted the sustainable use of components of biodiversity and the equitable sharing of benefits Management advice developed to enable people to benefit from use of wetland resources in a sustainable way, and local language guidance produced and distributed	(do not fill not applicable)
Purpose Local communities around Koshi Tappu Wildlife Reserve (KTWR) manage buffer zone wetlands sustainably, obtaining sufficient livelihood without compromising ecological integrity of buffer zone and KTWR	Increased wetland-related income and employment opportunities in the buffer zone Reduced encroachment and illegal use of KTWR	Demonstration fish ponds established and successful harvest made, with profits used to extend fish farming amongst local wetland dependent communities. Community-managed fish nursery completed which provides additional opportunities for increasing wetland related income. Income from other wetland resources diversified through development of additional livelihood options with positive or neutral impacts on biodiversity, and associated training and investment	Continued presence at KTWR by BCN with WWT support will continue to promote the sustainable livelihood activities developed by this project BCN staff will work closely with UNDP Wetland Project office at Koshi to help facilitate appropriate community-based activities under that project DNPWC imminently taking ownership of wetland management guidelines to embed them within KTWR management prescriptions

		Awareness of wetland values raised and provision of benefits to people encourages wise use and improves local attitudes to KTWR	
Output 1. Personnel trained and capacity built in local organisations and community groups	A minimum of 105 people (5 from 2 partner institutions, 100 from local communities) trained by end Yr 2 in alternative livelihoods, participatory biodiversity surveys, sustainable wetland management, and community learning and education	460 people have received training, including 418 in livelihoods training, 28 in participatory biodiversity surveys and 10 in facilitation of livelihoods training events. Four staff members have received in-job training.	
Activity 1.1 Participatory wetland socio-economic valuation		Completed	
Activity 1.2 Formation of Action Plan Committees for eastern and western sectors of KTWR buffer zone etc		Completed	
Activity 1.3 Learning needs assessment in collaboration with local schools and community groups completed		Completed	
Activity 1.4 Training activities from CAP to improve livelihood options and enhance wetland biodiversity		Completed	
Activity 1.5 Community learning workshop		Completed	
Activity 1.6 Community learning plan to provide basis for awareness raising activities Yr 2.		Completed	
Output 2. Sustainable wetland management promoted using wetland management guidelines for sustainable livelihoods	Through local NGOs and BZMCs awareness raised of 2000 families in wetland values and sustainable wetland management practices Actions to improve wetland related income of 20 households of target group	Guidelines produced and approved by the Department of National Parks and Wildlife Conservation, the management authority for KTWR. Factsheets for five sustainable livelihood activities produced, and 2000 copies of each distributed through BZMC and drop-in centres. Evaluation of drop-in centres suggest target of raised awareness in 2000 families has been met. Repeat household surveys demonstrate that those directly involved in project activities were more likely to increase their wetland-related income (both in total and as a proportion of all income) during the course of the project than those who were not involved.	
Activity 2.1. Participatory wetland socio-economic valuation		Completed	
Activity 2.2. Community Action Plan (CAP)		Completed	
Activity 2.3 Wetland tenure surveys		Completed	
Activity 2.4 Establishment of field sites		Completed	

Activity 2.5 Data collection from field sites to inform management actions		Completed
Activity 2.6 Participatory biodiversity surveys		Completed
Activity 2.7 Management actions from CAP to improve and demonstrate livelihood options and enhanced wetland biodiversity		Completed
Activity 2.8 Wetland management guidelines for sustainable livelihoods produced and disseminated		Completed
Output 3. Sustainable fisheries management plan developed and promoted	Management plan peer reviewed, published, disseminated and interpreted for local use; 1000 copies produced and distributed by Yr 3; fish hatchery/nursery operating Yr	Fisheries plan outlining main issues and recommending future action produced and adopted by DNPWC as part of Wetland Management Guidelines. Nursery construction completed. Co-operative management system in place.
Activity 3.1 Fisheries management surveys		Completed
Activity 3.2 Develop plan to manage fishery sustainably whilst providing sufficient livelihood to local people		Completed
Activity 3.3 Draft plan		Completed
Activity 3.4 Final versions produced		Completed
Output 4. Darwin Centre for Wetland Management for Sustainable Livelihoods established	Training and education facilities providing information and advice on wetland management, and interpretation for local and non-local visitors designed with local people and project partner advice, opened Yr 3	Four drop-in centres now established as part of existing tea-shop businesses. Evaluation suggests enthusiasm for them both from audience and also tea-shop owners who detect considerable increase in business when interp material is installed.
Activity 4.1. Centre development workshop		Completed
Activity 4.2 Determine appropriate purpose and form of Centre		Completed
Activity 4.3 Improve existing facilities/develop new facilities		Completed
Activity 4.4 Develop interpretative material using information from surveys and workshops		Completed
Activity 4.5 Opening of facilities		Completed

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

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**			
Project sub-goal Wetlands around Koshi Tappu Wildlife Reserve managed sustainably to increase benefits for local people from wise use of wetland resources, with resultant positive impacts on wetland biodiversity	Wetland biodiversity indicators of buffer zone wetlands Socio-economic indicators	Participatory biodiversity monitoring data KTWR reports Socio-economic surveys	
Purpose Local communities around Koshi Tappu Wildlife Reserve (KTWR) manage buffer zone wetlands sustainably, obtaining sufficient livelihood without compromising ecological integrity of buffer zone and KTWR	Increased wetland-related income and employment opportunities in the buffer zone Reduced encroachment and illegal use of KTWR	KTWR reports Buffer Zone Management Committee reports District Development Committee (DDC) reports Household surveys Most Significant Change surveys	Local communities remain involved in and supportive of the project Partner NGOs remain committed and viable

Outputs			
1. Personnel trained and capacity built in local organisations and community groups	A minimum of 105 people (5 from 2 partner institutions, 100 from local communities) trained by end Yr 2 in alternative livelihoods, participatory biodiversity surveys, sustainable wetland management, and community learning and education	Attendance records Training assessment forms	Trained staff remain in institutions or local communities and use skills provided
2. Sustainable wetland management promoted using wetland management guidelines for sustainable livelihoods	Through local NGOs and BZUCs awareness raised of 2000 families in wetland values and sustainable wetland management practices Actions to improve wetland related income of 20 households of target group	Field survey reports Desk survey reports Reviews/feedback on guidelines Community Action Plan monitoring and evaluation	Local stakeholders willing to participate in development process
3. Sustainable fisheries management plan developed and promoted	Management plan peer reviewed, published, disseminated and interpreted for local use; 1000 copies produced and distributed by Yr 3; fish hatchery/nursery operating Yr 3.	KTWR reserve reports BZMC reports Reviews/feedback on manual	Management authority remains supportive
4. Darwin Centre for Wetland Management for Sustainable Livelihoods established	Training and education facilities providing information and advice on wetland management, and interpretation for local and non-local visitors designed with local people and project partner advice, opened Yr 3	Operation plan for 5 years Visitor records	Information reaches local communities and schools, and has a positive impact

Activities
Output 1. Personnel trained and capacity built in local organisations and community groups 1.1 Participatory wetland socio-economic valuation Yr 1 1.2 Formation of Action Plan Committees for eastern and western sectors of KTWR buffer zone Yr 1 1.3 Learning needs assessment in collaboration with local schools and community groups completed Yr 2 1.4 Training activities from CAP to improve livelihood options and enhance wetland biodiversity Yr 2-3 1.5 Community learning workshop Yr 2 1.6 Community learning plan to provide basis for awareness raising activites Yr 2
Output 2. Sustainable wetland management promoted using wetland management guidelines for sustainable livelihoods 2.1 Participatory wetland socio-economic valuation Yr 1 2.2 Community Action Plan (CAP) Yr 1 2.3 Wetland tenure surveys Yr 1 2.4 Establishment of field sites Yr 1 2.5 Data collection from field sites to inform management actions Yr 1-2 2.6 Participatory biodiversity surveys Yr 2 2.7 Management actions from CAP to improve and demonstrate livelihood options and enhanced wetland biodiversity Yr 2-3 2.8 Wetland management guidelines for sustainable livelihoods produced and disseminated Yr 3
Output 3. Sustainable fisheries management plan developed and promoted 3.1 Fisheries management surveys Yr 1-2 3.2 Develop plan to manage fishery sustainably whilst providing sufficient livelihood to local people Yr 2 3.3 Draft plan Yr 2 3.4 Final versions produced Yr 3
Output 4. Darwin Centre for Wetland Management for Sustainable Livelihoods established 4.1. Centre development workshop Yr 2 4.2 Determine appropriate purpose and form of Centre Yr 2 4.3 Improve existing facilities/develop new facilities Yr 2-3 4.4 Develop interpretative material using information from surveys and workshops Yr 2-3 4.5 Opening of facilities Yr 3
Dissemination and publicity Radio broadcasts Yr 1, 2 and 3 Information provided to Wetland Link International web-site (Yr 3) 2 newsletters for local communities Yrs 2 and 3 Posters, info sheets Yr 2-3 WWT magazine articles Yrs 1, 2 and 3 2 peer-reviewed papers Yr 3

Monitoring activities
Collection of baseline data for monitoring indicators Yr 1-2
Develop ability to monitor purpose and output level indicators Yr 1
Develop indicators for project activities in consultation with APC Yr 1
Project evaluation workshop Yr 3

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		Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring		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	40	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	30	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		Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training		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	20	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 and equitable way of results and benefits.

Article No./Title	Project %	Article Description
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		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	10	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	Number of Masters qualifications obtained	2. Pramod Rijal completed his masters thesis based on research under this project. Chudamani Pandey completed his thesis for his masters in Wetland Management at Stirling University based on research under this project, supported by a DI fellowship
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification(ie not categories 1-4 above)	1 Nepali project staff received on-the-job training for 3 yrs, 2 staff for 18 months, and 1 staff for 9 months
6a	Number of people receiving other forms of short-term education/training (ie not categories 1-5 above)	456, including 418 local resource users trained in a range of sustainable livelihood practices, 28 in participatory surveys and 10 in training facilitation
6b	Number of training weeks not leading to formal qualification	22 weeks of training courses
7	Number of types of training materials produced for use by host country(s)	5 types: four livelihoods fact sheets, one poster, two newsletters, one video documentary, one set of wetland management guidelines:
Research Measures		
8	Number of weeks spent by UK project staff on project work in host country(s)	20 UK staff weeks
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	2: Wetland Management Guidelines and Sustainable fisheries plan
11b	Number of papers published or accepted for publication elsewhere	1: paper published in proceedings of conference
Dissemination Measures		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	3: workshop held at Koshi Tappu to present project findings to local stakeholders; two events held as part of World Wetlands Day celebrations at Koshi
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	3: Society of Wetland Scientists European Chapter conference, Czech Republic 2007; Managing wetlands for sustainable development seminar, Thailand, 2008, Asian Wetland Symposium,

Code	Description	Totals (plus additional detail as required)
		Vietnam, 2009
15a	Number of national press releases or publicity articles in host country(s)	5 press releases, resulting in a 10+ press articles in national press. One article in BCN member's newsletter 'Danphe'.
15b	Number of local press releases or publicity articles in host country(s)	16 articles in local newspapers
15c	Number of national press releases or publicity articles in UK	7: two articles in WWT Waterlife members magazine; two articles in WWT's Action for Survival newsletter; one item in PCLG news, one article in Green Places magazine 2009.
15d	Number of local press releases or publicity articles in UK	1: article in Weekend Citizen (local newspaper)
16a	Number of issues of newsletters produced in the host country(s)	2 Koshi Wetlands for Life newsletters
16b	Estimated circulation of each newsletter in the host country(s)	3,000 of each
16c	Estimated circulation of each newsletter in the UK	50
17b	Number of dissemination networks enhanced or extended	2: WWT web-site, BCN web-site
19a	Number of national radio interviews/features in host country(s)	8: as part of BCN regular slot on national radio station.
19c	Number of local radio interviews/features in host country (s)	35: as part of work with the District authorities and a local FM radio station 'Saptakoshi FM'
Physical Measures		
20	Estimated value (£s) of physical assets handed over to host country(s)	
21	Number of permanent educational/training/research facilities or organisation established	4 fishponds, 1 fish nursery, 4 drop-in centres
22	Number of permanent field plots established	34 – ponds at which monitoring activity was established.
23	Value of additional resources raised for project	
Other Measures used by the project and not currently including in DI standard measures		
	Awards	1: Specially commendation in CIWEM World of Difference Award

Annex 5 Publications

Type * (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
Poster*	*Wetlands for Life!* Bhagwan Dahal, Seb Buckton, 2008	Bird Conservation Nepal, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
Newsletter*	*Koshi Wetlands for Life!.* Bhagwan Dahal, Seb Buckton, 2008	Bird Conservation Nepal, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
Newsletter	*Koshi Wetlands for Life!.* Bhagwan Dahal, Seb Buckton, 2009	BCN, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
Paper in conference proceedings*	*Using participatory socio-economic wetland valuation to address wetland management issues at Koshi Tappu, Nepal*. Bhagwan Dahal and Seb Buckton, 2008	Faculty of Environmental Management, Prince of Songkla University, Thailand	Seb Buckton, WWT Slimbridge, UK, GL2 7BT	0
Documentary	*Koshi Tappu*	BCN, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
Factsheets (in Nepali)	Aquaculture in Buffer Zone by *Malaha* community, best practice for wetland management Bhagwan Dahal and Seb Buckton, 2009	BCN, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
	Alternative fuel source- bio-briquette Bhagwan Dahal and Seb Buckton, 2009	BCN, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
	Making mats and handicrafts from wetland products Bhagwan Dahal and Seb Buckton, 2009	BCN, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
	Using water hyacinth for compost fertiliser, a practical approach for wetland management Bhagwan Dahal and Seb Buckton, 2009	BCN, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
Booklet (in Nepali)	Fish of Koshi Tappu – Pramod Rijal and Madhav Shrestha, 2009	BCN, Kathnmandu	BCN, PO Box 12465, Kathmandu, Nepal	0

Annex 6 Darwin Contacts

Ref No	15/014
Project Title	Managing wetlands for sustainable livelihoods at Koshi Tappu, Nepal
UK Leader Details	
Name	Seb Buckton
Role within Darwin Project	Project Leader
Address	WWT Slimbridge, Glos, GL2 7BT, UK
Phone	
Fax	
Email	
Other UK Contact (if relevant)	
Name	Anton Immink
Role within Darwin Project	Fisheries advisor
Address	Institute of Aquaculture, University of Stirling, Stirling, FK9 4LA, UK
Phone	
Fax	
Email	
Other UK Contact (if relevant)	
Name	Dr Sean Murphy
Role within Darwin Project	Invasive species advisor
Address	CABI, Bakeham Lane, Egham, Surrey, TW20 9TY, UK
Phone	+44 (0)1491 829071
Fax	
Email	
Partner 1	
Name	Dr Hum Gurung
Organisation	Bird Conservation Nepal
Role within Darwin Project	Advisor – Chief Executive of BCN
Address	P.O.Box 12465, Kathmandu,Nepal
Fax	
Email	
Partner 1	
Name	Bhagwan Dahal
Organisation	Red Panda Network- Asia (previously BCN)
Role within Darwin Project	Darwin Project Officer
Address	P.O.Box 2785, Kathmandu, Nepal

Fax	
Email	
Partner 1	
Name	Dr Hem Sagar Baral
Organisation	Himalayan Nature (preciously BCN)
Role within Darwin Project	Advisor
Address	PO Box 10918, Lazimpat, Kathmandu, Nepal
Fax	
Email	
Partner 2 (if relevant)	
Name	Dr Madhav Shrestha
Organisation	Institute of Agriculture and Animal Science, Tribhuvan University
Role within Darwin Project	Fisheries Advisor
Address	Department of Aquaculture, Rampur Campus, IAAS, Rampur, Chitwan, Nepal
Fax	
Email	

Annex 7 Stories gathered from project beneficiaries and stakeholders

Malati Rishidev

Malati Rishidev had never used *Cattail* for weaving mat before. She did not know that mat weaving work can earn money even using leisure time. She was thinking weaving mat is a very tough job but when she has got motivation that *Cattail* can turn into many wetland products, she started caring about *Cattail* in her area. She was using *Cattail* just as fuel wood mixing it with cow dung but she did not try to use it for mat. When she received training and motivation about the use of *Cattial* for making money, she is now doing mat weaving business. She is weaving 2-3 mats using her leisure time and making 3500-4000 rupees every month. She realized the importance of *Cattail* in her livelihoods only if she could conserve surroundings wetlands for the *Cattail* grow.

Pankaj Mahato, Chairman, Madhuban User Committee

Mr. Mahato is happy now because he is having less pressure from the Malaha community to recommend for letter license issues. Since he is the chairman of the Madhuban User Committee, he has to recommend fish catching licenses for fish farmers to fish in the river. When BCN has technically and financially supported fisher community in fish farming activities, fishers were engaged in the fish farm and frequency of fishing in the River has slightly declined. He said that only 10 Malaha people came to him for the recommendation for fishing this time however they have 20 licenses in that village.

Goma Baral, Vice-president, Water hyacinth compost fertilizer committee

A local farmer, Mrs. Goma Baral was showing to the small size maize plant in her farmland which was not fully grown and not sufficiently healthy. She was reasoning to the journalist that these crops are grown using chemical fertilizers. At the same time, she was showing a healthy maize plant on other side. She was making briefing with full of excitement that these crops are fully grown and very healthy, it is because of using compost fertilizer made from water hyacinth. “I have used chemical fertilizer in some of farm plots because I was not sure whether compost fertilizer can produce yield as that of chemical fertilizer. After the results, I am very much proud of project team who taught poor people like us a cheap way of making compost fertilizer”.

How did you know this? One of the enthusiastic journalist asked question to her. She smiles and indicated to Darwin Project Officer that he has taught us about the use of water hyacinth in the form of compost fertilizer. The project has given us a proof that the compost fertilizer made from water hyacinth has all nutrients component that chemical fertilizers do contain. She was further briefing to the team that after the training, she started production of compost fertilizer and she has already used these compost fertilizer to the beans and maize farm land in which she is very much happy with the production. As a result, she has already deposited compost fertilizer made from water hyacinth for paddy field in the coming seasons. She is very much optimistic that she will be able to get satisfactory production even from the paddy field. However many people has been saying that in the field the root of the hyacinth might regenerate because of sufficient availability of water in the paddy field but she does not belief on it because the compost fertilizer what she is fully decomposed and there is no chance of regenerating. Before training we did not know that hyacinth can save our money and prevent degradation of our soil.

Gulabi Mukhiya, Chairperson, Kamala Wetland User Committee

We had a wrong perception that fish of Koshi flow down to India. If we don't fish them, somebody will fish, so why not to fish using any kinds of methods that catch a good amount of

fish, said Gulabi Mukhiya. With series of discussion and interaction with project team, we have understood that there is reproduction of fish species in a certain intervals and we can catch them after certain weight. So, it is foolish to use poisoning and other kinds of destructive fishing gears which ultimately effect our livelihoods. Most of buffer zone people don't go for fishing but they buy fish from us. However we solely rely on fish resources so the cutting branch of tree where we are perching on is really a nonsense work which we have been doing in the past. We have also got opportunity to learn aquaculture practices in the buffer zone which will help us to promote our livelihood. In the other hand, fish will get opportunity to breed successfully when we are engaged in the buffer zone.

Perception about drop in center

Mr. Manoj Sah, tea shop owner, had not expected that information about the Koshi Tappu and its wetlands could bring many people in his tea shop. When project team approached him with this concept, he was excited to keep the information board as a decorating material. But when he saw many people visiting his shop and staying longer time drinking tea, he realized the values of wetland information in business promotion. The person who usually had tea once in a morning now have started drinking tea more than thrice after the installation of the information board. It encourages him to explain more briefly about the importance of wetlands in the local livelihood and Koshi ecosystem. He encounters many new visitors at his shop asking about information that are placed in his shop. Although local people are residing in the fringe of wetland resources, they could not quantify long term benefits of the wetland resources for the livelihood of the wetland dependent communities. Now he is happy delivering information on Koshi wetlands and at the same time promoting his tea business.

Mr Pani Lal bahardar, President of Fish Farming management group, Madhuban-4,5, Sunsari,

From the Darwin project, we have gained useful skills and knowledge on fish pond management, and utilization and management of fish feeds. The fish culture gives good profit in very short period. Nowadays, because of the scarcity of fish in the rivers, fisher communities are diverting towards fish culture. Although the provided fishponds will not help in livelihood of the fishers it is certain that the skills gained through this program will secure our path to the sustainable livelihood. We will be very grateful if the project will help us building a hatchling centre for the production of fish fry. Project has been providing technical support and it would be better if financial support could be provided as well. In the past, similar kind of programs were organized but failed in terms of good result due to lack of our knowledge and skills. But due to the encouragement and awareness provided by BCN, program is running very smoothly and successfully. Project's staff have played important role on encouraging people by visiting regularly and conducting training programs. I really like the idea of providing 1 kattha fishpond to 1 family, which will generate the sense of responsibility within individuals. The program is running very successfully now and it has really opened our eyes and showed us the right path.

List of responses to Most Significant Change question from repeat household survey:

Most significant change in quality of community people's lives
Little bit improvement in economic condition/New skill developed
New skill developed for wetlands resources utilization/conscious on education
Skill development/Sensitized group/Economic development
More conscious on economic condition & education
Good improvement in income generation/Prominent changes in life-standard
Socio-economic condition is promising/focus on children education
Capacity build-up, Improvement in economic status, scientific fish-farming method learnt
Mainly skill development, improvement in livelihood
New skill developed in high level mat weaving/people of the communities are giving emphasis on socio-economic development
Technical knowledge developed on compost fertilizer/Focusing on education
Skill developed/Good support to sustain livelihood/Actively participated in pig rearing
Socio-economic condition is improving/Skill developed in pig rearing

New skill developed/Economic condition is improving
Skill development/focus on education
Skill development
Given emphasis on education, skill development in wetlands resources utilization
Skill development/ awareness in communities on childrens education; improvement in living standard
Capacity build-up/ Conscious on children education/Improving life standard
They have raised group seed money & don't have to depend on others for money/Also focusing on children education
Skill development
Awareness level raised, scientific fish farming method learnt, group seed money established.
Improvement in life standard
Conscious on economic condition
Economic condition uplifted/children started to go school/Fish farming started by *Malaha* group
Children started to go school/change in living standard
Skill developed for wetlands resources utilization/focusing on socio-economic condition
Economic condition is improving
Socio-economic status is promising/giving focus on socio-economic improvement
Skill developed in wetlands resources utilization/Focusing on education
Better than before in economic condition/knowledge gained on wetlands resources utilization
Giving more focus on children education
Emphasis on education/Economic condition is promising
Skill developed/Giving more focus to uplift the socio-economic condition
Conscious communities on economic condition upliftment/Focus on children education
Socio-economic condition is promising/Conscious on children education
Improved in livelihood/skill developed/awareness of wetland conservation
Skill development/Children go to school/Own group seed money as backbone
Skill developed for scientific fish-farming/involvement in more leased fish pond/Life standard improving
Came to know sustainable utilization of wetlands resources/improved economic condition
Skill development/little bit focus on conservation/Socio-economic condition improved
Socio-economic condition is promising/Prominent changes in life style
Scientific method of fish-farming learnt Education development, Sensitised Group
Skill development in fish-farming, Group has own seed money & group capacity build-up
Socio-economic condition is promising
Skill developed in wetlands resources utilization/Improvement in socio-economic condition
Skill developed in compost fertilizer making/economic condition is promising
Skill development/Sensitised group/An aware communities on children education
Good knowledge on invasive species like water hyacinth, which is used as food of pig. Got opportunities to sustain lives and focus on children education.
Economic status is improving/More focus on children education
Skill developed in fish farming from Malaha group/An aware in wetlands conservation
Skill developed to sustain livelihood, Living standard improved, Focus on children education
Great support in livelihoods/Do not depend on others for money borrowing
Socio-economic condition is improving/An aware communities on wetlands resource utilization
As project working directly in community, got better opportunities for skill development Socio-economic condition is improving
Economic condition improving/Emphasis on education
Socio-economic development/ Knowledge gained on scientific methods of fish farming
Skill developed in compost fertilizer making/conscious towards economic condition. conservation of wetlands
Socio-economic condition is promising/Skill developed
Improvement in economic condition/skill developed
New skill developed for mat weaving/Economic condition is promising
Socio-economic condition is improving/life-standard is good/Focus on children education
Life standard is little bit improving/sensitised community on wetlands resources utilization
Income generation is in promising stage
Group capacity build-up/ An aware communities on conservation/Skill developed for livelihood
Economic condition is promising/Technical skill is developed

Annex 8 Foreword from DNPWC in Wetland Management Guidelines

See separate pdf attachment.