



## Darwin Initiative Annual Report



### Important note:

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

**Submission deadline 30 April 2009**

### Darwin Project Information

Project Ref Number	15/014
Project Title	Managing wetlands for sustainable livelihoods at Koshi Tappu, Nepal
Country(ies)	Nepal
UK Contract Holder Institution	Wildfowl & Wetlands Trust
Host country Partner Institution(s)	Bird Conservation Nepal; Tribhuvan University; Koshi Camp
Other Partner Institution(s)	Institute of Fisheries, University of Stirling; CABI Bioscience
Darwin Grant Value	£198,835.27
Start/End dates of Project	1/10/06-30/09/09
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	1 April 2008-31 Mar 2009, Annual report number 3
Project Leader Name	Seb Buckton
Project website	<a href="http://www.wwt.org.uk/text/511/koshi_tappu_nepal.html">http://www.wwt.org.uk/text/511/koshi_tappu_nepal.html</a>
Author(s) and main contributors, date	Seb Buckton, Bhagwan Dahal, Ravi Pandit, Hem Sagar Baral; 28 <sup>th</sup> April 2009

### 1. Project Background

Koshi Tappu Wildlife Reserve (KTWR) lies in the lowlands of eastern Nepal (Figure 1). The reserve comprises 175 km<sup>2</sup>, and was gazetted in 1976 to conserve the last remaining wild Nepalese population of the globally threatened Asiatic Water Buffalo. It was declared a Ramsar Site in 1987, and is the most important wetland for migratory waterbirds in Nepal, and one of the most important in Asia. The site is surrounded by a buffer zone of 173 km<sup>2</sup>, in which over 80,000 people live, most of whom are dependent on the natural resource base for their livelihoods.



Figure 1. Koshi Tappu Wildlife Reserve and Buffer Zone

Current resource use in and around Koshi Tappu Wildlife Reserve is unsustainable. Pressures on people’s livelihoods mean that existing patterns of resource use bring people into conflict with the reserve because people perceive that the conservation of the site results in reduced benefits for them. These impacts include reduced access to resources as well as increased risk from human-wildlife conflict. As a result, the reserve is viewed negatively by many and as a result there is non-compliance with reserve laws leading to unsustainable exploitation of resources within the reserve and associated disturbance.

For the long term viability of the KTWR, people living adjacent to the site who depend on wetland resources for their livelihoods must be able to obtain a sustainable livelihood – i.e. a livelihood which is resistant to environmental shocks and does not result in the unsustainable exploitation of those resources. This project aims to assist local communities around KTWR in managing buffer zone wetlands for sustainable livelihoods, whilst enhancing wetland biodiversity, thus reducing the pressure on resources within KTWR.

## 2. Project Partnerships

Bird Conservation Nepal (BCN) is the primary host country partner. The partnership has continued to work well, with BCN responsible for the day to day management of the project activities within Nepal and 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 year, whilst three staff from WWT have contributed during this time. The project leader from WWT (Seb Buckton) is responsible for the delivery of project outputs on time and within budget, and is responsible for all reporting to the Darwin Initiative. He also

supervises the planning of project activities, and has visited Nepal twice during 2008/09. Matt Simpson has provided technical advice on ecohydrological assessment and visited the site in November 2008 to gather information on the economic benefits of different livelihood activities on fishponds. Rob McInnes also provided technical advice on project activities, particularly those involving hydrological work, until July 2008 when he left WWT.

During each project visit, a work plan for the following 3-6 months is discussed and agreed with the BCN Darwin Project Officer (DPO- Bhagwan Dahal) and project co-ordinator (Ishana Thapa). This is 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. During each visit, a few days were spent at Koshi visiting project activity sites, reviewing progress and discussing future plans. There are 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 is also spent in Kathmandu, discussing project issues with BCN staff based there, and visiting other organisations based in the capital as appropriate. Some time is also normally spent discussing other projects that BCN are involved in or would like to be involved in, where WWT has relevant expertise.

The role of the DPO is to oversee the day-to-day operation of project activities, and he was based at Koshi Tappu throughout 2008/09. Three additional staff worked under the project officer during 2008/09. The Education Officer (Ravi Shankar Pandit) worked full time for the year and took forward many of the awareness-raising and learning activities under the project. He has been responsible for developing and implementing the Community Learning Plan, specifically developing wetland information centres, learning materials, and school and community awareness raising activities. The Participatory Biodiversity Monitoring Officer (Dibesh Kumar Chaudhary) was employed 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 year, to support the DPO and other field staff in various elements of the project, in particular liaising with some of the local communities involved in project activities, and offering support where required. For example, he was responsible for visiting demonstration fishponds and helping them to record fish numbers and growth rates. BCN has a good presence at Koshi, and staff work out of a small office located in a busy village.

Ishana Thapa, the BCN project co-ordinator, is based in Kathmandu. Her role is to line-manage the DPO and oversee the central management of contracts, and finances. She is also able to liaise with Kathmandu-based organisations over any project matters. The BCN Finance Officer (Pratikchha Srivastava) monitors project expenditure and liaises 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 continues to do so even since he has left BCN. He was also instrumental in developing the project proposal with WWT.

Communications are maintained outside of project visits by regular email contact, and occasionally phone calls when required, although communication is usually easier through email. Even during severe electricity shortages in Nepal, which were particularly acute in late 2008 into early 2009, when power was often only available for two 4-hour periods over 24 hours, it was normally possible to maintain regular email contact, but field staff were often forced to work late into the evening to utilise the available electricity. The regular (roughly twice per year) management meetings held when the Project Leader visits Nepal are, however, essential: communication is much easier face to face for both parties.

Relationships with other host country partners have remained focused. A TU Masters student and local government fisheries officer (Pramod Rijal) studying the role of fisheries and aquaculture in livelihoods in the Koshi Tappu Buffer Zone was completed, as was another TU Masters student (Chudamani Pandey) project supported by a Darwin Fellowship via Stirling University. Both have informed the development of the fisheries management plan (Output 3). Following the completion of Pramod's thesis, he has maintained close links with the project in his role as Fisheries Development Officer for Sunsari District, and has 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. Madhav Shrestha has also remained closely involved in the project, providing advice and training on fishpond management, input into the design of the fish nursery. Together with Pramod, he has authored a small booklet describing the fish diversity of Koshi, the production of which was supported by the project. The relationship with local fisheries officials has also developed, and Arjun Thapa, co-ordinator of the Fisheries Research Centre in Sunsari District has also provided advice on development of fisheries training, and specifically input into the design and management of the fish nursery being constructed in the eastern Buffer Zone with project support.

As described in the 2<sup>nd</sup> Annual Report, the relationship with Koshi Camp has remained as primarily as providing a base to host members of the project team when visiting.

The relationship with UK partners has continued as described in the 2<sup>nd</sup> Annual Report. Sean Murphy (CABI) and Anton Immink (Stirling University) have provided input to the development of project work over the year. Anton visited Koshi 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 has helped inform the development of the fisheries management plan that he is leading on with Madhav Shrestha. Following Sean's visit to Koshi in March/April 2008 (reported in the 2<sup>nd</sup> Annual Report) he provided further input into the development of the invasives monitoring programme, and how to use the resulting data. He has also provided comments on invasives elements of the Wetland management guidelines.

#### **Other Collaboration:**

We have continued collaborating with the UNDP-GEF funded project 'Conservation and Sustainable Use of Wetlands in Nepal' through the National Programme Manager, Top Bahadur Khatri. For various bureaucratic reasons, the project remains in the planning stage as regards to the activities due to be carried out at Koshi, but a meeting was held between the National Programme Manager and the Darwin Project Leader where the former support for our project was re-iterated, and the desire to ensure outputs and experience from the Darwin project help in the delivery of activities in the UNDP-GEF project. These links will be maintained by BCN even after the Darwin project is completed.

We have also shared experiences with WWF-Nepal in relation to the Koshi River Basin Management (KRBM) programme, initiated by the Government of Nepal's Water and Energy Commission Secretariat (WECS) in conjunction with WWF. Although taking a different approach and at different scales, both projects have lessons to learn from each other and communication will be maintained, particularly in the light of any potential future activities at Koshi Tappu. This project is quite timely, as it may help address some of the bigger issues within the Koshi Basin, which will impact on the site, but are not within the remit of this project (i.e. the operation of the Koshi Barrage, and the planned high dam on the Koshi River).

The project does not have a direct link with the CBD focal point (the Environment Division of Ministry of Forest and Soil Conservation) but it does have a close link with the Ministry's Department of National Parks and Wildlife Conservation. Meetings are organised both at central and field level to brief the DNPWC on project activities. DNPWC are being consulted over the project outputs and as a result they are keen to involve BCN in the revision process for the KTWR Management Plan.

### 3. Project progress

Our project aims to address the issues of unsustainable exploitation at KTWR by moving from a situation of unsustainable use to sustainable use, and by increasing the benefits resulting from the conservation and use of the biodiversity of the reserve and its buffer zone. To deliver the project we have:

1. Researched how people use wetland resources in and around Koshi Tappu, and related this resource use to social and environmental conditions
2. Evaluated this information to identify:
  - potential impacts of wetland resource use on KTWR and buffer zone biodiversity;
  - the appropriate target groups of people for our project;
  - the barriers to local people obtaining sustainable livelihoods from wetland resources.
3. Produced plans to set out actions required to overcome these barriers
4. Begun Implementation of these plans

As the plans are implemented, monitoring and evaluation enable us to better understand resource use and the impacts of this use, and refine the plans accordingly.

The project is now half way through the final year. This report concerns progress in the second half of year 2 and the first half of year 3 of the project.

#### 3.1 Progress in carrying out project activities

There are four major outputs from the project:

1. Trained people and built capacity: involving personnel from organisations trained in various survey, evaluation and monitoring practices, and members of local community groups trained in a range of livelihood and associated management practices
2. Guidance on managing wetlands for sustainable livelihoods based on the information gathered under the project
3. The development of a specific plan on managing fisheries in Koshi Tappu, recognising the key role that fisheries play in people's livelihoods
4. Dissemination facilities through which information can be conveyed concerning these guidelines and awareness of wetland values can be raised

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

During this year, we have continued to deliver **training activities** outlined in the Community Action Plan presented in the 2<sup>nd</sup> Annual Report (**Activity 1.4**). These activities have now largely been completed. The following training has been delivered in 2008/09:

##### *Fish farming training*

Following the leasing of fish ponds reported on in the 2<sup>nd</sup> Annual Report (see also under Activity 2.7 below), 40 *Malaha* fishermen involved in managing the ponds have received training in fishpond management, in several stages over the course of the fish-production cycle. Following the 3 day exposure visit to Chitwan (see 2<sup>nd</sup> Annual Report), members of the fishpond management groups involved have received pre-stock management training, group sensitization training, second phase of fishpond management training, and disease and fish-wildlife conflict training. In addition, monthly visits from project staff have involved informal training in record-keeping, water quality monitoring and wildlife monitoring. A report on the demonstration ponds and associated training is provided as Annex 3).

### *Livelihood support training*

Following the successful mat weaving training events in 2007/08, four additional livelihood supporting activities were identified in consultation with local people (BZMC, KTWR, and various resource user groups). Further details of these activities is provided under Activity 2.7 (see below). These activities were promoted during 2008/09 and training was provided to local people.

Two events were held to provide training and equipment to promote the use of non-native invasive plants to produce charcoal briquettes. Additionally, support has been provided to facilitate the delivery of an additional training event, organised by a local CBO, the Koshi Development Foundation (KODEF). Five events were held to provide training in the production of compost using water hyacinth, together with one refresher event. Two events were held to train women in handicraft production from wetland grasses. Training was carried out as part of two pig distribution activities to provide an alternative source of income to *Jhangad* groups, the only group in the KTWR area who are willing to raise pigs.

### *Participatory Biodiversity Monitoring training*

The Participatory Biodiversity Monitoring workshop reported on in the 2<sup>nd</sup> Annual Report had the following objectives: to increase understanding of the benefits and obstacles of participatory monitoring of bio-diversity; to raise awareness of bio-diversity conservation, sustainable management and resource utilization; to increase understanding of methods for data collection, analysis and dissemination; and to highlight the connection between bio-diversity and livelihoods. The workshop met these objectives, but did not result in any meaningful monitoring programmes being initiated, as one of the obstacles identified was that the audience for this training could not devote the time necessary to carry out biodiversity monitoring activities as part of their normal daily activities. The project team, in discussion with local stakeholders, therefore identified Community Forest guards as a more appropriate target for participatory biodiversity monitoring training, as they already have the remit of monitoring human activities in Community Forest areas, and therefore regularly patrol the CF areas. There are 19 CF areas around the Koshi Buffer Zone, (4 in Tapeswori on the western side and 15 on the eastern side). Most include areas of wetland, and access to wetland resources within CF areas is generally regulated in a similar manner to access to forest resources. Therefore two Participatory Biodiversity Monitoring training events were held for Community Forest guards, one event on the east side of KTWR, and one on the west side. Capacity for participatory biodiversity monitoring was further enhanced by the provision of eight pairs of binoculars to enable CF guards to collect data.

### *Other training/capacity building activities*

Other training activities carried out during the year have helped build the capacity of local organisations to deliver biodiversity conservation and sustainable wetland management activities both at Koshi and elsewhere in Nepal.

Capacity of the host country partner (BCN) in delivering its strategic objectives has been improved. Bhagwan Dahal attended the Asian Wetland Symposium, in Hanoi, Vietnam in June 2008. Bhagwan made a presentation on socio-economic valuation of wetlands at Koshi Tappu, in the Wetlands and Sustainable Livelihoods Technical Session. A field visit to the Red River Delta provided an opportunity to observe a range of different wetland types and the livelihoods obtained by local people. There were also opportunities to network and discuss experiences with other participants from across the Asian region.

Ishana Thapa, Darwin Project Co-ordinator and Conservation Officer at Bird Conservation Nepal is attending the Durrell Endangered Species Management Graduate Certificate (DESMAN) course 2009, with partial support from Darwin funds, to cover travel costs. Elements of the course content with particular relevance to Ishana's work on the Koshi Darwin project are:

- Conservation planning and priority setting
- In-situ conservation
- Management skills

- Facilitation training

The course began on March 19<sup>th</sup> and finishes in June.

Bhagwan Dahal researched and organised a small training event in December 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 the project is completed. This training has informed how the team have worked in January-March in building the capacity of local organisations to deliver training and awareness-raising activities in the future.

In addition to livelihoods training, capacity to deliver training locally has been enhanced by provision of training in facilitation of livelihoods training events. Buffer zone and Community Forest leaders attended a three day residential Training of Trainers event, on sustainable livelihoods and management of small scale wetland-based industries, to encourage replicating these activities throughout the Koshi Tappu Buffer Zone.

Renu Sah, the chairwoman of the BZMC, attended the Department of National Parks and Wildlife Conservation Warden's Seminar in Kathmandu in March. Her costs were supported by the Darwin project. Bhagwan Dahal, the project officer, discussed the seminar with her afterwards and provided the following report:

“Renu presented a poster on the Darwin project activities. She explained that the poster demonstrated how buffer zone people have received benefit from the Darwin project. She praised Bird Conservation Nepal and the project partners for achieving success in leaving excellent models of livelihoods for wetland dependent communities using wetland products. She explained that BCN had identified problems that local people face in close coordination with buffer zone and target communities, and implemented a plan with people at the grass roots level, who are the real wetland users. She was very grateful to BCN and expressed hope that project work could continue to help the local community become more accustomed to the activities carried out in the project. She explained each livelihood activity in detail and everybody appreciated BCN's working modality.”

Following the production of the learning needs assessment, the **Community Learning Workshop (Activity 1.5)** comprised informal discussions with local stakeholders, including school committees, wetland user groups, and other stakeholders, including as part of an Action Plan Committee evaluation workshop held in December. As a result of these discussions a **Community Learning Plan (Activity 1.6)** comprising awareness raising activities was produced (Annex 4). Project staff have now trialled a variety of activities that were suggested in the learning needs assessment. Part of this plan also relates to the Centre development workshop (Activity 4.1 below), and the community learning activities are reported on under Output 4.

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

**Data collection from field sites to inform management actions (Activity 2.5)** has now been completed. Surveys of 30 study ponds were described in the 2<sup>nd</sup> Annual Report. Further data collection has been carried out, from a total now of 35 ponds. Ecohydrological surveys were completed and further data collection carried out on specific livelihood activities in October/November 2008. A report on the findings of this study is available on request, and the summary is attached as Annex 5. Elements of this report form part of the Sustainable Wetland Management Guidelines (see Activity 2.8 below).

Data collection has also been undertaken from the five demonstration fish ponds leased for local *Malaha* fishing communities (see under 2.7 below)). The following data collection has taken place:

- Monthly surveys between June and December of biodiversity (birds and plants)
- Monthly recording of water quality from April to November
- Monthly recording of fish size and weight of a sample of farmed fish present in the ponds, from July to November.

On harvesting fish from the demonstration ponds, the weight of fish captured was recorded as well as the price obtained for them at market.

An invasive species survey was carried out pre and post monsoon to identify patterns in distribution in areas of the buffer zone and reserve.

The two Participatory Biodiversity Monitoring training events described under Activity 1.4 have resulted in a data sheet being developed for CF guards to complete **participatory biodiversity surveys (Activity 2.6)** during their weekly patrols. Three of the Community Forest groups have an annual work plan, and the guards are collecting data based on that plan. Other community forest groups will develop new work plans once the current round of elections to these groups is completed.

Participatory biodiversity surveys were also carried out on the demonstration fishponds, to assess impacts of fish pond management on biodiversity (see under Activity 2.5 above and 2.7 below). These will be reported on as part of the assessment of demonstration ponds.

**Management Actions from CAP to improve and demonstrate livelihood options and enhanced wetland biodiversity (Activity 2.7)** continued in 2008/09. A major barrier to local people obtaining a sustainable livelihood described in the Community Action Plan was the lack of access to good fishing areas. To overcome this, we have supported the leasing of demonstration fishponds by groups of *Malaha* fishermen (described above), and these have been operational for one year. Two different management strategies were trialled, and monitoring of various parameters has been carried out throughout the fish-growing cycle. Training was provided in different aspects of fishpond management (see Activity 1.4). A full report on the establishment of demonstration ponds is provided as Annex 3. Monitoring activities (described under 2.5 above) were implemented throughout the year to assess the success of the demonstration ponds as well as the impact of intensive fish farming on water quality and eco-hydrological attributes. The ponds have been a success in terms of livelihood provision, with good harvests obtained from both sets of ponds, and profits returned for both sets, even allowing for the financial support from the project. Both groups have continued the lease, and are aiming to lease additional ponds – one group has already leased additional ponds to bring the total being managed by them to 3 ha. The other group is looking for an additional 1 ha of ponds. Importantly, both groups are aiming to limit the numbers of people responsible for each pond, to ensure good returns per household. Recommendations resulting from this work will form part of the fisheries management plan as well as the wetland management guidelines (see Output 3). A report based on the monitoring data is currently being produced and will be available within the next 3 months. The demonstration ponds have also addressed various elements of other issues identified in the Community Action Plan relating to fisheries management.

The CAP also identified the lack of a local source of young fish as a major constraint on fish farming in the Koshi Buffer Zone. We have looked at the options to address this issue, and in consultation with local stakeholders (Wetland User Groups, BZMC, KTWR warden) and with the input from local fisheries officials, have developed a master plan for operating a fish nursery within the eastern Buffer Zone. A nursery was considered a more sustainable option initially, because its operation is relatively straightforward, construction costs are lower, and the risks involved considerably less than a fish hatchery. There is also the potential to extend a nursery to also operate as a hatchery at a later date if so desired. The project supported the identification of land for purchase on which to construct the nursery, which Bird Conservation Nepal has now purchased, and construction has begun. We are in the process of forming a management committee to oversee management of the hatchery. The major stakeholders will be wetland dependent communities and the fish farmer association. A management agreement



will be produced with BCN to allow the management committee to manage the nursery. When the capacity of the management committee to successfully manage the facility has been enhanced through technical and management training, and subsequently demonstrated, BCN will hand over management responsibility to the management committee. The agreement between BCN and the Management Committee will state that the property cannot be sold. The KTWR, BZMC and District Agriculture Office will be members of the management committee, and the agreement will be registered with the KTWR and Agriculture Office.

A key element of managing wetlands to support sustainable livelihoods is to ensure there is a diversity of livelihood options available to people, and this was reflected in the Community Action Plan. Livelihood diversity will increase resistance to shocks and reduce the likelihood of unsustainable exploitation during hard times. With this in mind, several livelihood support activities were trialed in 2008/09 (as outlined under Activity 1.4), to add to the mat weaving training already carried out in 2007/08. Where possible these have been designed to also raise awareness of the value of wetlands and the resources they support to people's livelihoods. Those that are likely to result in neutral or positive impacts on biodiversity are promoted in the Sustainable Wetland Management guidelines. Further investigation of the benefits of the various livelihoods was also carried out as part of the eco-hydrological assessment of Koshi waterbodies (see Activity 2.5). These livelihoods are:

- Handicraft production from local grasses

*Muj* is the local name for young shoots of *Khar* grass, which refers to both *Phragmites karka* and *Sacchrum* spp., both grass species found commonly in wet areas all around Koshi. Traditionally, wetland dependent communities (particularly *Tharu*, *Sardar* and *Musahar*) use *Muj* to make a variety of handicrafts, such as baskets and *dhaki*. These support local sustainable livelihoods of these people. However, there are many other products which can be prepared from *Muj*, such as door-mats, tea-mats, pen holders, purses, caps, ladies bags, shopping bags etc. If produced and managed appropriately, these handicrafts can replace items made from plastic. Good money can be earned from their sale. Sustainable production of *Muj* is conducive with good habitat management for a range of grassland birds, and raises awareness of the value of this habitat, which is widespread around Koshi, to local people's livelihoods.

- Charcoal briquette production.

Nepal depends heavily on firewood for fuel. Demand for firewood is increasing and as a result forest resources are in high demand. Shortages result in large quantities of animal dung being burned, resulting in health problems from excessive smoke inhalation, and also reduced quantities of animal manure being available for crop fertilisation and soil improvement. However, invasive non-native plants (*Karmi Ipomoea carnus* and *Lantana Lantana camara*) that are damaging to forest and wetlands can also be used as fuel. Both can be harvested to make charcoal, which can then be processed to form briquettes. They have a number of advantages over other forms of fuel available: they are cheap and easy to use, and are a good and versatile fuel for cooking and heating; they are largely smokeless, reducing potential health risks from using other fuels which produce much smoke, often in confined places including people's homes; they burn more efficiently, so provide better and more even heat, reducing costs and reducing the blackening by soot of dishes and utensils; their use reduces demand for firewood and manure used as a fuel; their production encourages the clearing of invasive plants from wetlands and forest, which improves conditions for biodiversity. Groups that have received training and investment are provided with a business opportunity, as there is good demand for briquettes locally. However, more widely, there are benefits because there is no local source of briquettes currently, and they are cheaper than firewood, and better for human health.

- Water hyacinth compost

Water hyacinth is an invasive non-native plant species which is commonly found around Koshi. It makes access to fishing sites difficult, resulting in reduced fish catch and loss of livelihood. It clogs up canals and freshwater rivers, blocks out light and uses much of the oxygen in the

water, with resultant impacts on biodiversity including diversity of fish stocks. It also increases water loss through evapotranspiration, provides habitat for a variety of disease vectors, and clogs intakes of irrigation, hydropower and water supply systems.

Water hyacinth can be used to make paper, fibre board, rope, basket work, charcoal briquettes, and in biogas production. It is sometimes used as an animal fodder and as fish food. However, the main potential use of water hyacinth at Koshi is to make compost fertilizer for use on crop lands. Analysis of compost samples produced by the project has shown that it contains a good balance of nutrients required for growth, at levels comparable to chemical fertilizers. Its production encourages removal of water hyacinth from ditches/oxbow lakes/canals, resulting in improved wetland habitat for aquatic biodiversity and easier access to fishponds for fishermen. Use of water hyacinth compost reduces dependence on chemical fertilizers, which have a cost implication for local people but also result in excessive nutrient inputs into Koshi wetlands.

- Pig rearing

Livestock rearing is an integral part of Nepalese agriculture. However, many of the poorest wetland dependent people living around Koshi have neither sufficient land on which to rear livestock nor sufficient income for the required investment. Pig rearing requires minimal resources in terms of land or income, as they can normally be kept close to the house, and can be fed a variety of freely available fodder, including water hyacinth. We identified one ethnic group, the *Jhangad* community, for whom pig rearing was culturally acceptable. Other groups consider them dirty animals and will not rear them. A participatory wealth assessment was carried out to identify the most disadvantaged households. *Jhangad* people were found to have some knowledge of pig rearing, but were not aware of modern husbandry practices and did not normally breed them. Training was provided in husbandry and breeding, with the aim of enhancing this livelihood option. *Jhangad* people are generally heavily reliant on wetland resources, and are reliant on the ditch fishery for a significant part of their income, rather than the river fishery.

The **Wetland Management Guidelines for sustainable livelihoods (Activity 2.8)** have been produced in two different forms. A single document has been produced in draft form (see Annex 6), for circulation amongst project partners and then to the KTWR Management Authorities, drawing together several strands of the project. Comments will be invited from the KTWR warden, the Department of National Parks and Wildlife Conservation and Buffer Zone Management Council. The final version will be produced by the end of Year 3. The KTWR Management Plan is soon to be revised, and these guidelines should form a key part of that revision. However, in the absence of external funding, the Management Planning process may be slow.

In addition to the single document for circulation to site managers, a series of practical 'factsheets' have been produced for local people, outlining five of the livelihood activities developed by the project and describing how each livelihood is reliant on sustainable management of wetland resources. They also include practical instructions for what each livelihood involves. The livelihoods so described are fish farming, Typha mat weaving, handicraft production from *Muji*, charcoal briquette production from invasive plants, and water hyacinth compost production. The factsheets are produced in Nepali and one example is provided as Annex 7. Full text translation will be available on request.

### **Output 3. Sustainable Fisheries Management Plan developed and promoted**

**Fisheries management surveys (Activity 3.1)** comprised gaining an understanding of the various fisheries management practices undertaken at Koshi, both in the reserve, in the wider Koshi river, in buffer zone wetlands, and in fish ponds. These surveys have now been completed and the results have been incorporated into the **development of a plan to manage the KTWR fishery sustainably, whilst providing sufficient livelihood to local people (Activity 3.2)**. The plan is now in **draft form (Activity 3.3)** and attached as Annex 8. The draft plan is shortly to be circulated for comments to KTWR warden, DNPWC, and BZMC alongside the Wetland Management Guidelines. Once comments are received, the **final version will be produced (Activity 3.4)** within the next 6 months. As fisheries management is a critical element of the management of wetlands to support sustainable livelihoods, the fisheries recommendations will comprise part of the Wetland Management Guidelines, in which much of the background and supporting material is provided. Therefore, Annex 8 focuses on recommendations for sustainable management of the fishery at KTWR.

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

The **Centre Development Workshop (Activity 4.1)** was undertaken as part of Community Learning Plan development (see under 1.6). This built on the assessment outlined in the 2<sup>nd</sup> Annual Report, and **determined the appropriate purpose and form of the Centre (Activity 4.2)**. It confirmed that the most appropriate model was that of the drop-in centre, associated with existing businesses, where information could be provided and people engaged in discussion about the values of wetlands to people. A number of potential locations were visited, and a suitable location found in a tea-shop near Madhuban market on the eastern side of KTWR, where this model could be trialled. The project staff discussed the idea with the stall owner, and found that he was well-educated and had some understanding of the issues at KTWR. It was agreed that the drop-in centre would provide opportunities to: demonstrate and disseminate information about the values of the KTWR wetlands and associated biodiversity and habitats; raise awareness of the dependence of the livelihoods of local communities on KTWR and buffer zone natural capital; and act as a focal point for information on sustainable livelihood options. The trial began in September 2008. After three months, an evaluation exercise was undertaken, and subsequently **new facilities were developed (Activity 4.3)** at four locations throughout the Buffer Zone. For all locations it was agreed that project staff would be responsible for **developing interpretative material using information from surveys and workshops (Activity 4.4)** and this material is now being displayed at all tea shops. Materials are changed once per month. In addition to a series of posters, other materials produced for dissemination and/or promotion through drop-in centres are a booklet describing the fish diversity of Koshi wetlands (see Annex 9), and the sustainable wetland management factsheets described under 2.8 above.

Following successful establishment of the first drop-in centre, and an encouraging evaluation exercise carried out in December 2008, three additional drop-in centres have been **opened (Activity 4.5)** in Sukrabare, Prakashpur and Tapeswori (the latter on the western side of KTWR). These are being managed in close co-ordination with local wetland user committees.

## **3.2 Progress towards Project Outputs**

### **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.**

Annex 10 lists the training events held during 2008/09. The first table relates to fishpond management training events for demonstration pond management groups. The second table

relates to livelihood support training activities. The third to participatory biodiversity surveys training. The tables list the numbers of trainees for each and summarises assessment forms completed in each event. As many participants are illiterate, and those that are not do not generally speak or write English, evaluation of training is often carried out through discussion with participants after the event, and a summary produced by project staff, including an assessment of level of understanding both before and after training.

The Annex demonstrates this output has been met. In 2008/09, 279 people, the majority of whom are members of local wetland resource user groups established by the BZMC, have received training on one or more of the livelihood support activities developed during the project. This is in addition to the 171 people receiving training in 2007/08. Increasingly, training events have 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 has been 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 in draft format, whilst sustainable wetland management factsheets about five specific livelihood activities have been produced and 2000 copies of each will shortly be distributed amongst Buffer Zone residents. The impact of these will be assessed through comments on the management guidelines, and through assessment of impact of drop-in centres.

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). 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 assessment will be made of awareness during the repeat of household surveys to be carried out in the next 6 months, and through further evaluation of all the drop-in centres.

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 1.** 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	Sukrabe	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	
<b>67% with increased awareness</b>					<b>Total</b>
Mean	128	104	166	156	<b>555</b>
Maximum	223	132	209	175	<b>739</b>

### 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 now been produced in draft form, and is currently being reviewed by KTWR, DNPWC and BZMC. BCN will collate comments from these organisations, which will constitute the means of verification of the review stage of the output. A final version will then be produced and disseminated. The project team 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. There are not sufficient resource (of either time or finances) available within this project to see this process through to completion. Additional resources are being sought to continue this work after the Darwin project comes to an end.

Dissemination of the fisheries recommendations amongst local wetland resource users will be undertaken by producing a summary document once a finalised fisheries plan is produced following incorporation of stakeholder comments. We will produce at least 1000 copies of this summary, but only limited copies of the complete plan. Part of the plan is also being promoted through production of the fish farming fact sheet, of which 2000 copies have been printed for circulation 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.

The fish nursery is currently under construction, following the production of a Master Plan. This sets out the background, information on site selection, and a budget for construction and operation. The nursery will be operational before the end of Year 3.

#### **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 2<sup>nd</sup> 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). 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 comprises agreements with small local community-based organisations (CBOs), and the establishment of small funds. We have now 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 has supported this organisation by making a contribution to this fund. In the eastern Buffer Zone, another CBO, the Koshi Development Foundation (KODEF), is in the process of establishing a similar fund, which the project has also contributed to. KODEF will shortly be delivering a training event to establish charcoal briquette production in the eastern Buffer Zone, with project support (see under 1.4 above). 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.

**Table 2.** Visitor numbers recorded by tea-shop owners at four drop-in centres in the Koshi Buyffer Zone between October 2008 and March 2009.

Month	Week	No. of visitors/week			
		Madhuban	Sukrabare	Prakashpur	Tapeswori
Oct-08	1	500	800		
	2	450	600		Not established
	3	400	710		
	4	400	500	Not established	
Nov-08	1	800	700	710	
Nov-08	2	750	600		630
	3	600	550		410
	4	500	500		305
	Dec-08	1	600	500	600
Dec-08	2	550	450	550	530
	3	400	400	400	421
	4	200	200	200	225
	Jan-09	1	800	550	800
Jan-09	2	750	500	700	515
	3	700	450	650	423
	4	500	400	400	321
	Feb-09	1	750	600	700
Feb-09	2	500	500	550	430
	3	400	450	450	325
	4	350	300	360	210
	Mar-09	1	700	600	730
Mar-09	2	650	550	520	529
	3	500	500	416	413
	4	400	300	320	320

### 3.3 Standard Measures

**Table 3 Project Standard Output Measures**

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Number planned for this reporting period	Total planned from application
5	Project staff in-job training	1 Nepali staff	1 Nepali staff; 1 student	4 Nepali staff	1 staff for 2.5 yrs, 3 staff for 1 year, 1 staff for 9 months	1	1 staff for three years
6A	Number of people trained	0	171	289	460	2	44
6B	Number of weeks of	0	10	12	22	1	6 weeks

	training provided						
7	Number of training materials	0	1	1	2	1	2
8	Project visits	2 UK staff weeks	12 UK staff weeks	5 UK staff weeks	19 UK staff weeks	2	19
9	Management and other plans	0	0	2 – wetland management guidelines and fisheries plan	2	1	3
11A	Papers published	0	0	0	0	1	1
11B	Papers submitted	0	0	0	0	1	1
14A	Seminars organised	0	1	0	1	0	1
14B	Conferences attended	0	2	2	4	2	2
15A	Press releases and articles in Nepal	1	1	3	5	0	1
15B	Local press releases and articles	0	1	15	16	1	4
15C	Press release and articles	2	3	2	7	0	4
16A	Newsletters produced	0	1	1	2	1	2
16B	Circulation	0	3,000	3,000	6,000	2,000	4,000
17B	Dissemination networks improved	0	0	2: Drop in centres; Info for WWT and BCN web sites	2	3	3
18A	Host country TV items	0	0	0	0	1	2
19A	National radio item in Nepal	2	3	3	8	1	2
19C	Local radio item in Nepal	2	3	30	35	1	4
20	Physical assets value	5,674.59	743.22	12,258	18,675.81	12,000	17,700
21	Permanent training / educational facilities	0	0	4 fishponds, 1 fish nursery, 4 drop-in centres	9	1	1
22	Number of permanent field plots	18	16	0	34	0	20
23	In-kind contributions	3,727.13	9,934.25	8,554.25	22,215.63	9,554.25	35,728.76



**Table 4 Publications**

Type (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
Documentary	Koshi Tappu	BCN, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
Newsletter	Wetlands for Life!	BCN, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
Factsheets (in Nepali)	Aquaculture in Buffer Zone by <i>Malaha</i> community , a best practice for wetland management	BCN, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
	Alternative fuel source- bio-briquette	BCN, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
	Making mat and handicraft from wetland products as good source of income for wetland dependent community	BCN, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
	Using water hyacinth for compost fertiliser, a practical approach for wetland management	BCN, Kathmandu	BCN, PO Box 12465, Kathmandu, Nepal	0
Booklet (in Nepali)	Fish of Koshi Tappu	BCN, Kathnmandu	BCN, PO Box 12465, Kathmandu, Nepal	0

### 3.4 Progress towards the project purpose and outcomes

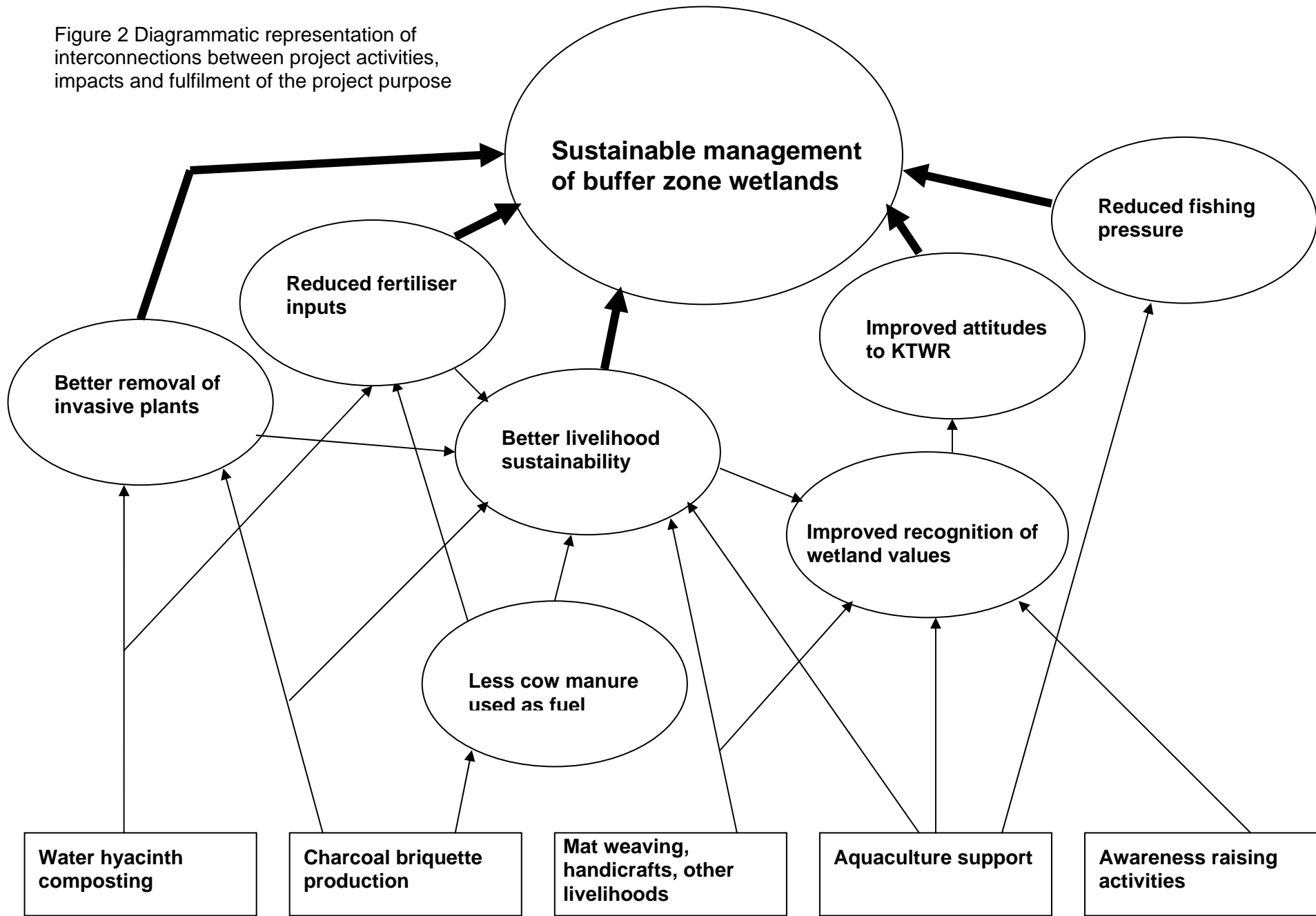
**Local communities around KTWR manage buffer zone wetlands sustainably, obtaining sufficient livelihood without compromising ecological integrity of buffer zone and KTWR.**

**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.**

Progress towards project purpose and outcomes has been good. 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

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



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.

Household surveys will be carried out in the last 6 months of the project, repeating the methodology used in the first year. We will aim to visit as many of the same households as possible, and collect the same data regarding use of resources, sources of income and expenditure, etc. However, we have already revisited a sample of those who received mat weaving training, 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 5).

**Table 5: 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 Rsidev	0	0	3-4	150/mat
Janani Devi Rsidev	0	0	3	150/mat
Parmila Devi Rsidev	0	0	3	150/mat
Sukuni Devi Rsidev	0	0	3	150/mat
Lalo Devi Rsidev	0	0	2-3	150/mat
Rupani Devi Rsidev	0	0	3	150/mat
Lila Devi Rsidev	0	0	3	150/mat
Kunti Devi Rsidev	0	0	3	150/mat
Tara Devi Rsidev	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 11. All are available on request.

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.

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

Progress at the final goal level is referred to as 'impact' and usually refers to a positive change in the object of the project. In Darwin projects the final goal is the generic goal which refers to

- a) a change in state of biodiversity; species, population or habitat loss reduced, etc.
- b) unsustainable use moving to sustainable use, or
- c) a human community living with biodiversity has the costs reduced or benefits increased stemming from the conservation or use of that biodiversity.

NB As current projects have not been asked to develop a project specific final goal statement, or to measure indicators of biodiversity impact, it may be difficult to report on progress towards these. In many cases positive biodiversity impacts may take a number of years to be seen, occurring beyond the life of a project, and usually there are other actions needed that also contribute towards positive impacts on biodiversity. Where possible, however, an idea of the project's impact on biodiversity should be given.

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. Capacity is being built in relevant organisations to ensure that monitoring against this baseline can take place in the future. This will be continued through BCN beyond the project term.

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 enable 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 need; and c) management and resource use practices that aim to enhance the status of the biodiversity that people's livelihoods depend on.

#### **4. Monitoring, evaluation and lessons**

As outlined in section 3.2, an Action Plan Committee (APC) evaluation workshop was held in December 2008. Other means of evaluating impact of project outputs is set out under Section 3.4.

Other internal monitoring and evaluation using the project key milestones and measurable outputs involves regular communication amongst project partners. This draws partly on the communications held between project staff and stakeholders. This has 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. As the project is dependent for success largely on the goodwill of the beneficiaries, and on the facilitation by the Buffer Zone Management Council, this has ensured that there has been 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.

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

The review of the 2<sup>nd</sup> 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.

#### **6. Other comments on progress not covered elsewhere**

The political situation in Nepal stabilised somewhat during 2008/09. Nevertheless, there was still frequent disruption caused by various groups, usually in the form of strikes that prevented road transport, or at least made it very difficult. As in previous years, this did not prevent project activities from taking place, but often made them more difficult to organise.

A major natural disaster struck the Koshi area in August 2008, when the eastern embankment that contains the river was breached just south of the KTWR HQ. Fortunately, there was little loss of life in the Nepali area affected, but a large area was laid to waste, with the main river channel flowing out through the breach and south-westwards into India for several months. The river was diverted back to its previous course in January 2009. The area inundated by the flood water has been left devastated with large areas under a thick layer of sediment deposited by the river. This affected project activities mainly through homes of some of the people involved in the project being lost. In the short term, project activities ceased whilst the major aid response took hold in the first few weeks. In the longer term, the event has highlighted the need for livelihood security through diversity, as many lost their sole livelihood as fishing grounds were lost. Whilst people remain in the camps set up to house displaced people, many of which are close to the boundary of the reserve, it is likely that levels of encroachment into the reserve will remain high until they can return to their homes.

## **7. Sustainability**

Local CBOs, civil societies and Buffer Zone User Committees have all received training to enable them to continue many of the activities promoted under the project. For example, local fish farmers are well aware of the benefits of using compost from water hyacinth, and there is real incentive to collect water hyacinth from water bodies now. Indeed, there is now competition to collect water hyacinth, whilst previously the same people were complaining to KTWR for not removing it.

KODEF and the Environment Protection Organization will take the lead in continuing operation of the drop in centre using profits from bio-briquette sales. Additionally, the tea shop owners will be encouraging these organizations to update information regularly, as they are seeing real benefits in terms of increased business as a result.

The aquaculture practice that the project has facilitated among local wetland dependent communities appear to be sustainable, since it has provided direct economic benefits to them. 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.

Livelihood activities have all provided sustainable benefits. In most cases, income generation potential has been enhanced, and therefore a significant incentive to continue and to manage the resources used sustainably provided. Even where little direct income has been earned from selling items, household expenditure is reduced by making cheaper options available.

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 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 Management Plan revision process is due to commence in the near future, but will proceed beyond the term of this project. BCN will be involved in the process, but additional resource would be required to drive the process forward with the urgency required to capitalise on the momentum gained through the project. In particular there is a need to build on the goodwill of local stakeholders that this project has engendered.

## **8. Dissemination**

Provide details of dissemination activities in the host country during the year, including information on target audiences. Will dissemination activities be continued by the host country when the project finishes, and how will this be funded and implemented?

Promoting sustainable wetland management involves a range of awareness-raising activities, which are informed by the project results. The learning needs assessment presented in the 2<sup>nd</sup> Annual Report, and the Community Learning Plan presented in Annex 4 describes the target audiences and a number of opportunities for dissemination.

As in 2008, the Bird Festival celebrated at KTWR on World Wetlands Day 2009 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 has produced a newsletter (3000 Nepali and 1000 English) and circulation will be completed by the end of May. Schools, government bodies, CBOs and local conservation NGOs are the main targets of distribution.

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

Dissemination of the guidelines for wetland management is being carried out 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. We intend to show the film 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. A total of 15 articles on project activities were published, which has raised the profile of the project in Nepal as well as awareness of the values to people of sustainable management of wetland resources.

Dissemination activities locally should 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.

## 9. Project Expenditure

**Table 1 Project expenditure during the reporting period (Defra Financial Year 1 April 2008 to 31 March 2009)**

Item	Budget (original proposal with adjustment agreed in Offer Letter for 2008/09)	Expenditure	Variance
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			
Others (specify) Participatory biodiversity monitoring w/s Wetland management training Community learning/centre dev w/s Invasive species management action Translation costs Audit costs			
Salaries (specify by individual) <b>Seb Buckton – Project Leader</b> <b>Malcolm Whitehead – Community Learning</b> <b>Emma Alesworth – Centre Development</b> Matt Simpson – WWT Technical advisor <b>Rob McInnes – WWT Technical advisor</b> Anton Immink – Stirling Fisheries advisor Sean Murphy – CABI Invasive species advisor Bhagwan Dahal – BCN Darwin Project Officer			



Ishana Thapa – BCN Project Co-ordinator <b>Project Assistants (x4)</b> <b>Dibesh Chaudhary –PAMEB Officer</b> <b>Ravi Pandit –Education Officer</b> <b>Ram Balak –Assistant Project Officer</b> Madhav Shrestha – TU-Fisheries advisor <b>Nilamber Mishra - KTWR warden</b> <b>DNPWC officer</b> <b>IUCN Project advisor</b> Pramod Rijal – fisheries booklet <b>Nursery manager 2009 salary</b> Sub-total			
TOTAL			

As described in previous Annual Report, staff changes at WWT, and altered relationships with project advisors have led to changes in staff time and salary allocations from the original budget. The changes not described in the 1<sup>st</sup> or 2<sup>nd</sup> Annual Report are outlined here.

Rob McInnes left WWT in July 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. This will help to inform the wetland management guidelines which are currently in draft form, and will also be available to DNPWC when revising the site management plan.

The new KTWR warden, Nilamber Mishra, has played a more active role in the project, attending various training events to inaugurate them and commenting on project plans etc. This has required some financial input which has been absent from previous years, although this was budgeted for. Nevertheless, much of the allocation for the warden's time was used to support the additional project staff as explained in the 2<sup>nd</sup> Annual Report.

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.

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

[I agree for LTS and the Darwin Secretariat to publish the content of this section](#)

Having identified the most resource-dependent people, we have developed and provided investment for four potential livelihood options, to reduce their dependence on other less sustainable wetland resources.

We leased five fishponds, to provide access to fish farming for 40 *Malaha* households. Training in fishpond management has been provided throughout the fish farming cycle. Recent harvests have provided good returns. The *Malaha* groups managing the ponds are now considering how to invest the profits from this harvest – some are renewing the original leases themselves, other

are leasing additional ponds to increase the area under fish farming for the group. As a result, demands on capture fisheries will be reduced.

We facilitated mat-weaving and woven-grass product training events around Koshi Tappu Wildlife Reserve, to provide an alternative livelihood option, with 133 women receiving training. Both crafts utilise wetland plants, encouraging recognition of the values provided to people by wetland biodiversity, and better management of wetland resources.

Nepal depends heavily on firewood for fuel, and shortages result in large quantities of animal dung being burned. We have promoted the use of invasive non-native plants to make charcoal, which can then be processed to form briquettes. They are cheap, a good and versatile fuel for cooking and heating, largely smokeless and burn more efficiently. Their use reduces demand for firewood and manure used as a fuel, and their production encourages the clearing of invasive plants from wetlands and forest. Groups that have received training and investment are provided with a business opportunity, as there is good demand for briquettes locally. However, more widely, there are benefits because there is no local source of briquettes currently, and they are cheaper than firewood, and better for human health.

Water hyacinth is an abundant invasive non-native plant species around Koshi. We have promoted the use of water hyacinth to make compost for use on crop lands. Analysis of compost samples produced by the project has shown that it contains a good balance of nutrients required for growth, at levels comparable to chemical fertilizers. Its production encourages removal of water hyacinth from ditches/oxbow lakes/canals, resulting in improved wetland habitat for aquatic biodiversity and easier access to fishponds for fishermen. Use of water hyacinth compost reduces dependence on chemical fertilizers, which have a cost implication for local people but also result in excessive nutrient inputs into Koshi wetlands.

## Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2008/09

Project summary	Measurable Indicators	Progress and Achievements April 2008 - March 2009	Actions required/planned for next period
<p><b>Goal:</b> <i>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</i></p> <p><i>The conservation of biological diversity,</i></p> <p><i>The sustainable use of its components, and</i></p> <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>		<p><i>Various project activities have raised awareness of values of wetland biodiversity to livelihoods</i></p> <p><i>Management advice developed to enable people to benefit from use of wetland resources in a sustainable way, and local language guidance being produced and distributed</i></p>	<p><i>(do not fill not applicable)</i></p>
<p><b>Purpose</b> 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</p>	<p>Increased wetland-related income and employment opportunities in the buffer zone</p> <p>Reduced encroachment and illegal use of KTWR</p>	<p>Demonstration fish ponds established and successful harvest made, with profits used to extend fish farming amongst local wetland dependent communities</p> <p>Income from other wetland resources diversified through development of additional livelihood options with positive or neutral impacts on biodiversity, and associated training and investment</p> <p>Awareness of wetland values raised and provision of benefits to people encourages wise use and improves</p>	<p>Alternative livelihood opportunities to be promoted through training delivered by local CBO, and completion of nursery construction</p> <p>Recommendations for sustainable fisheries management plan to be finalised and promoted</p> <p>Wetland management guidelines to be finalised and discussion held with DNPWC about how to incorporate them into KTWR MP revision</p>

		local attitudes to KTWR	
<b>Output 1.</b> 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	274 people have received training, including 236 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	
<b>Output 2.</b> 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	Draft guidelines produced. Factsheets for five sustainable livelihood activities produced, and 2000 copies of each are being distributed through BZMC and drop-in centres. Evaluation of drop-in centres suggest target of raised awareness in 2000 families will be met.	

	Actions to improve wetland related income of 20 households of target group	Assessment of wetland-related income of 60 households to be undertaken in next 6 months.
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		Draft produced; comments to be received and revision produced within next 6 months
<b>Output 3.</b> 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	Draft fisheries plan outlining main issues and recommending future action produced and circulated for comment. Once comments received and final version produced, a summary to distributed locally around Koshi will be produced.  Land for fish nursery purchased and construction begun. Completion within the next 3 months.
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	Final version will be produced within next 6 months. once comments received.
<b>Output 4.</b> 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
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 full current logframe

The revised format and the changes from the original logframe (indicated in bold) were approved by DEFRA in March 2008.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Goal:</p> <p>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</p> <ul style="list-style-type: none"> <li>• the conservation of biological diversity,</li> <li>• the sustainable use of its components, and</li> <li>• the fair and equitable sharing of benefits arising out of the utilisation of genetic resources</li> </ul>			
<p><b>Project sub-goal</b></p> <p><b>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</b></p>	<p><b>Wetland biodiversity indicators of buffer zone wetlands</b></p> <p><b>Socio-economic indicators</b></p>	<p><b>Participatory biodiversity monitoring data</b></p> <p><b>KTWR reports</b></p> <p><b>Socio-economic surveys</b></p>	
<p><b>Purpose</b></p> <p><b>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</b></p>	<p>Increased wetland-related income and employment opportunities in the buffer zone</p> <p>Reduced encroachment and illegal use of KTWR</p>	<p>KTWR reports</p> <p>Buffer Zone Management Committee reports</p> <p><b>District Development Committee (DDC) reports</b></p> <p><b>Household surveys</b></p> <p><b>Most Significant Change surveys</b></p>	<p>Local communities remain involved in and supportive of the project</p> <p>Partner NGOs remain committed and viable</p>

Outputs			
1. Personnel trained and capacity built in local organisations and community groups	<b>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</b>	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	<b>Through local NGOs and BZUCs awareness raised of 2000 families in wetland values and sustainable wetland management practices</b> <b>Actions to improve wetland related income of 20 households of target group</b>	Field survey reports Desk survey reports Reviews/feedback on guidelines <b>Community Action Plan monitoring and evaluation</b>	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; <b>fish hatchery/nursery operating Yr 3.</b>	KTWR reserve reports <b>BZMC reports</b> Reviews/feedback on manual	Management authority remains supportive
4. Darwin Centre for Wetland Management for Sustainable Livelihoods established	<b>Training and education facilitates 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</b>	Operation plan for 5 years Visitor records	Information reaches local communities and schools, and has a positive impact



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

**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