

Sustainable wetland management for wildlife and people at Koshi Tappu Wildlife Reserve

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Koshi Tappu Wildlife Reserve (KTWR) which lies in the lowlands of eastern Nepal is the most important wetland for migratory water birds in Nepal, and one of the most important in Asia. It is surrounded by a buffer zone of 173 km², in which over 80,000 people live, most of whom are dependent on the natural resource base for their livelihoods. Uncontrolled fish harvesting has severely depleted fishery resources depriving local fishermen of their major source of subsistence. Annual waterfowl count has indicated a rapid decline of bird species that are heavily dependent on fish populations. The Darwin Initiative project is assisting local communities around KTWR in managing buffer zone wetlands for sustainable livelihoods, whilst enhancing wetland biodiversity, thus reducing the pressure on resources within KTWR

Key words: Ramsar site, globally threatened species, wetland, community, livelihood

Wetlands are among the most productive ecosystems on the planet. In addition to supporting exceptional levels of biological diversity, the ecosystem services provided by wetlands contribute to natural disaster prevention or mitigation, poverty reduction, socio-economic development, and water and food security, positively contributing to human health and well-being. However, wetland ecosystems have received less attention in Nepal. Unsustainable exploitation of resources and loss and degradation of habitat are the main threats to wetlands in Nepal. Root causes include inadequate capacity and awareness of wetland biodiversity conservation, and high local community dependence on wetland resources but low involvement in their management.

Nepal has established its first National Wetlands Policy (2003), the major objective of which is to 'involve local people in the management of Nepal's wetlands and conserve wetlands with wise use of wetland resources'. To enhance the conservation and wise use of wetlands in Nepal, the policy explicitly establishes the need for participatory management of buffer zones; benefit sharing; the development of sustainable wetland eco-tourism; the promotion of wetland conservation awareness, including through the establishment of small information centres; the development of income generating activities; and control.

Biodiversity conservation has a long history in Nepal. Early conservation measures involved creating strict protection areas, resulting in a strong protected area network. However, sudden restrictions imposed on people living around protected areas gave rise to discord between park management and local communities. As a result, it was recognised that conservation could not be balanced and sustained without reducing the dependency of local people on protected area resources, and that effective conservation would not be possible without the goodwill and support of local people. A 1994 amendment to The National Parks and Wildlife Conservation Act, 1973, allowed park authorities to declare buffer zones adjacent to existing protected areas. These buffer zones are designed as an interface between parks and people, to reduce the impact of a park on local communities, rather than only to protect the park from the impacts of outside intervention.

The Buffer Zone Regulations of Nepal advocate a community-based approach to the conservation of park resources through the forging of partnership agreements between community organizations and park authorities (DNPWC/MFSC 1999). The objective is to stimulate new livelihood opportunities and the use and development of alternative natural resources. The regulations allow for a proportion of Park income to be recycled into local communities

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for natural resource management and community development. However, the effectiveness of these regulations in improving local perceptions of protected areas is limited.

These issues are brought into focus at Koshi Tappu Wildlife Reserve (KTWR) which lies in the lowlands of eastern Nepal. The reserve comprises 175 km², and was gazetted in 1976 to conserve the last remaining wild Nepalese population of the globally threatened Asiatic Water Buffalo *Bubalus arnee*. It was declared a Ramsar Site in 1987, and is the most important wetland for migratory water birds in Nepal, and one of the most important in Asia (Sah 1997; Baral and Inskipp 2005). It has the largest heronry in Nepal (c. 30,000 breeding pairs in 1996). As many as 21 globally threatened bird species have been recorded in the Koshi Tappu and Koshi Barrage area which is especially important for some wetland species, notably Swamp Francolin *Francoelinus gularis*, Baer's Pochard *Aythya baeri*, Pallas's Fish Eagle *Haliaeetus leucorhynchus*, Greater Spotted Eagle *Aquila clanga*, Imperial Eagle *Aquila heliaca*, Lesser Adjutant *Leptoptilos javanicus* and Spot-billed Pelican *Pelecanus philippensis*. The site is also important for Nepal's near-threatened birds; 11 of the country's 19 occur and eight of these are wetland birds (Baral and Inskipp 2005). Other globally threatened species include Ganges River Dolphin *Platanista gangetica*, Nilgai *Boselaphus tragocamelus*, Smooth-coated Otter *Lutrogale perspicillata*, Gharial *Gavialis gangeticus* and Red-crowned Roof Turtle *Kachuga kachuga*. A total of 685 plant species has been recorded including 9 globally threatened plants and 284 wetland macrophytes (Sah 1997). The site is surrounded by a buffer zone of 173 km², in which over 80,000 people live, most of whom are dependent on the natural resource base for their livelihoods (IUCN Nepal 2004).

Over-fishing was identified as a major problem at Koshi Tappu in the Nepal Biodiversity Strategy (HMG/N/MFSC 2002). Uncontrolled fish harvesting has severely depleted fishery resources depriving local fishermen of their major source of subsistence. Fish-farming was initiated as a cage fishery pilot project in Koshi Tappu during 1994-1997, with support from the Wetland Conservation Fund of Ramsar Convention, and since 1995-2001 the buffer zone development programme under the Parks and People Programme further encouraged establishment of fish ponds, just outside the reserve area.

The annual waterfowl counts indicate that bird populations are declining and especially of those that are heavily dependent on fish stock with the possibility that this is due to the declining fishery of the reserve. For example, the population of River Tern *Sterna aurantia* and Black-bellied Tern *Sterna acuticauda* shows a decline of 80-90% over the last 20 year period (Baral and Inskipp 2004). The most noticeable fact is that even after the site was declared as Ramsar (1987), population continued to decline. Similarly several other species of waterfowls and waders have had over 50% decline in the recent years. Possibly as a result of the declining fishery in the reserve, fish-eating birds from the Koshi wetlands come to feed at the fish ponds and this has led to a significant conflict of interests: birds are being persecuted and fish farm stocks are threatened.

Current resource use in and around KTWR 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. On the other hand there is also an increased risk from human-wildlife conflict. As a result, the reserve is viewed negatively by many and 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.

With financial support from the UK government's Darwin Initiative for the Survival of Species, Bird Conservation Nepal (BCN) and the Wildfowl and Wetlands Trust (WWT) is working around KTWR to address some of these issues, where many people's lives are fundamentally dependent on wetlands. The main concept is 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.

Objectives

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.

Four main objectives of the project are:

- Train local community groups in a range of livelihood and associated management practices
- Prepare guidelines on managing wetlands for sustainable livelihoods
- Develop fisheries management plan for Koshi Tappu, recognising the key role that fisheries play in people's livelihoods
- Establish information centre for wetland management.

Achievements

A Community Action Plan has been established through PRA process, outlining actions required to achieve sustainable livelihoods from wetland management. An Action Plan Committee consisting of members of local wetland user groups has been set up to oversee its implementation.

The project is mainly involved in broadening the scope of livelihood benefits available to the most wetland dependent communities of the buffer zone area that are more diverse and, therefore, resilient to change, resulting in a reduced need to exploit resources unsustainably in times of need.

The *malaha* people are the key wetland resource users around Koshi Tappu and their livelihoods are mainly based on fishing in the Koshi River and surrounding wetlands. They are also the most disadvantaged, and often suffer rice shortages due to the unpredictability of their primary source of income (fish).

In Nepal, one of the most locally available wetland resource uses is the weaving of mats (called *gundri* in Nepali) from Cat-tail *Typha elephantine*, a wetland plant common through much of lowland Nepal. Mats are used for various purposes: sleeping on, sitting on during meetings, storing crops, etc. This existing indigenous knowledge has a potential of securing alternative and sustainable sources of income to support livelihoods. However, *malaha* people are not traditionally involved in mat-weaving. So the project has facilitated in transferring this alternative skill to these groups. Mat weaving has now become a good source of income for this fishing community. Additionally the project is also supporting the local communities in producing briquette and compost from wetland resources. These activities have raised awareness of the value of wetland resources and their conservation.

Fisheries play crucial role in the lives of people living around Koshi Tappu and fish are also a key component of wetland biodiversity. The project has identified improving the access of landless, poor, wetland-dependent people to fish as one of the key requirements for sustainable wetland resource management. A fundamental element of this is providing training in fish farming techniques, in association with provision of enhanced access to fishponds. A number of fishponds have been leased to provide access to the project target groups. Through objectives-based management, fisheries stakeholders are devising the best way to maximise the value of fisheries and aquaculture, whilst taking environmental and social limits into account. These are helping in the development of a sustainable fisheries management plan.

Eco-hydrological surveys of water bodies within the buffer and core zones of the Wildlife Reserve are undertaken for identification of physical water body characteristics that are potential barriers to local natural resource users obtaining sustainable livelihoods from buffer zone wetlands. A key element of biodiversity that has significant livelihood implications at Koshi is invasive alien weeds (IAW). A sampling strategy has been developed for better understanding of their distribution to assess the impacts.

As the primary audience for the sustainable wetland management advice 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), a more suitable approach is to establish a small number of 'drop-in' centres spread throughout the buffer zone rather than a single 'Wetland Centre' which is unlikely to deliver a facility of high utility to local people. 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 in more sustainable way. The project has established such drop-in wetland centres as part of existing businesses (e.g. tea-shops, fishing equipment shops), which will enhance their sustainability.

Conclusion

Many locally available wetland resources can provide a significant source of income if sustainable methods

of utilization are known. However due to a lack of awareness of existing indigenous knowledge of wetland resource use as a means of securing alternative and sustainable sources of income to support livelihoods, these resources are often either neglected or underestimated. This can lead to the destruction of the resources through unsustainable use or poor management. Increased awareness of the potential for utilizing these resources to improve living standards is likely to result in the sustainable management of these resources, and a wider appreciation of the economic values wetlands provide.

Community forestry in Nepal stimulates local motivation for investment in natural resource management by providing tenure and legal user rights to villagers as they make their own operational plans. Such mechanism for community wetland users could ensure long term wetland conservation.

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