Integrating biodiversity and livelihoods into protected areas planning: A case study of the implications of the proposed Preah Sakhon Core Zone on local livelihoods, Stung Treng Ramsar Site, Cambodia

Alvin Lopez, Mark Dubois, Kong Kim Sreng, Madhusudan Bhattarai, Try Thuon and David Allen
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Summary
Managing natural resources for both biodiversity and livelihoods (of the rural poor in particular) is possible if an integrated, participatory approach is taken to understand their linkages, interdependence and the implications of conservation interventions, such as applying proposed zoning regulations.

Introduction
Wetlands contain biodiversity of exceptional conservation significance, with many unique ecosystems and a wide array of regionally and globally-threatened species. At the same time they typically form an essential component of local, national and even regional economies, as well as underpinning the livelihoods of local communities. Wetland resources and services are often particularly important to poorer and more vulnerable households, who lack alternative sources of income and subsistence and have weak access to basic services. Yet, despite their importance, wetlands are under increasing pressure. Wetland degradation and loss poses a severe threat to both development and conservation goals, and impacts disproportionately on some of the world’s poorest communities.

The under-valuation of wetlands, especially of their biodiversity and livelihood values, in decision-making remains one of the major factors underpinning their degradation. When decisions are made to invest funds, or to manage conservation sites, they rarely take note of the combined biological, ecological, livelihoods or economic value of wetlands. There are seen to be few costs to wetland loss, and few benefits to wetland conservation, and where biodiversity conservation does go forward, it sometimes takes precedence over livelihood needs.

The IUCN – World Conservation Union project *Strengthening pro-poor wetland conservation through integrated biodiversity and livelihood assessment*, funded by the UK Darwin Initiative, is developing an integrated assessment methodology to fully value wetland systems and ways of presenting the information to decision-makers. Coordinated by the IUCN Species Programme and working with IUCN offices in Cambodia and Viet Nam, the Mekong Wetlands Biodiversity Programme, and in partnership with the Department of Nature Conservation and Protection (DNCP) of the Cambodian Ministry of Environment, the project has carried out an integrated assessment of the Stung Treng Ramsar Site in Cambodia, focusing on the impacts to the livelihoods of local communities of proposed management zones within the Ramsar site (Timmins 2006).

The Stung Treng Ramsar Site
The Mekong River in Stung Treng Province, Cambodia, is a wetland of international importance recognized both by the Royal Government of Cambodia and the Ramsar Convention on Wetlands. The Ramsar site encompasses a 41km section of the Mekong from slightly North of the confluence of the Sekong and the Mekong rivers, to just South of the Lao PDR border (see Fig. 1, below). Within the Ramsar site there is a complex mosaic of wetland habitats and vegetation types, including seasonally inundated forest, channel bushland and woodland, sandbars, deep pools, and pebble beaches/banks, that host a range of threatened and rare species. The seasonal variation in

water levels of the Mekong provides unique niches for a range of aquatic species, influencing migrations, spawning or nesting periods, and providing dry season refugia for many species.

For biodiversity and livelihoods
The Ramsar site is recognized nationally and internationally for its unique biodiversity value and the role it plays in maintaining a range of important ecosystem services in the wider Mekong. The wetlands of Stung Treng provide drinking water and sanitation for local people. They are also vital for food security and nutrition, and provide opportunities for trade and exchange. Many economically and nutritionally important fish species’ migrations, e.g. *Trey Riel* (*Henicorhynchus siamensis*), are triggered by seasonal hydrological changes. Wetland livelihoods are characterised by the use of a wide range of resources; their viability and sustainability relies upon this availability and the ability to convert these resources into livelihood outcomes.

Figure 1. Map showing the location of the Stung Treng Ramsar Site on the Lower Mekong, south of the Lao border. At present, the Transboundary Anlong Cheuuteal deep pool, a key habitat for the Critically endangered Irrawaddy Dolphin is outside the Stung Treng Ramsar site.

An integrated assessment conservation of proposed management zones
As part of the process of developing a conservation management strategy for the Ramsar site, the Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme (MWBP) commissioned a baseline biodiversity study (Timmins 2006) that also proposed a number of special management zones (see Fig. 2) to protect populations of threatened animals and their habitats. The Preah Sakhon Core Zone (termed a *sanctuary* in Timmins *ibid.*) is one of the most remote areas in the Ramsar site, with no permanent settlements and one of the lowest levels of human use. It also appeared to be the area with the highest concentration of breeding River Terns *Sterna aurantia*, a regionally-
threatened wetland bird, and also one of, if not the only area where cormorants and darters breed. Timmins (*ibid.*) recommended that if designated as a sanctuary, human access to the area should be restricted (essentially a ‘no-go’ area), and dogs and livestock totally excluded. It was also proposed that the area be designated as a fish sanctuary, where fishing activities would not be permitted, as in the dry season it has small pools, small channels and a few larger pools that are important fish refuges.

The Stung Treng Ramsar Site was selected as one of two demonstration sites for the *Strengthening pro-poor wetland conservation using integrated biodiversity and livelihoods assessment* project (Darwall *et al.*, in prep.2) recognises the intricate link between wetland resources, biodiversity and livelihoods, and is developing an assessment methodology that fully values both biodiversity and the livelihood needs of the poorest in the communities that depend on the wetland resources.

Concerns were raised about the potential implications of the proposed conservation management zoning on the livelihoods of communities within the Ramsar site, and an assessment following the methodology developed by the Darwin Initiative project was undertaken to evaluate the implications of the proposed zoning plans, focusing on the proposed Preah Sakhon core zone. The results of

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the integrated assessment (Lopez et al., in prep.) show that there are alternative options for management that take into account the livelihood needs of local communities whilst meeting biodiversity targets. The recommendations and management options for Preah Sakhon, a proposed core zone within the Stung Treng Ramsar Site are presented here.

**Assessment approach**

A range of participatory qualitative and quantitative tools and techniques were employed in the integrated biodiversity, livelihoods and economic assessment with the emphasis being on qualitative methods. The Darwin Toolkit (Darwall et al., in prep) was used as the source methodology for the assessment. The team sought a range of opinions across gender, generational and wealth lines. At each level of enquiry, detailed data were collected, with each level directing and informing the next.

The approach required three different areas of focus due to the local context, these were:

- Village based
- Resource based
- Settlement based

Representatives from over one hundred and fifty households were interviewed across five villages, one pioneering settlement, and a number of permanent and temporary camps including those established by fishers. Direct biodiversity observations were made to support the identification of species critical to livelihoods highlighted through the assessment.

The approach focused on identifying key resource users, their wealth status, the main resources harvested and reasons for current resource use patterns, key livelihood species, the economic contribution of these resources to livelihoods, implications of general patterns of resource use on biodiversity within the proposed zone, and finally, options for management.

**Key assessment findings**

- Preah Sakhon is one of the few remaining biodiversity hotspots within the Ramsar site that is subject to minimal anthropogenic influence.
- A range of bird species of high conservation significance are confirmed to be nesting in Preah Sakhon.
- There is considerable livelihood and economic values associated with the human use of biodiversity, especially fisheries, in and around Preah Sakhon (see Fig. 2).
- Poorer people are most dependent on common property resources, such as fish, aquatic plants and other wetland species.
- Resource users are highly mobile and move throughout the Ramsar site and beyond. These movements take a number of forms, from the seasonal Trey Riel fishery, to the pioneering activities adopted by many of the poorest in communities e.g., those settling channel islands such as Koh Kon Kham (adjacent to the west of Preah Sakhon) for farming and fishing.
- Current resource use patterns indirectly affect critical habitats within Preah Sakhon that are important for threatened biodiversity (see Table 1).

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- Unintentional disturbance, such as from dogs and livestock introduced by local people, is impacting habitats of sandbar nesting species (including regionally-threatened River Tern).
- Invasive filamentous green alga threatens the ecology and natural processes in Preah Sakho
- Designating Preah Sakho and its perimeter as a no-go area (sanctuary) is questionable from an economic, social, cultural and biodiversity perspective.
- Banning fishing will have serious impacts on livelihoods, especially of the poorest.
- Limiting/banning access for non-fishing purposes will have minimal impact on livelihoods.
- Landlessness is a key ‘driver’ of off-farm and pioneering activities in the Preah Sakho core zone.
- Local stakeholders should be included in planning, management and monitoring of conservation initiatives.

Management recommendations and conclusions
The wetlands of the Stung Treng Ramsar site, especially within the proposed Preah Sakho core zone, form the foundation of food security and nutrition for many people, especially of the poorest. At the same time, the wetland complex within the Preah Sakho proposed core zone is important for a range of critical biodiversity species at various stages of their lifecycle.

Table 1: Calendar showing the overlapping uses of the Preah Sakho core zone for livelihoods (resource harvesting) and for selected species of conservation concern. Notes: SPD – Spot Billed Duck, GTK – Great Thick-knee, OD – Oriental Darter. Poverty: P – Poor, M – Medium, E – Enough.

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Many people depending on resources from the proposed Preah Sakhon Core Zone are considered ‘poor’ and are subject to a lack of access to basic health care services, poor access to safe drinking water, low agricultural productivity, a lack of access to state extension services, weak links to markets, poor communications and limited income generating opportunities. Existing communities will continue to be highly migratory for both off-farm and on-farm activities. With an increasing population density and declining resource base, migration continues to be driven by constraints on resource and land access and availability.

The poor and landless are the most reliant upon the resources of Preah Sakhon and other common property areas in the upper island zone, especially for fishing, which constitutes the main source of household income and nutrition. Exclusion of local communities from the proposed special management zones will have extensive negative impacts on the livelihood strategies of the poorest people within the Ramsar site.

**Is total protection an option?**

When considering the impact of management options on groups from different wealth classes employing a range of livelihood strategies (Table 2), it is clear that the poorest will be affected most by exclusion measures. Total exclusion is not a viable option for managing the proposed conservation zones due to the negative impacts on the livelihoods of those currently using these areas. Conservation management interventions should instead aim to restrict access during periods critical for biodiversity, such as breeding seasons whilst at other times allowing sustainable activities with due consideration to sustaining ecological integrity. Limited protection is proposed (see Table 3) that balances the needs of biodiversity conservation with the livelihood needs of people.

**Table 2:** Livelihood impacts from a range of potential conservation interventions. Wealth Classes according to main occupation: Enough - Paddy and off farm activities; Medium - Paddy and plantation and fishing; Poor - Fishing only

<table>
<thead>
<tr>
<th>Wealth class</th>
<th>Options</th>
<th>Option 1 Total protection - no access</th>
<th>Option 2 Limited protection - restricted access</th>
<th>Option 3 No protection - open access</th>
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<td>Enough</td>
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<td>Medium</td>
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<td>LOW Initially to potentially MEDIUM</td>
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<td>Poor</td>
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<td>MEDIUM - HIGH</td>
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<td>LOW Initially to potentially HIGH</td>
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</table>

**Table 3:** Potential impacts of conservation interventions on both biodiversity and the livelihoods of the poorest. ‘No access’ as defined by Timmins (2006).

<table>
<thead>
<tr>
<th>Importance</th>
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<th>Option 2 Limited protection - restricted access</th>
<th>Option 3 No protection - open access</th>
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</thead>
<tbody>
<tr>
<td>Biodiversity</td>
<td>☺☺☺</td>
<td>☺☺ Subject to illegal activities</td>
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<td>Livelihood impact on fishing (poorest)</td>
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Policy recommendations

Stakeholder participation in wetland conservation initiatives is highly desirable given the high incidence of poverty, high levels of resource exploitation, and the proximity of local and migratory communities to key biodiversity areas within the Stung Treng Ramsar Site. Efforts to implement initiatives without local participation in assessment, planning, management, monitoring and enforcement are likely to fail as a consequence of the negative impacts of management interventions on livelihoods.

The Ramsar implementing authority should seek advice and input from community fisheries organizations where they exist, and ensure representation from surrounding communities including those from outside of the authorities' jurisdiction (such as Koh Khon Kham), in the planning and management of Preah Sakhon. It is vital to engage local government to gain their endorsement and support for management regimes.

The high incidence of poverty in wetland areas, especially in households highly dependent on fishing, coupled with a lack of viable livelihood alternatives, make it of utmost importance to link conservation with the continuation or development of income generating activities, awareness raising, and the investigation of alternative livelihood options.

Critical areas for biodiversity (refugia) are often areas of minimal anthropogenic influence. Preah Sakhon is one example of such an area. The Darwin integrated assessment revealed the complex inter-relationships between resource users and biodiversity. The reality in the case of Stung Treng, in common with many wetland areas, is the fact that pioneering settlements (usually established by the poorest) are often the greatest threat to biodiversity. By applying an integrated assessment approach, as piloted through the Darwin Initiative project, together with an understanding of the relationships between resource availability, biodiversity, and temporal changes in resource use patterns, effective management solutions that sustain livelihoods whilst conserving biodiversity are possible.

For more information on the Stung Treng integrated assessment or the Darwin Initiative project please contact:

Mr. Kong Kim Sreng
Project Officer, IUCN Cambodia
#19 Street 312, Tonle Basac, Chamca Mon
P.O. Box: 1504 Phnom Penh,
Cambodia
Tel: +855 (023) 222 311 Ext 110
Fax: +855 (023) 222 312
Mobile Phone: +855 (012) 888 847
E-mail: kksreng@iucncambodia.org

Dr. William Darwall
Coordinator, Freshwater Biodiversity Unit
IUCN Species Programme
219c Huntingdon Road
Cambridge CB3 0DL. UK
Tel: +44 1223 277966
Fax: +44 1223 277845
E-mail: will.darwall@ssc-uk.org

Integrated wetland assessment project website:
http://www.iucn.org/themes/ssc/our_work/freshwater/darwin_index.htm