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Pond rotifers in the Mekong Basin
The real value of medicinal plants
Horseshoe bats

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Cover photo: A male freshwater needlefish or 'trey phtong' *Xenentodon canceloides* from the Pramaoy River, Phnom Samkos Wildlife Sanctuary (© Jeremy Holden/ Fauna & Flora International). The management of fisheries is explored in this issue's Editorial.

Editorial - A new point of view for Cambodian aquatic natural resources

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A relatively small number of people in Cambodia see *fish as income only*. Fish as an extractive resource, caught and traded in the market for cash, disproportionately benefit only a minority of Cambodia's wealthy elite. To most Cambodians *fish are food and income*. Fish are also *culture*. Fish, combined with rice and vegetables, provide *essential nutrition*, and ultimately *survival* for Cambodia's rural poor (McKenney & Prom, 2002).

Yet conventional fisheries management in Cambodia focuses on the state's commitment to improving commercial catch production. Fish are treated as an important tradable national commodity and a target for more commercialisation, in spite of chronically poor monitoring and statistical analysis in Cambodia's freshwater, brackish and marine fisheries (but see Allebone-Webb & Clements, 2010, as a recent exception). This narrow focus, coupled with a lack of data, is especially problematic at Community Fisheries (CFi) levels. Currently, there are no readily available data on productivity or catches to empirically assess the contribution, if any, that the CFi management system makes to fish conservation or improving the lives of Cambodian fishers. Cambodia is not alone, as this is true of most small-scale fisheries in the Global South (Béné *et al.*, 2006). Their biodiversity, productivity and socioeconomic importance is downplayed or ignored in national resource accounting (Degen *et al.*, 2000).

A new framing or imaging of Cambodian fisheries governance is required (Jentoft *et al.*, 2010). A new viewpoint is needed to better understand how the world's fourth largest freshwater fishery (Van Zalinge *et al.*, 2001), a dynamic and historical social-ecological system, fits into local, regional and global aquatic value chains. We need to look at Cambodian and the broader Mekong fisheries as part of an increasingly globalized fish commodity market, with many influences fundamentally originating from outside the region and impacting across multiple and different scales on harvesting levels and trade (Taylor *et al.*, 2007). Conventional quantitative assessments do not capture the nuanced social-ecological

and cultural factors of how local communities view their resources and the resulting impacts and declines (Bush & Hirsch, 2008). This is essentially how we currently look at all fisheries - as extractive resources for those who catch and possess them. Even after they are caught, fish continue to move from the South to the North, from developing to developed countries, from rural to urban areas, and from the poor to the rich. Transboundary trade patterns show the Mekong region is no exception.

The alternative point of view is to see fish and fisheries as part of the broader natural history of Cambodia, and aquatic resources as intimately connected to people and place. Aquatic resource systems co-evolved with people, intricately connected in time and space, and responding to changes in Mekong hydrology and geomorphology, resulting in high biodiversity and fish yields.

Perhaps we now need to see fish divorced from their primary role of contributor to Gross Domestic Product (GDP) and export earnings. The true value of Cambodian fisheries to its peoples has never been adequately calculated in any national accounting process (Hap & Bhattarai, 2009). It is already acknowledged that the Food & Agriculture Organization and official catch data grossly underestimate the actual catch of fish, let alone account for the small-scale, family-level contributions that common, rural local fisheries make to overall population health, wellbeing and food security (Béné *et al.*, 2010). What is the true value of fisheries in preventing mass rural food insecurity in Cambodia?

A new fisheries paradigm for Cambodian CFis requires putting the conservation of fish and their ecosystem support services first (Berkes, 2010). At the same time CFis should develop measures of local livelihoods governance. The Community Fisheries Law must be reformed or made flexible enough to account for the diversity of local, community-based innovations in resource governance, which may come to oversee the conservation and management within CFis. The Fishery

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Law is a commitment to decentralisation and deconcentration, as the legal framework of fisheries co-management. The Community Fisheries Law is now encoded in the Fisheries Administration 10-year Strategic Planning Framework (FiA, 2010).

But I fear this discussion may be too late, not just here in Cambodia, but in other heavily stressed commercial-subsistence freshwater systems in the Global South. Without the willingness and commitment of manpower and other resources to develop and enforce effective community-based fisheries legislation - both in freshwater and coastal areas - we can only hope that our piecemeal approaches to management and advocacy will delay the massive collapses that are coming. These collapses will happen, even without the impacts from Mekong main-stream dams (Barlow *et al.*, 2008).

So I put this question forward. Under the many current fisheries governance environments found in the Global South, *can any freshwater capture fishery sustainably contribute to GDP growth?* The new paradigm suggests that continued reliance on small-scale fisheries to contribute to exports is unrealistic under current management practices. The role of freshwater fisheries in developing countries is better served in contributing to local wellbeing and thus human security. However, success is often the result of political decisions. Cambodian fisheries, like agriculture, are primarily viewed as production crops, and placed in the Ministry of Agriculture, Forestry and Fisheries. Even in Cambodia, fisheries are not seen as essential to national sustainable development.

Questions, conflicts and case studies in Cambodian freshwater fisheries still primarily centre on who has the right to catch certain fish in certain territories. For example, Fishing Lot lessees locked in long term conflicts with the local CFi or community-base organisation alliances, or disputes between neighbouring CFis and provincial fisheries cantonments. Such conflicts are primarily about harvest access and benefits, and take a property rights approach to settling exclusionary problems in the commons. This is about cross-scale power and influence in controlling the mapping and enforcement of fisheries territories and thus access rights. It is about networks of fishers standing up for their rights to fish and combat 'illegal fishing'. It is about NGOs and the government designing co-management approaches to better harvest fisheries resources, and struggles by FiA to enforce the law. The Cambodian fisheries narrative is never about the conservation of fish and their habitats to ensure sustained ecological production and maximize biological diversity. Fish are seen by the state as a product; a commodity to be harvested with maximum efficiency and returns to their 'rightful' owner under law. Cambodia's

researchers and conservationists need to increase their presence in the political discourse of Cambodian fisheries co-management. Who is speaking for the fish in these formal and often informal negotiations? Fisheries conservation and sustainable livelihoods need not be incompatible.

The Mekong Basin, its people, livelihoods and cultures are changing under a number of multiple and cross scale drivers. Mekong fisheries will also change, and the trajectories do not look good. Mekong fisheries must no longer be taken for granted as a historical birthright, always there and always providing (Friend *et al.*, 2009). We have hopefully learned about the results of such hubris and mismanagement from the massive collapse of the Northern cod *Gadus morhua* stocks off Newfoundland, Canada, in the 1990s. Stocks that supplied vast amounts of fish for over 300 years were gone in 30! International fisheries governance organizations failed to prevent the collapse of these stocks. It required the governments and scientists to listen and pay attention to fishers whose lives depended on sustaining the fish. This example took place in a wealthy, informed, well-connected, developed country with little or none of the socioeconomic problems the Mekong faces. So again, *who speaks for the fish?* Whose knowledge and voices actually count in Mekong fisheries decision-making arenas?

All stakeholders need to begin by taking a more integrated conservation and development approach to managing fisheries (Berkes, 2006). This would include an open and accountable national government commitment to adaptive co-management based on the unique attributes of each CFi. This will require devolving effective decision-making powers to the commune councils. Local fisheries knowledge should be integrated in a systematic way into CFi planning and management. The locally elected commune councils should be provided with adequate financial resources and enforcement powers to manage their CFi, and given the powers to develop their own income streams, including aquaculture. The natural resource and conservation NGO sector should make a firm commitment to building up cross-scale capacities to integrate local knowledge into integrated conservation and development planning strategies. Local people and their legitimate representatives should have both the rights and responsibilities to use and protect aquatic resources. The multiple levels of assistance available in Cambodia should be mobilized to create realistic, integrated approaches to conservation and fisheries management. This would include a commitment by all parties to a binding third party dispute-resolution mechanism to resolve any territorial disputes. It also means devolving real power to commune councils to enforce the fisher-

ies legislation, whether the problem is illegal fishing by foreign trawlers or the local use of destructive and illegal gear. This requires all actors to look at holistic approaches to aquatic biodiversity conservation and management. It means working with integrated farming systems, rice-fish aquaculture and field refuge systems to improve rice field capture fisheries. It means working with indigenous and isolated communities to protect the fisheries linked to the remaining valuable forested watersheds in such areas as the '3S' (Sesan, Sekan and Srepok Rivers), Cardamom Mountains and coastal mangroves.

It means seeing through a new pair of glasses that our health and wellbeing are critically dependent on the goods and services that aquatic systems provide (Baron *et al.*, 2002).

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News

Cambodian Reef Conservation Project scholarships from Coral Cay Conservation

Coral Cay Conservation (CCC) is an award-winning non-profit organization working for the protection of coral reef resources by working closely with local communities. CCC has helped to establish numerous marine reserves and sanctuaries worldwide. This team was invited by the Cambodian Fisheries Administration in 2009 to lead a long term monitoring project around Koh Rong's coral reefs and produce global information system 'hot spot' maps and marine protected area management plans.

CCC projects work closely with local communities to raise awareness of the plight coral reefs. One method of achieving this goal is through CCC's Scholarship Award Programme. Applications are now being accepted from Cambodian citizens wishing to make an active contribution towards the protection and sustainable use of their coral reefs. CCC offers four scholarship places every month with three awards available:

1. CCC Snorkelling Reef Awareness Awards
A three-day scholarship that includes snorkel training and a short course in reef biology, awareness and conservation.
2. CCC SCUBA Reef Awareness Awards
A six-day scholarship that provides training in scuba diving (to PADI Open Water certification), reef biology, awareness and conservation.
3. CCC SCUBA Reef Conservation Awards
A four-week intensive residential scholarship course. Participants will obtain SCUBA training certification (to PADI Advanced Open Water certification) and certification under the CCC Skills Development Training Programme and Reef Check.

Scholarship candidates receive full board and lodging at the project base on Koh Rong Island.

The scholarship is a great opportunity for international volunteers and Cambodian citizens to learn about new cultures. It is also a crucial step towards the ultimate goal of the project, eventually handing over the Cambodian Reef Conservation Project to the Cambodian people to continue monitoring and conserving their valuable

ecosystem. For a scholarship application please visit <http://www.coralcay.org/content/view/104/423/>

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A new website for orchid research in Cambodia

The first rank in Cambodian flora is most likely held by the orchid family due to its rich diversity of species: over 500 species are estimated to occur here. The documentation of local wild orchids goes back over 700 years, as bas-reliefs of orchids are seen in Bantey Srey and in Angkor Wat. Yet scientific information about the 'kesorkol' (the Cambodian name for orchids) is still limited.

Unfortunately, much of the data from modern research on Cambodian orchids were lost during the Khmer Rouge regime. Explorations made during the last decade by French, American, British and Cambodian botanists are revealing once again the rich diversity of orchids in the mountains and humid tropical forests, and in the unique Tonle Sap swamp forest. The distribution of orchids varies across these different biogeographical zones. According to Dr Marpha Telepova, approximately 35% of Cambodia's species are found in the coastal region, 40% in the Cardamom Mountains range, more than 13% in the dry forest savannah and 10% in the Mekong Confluence.

A new website, www.orchidcambodia.com, provides detailed information on the Cambodian discoveries. This site is intended to share information and promote the conservation of wild orchids. To alleviate the plundering of wild orchids, it also highlights "market orchids" (mostly hybrids) and explains how these are better suited for non-specialists. The site provides a first checklist of documented orchids, with over 53 genera and 170 species listed to date. The main genera present are *Bulbophyllum*, *Eria*, *Dendrobium*, *Cleisostoma* and *Coelogyne*.

Today, habitat destruction (the clearing of forests to create agricultural or pasture lands) and the illegal trade of these protected species are on the rise. There is an urgent need to promote the research and understanding of what exists before it disappears in the wild.

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