



WWF-Greater Mekong / WWF Water Practice

COMMUNITY-BASED FISH CONSERVATION

Working with communities in the Lao PDR, Cambodia & Thailand to preserve the Mekong river basin's endemic species and livelihoods

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Introduction

Few places on earth illustrate the reliance of people on freshwater ecosystems as vividly as the Greater Mekong, which spans Cambodia, the Lao People's Democratic Republic (PDR), Myanmar, Thailand, Viet Nam and China's Yunnan province. The Mekong river basin accounts for up to 25% of the global freshwater fish catch, making it the world's largest inland fishery and a vital source of food and income for over 60 million people.

Fish typically accounts for 80% of protein in household diets, with fishing being an important (if usually secondary) activity in most families. The unsustainable exploitation of fisheries has led to declining fish populations and catches and to the inclusion of several food fish species in the IUCN Red List, among them the endemic Jullien's golden carp (*Probarbus jullieni*) and thicklipped barb (*Probarbus labeamajor*), both of which are categorized as Endangered.

Gill-netting has resulted in bycatch of the Mekong River subpopulation of the Irrawaddy dolphin (*Orcaella brevirostris*), contributing to its 'Critically Endangered' listing, a status shared with the Mekong giant catfish (*Pangasianodon gigas*). Both the Irrawaddy dolphin and Mekong giant catfish were 'focal species' for the Greater Mekong Conservation Programme FY11–FY15.



Mekong Giant Catfish



Irrawaddy Dolphin

This case study details work done within the Mekong on community-based fishery management, partly within the scope of the HSBC Water Programme.

What did we do?

WWF (as well as other international conservation actors, including IUCN and the Critical Ecosystem Partnership Fund), is working to promote conservation of freshwater biodiversity through community-based fishery management, particularly through Fish Conservation Zones (FCZs) in the Lao PDR – an approach also extended to Thailand – and Community Fisheries (CFis) in Cambodia¹. International development organizations, such as Oxfam and WorldFish Center, are also engaged with community-based fishery management in the region, because of its significance for food security and sustainable livelihoods.

In the Lao PDR, FCZs are typically small (2–100 ha, but mostly at the lower end of this range), community-defined and community-managed protected areas where no fishing is allowed. The theory of change is that FCZs act as spawning and nursery refuges for key fish species, allowing numbers to increase and ‘spill over’ into the wider river system, thereby providing ‘win-win’ benefits for both biodiversity conservation and sustainable development of livelihoods.

In Cambodia, CFis overseen by the government Fisheries Administration provide communities with the rights and responsibilities to manage fishery resources in specific areas. CFis play an important role in day-to-day management of these resources and help to reduce illegal fishing through a mix of education and patrolling. Bycatch of river dolphins has been reduced through the removal of gill-nets in community-patrolled protected areas.

In Thailand, WWF has supported collection of baseline data through a participatory (Thai Baan²) livelihood assessment and socio-economic survey conducted in the Lower Songkram basin in the northeast of the country. This information was used in the development of management and monitoring plans for critical fish habitat, notably the establishment of FCZs. Three years on from FCZ establishment, fish-catch monitoring has shown increases in the overall catch, as well as higher species diversity, bringing dual benefits for local communities and

¹ WWF involvement with community-based fishery conservation in Viet Nam is on hold, subject to finalization of that country’s fishery law to provide the necessary framework.

² For more information on Thai Baan participatory research methodology see: https://cmsdata.iucn.org/downloads/thai_baan_research_an_overview_1.pdf



Fish Conservation Zone, Khong District, Champassak Province, The Lao PDR

nature conservation. As in the Lao PDR, FCZs are strict ‘no fishing’ areas: breaches of the regulations attract a THB 1,000–5,000 (US\$28–140) fine.

How did we do it?

WWF has long recognized community-based fishery management as a potentially powerful tool for reducing the negative impacts of unsustainable fishing practices on biodiversity in the Mekong basin because, when successful, such management can also deliver direct economic benefits to local communities through increased fish catches and therefore improved livelihoods and food security.

Given that annual per capita GDP for the Lao PDR was about US\$1,700 during 2010–2014, and the corresponding figure for Cambodia was lower still at just over US\$1,000 (source: World Bank data), being able to demonstrate tangible development gains is critical to securing community and government support for conservation programmes.

THE LAO PDR

Beginning in 2004, with funding primarily from New Zealand Aid Programme, WWF implemented a project on aquatic resources and livelihoods – with FCZs the main approach – in the Sekong basin, a so far largely undammed and free-flowing sub-basin of the Mekong in southern Lao PDR.

FCZs are subject to ‘co-management’, being recognized by the government and established under the provisions of the national fishery law (itself developed with inputs from the Mekong River Commission, FAO and WWF), but managed by the local communities themselves.

A large part of WWF’s effort in the Lao PDR has therefore been devoted to bringing government officials and community representatives together, establishing WWF as a partner that is trusted and respected by both sides, and helping to build durable consensus between them. In Cambodia and Thailand too, WWF plays a key role in helping to build constructive partnerships between government institutions and local communities.

In the Lao PDR the process for establishing FCZs takes approximately six months to one year per village, depending in large part on the timing of the process in relation to the community’s seasonal agricultural priorities. Progress is also critically dependent on the qualities and skills of individual community leaders. Set-up costs are in the range of US\$800 to 1,200 per FCZ unit.

The key steps in the process are summarized in guidelines for fisheries co-management produced jointly by WWF and the Lao PDR Government Department of Livestock & Fisheries in 2009. These are:

- Consensus building
- Drafting of regulations
- Revision of draft regulations
- Agreement of revised draft regulations by local stakeholders
- District-level ‘Approval of Aquatic Resources Management Regulations’
- Public announcement of the establishment of ‘Village Regulations for Aquatic Resources Management’
- Periodic review (e.g. every 3 years) with on-going community participation in review process

FCZs are typically demarcated by a flag attached to floating bamboos, but such markers are vulnerable to being washed away in floods.

CAMBODIA

In Cambodia, WWF’s work on Community Fisheries (CFis) is combined with community forestry initiatives, including the development of alternative livelihoods, and is particularly focused on communities living close to the core zone of protected areas in the Mekong Flooded Forest Landscape. Funding has been provided by CEPF, BMZ and SDC.

The legal basis for CFis is provided by the Community Fishery Guidelines of the Cambodian Fisheries Administration (FiA). CFis extend for 10–20km and may include more than one village. WWF’s role is primarily as a coordinator and facilitator, working to mobilise and engage both local community leaders and FiA officials. Meetings take place in the communities themselves, throughout the process, with WWF and FiA representatives attending together. The whole process – from inception to legal establishment of a CFi – takes up to 18 months and, under official FiA guidelines, includes nine steps (some of which may operate in parallel).

- Establishment of founding group
- CFi site needs assessment (e.g. collection of key documents; fishery resource assessment and socio-economic assessments)
- Registration of CFi members

- Preparation of CFi by-laws and internal rules
- Delineation of boundaries and mapping of CFi
- Founding congress of the CFi to elect CFi Committee responsible day-to-day management (typically 11–13 individuals from the local community, including the leader and deputy leader)
- CFi agreement
- Registration and recognition of CFi (requires approval by both local and national authorities)
- CFi management planning and implementation of management plan (based on a template supplied by the FiA, to be monitored and enforced by a patrol team of 5–10 persons)

The costs of setting up a CFi (whole process summarised above) are about US\$30,000 per CFi, while annual operating costs are about US\$15,000 per CFi.

WWF is supporting networking between CFis to support sharing and learning (and hence better enforcement) and is working in synergy with other NGOs to facilitate this, including through NGO meetings that take place quarterly in two Cambodian provinces. WWF aims specifically to bring in the experience and know-how of other specialised NGOs, for example those with expertise in livelihood projects and community outreach/awareness raising.

THAILAND

In Thailand WWF's main role is also that of a coordinator and facilitator, bringing together local fishing communities with the government's Department of Fisheries to promote shared learning. WWF also brings important technical contributions, for example the application of the Thai Baan participatory research methodology and the provision of GIS facilities/expertise.

As in Cambodia, following demarcation of an FCZ, the community and Thai government officials work together to establish management regulations and also collaborate on patrolling and policing. The process from the collection of baseline data to the establishment of an FCZ takes 6–10 months.

What have we achieved?

When considering the achievements to date it is important to understand that there are numerous community-based fishery

initiatives in the Mekong basin, including more than 1,000 FCZs in the Lao PDR alone. WWF has not been involved in the establishment of all of these, being one of a range of international partners working with authorities and communities in the region.

WWF is using a number of different methods to evaluate the impact of FCZs in the Lao PDR. These include: local knowledge; trials of Environmental DNA (eDNA) methods (detailed later) which can provide baseline data for comparison going forward; fish catch monitoring and fish tagging.

In the Lao PDR, FCZs have been widely embraced by the communities that have implemented them, with frequent feedback along the lines of “*more fish are caught more easily around FCZs*”. Local knowledge is captured using a variety of methods, including interviews recording information on last sightings of species.

In addition to strong anecdotal evidence from fishers themselves, WWF contracted the consultancy company FISHBIO to undertake a scientific assessment of the hoped-for ‘spill over’ of fish numbers and diversity from FCZs into the surrounding fisheries. The study concluded that: “*...at least eight species of fishes do move outside of FCZs, and this spill over can contribute to nearby fisheries (within at least 10 km). A more detailed mark-recapture project, in which fishes are tagged throughout the year and re-captured both inside and outside of the FCZ, would clarify which species of fish are more likely to spill over into the surrounding fisheries, and which species will remain in the protected habitats.*” As a note, some of the species whose spill over from the FCZs was noted are non-migratory species.

Two rounds of fish catch monitoring have taken place in the Lao PDR so far using a unified methodology: one in 2013 and one in 2015. WWF would like to obtain more data, hopefully by obtaining funding to repeat the survey in 2017, before being able to have confidence in the comparative results. In addition, attribution of results to WWF’s involvement in the FCZs will continue to be difficult.

In southern Lao PDR’s Siphandone area, locals have noticed a big increase in the number of fish in the river. More recently, this may partly be due to the blockage of some river channels for the construction of the Don Sahong dam, causing a higher concentration of fish populations in remaining channels. However, the increase had been noticed before the channels were blocked off – local government officials have attributed this to improvements in river channels by the dam company, better law enforcement, and WWF’s support of the FCZs and

communities (which also has implications for law enforcement).

In Cambodia, the first four WWF-supported CFIs were established in 2007 and WWF continues to support implementation of the corresponding management plans. A reduction in illegal fishing has been observed, resulting in increased fish stocks, thereby benefiting local communities. For example, in the central section of the Mekong Flooded Forest Landscape, shared by Kratie and Stung Treng Provinces, where WWF has supported CFIs with training and capacity building, as well as the provision of equipment, there are community patrols conducted by CFI committees and river guards³ (using SMART⁴ patrolling) to monitor illegal fishing and, where necessary to remove gill-nets from the core zones for River Dolphins, especially deep pools in the dry season. In 2013 some 6 km of illegal gill-nets were removed. There has been a reduction in dolphin mortality and an improvement in calf recruitment.

A one-year pilot fish-catch monitoring scheme (information on species diversity and fish size is collected daily and sent to CFA for analysis) is currently being implemented to support anecdotal evidence on the success of CFIs with quantitative data.

Contribution to conservation goals

As mentioned in section 1, both the Irrawaddy dolphin and Mekong giant catfish were focal species under WWF's Greater Mekong Strategic Plan and Conservation Programme FY11–FY15. The work on community managed fisheries contributed to delivering Strategy 3 '*Strengthening law enforcement and protected area management to secure priority habitats and species*'. WWF's establishment of FCZs and CFIs has been focused on the 'priority landscapes' also established by the Strategic Plan.

What helped to ensure our success?

The following are all regarded as 'factors for success' in WWF's work on community-based fishery management in the Mekong:

- Ensuring that an adequate legal framework exists.
- Reaching out to local communities to explain the benefits, legal requirements and official procedures.

³ River guards are overseen by the FiA and conduct day-to-day patrolling in key areas for River Dolphins.

⁴ <http://smartconservationtools.org/>

- Identifying and working with those communities that have strong leaders who ‘get’ the concept of what WWF is trying to achieve.
- Promoting community-based management of fisheries as a tool for improving livelihoods, not primarily as a biodiversity conservation tool.
- Positioning of WWF as a credible partner and source of expertise trusted by both governmental and community stakeholders and that works mainly as a convenor, facilitator and networker.
- Allowing sufficient time and space for community discussion and agreement at all stages of the process.
- Ensuring consensus between stakeholders is established – and real.
- Ensuring that no-fishing or restricted fishing zones are situated in the places where they are likely to have the greatest beneficial effects (as mentioned below, there can be a tendency, especially early on, for such zones to be proposed for river stretches of relatively low fishery value).
- Encouraging networking between community fishery management sites for improved sharing and learning.
- Working in synergy with other organizations whose expertise (e.g. in development issues) complements that of WWF.

What didn't go so well?

In the Lao PDR, some FCZs were badly located in the first place. In some cases communities were reluctant to restrict fishing in genuinely fish-rich areas as they had no proof this new concept would actually work in practice and so they deliberately located FCZs in unsuitable places. In other cases, government officials may have pressurized villages into accepting FCZs in locations that were against community wishes and advice.

Due to a lack of specifically allocated resources, WWF has so far not returned to some of the longer-established FCZs to see how they have evolved.

WWF staff in the basin recognise that more could and should be done to gather evidence showing the biodiversity benefits of FCZs; currently the most tangible benefits are for community livelihoods, though there is anecdotal evidence for increase in fish diversity and numbers as well as limited objective evidence from the FISHBIO study mentioned above. WWF, with France-

Three top lessons

For other freshwater programmes

- Ensure there is a supportive fishery law in place to begin with.
- Ensure buy-in from both government and communities and build consensus between them.
- Ensure that FCZs (or similar community-based fish conservation areas) are located in the right places.

based laboratory SPYGEN, is piloting the eDNA⁵ approach for monitoring fish diversity, recognizing that monitoring diversity through fishery catch data has significant drawbacks (e.g. fishing effort may disproportionately target certain species). Some of the most effective methods for monitoring fish, e.g. sonar, are very costly.

More could also be done to demonstrate the relationship between biodiversity conservation through community-based fishery management on one hand and WWF's wider objectives for the Mekong basin on the other – notably in relation to the threats from poorly-located hydropower dams.

In a wider context, one of the four Conservation Strategies in WWF's Strategic Plan for the Greater Mekong FY11–FY15 was on '*Ensuring sustainable hydropower development to maintain ecosystem integrity of the Mekong River, priority tributaries, and other rivers in priority landscapes*'. Maintaining ecosystem integrity is clearly a prerequisite for approaches such as community managed fisheries to succeed in the long term. Unfortunately, there have been major recent setbacks in this regard and a number of unsustainable hydropower developments, with highly damaging cumulative impacts from a dozen major dams, are scheduled for the Lower Mekong.

Where will we go from here?

Priorities include (some subject to availability of funding and capacity):

- Gathering more scientific evidence for the biodiversity benefits of community-based fishery management (e.g. through spillover from FCZs and CFIs) and using that evidence to underpin WWF's theory of change;
- Devising sustainability and 'exit' strategies to ensure that the progress achieved to date as a result of WWF activities are maintained once WWF's input is scaled back or comes to an end;
- Returning to some of the longer-established FCZs in the Lao PDR and reassessing their value;
- Establishing more FCZs on the Sekong and Xebanghian rivers (the Lao PDR) two of the remaining undammed major tributaries of the Mekong;

⁵ See for example:

<http://www.sciencedirect.com/science/article/pii/S0006320714004443>

- Scaling up CFI/FCZ work in Cambodia and Thailand by continuing to promote the benefits with other funding and implementing partners;
- Establishing community-based fishery management in Viet Nam when the legal framework has been clarified.

Resources

[WWF-Cambodia report on fish catch monitoring](#)

[Case study on the use of eDNA in the Mekong](#)

FOR MORE INFORMATION

Contact the WWF-Greater Mekong team



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To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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