

Sustainable community fisheries management: a case in Cambodia

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Abstract

In Cambodia, fisheries are predominantly small-scale, utilizing almost the entire inland waters. The livelihoods of millions of rural people depend greatly on fisheries and fisheries-related activities. In 2001, small-scale fishers were granted new user rights with the revised legal framework from the Cambodian government to fish in their exclusive fishing zones, which would improve their livelihood and encourage participation in sustainable fisheries management. In total, 516 community fisheries (CFi) have been established throughout inland and marine waters. There are only 39 CFi in the coastal area. This study presents the case of Koh Keo CFi in Tonle Sap floodplain, Kampong Chhnang Province. Despite some challenges in the implementation of CFi management, it is the way toward maintaining sustainable fisheries and an equitable distribution of fishery resources. Community fishers play very important roles in fisheries management and conservation. The study also discussed the impact new user rights had on community fishers and their livelihood.

1. INTRODUCTION

1.1 Description of the fishery

CFi fisheries in Koh Keo, Kampong Chhnang Province, Cambodia, are the freshwater lacustrine and floodplain fisheries, covering the area of 1 200 hectares (ha) in Tonle Sap floodplain, Cambodia. The fishing activities take place mainly in their own community fishing ground Koh Keo in Svay Chrum Commune, Roleab Ear District, Kampong Chhnang Province. The fisheries take mainly small-scale or family subsistence forms, arranged under CFi co-management between the government and fishing community. They target multiple species, commonly capturing 55 species for family consumption; the surplus is for currency exchange. Most of the fish species caught every year are small, cyprinid species. So far, there is no scientific study about the status of fish stock in this community fishing ground. Community fishers reported that some species are overexploited, while some others are recovering. There are some 900 fishers, members and non-members of the CFi from the fishing community within the Svay Chrum commune, and some others from nearby communes within 20 kilometres (km) from the community fishing ground. Most fishers have regular access to this fishery. The community currently allow individual fishers or family fishers to hold the legally recognized rights for this fishery.

The community fishers commonly used cast nets, gillnets, set gillnets, traps (bamboo tube trap for eel, brush bundle trap (Khmer name: kansum)), plunge baskets (Khmer name: Ang rut), hooks and lines, hand dragged seine nets and wedge-shaped scoop baskets (Khmer name: chhneang day). The fishing boat has an engine capacity of 6-20 horsepower (hp). Fishing is done by family members without hiring any crew, on motorized and non-motorized boats. No fish aggregating devices are used in this fishery and fishing with aggregating devices is illegal. The boats are less than ten m long, and less than ten gross tons in weight. No boat has any ice storage, as the fish catches are freshly stored and brought to nearby markets. There are no fish landing sites either. Every individual fisher owns the fishing boat, operating it by themselves less than ten km away from the shoreline in an area of up to 6 m in depth.

The average duration fishing trip takes less six hours per day in this fishery. The fishing boat and facilities are owned by a family, while men usually do fishing. Sometimes, women may accompany to help fish. The conflict happened between small-scale fishers and large-scale fishers (the owners of fishing lots) before the reform of the fishery sector, over the invasion of small-scale fishers in fishing

lots. The fishery reform abolished all fishing lots, handed over to local fishers and established CFI. After this (2007), there have been no conflicts. The conflict between community fishers and agricultural farmers over the use of water in farming may still occur in other fishing communities. Pumping water from a lake adjacent to the Tonle Sap Lake in the dry season caused drought and led to the death of fish. Occasionally, community fishers may suffer from floods, drought, storm, and fish diseases, which cause damages to crop, houses and school, and the death of fish in the dry season.

1.2 Economic contribution and social implications of the fishing activity

The fishery is very important for food security and family income for the daily livelihoods of community people. Rice and fish are Cambodian staple foods with a long history in Khmer culture (Thuok and Lieng, 2008). This rural community of fishers depend fully on freshwater fisheries. Most rural Cambodians, particularly Koh Keo community fishers, are both farmers and part-time fishers for food and family income. They are full-time fishers in the wet season and farmers/part-time fishers in the dry season.

Most fish catch was sold to nearby local markets for local consumption. The fish catch from the fishing community was sold to international markets less than in the past when the fish catch came from large-scale fishing (fishing lot). The rural community fishers ate fish almost every day. Generally, Cambodians eat 67 kg of fish per person per year (Hortle et al., 2004). In addition to food consumption, fishing provided an annual family income of around USD 589 – 1 433 (NIS, 2014). The income from fishing contributes to around 30 percent of the total family income. The money gained from fishing is not only used as family cash income, but also to buy fuel, rice seeds, and fertilizer for rice farming (Lieng et al., 2018). The income from fishing contributed to part of the family income because the Cambodian GDP per capita in 2016 was USD 1 269.9 (WB, 2018). The average family size in Cambodia is five persons (NIS, 2014). Typically, a household has more than one occupation and may grow crops, run a small business, or raise cattle, pigs, chickens, or ducks in their home lots (Lieng et al., 2018). Seventy-eight percent of the households in the Tonle Sap region raised livestock and/or poultry (NIS, 2009).

The community fishers performed other fishery-related activities, such as fish culture, fish processing and marketing. Hap et al. (2016) reported that there was a need for community fishers to perform many economic activities to earn a living. A study in the two nearby community fisheries in the Tonle Sap region found that most rural households owned farmland of approximately 0.5–1.5 ha and cropland of a similar size (Lieng et al., 2018). This finding was similar to the 2013 census of agriculture in Cambodia, which found that rural Cambodians owned an average of 1.64 ha of farmland (Oxfam, 2012). Rice production yield, on average, is 4.2 tons per hectare (Oxfam, 2012). The diverse livelihood activities may contribute to improved fishery management, and could divert some efforts to appropriate alternative occupations, relieving pressure on natural resources (Marschke and Berkes, 2005). Although the income of the two rural communities did not depend fully on fishing, CFI members of the were likely to focus on fisheries (Lieng et al., 2018). Effective fishery co-management requires the involvement and active participation of local community members (Marschke and Berkes, 2005; Barakagira and Wit, 2017).

2. MANAGEMENT OF THE FISHERY AND RIGHTS-BASED APPROACH

2.1 Management of the fishery

The fishing rights of the community fisheries are defined by the Law on Fisheries (RGC, 2006), sub-decree on community fisheries, and internal rules and regulation of CFI (RGC, 2005). According to the above law, sub-decree, rules and regulation, CFI have roles and a duty to participate in managing, conserving and utilizing fisheries resources for their livelihood need in a sustainable manner. It must be in compliance with the by-laws and community fishing area management plan and with laws and other instruments related to fisheries. All CFI members have equal rights in the sustainable use of

fisheries resources as stipulated in the by-laws. The by-laws are formulated and adopted by CFI members. CFI have the rights to organize fishing activities in compliance with the law and other regulations and to cooperate with nearby competent fishery authorities to suppress all fisheries violations in the community fishing area. The boundary of the community fishing area is clearly defined.

CFI is given the responsibility to manage the fisheries resources in the community with agreement from the government. The fisheries have signed the community fishing area agreement with the Fisheries Administration that represents the government. CFI shall develop a plan for the management of a community fishing area as well as an appropriate strategy, and mechanisms/methods for successfully monitoring and implementing the community fishing area management plan. The community fishing area management plan shall be formulated and adopted with the participation of community fisheries members, the local authority, and the Fisheries Administration. The community fishing area management plan describes demography, socio-economic conditions, and the status of fishery resources. It defines the conservation area and action, allowable number and types of fishing gears, management action measures, and aquaculture development plan. There is no scientific research study in the community. The community fishers do the participatory planning and assess the status of fisheries resources and management of the action plan. Small-scale fisheries in Cambodia are not required to get fishing licenses and have no need to pay a fishing fee to the government. The Fisheries Administration follows up, monitors and enforces the implementation of the community fishing area agreement and management plan, making an annual evaluation with the participation of local authorities, local people and community fisheries.

The community fishing area has multiple uses such as a farming area in the dry season, family water use, agricultural irrigation and navigation and transport. The conflict may happen over the different use of water-related resources. The conflict is solved according to the existing fisheries and other relevant laws, rules and regulations. The conflict resolution is followed via consultation and coordination from low (commune and district authority) to a high level (provincial and national level) authority/court, the relevant competent fisheries authority, and a local authority.

2.2 Brief history of the former rights-based approaches used in the fishery

In the past, fisheries management measures have traditionally concentrated on larger water body (Zalinger et al., 2004). The large-scale fishing gears such as fishing lots (barrage fisheries), arrow-shaped trap, seines, trawls, and bagnets (Dai) are the focus on their management (Zalinger et al., 2004). The large-scale fishers were given rights to fish through bidding and/or licenses. They had to pay a fishing fee to the government revenue. The management of large-scale fisheries, particularly the fishing lots, are not based on an integrated management approach in a sustainable way and intend simply to maximize profits (Zalinger et al., 2004; Degen et al., 2000). However, because of its effective control of the fishery resources in the fishing lots, it was termed as “the best management practice” (Coates, 2001). However, if social issues exist, they can be addressed. Prior to 2000, many conflicts happened between small-scale and the large-scale fisheries (fishing lots) over the use of fishery resources and around fishing ground encroachment. Fishery co-management had been implemented in Cambodia in the early 1990s by NGOs and in the lower Mekong countries. In order to solve the problems in fisheries, the Cambodian government decided to decentralize the fishery authority in the fishery policy reform of 2000. In the reform policy, all fishing lots were abolished and handed over to local fishers as CFI was established. The community fishers are given the rights and responsibilities to manage, conserve and utilize the fisheries resources in a sustainable manner.

2.3 Rights-based approach: allocation and characteristics

The fishery had legally recognized fishing rights since the establishment of CFI in 2008 and in Cambodia more generally in 2001. The traditional fishing rights are respected, permitted for use and inclusion in the fisheries law. The current fishing rights are allocated by CFI, and there is a community-based effort

quota practiced in the designated area of the community fishing ground. Migratory/outside fishers and members of other CFI can fish in a given community fishing ground, permitted that the committee of the community fishery is informed and the rules and regulations are respected. The sustainable livelihood of the CFI, the poor or vulnerable people, rights to fish for the next generation, gendered dimensions, and sustainability of the fish stock, were all factors considered in the consultation of the law on fisheries and relevant rules and regulations. These issues were included in the existing fisheries legal framework. There is neither an individual catch nor individual processing quota, but CFI defines a limited number and types of fishing gears permitted to fish in their fishing ground. The fishing rights are equally given to all CFI members and non-members, individual fishers, family members of fishers, and community in compliance with the law on fisheries, with no limitation of time and space.

The committee of community fisheries, local authority, and local fisheries officers cooperate together to allocate and monitor the traditional fishing rights and law enforcement in general. The fishing rights cannot be leased or sold. The law on fisheries does not mention heritage, but if the next generation still lives in the present CFI, then they bear the current fishing rights. The fishing rights have no limitation to any person, community fishers and any Khmer fisher, but foreign fishers are not permitted to hold fishing rights. As long as they are fishers, they have the same fishing rights, they have no need to transfer the rights, and the law does not mention that transfer of rights is not permitted. The traditional fishing gears are gillnet, trap, and hook and line, permitted by law and commonly practiced to fish by local community fishers. Those fishing gears capture many small cyprinid fish species such as small-scale mud carp, Siamese mud carp, Smith's barb, and tawes.

There is not any study to assess the status and trend of the compliance of the rights-based approach so far. Illegal fishing activities still happened in many CFI. The rate of compliance could more or less vary in time and space. Fish poaching in the conservation area of the CFI can still be the case. The use of small, mesh-sized nets is defined as illegal, but in many cases in the community, it still persists.

3. CONTRIBUTION OF THE RIGHTS-BASED APPROACH TO ACHIEVING SUSTAINABILITY

3.1 Sustainable use of the resources

The fisheries resources in CFI are co-managed by CFI members, local authority and the nearby fisheries administration (FIA). To maintain the sustainability of the CFI fisheries resources, the fisheries resources are given to the CFI to responsibly conserve and manage, utilizing them in a sustainable manner. The CFI has established an annual and five-year rolling-fisheries action plan. The plan addressed the management and control of fishing capacity, improvement of the CFI fisheries domain, conservation area, the flooded forest fish habitat, law enforcement, awareness-raising about fisheries management and conservation to community fishers, livelihood development, tourism development, and savings group (revolving fund).

So far, no fish stock assessment has been done for the community, but with the participation of CFI fishers, community members can understand the status of some fish species. For instance, the status of fish abundance of giant barb, tawes, Smith's barb, and a siluridae fish species (*wallago dinema*) has seen an increasing trend.

3.2 Economic viability of the fishery

The general characteristics of the fisheries have been observed as unchanging. This may be due to the geographic location of the fishing villages and the freshwater fisheries resources in the Tonle Sap floodplain. Fishing boat and gears are owned by individual fishers, who travel the same distance from their home villages to their fishing grounds. The number of outboard engines was reported to have increased. The aggregating devices, which are defined as part of illegal fishing practices, are not used to attract fish to support fishing. The characteristics of their fishing boats such as length of the boat, the capacity, and the power capacity of their boat engines, have also not been changed compared to

prior and after the introduction of new fishing rights in 2008. However, it was reported by the CFI fishers that the individual fishing effort of gillnet, hook and line, and fish trap had been reduced due to the decision of the CFI committee. With the participation of CFI fishers, the total number of fishers has increased along with the growth of local people. Therefore, it may not be possible to control the CFI fishing capacity, as there is a growing need of local people for livelihood. It is hard to leave other fishers out of the fisheries, giving more pressure on fisheries resources.

3.3 Social equality

The law on fisheries in Cambodia aims to ensure that fishery resource management enhances aquaculture development, the management of production and fish processing, and promotes the livelihood of people in local communities for the social-economic and environmental benefits. This aims toward the sustainability of fisheries resources for the next generation of the Cambodian people. The law also ensures the rights on traditional use of fishery resources for local communities under the regulations of this or other, related laws. During the formulation of the fisheries law, sub-decree on community fisheries management and declaration on the CFI guideline, several factors were taken into account. These included the ability of the poor, the rights to fish of migratory fishing community fishers, livelihood needs, the sustainability of fish stock, and women's rights.

After the introduction of the fishery reform policy, the new fishing rights have been given to the community fishers, the fishers have more secure access to fish, are able to eat more fish, experience increased solidarity among the CFI members, and have a fair and improved distribution of resources, improving livelihoods (Kurien, 2017). There is an increasing need for more fish, as the number of people in the community increased. Fishery conservation has been recognized as an important action for sustainable fishery resources for the next generation. Additionally, women have been noticed as playing an essential role in peacefully preventing illegal fishing activities (Kurien, 2017). In the case of natural disaster, all the affected community fishers and villagers will receive aid from different sources.

4. MAIN CHALLENGES AND WAY FORWARD

4.1 Challenges for the fishery

The introduction of the new fishing rights to the community fishers does improve the fisheries conflicts. Since the introduction of new fishing in 2000 and 2012, there is almost no existence of large-scale fisheries at all. The conflict, so far, happened between the small and large-scale fisheries. When there is an absence of large-scale partners, no conflict happens between the two groups. The other conflicts occur between the CFI committee and the outside fishers who overfish in the CFI fishing ground. Generally, conflicts have decreased after the introduction of new fishing rights in 2008.

With the introduction of the new fishing rights, community fishers have been given the legal responsibility to manage fishery resources in their own community fishing grounds. Fisheries have an obligation to formulate their fishery management action plan, and a lack of funds hampers the operation of the fishery action plan. Many community fishers are in poverty, too, which creates difficulty with the enforcement of fishery law, rules and regulation. The challenges to fish lead to the introduction and intensification of the fishing to get more effective fishing. Illegal fishing practices still happen in many cases. The effect of managing the fisheries resources in the community fishery area is that there is a need for the enthusiastic participation of community fishers. This is vital for leadership, management capacity and funds for the CFI area operations. The introduction of fishing rights does not cause the damages on houses, roads and other infrastructure, regardless of small or large-scale fisheries.

4.2 Improving fishery sustainability in the future

The existing fishery law, rules and regulations are good at ensuring the sustainability of fishery resources for the next generation, social equity and economic viability of the community fishers, but it is important to translate those fishery policies to meaningful actions. The current fishing rights shall be improved to enhance the CFI operational action plan. The current legal framework has given all relevant stakeholders involved with roles and responsibility, but the main obstacles existing are the implementation capacity of the action plan and funds for the CFI operation. The improvement of CFI livelihoods will also release the pressure on fishery resources and help to maintain the sustainability of fishery resources. The key to successful fishery management is to maintain fishery reproductivity. This may come through the protection and conservation of fish brood stock, spawning grounds and fish habitats (for spawning and feeding).

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