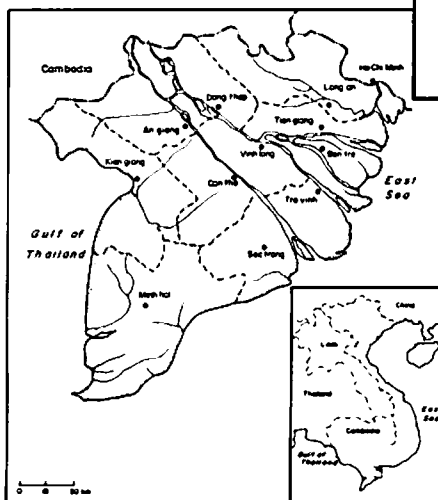


# Management of Freshwater Capture Fisheries of Cambodia — Issues and Approaches

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## Introduction

Fish provides more than 75% of the animal protein to Cambodia's 9.8 million population (Mekong Committee 1992). About 90% of the population still live in the rural areas, concentrating around the country's extensive inland water systems and practicing subsistence-oriented farming and fishing activities. Current production from the inland capture fisheries is more than 100 000 t including an estimated 34 000 t produced by small-scale household fishing for subsistence. It is the Mekong River, through its annual hydrological cycle influenced by the monsoon floods, that has created the vast freshwater capture fisheries in Cambodia. The Mekong River, after traveling about 120 km of rapids from the border of Laos, flows into the central plains of Cambodia, where it meets the Tonle Sap and Bassac Rivers and feeds into a vast natural lake, called the Great Lake or Tonle Sap (see *Naga*, October 1994, p. 5) (Fig. 1). The Great Lake that rises to a size of 10 000 km<sup>2</sup> during the monsoon season and the 150 km long Tonle Sap River that connects it with the Mekong together account for 60% of the total inland fishery catch. The Mekong-Bassac Rivers that overflow into the surrounding plain lands, creating a water expanse of another 10 000 km<sup>2</sup> during the monsoon rains, account for the remaining 40% of the catch. The fish population, consisting of more than 200 species, is intensively harvested for food.



Cambodia and its main districts.

## Property Rights, Access and Management

The state holds the property rights and manages the fisheries through an extensive regulatory regime that uses control and enforcement as the major instrument. Regulations on fishing were designed by the French in the beginning of this century. The French divided the fishing into commercial and family fishing and used the commercial fishing to generate tax revenue. At present fishing is organized at three levels: 1. family (subsist-

*Located in the Lower Mekong Basin, the inland waters of Cambodia support an extensive fishery and provide food security to the country's largely subsistence oriented population. Current fishery production from inland waters is estimated to be more than 100 000 t, one third of which come from subsistence fishing. Despite government regulations, the fishery is threatened by loss of critical habitats like the inundated forests, destructive fishing practices and increasing commercial exploitation. This article reviews the consequences of existing systems of management and fishing rights allocation.*

ence) fishing; 2. middle-scale (artisanal) fishing; and 3. large-scale (industrial) fishing (Table 1). The fishing calendar is divided into two seasons: open (October-May) and closed (June-September) seasons. The State recognizes the fishing rights of families for subsistence at all times of the year, imposing restrictions mainly on the effort (e.g., gear and mesh size). Middle-scale and large-scale fishing are allowed only in the open season.

Large-scale fishing takes place in about 300 fishing grounds (known as fishing lots) located along the periphery of the Great Lake, the Tonle Sap and Mekong-Bassac Rivers (Fig. 1). The fishing lots are leased out for a two-year term (Table 1). The size of a fishing lot in the Great Lake ranges from 15 to 25 km in length and 5 to 10 km in width and produces 150-400 t of fish during the open season.

Large-scale fishing is controlled by the rich people and their agents. Bidding for fishing lots take place among a limited set of people. Subleasing of a part or whole of the lot is a usual practice. About 60% of the commercial catch consisting of more high valued species comes from the fishing lots and are mainly supplied to the urban and export markets. Fishing labor forces are contracted on

fixed wages mainly from poorer regions of the country.

The current monitoring, control and surveillance activities of the Fisheries Department deal mainly with the enforcement of gear restrictions and fishing prohibition in the fish reserves by family and middle-scale fishers. The compliance with the regulations is very poor. The government collects about two million dollars annually as lease and license fees.

## Fishing Practices and their Impact

Fish migration and recession of flood waters govern fishing activities to a large extent. Most of the gear is designed and used to take advantage of the water current. The fishers mainly seek to filter or screen the water either by installing barriers made of wooden stakes across the streams, or by enclosing large areas with bamboo fence, or by using fixed bag nets into which migratory fish are swept along with the water current.

Stocks are heavily exploited during their migration through the waterway canals linking various habitats. Intensive fishing in the Great Lake was identified as a major cause of decline in fish production as early as the 1940s. The current fishing pressure is quite intense. Mechanized fishing boats and nylon nets were introduced in the early 1960s.

After several years of dislocation due to internal conflicts, the number of registered fishing crafts nearly doubled between 1982 and 1992. The current level of the annual commercial catch is considered to be only 60% of the level caught in the 1960s. Some of the large fish species such as giant catfish (*Pangasionodon gigas*) and *Catlocarpio siamensis* which were commonly caught in the 1960s have become rare nowadays.

## The Role of Inundated Forests

Seasonably inundated forests (about 680,000 ha, 80% of which are located around the Great Lake) serve an important ecological link to the continued regeneration and sustenance of the freshwater capture fisheries. They provide breeding and nursing habitats as well as an extended feeding ground for most of the fish species. The forests are heavily exploited



PHOTOS BY M AHMED & TS TANAI

*Bamboo fence being constructed by women and children members of a fishing household to be used as a fish trapping device in large-scale commercial fishing in the Great Lake.*

for firewood and household materials by the fishing and farming communities. During the last three decades many parts of these forests have been cleared for crop farming, causing nearly 40% reduction.

## The Fisher Community

Both family fishers and middle-scale fishers come from the communes that are located in the Great Lake area, and along the banks of Tonle Sap and Mekong-Bassac Rivers. The Lake and river waters provide them with fishing and fishing-related employment opportunities. The flood forests provide them with firewood and supplementary materials for fishing and housing. During the closed season most fishers engage in subsistence fishing using family fishing gear. In the open season members of the communities obtain licenses and organize middle-scale fishing. The great majority still continues to fish as family fishers using smaller gear and participate in fish processing and fish rearing activities in cages.

In the Great Lake as well as in many of the traditional fishing grounds, the fishing communities are facing limited access and acute competition. Most of the areas along the shores of the Great Lake are either leased out as fishing lots or designated as reserves (fish sanctuaries), which are offlimits to family fishing and middle-scale fishing. The open space in between the lots and reserves along the shore

is not much compared to the needs of many fishing communities. With the increase of population size the communities need a larger space for establishing fish processing base, operating small-sized family fishing gear and accessing fishing grounds in the middle of the Lake. Often, lot operators extend the boundaries of their leaseholds into the areas kept open for fishing by family- and middle-scale fishers.

Ordinary fishers can hardly earn a living by fishing these days. They try to collect as much fish as possible in dried, paste and fermented forms for year-round family consumption during the peak fishing period. They need 5-7 kg of fish to buy one kilogram of rice. Since most families are involved in small-scale fishing, catching only small-sized and less valuable fish, the cash earned from fish sales is not sufficient to buy daily necessities. They do not have any market power, their products are of low priority to the buyers and exporters.

## Socioeconomic and Policy Issues

### ☛ Inequality in the Distribution of Access and Benefits

A large part of the fisheries benefits are currently taken away by the large-scale fishing lot operators and their agents and patrons who are mostly nonresidents in the fishing communes. Subsistence and artisanal fishers have

limited access to good fishing grounds. This has placed them in a competitive situation with the government and with the fishing lot operators, prompting them to violate fish reserves and lot boundaries in order to obtain a bigger catch for their efforts.

#### ☛ **Lack of Extension Services and Infrastructure in Fishing Communes**

The government does not have any program to look into the social and economic infrastructure needs of the fishing communities. This situation has resulted in a low social and economic mobility of the members of the communities, and continues to hinder human development and improvement in the quality of life of the people, the majority (nearly 70%) of whom are women.

#### ☛ **Lack of Community Participation in Management**

The current fisheries legislation (the Fiat-Law 1987), though quite comprehensive in terms of conservation needs, relies on control and enforcement through policing by the Fisheries Department. It has alienated the traditional fishers from cooperating with the regulatory regime. With no alternative income earning opportunities, low risks of apprehension, low penalties and continuing internal conflicts, regulatory management is becoming less and less effective.

#### ☛ **Lack of Ecological and Environmental Perspective**

In the absence of an overall policy framework, fisheries and flood forests are threatened by nonfisher interests. Thus, flood forests are continually being cleared by upland farming communities seeking to supplement their crop production needs. Likewise, large areas within the inundated forests are offered for lease to rich people for intensive fishing. This has reduced the capacity of the environment to produce surplus fish yield for harvest. Moreover, it has resulted in a net drainage of economic surplus out of the fisheries.

#### ☛ **Impact of Future Development**

Significant negative impact on the environment and fish habitat is foreseen as large amounts of public investment will be made in the near future in improved agricultural production technologies, through construction of irrigation dams and embankments, and supply of chemical fertilizers and pesticides.

#### ☛ **Impact of Water Resource Development by Neighboring Nations**

The freshwater fisheries of Cambodia rely heavily on the hydrological regime (flooding) of the Mekong River. As neighboring countries continue to modify the hydrological regime of the river for irrigation and electricity

generation, the livelihood base and protein supply to millions of fishers and farmers will inevitably suffer.

## Policy Alternatives

The benefits from fisheries extend beyond the current official estimate of 70 000 t of commercial fish catch. The catch obtained by thousands of family fishers and subsistence farmers are not recorded at all. Moreover, the wide range of products and benefits reaped by the aquatic commons living around the waters are considered to be the single largest important ecological subsidy. Reduction of these benefits has much greater implications for equity and social justice not often measured by socioeconomic cost-benefit analysis.

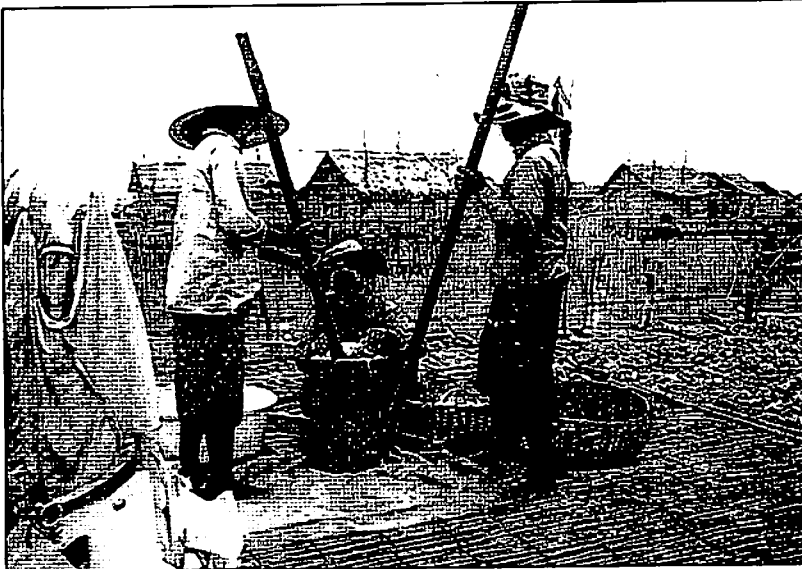
Given various users and use conflicts, it is impossible for the government to protect fishery, forestry and wildlife resources solely by means of policing — control and enforcement. A socially equitable fishing rights policy is a precondition for any improvement in the management. The communities deserve to be involved in the management of resources. The role of lakeside residents in protecting critical wildlife and fish habitat needs to be recognized and institutionalized. There is a need to reduce gradually industrial fishing through fishing lot operations. Some of the fishing lots located within the inundated forests have been causing significant damage to fish and wildlife populations. Bird habitats and nesting places are being destroyed by intensive human activities within the fishing lots.

At present, access to inundated forest resources, though prohibited by law, is equally open to the members of both the farming and fishing communities. The upland farming communities are more interested in agricultural practices than in harvesting the forest products. On the contrary, the fishing communes have a vested interest in keeping the forest intact, as it supports their livelihood. Policy measures should include:

- gradual reduction of number and size of fishing lots to protect critical habitats and release more area for community fishing;
- equity in access and distribution of fisheries benefits;
- recognition of community fishing rights by giving them priority over revenue-oriented fishing lot management;



*A fishing team operating mobile fishing gear (seine net) in the Great Lake.*



Family members of fishing households prepare fish paste (locally known as Prahoc) from surplus catch.



A young member of a fishing workforce sorts fish from a net-cage in the Great Lake.

Table 1. Characteristic features of fishing practices in freshwater fisheries, Cambodia.

	Family fishing	Middle scale	Large scale
Fishing period	Year-round	October-May	October-May
Major gear	harpoon/spear; castnet (<5 m); small gillnet (<10 m); single hooked lines; and bamboo traps	seine net; gillnet; castnet; hooked line; and bamboo traps	bagnet; bamboo/ wooden barrage; and bamboo fence and traps
Fishing rights allocation	Free within areas outside fish reserves and fishing lots	Annual license fee according to gear type and size	Leasing of designated fishing grounds every two years through competitive bidding
Background of fishers/operators	Artisanal fishers; subsistence farmers and landless	Artisanal fishers from river- and lake-side communes	Financially and politically powerful people and their agents
Source of fishing labor and terms of employment	Family members	Family members and covillagers as partners, and occasional hired workers; income sharing	Hired workers from nonfishing communes; fixed wages (cash and food) according to skills
Average size of crew	1-3	3-6	50-80

- integration of fisheries management with overall rural development in fishing communities; and
- extension of institutional responsibilities of fisheries management to fishing communities.

To conclude, forging a partnership with fishing communities will help increase fishers' share of net eate among them a sense of own-ership for the resources.

## Further Reading

Mekong Committee. 1992. Fisheries in the Lower Mekong Basin Main Report. Interim Committee for Coordinatio of Investigations of the Lower Mekong Basin, Cambodia. 92 p.

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