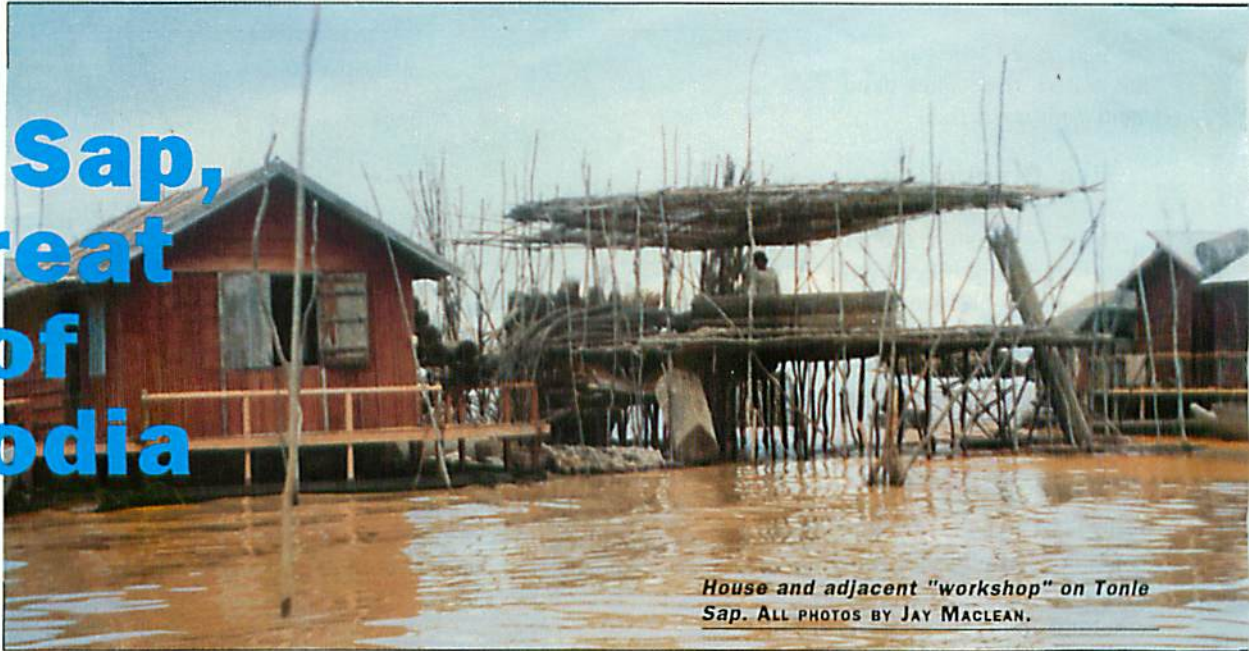


On Tonle Sap, the Great Lake of Cambodia

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House and adjacent "workshop" on Tonle Sap. ALL PHOTOS BY JAY MACLEAN.

The Cambodians call Tonle Sap the Great Lake, but it is hardly known outside the country. To most visitors, Tonle Sap is an expanse of reddish brown mud that follows their aircraft flight from Phnom Penh to Siem Reap - the site of the famous twelfth century, Angkor Wat temple complex.

The Great Lake is a long elongate strip, 100 km x 30 km, swelling to ten times that size, 300 km x 100 km, at the height of the rainy season. The lake's outlet is the Tonle Sap River which joins the Mekong River at Phnom Penh.

My wife and I were amongst those visitors looking down on muddy Tonle Sap on our way to Angkor Wat in May 1994.

Touch Seang Tana of the Cambodian Department of Fisheries had helped us organize the trip. "You must visit the Great Lake," he instructed us. "The Director of Fisheries at Siem Reap, Lao Thuok, will take care of you."

Mr. Thuok met us at the airport and drove us straight to the lake. Most of the 20-km journey was along what is part of the lake bed for half the year; so it was a long, bumpy trip.

At the shore, Thuok introduced us to the local fisheries inspector and the four of us set off along a narrow footway into the lake past marshes and rows of near flat-bottomed, unpainted timber craft; their weathered lines nevertheless very graceful. In the small fisheries office, Thuok

explained the fishing system of Tonle Sap on a map that covered one of the walls.

The shoreline of the lake is divided into fishing lots, which are then fenced. The lots are auctioned each year. Thuok pointed to one: "This one, 13 by 3 km, was sold for a hundred million riels (US\$40,000) this year. There are seven lots in this province totalling over a billion riels. One is 28 km long." Fencing in this space each year was a mind boggling effort.

"It works like this," said Thuok. "Sometime early in the year, boundary posts are set up every few kilometers (!) to mark the lots. By March or April, the whole area is fenced."

"Is that to keep other fishers out?" I asked.

"No," hastened Thuok, "the fence is to keep the fish in. To begin the harvest, they move the fence inward in several stages, gradually concentrating the fish into a smaller and smaller area until it becomes a manageable fish pen. The fish are then kept in big pens." The dimensions of the operation were making me dizzy, moving and setting up 200 km² of fencing every week or so.

"By May, they must have cages ready, unless they sell all the fish, because when the rains become heavy, the lake level may rise by half a meter a day and quickly submerge the pens. Then the crop is lost", continued Thuok. "The fish must be transferred in time from the pen to the cages."

Cages. I could come to grips with cages, man-handleable objects, or so I thought. However, Tonle Sap cages, like everything else, are made on a grand scale. They are about 120 meters long, 6 meters wide and carry over 100 tonnes of fish. They float half-submerged. Some fishers tow them all the way to Phnom Penh, 250 km down river, to get good prices. Cambodians love really fresh fish. Other fishers hold their stock until the following year or more, remaking large pens in the dry season and transferring



Floating fish cage, capable of transporting 120 t of live fish.

the fish back to the cages as the waters rise. They feed them with trash fish.

Fish Production

There is no shortage of trash fish or any other kind of fish in Tonle Sap. We visited a floating fish landing where several tonnes of fish were being sorted into commodities: fresh fish, fish for drying, fish for fermenting, and fish to be sold as trash. The catch we saw was from one haul of a seine net between 300 and 500 meters long. This was from outside the fishing lots, in the open lake. The fishers were apologetic. It was a bad year. Last year they had to return to the net three times to transfer the harvest of one haul to the landing. They sometimes catch up to 20 tonnes in a single haul. This is one productive lake.

Total annual production from the Great Lake is about 50,000 tonnes. Mr. Thuok wrote down some of the main genera: *Pseudosciaena*, *Channa*, *Cirrhinus*, *Trichogaster*, *Cyclocheilichthys*, *Pangasius*, and *Kryptopterus*.

There are conservation measures. Fishing is banned altogether in the lake from June through September and there is a fish sanctuary in each province around the lake, accounting for maybe ten per cent of the lake area. The nearest sanctuary to Siam Reap measures 16 x 4 km.

There were many more facts and figures, but I was distracted by a large machine gun in the inspector's office. It had a bore that could have fired golf balls. An immense thing.

"Does he shoot that?" I interrupted Thuok.

"No, he only points it. If he has no gun, the fishers don't obey the laws."

We all climbed into his long, narrow patrol boat. In faded paint, I read FAO (Food and Agriculture Organization of the United Nations) on the inside. We set off into the lake. Into another world.



Fishing boats, kids and poor housing on the edge of the lake.

Ahead of us was a floating community. Some 600 families have organized their floating houses into a loose village called Chong Khneah with a main "street", along which we cruised sedately. It is a temporary arrangement, however. When the rains set in, the water rises from its present depth of 50 cm or so, less than waist depth, to some 10 meters. The



Fish drying on a temporary platform; fish pen with feeding station behind.

houses then lift off their moorings and make their way towards the foot of a nearby hill, following the shoreline. Some houses stand on stilts; large flat barges are positioned under them and rise up to carry the houses; other houses remain over their boats, while others are simply covered boats. Some larger enterprises have huge pens beside them, teeming with fish - the product of fishing lots. Massive cages are moored nearby, ready.

We cruised past little floating stores selling everything you could want for fishing. Thuok explained that there was a floating health center, a church, a school "and Unesco is building a floating library for children and the fishers." There was even a "video cafe" where we ate delicious fresh fish straight out of the lake.

Throughout the village, there is a constant traffic of small craft - some rowed standing near the rear or paddling at the front or both, larger canoes with diesel engines

balanced over long shafts, propellers almost out of the water; these are fishing boats and supply boats.

Problems in Paradise

Despite huge catches of fish, it is evident from their life styles that the villagers on Tonle Sap are not the ones reaping the rewards of their labor.

Apart from rapid flooding, when fish may escape from pens, there are occasions when the lake water becomes too hot and fish die-offs take place. The lake itself may be changing also. In the 1960s the water level rose to 14 m deep in the wet season, while now the maximum seems to be only 10 m.

Much of the floodwaters actually come from *downstream*, from the Mekong River, and which back up into the Tonle Sap floodplain to create seasonal feeding and spawning grounds for many fish species.

Proposed hydroelectric dams could alter this natural regeneration system dramatically.

Acknowledgement

Thanks to Messrs. Touch Seang Tana and Lao Thuok for arranging this visit.

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