

Great Transformations on a Great Lake

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Tonle Sap Great Lake in Cambodia is a natural flood reservoir of the Mekong River that runs across the country and supports Cambodia's major inland capture fisheries. Records have shown that during the flood season, the Lake could have water area of about 10,000 km² and depth of 10-14 m and during the dry season the area is reduced to about 3,000 km² with depth of less than 1.0 m. During the monsoon season, the Great Lake expands to about 6,000 km² inside inundated forest creating an enormous ground for breeding, spawning, nursing, and feeding of various freshwater aquatic species (Serywath and Vann, 2009).

Cambodia covers an area of 181,035 km², 30% of which is seasonally flooded making freshwater and fisheries among the dominant features of the country. The Mekong River watershed of Cambodia includes the Tonle Sap Great Lake which is considered one of the largest floodplain lakes and most productive inland ecosystems in the world (Try and Sitha, 2011). Fish production from inland capture fisheries of Cambodia in 2009 was about 390,000 metric tons accounting for about 16% of the inland capture fishery production of the Southeast Asian region (SEAFDEC, 2011). About 75% of the country's protein requirement which is estimated at 67 kg/person/year is provided by freshwater fishes 60% of which is produced from the Great Lake. Try and Sitha (2011) also reported that between one and three million people depend directly on Tonle Sap fisheries for their livelihood and food security.

Impacts of Climate Change on Inland Capture Fisheries of Cambodia

Yusuf and Francisco (2009) concluded in an IDRC Report on Climate Vulnerability Mapping in Southeast Asia that Cambodia being one of the most vulnerable areas in Southeast Asia would be hard hit by the consequences of climate change. Not so much because of the actual physical impacts, but more because the country has relatively low adaptive capacity to mitigate the changes. Taking into consideration the case of Cambodia in the IDRC mapping report, many questions cropped up regarding the sustainability of inland capture fisheries in the country. Specifically, on how the fisherfolks around the Tonle Sap Great Lake regard their future; and on their adaptive capacity not only with regards to climate change but also to the prospects of the construction of dams in the Mekong River region.

In order to hear the voices of the fisherfolks, a survey was made by interviewing small-scale fishers in and aquafarmers near Tonle Sap Great Lake to get their insights of the future with changes in the climate as well as massive increase in hydroelectrical dams looming in the not so far distance. Interviews with resource persons from NGOs and authorities were also made to put the fisherfolks' voices in perspective. This study was carried out in 2011 and was partly funded through a travel grant from the Danish International Development Agency (DANIDA).

One respondent, Mr. Thoun, is a fisherman on Cambodia's Tonle Sap Great Lake. One could almost believe that the poor fisherman had read the IDRC Report because his words mirrored the contents of the said Report. When asked how he considers the weather lately, Mr. Thoun's thoughts and the IDRC report's conclusions are the same, *i.e.* great changes are under way.

In the stilted village of Kampong Phhluk on the northeastern part of the lake two generations speak about the changes. Mr. Thoun and his 71-year old mother-in-law both agreed that before there were less frequent and not so violent storms. Now not only has that changed but the seasons have also become unpredictable. The weather is hotter and drier, and more people are getting sick with dengue-fever, malaria and stomach-related disorders. However, Mr. Thoun thought that the dwindling fish catch from the lake has anything to do with climate change. He sees it more as a problem with illegal fishing.



Map of Cambodia showing the Tonle Sap Lake



Most people in the stilted village of Kampong Phhluk make a living in fishing, but a little house-gardening supplements their income



Mr. Thoun and his wife look into an uncertain future as fishers on the Tonle Sap Great Lake

Short-term Adaptation Strategies

A research analyst with the WorldFish Center in Phnom Penh, Cambodia, Mam Kosal elaborated a bit on the present and the future of the Lake and its people. He stated that ‘with climate change you will see changes in the

ecosystems as flooding seems to be less predictable with the time and level of flood. It will affect everything, especially fishing, farming and irrigation. There are other problems as well. The famous flooded forest is shrinking and as the natural forest is degraded, invasive species like the mimosa will out-compete the forest. The fishery itself is becoming smaller maybe because of changes in the ecology, fishing efforts and practices. Illegal fishing still persists as many claims that if they followed the restrictions stated in the law it would not allow them to fish enough for their survival. Destructive fishing is also practiced and enforcement of rules is difficult as the area is large and accessibility of many places is difficult. Fishers have reported that 14 different government agencies are involved in different kinds of enforcement and thus create a kind of competition’.

On the matter of adaptation, Mam Kosal explained that ‘the people in the communities are aware of the changes and that they will have to change their ways of living in the future. They compare the situation now with earlier times. They cannot say it is the effect of climate change – they even do not know what climate change is – but they know what they see. When it comes to adapting to the new conditions, livelihood adaptation strategies are not very effective. The people look only at the short-term - if they know how to deal with it at all. The poorest has not much incentive to participate as they have to fish which makes it difficult to engage them. They encourage their children to go to school, but for the poorer this is a dilemma as they still need them to help out with the fishing’.

Uncertain Answers

About 1.2 million people live on the Tonle Sap floodplain of which 25% live on floating villages. Out on the lake is the floating village of Kampong Loung where one of the local fishers was a bit more confident about the future than Mr. Thoun. Unlike Mr. Thoun, this fisher is not a full-time





Good business: To fish on the lake and to farm fish is not such a bad combination as this fisherman makes a decent living

fisherman as he also rears fish in cages. However, when he fishes he always go to the lake. What he catches he puts in floating cages. He feeds his fish with feeds bought from Vietnam, and fattens the fish for three months before they are sold at the local market. For such reason, although the water level of Tonle Sap Great Lake in the beginning of 2011 was very low, this did not mean anything for his business. The same positive attitude to business is found with another fisher. Her family catches tigerfish and snakehead fish, after which she salts and dries them. Although the price was low in the beginning of 2011, it was still a good business for her family.



After being salted and dried the fish could be sold for 15.000 Riel/kg or approximately US\$ 3.80

When asked if they have heard about climate change, most fisherfolk did not understand the question – or rather the term. In the Khmer language one term translates both as ‘climate’ and ‘weather’. In that respect they are opposite compared to most other Cambodians. In a study about the Cambodians’ perceptions on climate change from January 2011, which was financed by DANIDA, UNDP and Oxfam (BBC World Service Trust and Ministry of Environment, 2011), almost all respondents recognized at least one of the terms ‘climate change’ and ‘global warming’.

However, when it comes to understanding the causes of climate change most people connect the changes in weather that they have experienced with the deforestation of Cambodia. Back in the shade of the stilted houses in Kampong Phhluk, Mr. Thoun was asked about his and his five children’s future. The fisherman hesitates a bit before answering - then says that it will be difficult to live from fishing and that it will be hard for his children’s generation. When asked about what he plans to do if there are no fish, Mr. Thoun had not got an answer to that question. What lies ahead are just uncertainties.

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