

## **Comments on Don Sahong Dam's 2013 Environmental Impact Assessment**

Mekong Watch<sup>1</sup>  
December 2014

### **Introduction**

There are numerous concerns about the environmental and social impacts of the Don Sahong Dam, planned on the Mekong mainstream, in Champasak Province of southern Laos. The Mekong River is the world's largest fishing ground for freshwater fish, and the dam is to be constructed on the Mekong's Hou Sahong Channel. This channel is very important as it is the one and only channel in the Khone Falls area that is a year-round fish pathway for migration. It is also located only a few kilometers from the habitat of the Mekong River subpopulation of *Orcaella brevirostris* (Irrawaddy dolphin), a critically endangered species on IUCN's red list and of which less than 100 remain.

Dam construction on this channel is expected to bring extensive adverse impacts on the ecosystem of the whole Lower Mekong Region (References 1, 2), and economic losses incurred by the fisheries sector are predicted to exceed the economic benefits generated by the dam (Reference 1). Taking these concerns into account, we have compiled these comments regarding the *Don Sahong Hydropower Project, Lao PDR Environmental Impact Assessment, January 2013* (References 4-8), presented by the government of Lao PDR. Comments are mainly regarding impacts on fish and these comments were made based on reviews by fish experts.

From our analysis, we conclude that the EIA for the Don Sahong Dam is insufficient both in terms of scope and survey duration. Much important data and information necessary to implement mitigation measures after dam construction is also lacking.

### **EIA Report Deficiencies**

#### **○Problematic data collection on fish catches**

- The EIA's studies of fish species are from data of fish catches by fishers in areas near the proposed construction site (see EIA Annex D). While this data is important for understanding the impacts that dam construction will have on the livelihood of fishing communities, it is necessary to conduct scientific studies using ichthyology and fishery science methods in order to understand fish migration patterns and natural resource interannual variability.
- There is insufficient data of fish species and migration during times of high water levels. The EIA seems to rely heavily on fishing using a fish trap called *Lee*. This trap, however, is used only when the water levels are below a certain point at the beginning and end of the raining season. If water levels rise unexpectedly, *Lee* sometimes break. If information was collected primarily from *Lee* catches, data on fish species and migration at times of high water levels has not been sufficiently collected.
- The data is not quantitative. There is no data on catch per unit effort (CPUE), nor on the type of

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gear/equipment used at each sampling location, though this data is essential for resource abundance monitoring.

### ○ Survey Flaws: Duration of Survey

- We are seeing unprecedented changes in water levels in the Mekong River basin. Massive floods and record setting droughts have been occurring over the past several years. Large changes in water levels within a single year also make it difficult to determine the impacts on fish resources from just two years of monitoring. For this reason, we feel the report's monitoring duration is insufficient. Even the SEA submitted to the MRC recommends basin-wide studies and proposes a 10 year moratorium on development (Reference 3), and there is clearly not enough information to ensure sustainable natural resource use.
- Fishers decide what fishing methods to use depending on the water levels, so fishing seasons are limited. As for the endangered Mekong giant catfish, they pass through the Hou Sahong Channel when the water level is highest. When water levels are high, it is not possible to fish using *Lee*, and there are cases (as seen in 2011) when none are caught. Therefore, it is still unclear how large fish, such as the Mekong giant catfish, use the Hou Sahong Channel for migration.

### ○ Survey Flaws: Scope of Monitoring

- Of the 17 channels of the Khone Falls area, the Hou Sahong Channel is unique in that it is the only passway through which fish can migrate throughout the entire year. There is no survey taking this into account. Studies on fish species were conducted on only 3 channels and no information is provided on the remaining 14. It is essential to assess what impact blocking the Hou Sahong Channel would have on all the other channels.

### ○ Survey Flaws: Impact of Changing Water Levels Overlooked

- Fish behavior changes as water levels fluctuate. Also, it can be predicted that water level changes during the dry season in the highly turbid Mekong River are an important factor in the rise and fall in quantity of aquatic plants. There are no studies, however, on this subject.

## **Missing Information**

Because studies are insufficient, the following information is missing from the EIA.

- It is known that fish migration in the Mekong River is triggered by increased turbidity and water level changes caused by rains at the end of the dry season (Reference 9). How changes in the amount of water flowing downstream from the Hou Sahong Channel would impact the migration of fish in the lower stream must be given separate and concrete consideration, but such studies have not been conducted.
- There is no information regarding the Hou Sahong Channel's effectiveness as a passage for fish in the life history of fish inhabiting the Mekong. To gather such information, data such as species collected by fishers, statistically analyzable numbers of species and their populations, and data such as length, weight, gonad index (gonadal weight) should be recorded.
- It is unclear which species use the Hou Sahong Channel seasonally or constantly, and for what purposes the Channel is used during what stages of the fish's life. Therefore, there is insufficient data to accurately

determine environmental impacts or to consider mitigation measures.

- In the Hou Sahong Channel area, the water level decreases during the dry season and there is massive growth of algae as sunlight reaches the river bed. These algae are important as food for fish, and they sustain the base of the ecosystem. With dam construction and creation of a reservoir, we can expect to see changes in algae production capacity, but there is no consideration of this point. There is a risk that production capacity of algae at Hou Sahong Channels will be lost.

### **Environmental Impacts during Construction are Underestimated**

- Impacts of water turbidity on fish during construction is not considered.
- It is planned to dredge the lower Hou Sadam during the dry season to make a by-pass of the Hou Sahong Channel. During the dry season, fish such as *Par Soy* use areas downstream of the Hou Sadam and Mekong confluence as a passageway, and it is possible that water turbidity during construction could have an impact on the run of *Par Soy* and other fish.

### **Environmental Effects after Construction are Underestimated**

- It is questionable whether appropriate management of fishing grounds will be possible after dam operation begins. The report uses the observed decrease in fish catches in the Si Phan Don area as a reason for assuming that the decrease in fish near the proposed construction site is due to overfishing by local people (EIA, p. ix-x). The report then implies that the impacts of the dam will not be serious because the decreased numbers are due to overfishing.

Even if overfishing is actually the reason for decreases in fish catch in recent years, it is not logical to conclude that the dam's impacts would be thereby insignificant, or that fish catch regulations or other means would effectively alleviate dam construction impacts.

As pointed out in prior paragraphs, base line data regarding fishing is currently insufficient and conditions necessary for monitoring sustainable resource use have not been set up. When fish catches decrease, fishers make individual efforts to increase their catches by changing fishing gear or moving to other fishing grounds. If data before dam construction is only of fish catch by fishers, then accurate monitoring of changes in resource abundance is impossible. Therefore, there are big problems with any plan that assumes at this point in time that meaningful fish ground monitoring can be accomplished after dam operation begins.

### **Uncertainty of Mitigation Plans**

- Mitigation Plans for Upstream Run  
It is planned to secure fish migration by modifying the flow of Hou Xang Pheuak and Hou Xang Pheuak Noi, channels that neighbor the Hou Sahong. Annex D (Reference 8) states that the effectiveness of trial channel flow modifications were confirmed through hearings with fishers. Fishers reported increased catches above the Larne Falls (Hou Xang Pheuak), but reduced catches 3 km upstream of Hou Xang Pheuak. The EIA report concludes that this is an indication of successful fish migration through the modified channel and would therefore mitigate impacts of blocking the Hou Sahong. (Annex D, p 17-18) We cannot agree that these anecdotal reports of fish catches in a modified channel provide sufficient objective data to conclude that these modifications would mitigate the impacts of obstructing a different channel.

In this way, the validity and reliability of the EIA report comes into question, as it lacks any scientific data for its evaluation of post-construction impacts. Both channels were only drilled in 2012 and data to verify the impact of modifications has not been compiled yet. Long-term monitoring is needed to determine effectiveness of mitigation measures, but the report not only prematurely evaluates the success of proposed mitigation measures, it claims that implementation of these mitigation measures will even improve the long-term sustainability of fisheries in the Lower Mekong Basin (Annex D p. 23). This is faulty logic and jumping to this conclusion is a critical problem.

- **Mitigation Plan for Downstream Run**

There is a plan to set up turbines that would enable fish to pass through alive for the downstream run. But the EIA report also mentions that the indicated survival rate of fish passing through the turbines is only available for salmon in North America. It is highly questionable whether mitigation methods for salmon are appropriate for very diverse Mekong River fish. Such mitigation plans should be proposed only after verification of data based on diverse fish species and various characteristics of migration. (Reference 4: EIA p.30)

Salmon only run downstream into the sea after hatching when their size is small. In the case of the Mekong River, it is likely that not only small, newly hatched fish will make their way downstream. The EIA mentions 3 sizes of fish running downstream, based on fish samples from Nakhasan Village Port, and these sizes are considered. The largest, however, is less than 80cm, so this means no consideration is being given to the larger species of Mekong River fish.

Recent studies show that the Mekong giant catfish do not mature unless they grow to a certain size (Personal information. 2014). There are also indications that other fish species that spawn multiple times during their lifetime migrate both up and down the Grete Fall Line (GFL).

- After starting dam operation, Adaptive Management is proposed to monitor and alleviate environmental impacts, and a 10-year study to monitor fisheries is also proposed (Reference 7, Annex C p.41). However, to evaluate the changes in fish resources in Si Phan Don, baseline data is necessary. To collect baseline data also requires long-term studies. As mentioned earlier, the monitoring period for preliminary studies was very short, and there is no quantitative data either. In such condition where baseline data is missing, it is extremely difficult to define standards or targets for mitigation or improvement when the environment changes. To implement Adaptive Management, it is essential to collect scientific data over a certain period prior to dam construction.

## **References**

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