



WWF

BRIEF

2014

DON SAHONG DAM BRIEF

VERY HIGH RISK FOR CAMBODIA

January 2014

Key Messages:

- The Don Sahong Dam would block the only channel suitable for year-round fish migration between Cambodia, Lao People's Democratic Republic (PDR) and Thailand.
- Would cause a very high risk for national and local fisheries with impacts likely to be experienced throughout the Lower Mekong Basin and repercussions for food security and nutrition for at least 75% of Cambodia's population, and the nation's economy.
- There currently exist no proven methods to mitigate the dam's impact on Mekong fisheries.
- The EIA and supporting documents submitted by Mega First incorporates inappropriate methodologies with recommendations not supported by scientific evidence.
- Financial returns of the US\$300 million dam are limited and disproportionate with the expected high risks.
- Construction and operation of the dam would likely hasten the extinction of the remaining 85 Critically Endangered Mekong River population Irrawaddy dolphins.

The Don Sahong Dam

The proposed 260 MW Don Sahong Dam is one of twelve hydropower projects currently being studied and proposed for construction on the lower stretches of the Mekong River. Located 1.5 kilometres from the Lao-Cambodian border in Champasak Province, Lao PDR, the dam will block the Hou Sahong channel, one of the main dry season channels that comprise the Khone Falls section of the Mekong.

The Don Sahong would be the second dam, after Xayaburi, which is also located in Lao PDR, to be approved for construction on the mainstream of the Lower Mekong River. Lao PDR has prioritized hydropower development with the electricity generated from the Don Sahong and Xayaburi Dams being planned for export to Thailand. Lao PDR is blessed with an abundance of water resources that it could utilise to generate much needed revenues and it would be a wise move for the Government of Laos (GoL) to pursue less risky projects to meet its energy needs and in turn balance future potential developments for the benefits of its people and downstream communities.

On 23rd March 2006, the Laos government and a Malaysian engineering and investment company, Mega First Corporation Berhad (MFCB), signed a Memorandum of Understanding to investigate the environmental, economic, and technical feasibility of the Don Sahong hydropower project. Environmental Impact Assessment (EIA) consultants PEC Konsult Sdn Bhd and Australian Power and Water were commissioned by MFCB to investigate the dam and an EIA draft report was released on 11th July 2007¹. Feasibility studies were also prepared in conjunction with the EIA and completed during October 2007. However, the EIA was not accepted, and a Project Development Agreement was signed with a caveat that the initial EIA should be redone.

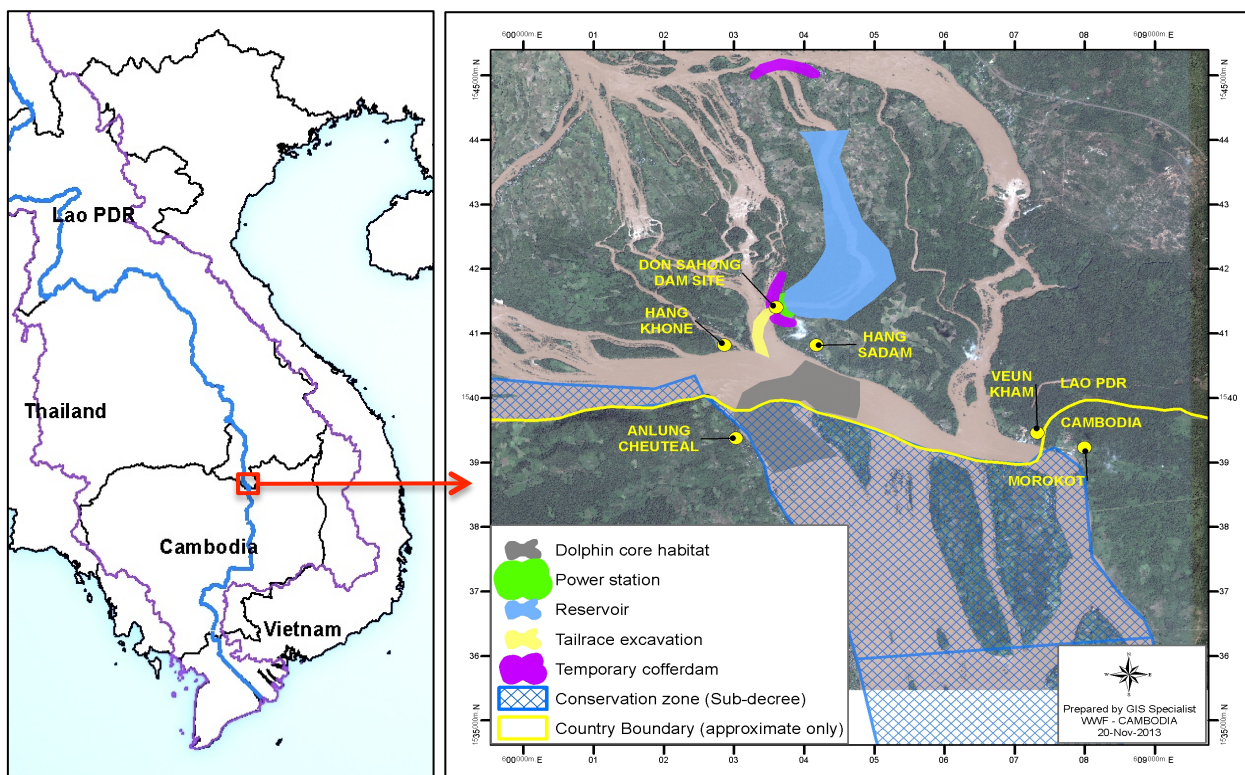


Figure 1 & 2. The proposed dam site indicating an Irrawaddy dolphin core deep pool habitat.

A concession agreement for the dam was signed on 13th February 2008 between Lao PDR and MFCB. During June 2008, MFCB formed a joint venture with IJM Corporation for the project development in which MFCB holds 70% of shares in the joint venture while IJM Corporation owns 30%². Whilst in 2010, the Don Sahong Power Company Limited was created as a subsidiary of MFCB and registered in the British Virgin Islands.

Continuing discord over MRC processes must be resolved

In October 2013, Lao PDR notified the Mekong River Commission (MRC) of its intention to go ahead with the construction of the dam. They claimed that the Don Sahong Dam is “not on the Mekong mainstream³” as it would be built on one of the several channels flowing through that

¹ PEC & APW. 2007. Don Sahong Hydropower Project Lao PDR. Environmental Impact Assessment, Volume 1, Report, 11th July 2007. Prepared for Mega First Corporation Berhad, by PEC Consult Sdn Bhd (PEC) and Australian Power and Water (APW), Vientiane, Lao PDR.

² Intellasia News Service. IJM to undertake Laos hydropower project with MFCB. The Edge Daily. 13th June 2008.

³ Mekong River Commission Secretariate. 03 Oct 2013. Lao PDR submits notification on Don Sahong Hydropower Project (<http://www.mrcmekong.org/news-and-events/news/lao-pdr-submits-notification-on-don-sahong-hydropower-project/>)

section of the river and thus requested to engage the “prior notification” process instead of the “prior consultation” process. All previously MRC communication stated, “the Don Sahong was a mainstream dam”⁴, this includes the Basin Development plan and the Strategic Environmental Assessment of the mainstream dams, all documents that were endorsed by the GoL.

MRC’s procedure of notification, prior consultation and agreement (PNPCA) is a requirement of the 1995 MRC Mekong Agreement. It sets forth the procedures for all 4 countries to collaborate to jointly review any dam proposed for the mainstream with a view to reaching consensus on whether or not it should proceed, and if so, under what conditions. In response to the notification of Don Sahong by the GoL, the 3 other Lower Mekong countries, Cambodia, Vietnam and Thailand requested the Don Sahong project to follow the full PNPCA process⁵.

However, the precedent of Xayaburi Dam, the only mainstream dam to date to entered a PNPCA, is concerning, as the countries have failed to reach consensus, and the project is now under construction against the advice of downstream countries. Representatives of the 4 Mekong countries had agreed in 2011 to delay a decision on building the Xayaburi dam and to jointly undertake further studies (referred to as the Council Study) to fill data and understanding gaps on its transboundary environmental and social impacts⁶. But in November 2012, this agreement was brushed aside when Lao PDR unilaterally decided to proceed with the construction.

The 4 countries have not yet addressed essential shortcomings in the MRC procedure, thus they still disagree on its interpretation. Past experiences indicate the procedures are not ready for implementation in another mainstream project. This lack of inter-governmental consensus demonstrates the fragile transboundary governance in the region, and the limited binding obligations of countries under the MRC agreement. This leaves space for private sector actors, including developers and investors, to take advantage of the limited capacity of government agencies to push through unsustainable projects that would not be acceptable in other places in the world. The MRC procedures thus need to be revisited and clear procedures agreed upon by the 4 countries before any other mainstream projects can be proposed.

The importance of Khone Falls and Mekong fisheries

At the Khone Falls, the site of the proposed Don Sahong dam, the Mekong River drops approximately 20 metres and into a complex network of narrow channels. Of these channels, The Hou Sahong in particular plays a crucial role in basin-wide fish migration, as it is wide and has no natural barriers along its 7 km length, making it easily passable by the huge volume of migratory fish species that travel up the Mekong River from Cambodia to the Khone Falls in Lao PDR⁷. Of the Mekong fish species whose life cycle is known, 87% of these are migratory and are mostly commercially important⁸.

⁴ Mekong River Commission Secretariate. 2007. Environmental Impact Assessment Report Don Sahong Hydropower Project, Lao PDR. Mekong River Commission Secretariat, Vientiane, Lao PDR, 19 November 2007.

⁵ Nations unite against dam, Phnom Penh Post. 02 December 2013.

⁶ Xayaburi dam delay pending further studies is a positive step, WWF. 08 December 2011 (<http://wwf.panda.org/?202755/Xayaburi-dam-delay-pending-further-studies-is-a-positive-step>)

⁷ Baird, I.G. 1996. Khone Falls Fishers: Catch and Culture (MRC Newsletter), vol.2, no. 2, November 1996.

⁸ Baran, E. 2006. Fish migration triggers in the Lower Mekong Basin and other freshwater tropical systems. MRC Technical Paper no. 14. Mekong River Commission, Vientiane, Lao PDR. 56 pp.

The economic value of the Mekong River's ecosystem services is immense. Wild capture fisheries are vital to all Mekong countries with the value of capture fisheries alone estimated at US\$1.4 billion–US\$3.9 billion per year. This does not include the economic value of subsistence fisheries, which provide food for millions of people living in the basin. Agriculture is the dominant economic sector in the Mekong River Basin and the ecosystem's freshwater resources are vital to the production of food. Freshwater fisheries, especially from wild capture, make up between 47 and 80% of animal protein consumed by the people living in the Lower Mekong Basin. About 75% of the basin's population depends on agriculture and fisheries for their livelihoods.

Mekong fisheries are of particular livelihood importance to Cambodia's population whose diet typically is a combination of rice, fish and vegetables. Aquatic resources account for 18% of the total food intake person/day and are the primary source (76%) of animal protein⁹.

Lao's experimental approach threatens regional fisheries

The Don Sahong Hydropower Project may have huge effects on fisheries, food security and livelihoods, as it will block the main migration channel of fish in the Mekong River, and most notably the only passage that can facilitate dry season migration¹⁰. This will inevitably contribute to further declines in fish catches throughout the lower Mekong Basin.

The EIA and supporting documents submitted by Mega First lack sufficient information to fully assess the potential impacts of the Don Sahong Dam on Mekong River fish migrations. Other concerns range from recommendations not supported by scientific evidence, communication gaps with local communities, lack of specific geographical knowledge on ecosystem services, ecology and fish species, livelihoods and presentation of contradictory evidence, inappropriate methodologies, and unsubstantiated statements¹¹.

The proposed attempt to mitigate the impact of the Don Sahong dam on fisheries involves an experimental approach to modifying small nearby channels in the hope that fish unable to migrate through the Hou Sahong Channel will instead move through them. The approach is to continue experimentation until monitoring suggests fish are passing through the channels – a dangerous and unproven approach. The mitigation measures proposed by Mega First have never successfully been used in the Mekong basin or any other tropical river, and far from guarantee any success. Without any evidence on the effectiveness of their proposed technologies, Mega First and the Don Sahong Dam are in direct violation of MRC's Preliminary Design Guidelines, for example, which requires a 95% fish passage effectiveness rate.

The likely consequences of constructing a dam across the Mekong River would be catastrophic. The Don Sahong Dam risks causing irreversible damage to the world's largest inland fisheries.

⁹ IFRDI. 2012. Mainstream dams in Cambodia and their impact on food security. Inland Fisheries Research and Development Institute, Fisheries Administration, Cambodia.

¹⁰ ICEM. 2010. Strategic Environmental Assessment (SEA) of hydropower on the Mekong mainstream, final report, Prepared for the Mekong River Commission by International Centre for Environmental Management. Hanoi, Viet Nam.

¹¹ WWF. 2013. Preliminary concerns about the EIA and management plans for the Don Sahong Dam – a scientific review (unpublished).

Impacts will include fragmentation of river systems, destruction of a critical fish migration, loss of fish catch, loss of livelihood income opportunities, and a loss of agriculture. Such a reduction in fish supply would affect the nutrition and the public health of Cambodians and Laotians, causing a much-reduced quality of life and an increased susceptibility to disease and infection¹². Don Sahong Dam would harm Cambodia and Lao PDR's ability to realize their Millennium Development Goal (MDG) commitments.

The Irrawaddy Dolphin would face extinction

There are approximately only 85 IUCN red-listed Critically Endangered Irrawaddy dolphins (*Orcaella brevirostris*) remaining in the Mekong River^{13,14}. These dolphins are all that remains of a population that once ranged over a territory from Khone Falls in the far south of the Lao PDR, downstream to the delta in Vietnam, and probably far into major tributaries like the Tonle Sap and Sekong Sub-basin. The population can now be found only from Kampi, in Cambodia's northeast, to Khone Falls over a distance of about 190 linear km; an 86% decline in their historic distribution.

Deep pools are a key refuge for fish and dolphins during the dry-season in the Mekong River¹⁵. Immediately below the Khone Falls is a deep-water pool overlapping the border between Cambodia and Lao PDR¹⁶. Just six dolphins remain isolated in this transboundary pool, these are the last remaining dolphins in Lao PDR^{17,18}.

Given the Critically Endangered status of the Mekong's Irrawaddy dolphins, their restricted territory and declining population¹⁹, only the lowest risk activities are compatible with the survival of dolphins in Lao PDR and the Mekong River.

Don Sahong Dam's proponents state that there will be "no significant impact" on dolphins²⁰, however an expert review of the project's impact assessment documents concluded that the Don Sahong Dam will affect dolphins directly through its construction and operation and indirectly through cumulative impacts on the species, and the broader environment; and that its effects

¹² Baird, I. 2011. The Don Sahong Dam: Potential impacts on regional fish migrations, livelihoods, and human health. *Critical Asian Studies*, 43:211-235.

¹³ Smith, B.D. & I. Beasley. 2004. *Orcaella brevirostris* (Mekong River subpopulation). In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1. www.iucnredlist.org.

¹⁴ Ryan, G.E., V. Dove, F.T. Trujillo, & P.F. Doherty Jr. 2011. Irrawaddy dolphin demography in the Mekong River: an application of mark-resight models. *Ecosphere* 2(5): art58.

¹⁵ Poulsen, A., Ouch, P., S. Viravong, U. Suntornratana & Nguyen T.T. 2002. Deep pools as dry season fish habitats in the Mekong Basin. MRC Technical Paper No. 4, Mekong River Commission, Phnom Penh. 22 pp. ISSN: 1683-1489

¹⁶ Baird, I.G. & B. Mounsouphom. 1997. Distribution, mortality, diet and conservation of Irrawaddy dolphins (*Orcaella brevirostris*) in Lao PDR. *Asian Marine Biology* 14: 41-48.

¹⁷ Ryan, G.E. 2012. Last chance for dolphins in Laos: a review of the history, threats, and status. A Technical Report from WWF-Greater Mekong Programme, Hanoi, Vietnam.

¹⁸ Ryan, G.E. 2013. Is the extirpation of Irrawaddy dolphins *Orcaella brevirostris* in Laos imminent: an assessment of status and recommendations for conservation. Report to the Scientific Committee of the International Whaling Commission, SC/65a/SM05.

¹⁹ Beasley, I., K. Pollock, T.A. Jefferson, P. Arnold, L. Morse, S. Yim, S. Lor Kim, & H. Marsh. 2012. Likely future extirpation of an Asian river dolphin: the critically endangered population of the Irrawaddy dolphin in the Mekong River is small and declining. *Marine Mammal Science* 29(3): E226-E252.

²⁰ NCC, 2013. Don Sahong Hydropower Project Lao PDR. Environmental Impact Assessment, Final, January 2013. Prepared for Mega First Corporation Berhad, by National Consulting Company (NCC) Vientiane, Lao PDR.

probably cannot be mitigated²¹, and certainly not according to the current design plans outlined in the project's impact assessment documents^{20,22,23}. Furthermore, the loss of habitat in the trans-boundary pool below Khone Falls would equate to approximately 34% decline in the extent of dolphin occurrence in the Mekong River and therefore place the entire Mekong population at significantly greater risk of extinction in the near future. Loss of the dolphin would significantly impact Cambodia's dolphin-watching tourism, which is valued at US\$4 million²⁴.

What are the alternatives?

By not building a dam on the Hou Sahong channel, Lao PDR are not disadvantaging their ability to produce electricity or their development ambitions. There exists other electricity generation and hydropower options that have been designed to be less destructive, and environmentally more sustainable²⁵. Employing user-friendly assessment tools, for example the International Hydropower Association's Hydropower Sustainability Assessment Protocol (HSAP) or the Rapid Sustainability Assessment Tool (RSAT), can help to understand and incorporate immediate and regional factors into the project site, design and operation.

One such project, the Thako water diversion, is a 172 MW hydropower project proposed for the Mekong mainstream taking advantage of the unique natural conditions nearby Khone Falls. Thako can produce nearly as much electricity as Don Sahong, with a relatively tiny environmental footprint. The Thako Project would not involve building a barrier across any of the channels of the mainstream Mekong River; instead, water would be diverted through an overland channel built around the Khone Phapheng Waterfall.

This innovative technology will produce approximately the same amount of electricity as the Don Sahong Dam but with far less impacts particularly as the project was extensively modelled for sustainability and has no dam and no reservoir. This approach has resulted in a hydropower project, which will have virtually no impact on upstream fish migration, and only a small impact on downstream fish migration. Therefore, would not markedly impact on fish migrations, and thus would not cause problems at a regional scale. Additionally, there will be no change in the flow distribution between different channels and no need for resettlement of any households, all of which would occur should the Don Sahong Dam be built.

The Thako project was also designed to be integrated within the tourism master plan for Siphandone, which was developed by the Lao National Tourism Administration and the Asian

²¹ Ryan, G.E. 2013. The Don Sahong Dam and the Mekong Dolphin. An updated review of the potential impacts of the Don Sahong Hydropower Proposal on the Mekong River's Critically Endangered Irrawaddy dolphins *Orcaella brevirostris*. A Science Brief from WWF Cambodia.

²² NCC, 2013. Don Sahong Hydropower Project Lao PDR (DSHPP), Environmental Monitoring and Management Plan, Final, January 2013. Prepared for Mega First Corporation Berhad, by National Consulting Company (NCC) Vientiane, Lao PDR.

²³ NCC, 2013. Don Sahong Hydropower Project Lao PDR. Environmental & Social Studies. Cumulative Impact Assessment, Final.

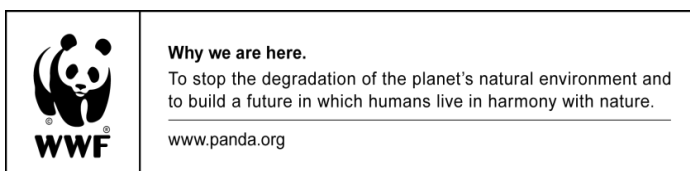
²⁴ O'Connor, S., Campbell, R., Cortez, H., & Knowles, T. 2009. Whale Watching Worldwide: tourism numbers, expenditures and expanding economic benefits, a special report from the International Fund for Animal Welfare, Yarmouth MA, USA, prepared by Economists at Large (<http://www.ecolarge.com/work/whale-watching-worldwide/#sthash.oOXm2ATf.dpuf>).

²⁵

Development Bank, and therefore enables local communities to benefit from tourism opportunities.

Conclusion

The Don Sahong Dam would threaten commercial and subsistence fisheries, regional economies, the Mekong's Critically Endangered dolphins, and the tourism sector. All currently available scientific evidence indicates that this dam is an environmentally and economically unviable electricity generation solution. However, it is not too late. Construction has not yet started. WWF calls for strict application of scientific based decision-making and transparent and participatory processes prior to any decision being made. The consequences if the Don Sahong Dam goes ahead are far too great.



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