



Assessing upstream fish migration measures at Xayaburi Dam in Lao PDR

Overview

Nine large hydropower dams will be constructed on the mainstem of the Mekong River in Laos, and two more are planned in Cambodia. These may have significant negative impacts on the Lower Mekong Basin's productive fisheries.

While dam construction is said to bring the benefits of job creation, supply and export of electricity and poverty reduction, there are potentially major impacts on food security and the livelihoods of tens of thousands of people dependent on the river.

A particular concern is the barrier effect of dam walls, which prevent fish migrations and access to vital spawning, nursery and feeding habitats.

The Lower Mekong Basin fishery has an estimated annual value of A\$22.4 billion but the dams are reported by some to impact at least half this important source of food and income.

Xayaburi Dam in Laos spans the entire width of the river. To manage the impact on fish migration, the company invested A\$395 million to incorporate fish passage facilities in the final design. The investment in, and complexity of the fish passage facilities are unprecedented globally. The company has invited Charles Sturt University to assess whether both the upstream and downstream fish pass facilities are performing as required. Findings will be used to provide operational advice to the company to optimise fish pass efficiency, and recommendations to both Laos government and construction companies on optimal design specifications for future hydropower developments.



KEY FACTS

ACIAR Project No. FIS/2017/017

Duration: September 2019 to December 2022 (3.5 years)

Target areas: Laos

Budget: A\$1,206,595

Project Leader

Dr Lee Baumgartner, Charles Sturt University

Key partners

- KarlTek Pty Ltd, Australia
- Living Aquatic Resources Research Centre, Laos
- National University of Laos
- Xayaburi Power Company Limited, Laos
- Department of Foreign Affairs and Trade, Lao PDR

ACIAR Research Program Manager

Ann Fleming

Objective

The aim of the project is to develop research methods that can be used to determine the effectiveness of the fish pass facilities. Because the dam site is so large, and the methods are untested on such a scale, the project will develop and establish robust approaches to calculating fish pass efficiency.

The objectives are to:

- Develop a suite of robust techniques to assess performance of mainstem dam fishways in the Mekong catchment.
- Assess upstream fish passage within the Xayaburi Dam fish pass facilities.
- Provide a standard for monitoring and constructing other mainstem dam fishways in the Mekong catchment.

Expected scientific results

- Development of a robust and scientifically defensible research program that will contribute significantly to the body of knowledge required to mitigate the negative impacts of large dams in the Lower Mekong Basin.
- Enable enhanced operations at Xayaburi to ensure fish passage is fully integrated into day-to-day dam operations.
- Scale-out of the findings of this project to influence the development of other mainstem dams and improve the design of their fish pass facilities.

Expected impact/outcomes

- Increased capacity of the Xayaburi Fisheries Research Team and participating Lao agencies through working with, and seeking advice from, international experts who specialise in monitoring upstream movement in fisheries using novel techniques.
- Implementation of research and monitoring tools to enable Xayaburi Power Company to operate the dam and fish pass in a manner that maximises fisheries-related outcomes and prevents the reduction of the fisheries resource.
- Effective fishway construction on mainstem dams will ultimately maintain fisheries productivity, which will maintain food security and income for fishing families, if the Xayaburi facilities are proven to work as designed.
- If the Xayaburi facilities are not proven to work as designed, the research from this project will be critical for any remedial works and actions.
- Minimisation of any negative impacts due to loss of access to fish species, by ensuring optimised fish passage at the Xayaburi Dam and through the standardised tools and protocols for fish tagging and monitoring.
- Improved designs for fish passage in future hydropower developments.

