



# Improving the design of irrigation infrastructure to increase fisheries production in floodplain wetlands of the Lower Mekong and Murray- Darling Basins



## Overview

**The Lower Mekong Basin (LMB) is the largest freshwater fishery in the world with more than 80% of rural households involved in capture fisheries.**

But up to 70% of its fishery species are at threat from the expansion of river infrastructure, such as dams, weirs, regulators and hydropower facilities because their survival depends on migration within rivers and between rivers and floodplain wetlands.

This migration is being disrupted by wetland regulators used for irrigated cropping and generation of electricity from mini-hydropower facilities.

Safe fish passage must be provided through wetland regulators. While significant progress has been made in restoring the safety of upstream fish movements, there has been little to no focus on critical downstream migrations. The potential injury and mortality of fish (up to 90% in some cases), on their return through wetland regulators back into the Mekong River must be addressed.

Developments in infrastructure design will improve fish survival and increase fisheries catches and incomes of farmers and fishers. It will also preserve the most important source of animal protein for the people of the Laos, and their traditional way of life.

## KEY FACTS

**ACIAR Project No.** FIS/2012/100

**Duration:** April 2014 to September 2019 (5 years)

**Target areas:** Laos

**Budget:** A\$1,238,684

### Project Leader

Dr Craig Boys, Department of Primary Industries,  
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### Key partners

- Department of Fisheries, New South Wales
- National University of Laos
- Living Aquatic Resources Research Centre, Laos

### ACIAR Research Program Manager

Dr Ann Fleming



## Objective

**The project's overall aim is to assist farming communities and water management authorities to adapt irrigation structures in ways that increase the value of the associated fisheries.**

**The project's three main objectives are to:**

- Better understand the impact of irrigation infrastructure on the downstream passage of fish between wetlands and rivers.
- Assess the effectiveness of different regulator designs for improving the survival of fish exiting wetland habitats.
- Quantify the economic benefit of improved capture fisheries resulting from improved fish passage survival at irrigation structures.

## Expected scientific results

- A more holistic understanding of the role of fish passage on the productivity of riverine floodplain ecosystems and fisheries productivity.
- Greater understanding of which species and life stages are most threatened by downstream passage through irrigation infrastructure.
- Greater understanding of the hydraulic performance (relevant to safe fish passage) of different types of irrigation infrastructure.
- Improved infrastructure design to provide safer passage and improved fish survival.
- Improved economic models surrounding the impact of wetland regulators and fish passage rehabilitation activities in the Lower Mekong Basin.
- Flow through of benefits from this work to the Australian fishery and agricultural sector, in particular the Murray-Darling Basin, where river regulation and irrigated agriculture has also disrupted fish passage.
- Creation of fish-friendly design criteria that is applicable to both the MDB and the LMB, through the analysis of information gathered on the hydraulic performance of irrigation structures in both regions, including those retrofitted with mini-hydropower facilities.
- Further application of project findings to the Australian fishery and agricultural sector, in particular the degraded MDB.

## Expected outcomes

- Increased awareness among local farmers, irrigation management authorities and donor bodies in Laos and riparian countries of welfare issues faced by fish at irrigation infrastructure, and of effective solutions.
- Adoption by management authorities of fish-friendly design criteria for the upgrade of wetland regulators.
- Increased awareness among local farmers and management authorities of the economic, social and environmental benefits achieved through a holistic approach to fish passage restoration.
- Increased fisheries catches and incomes of farmers and fishers, due to increased fish survival rates.
- Greater capacity of Lao scientists on a more holistic approach to fish passage research and development and rehabilitation—both upstream and downstream.
- Greater focus on skills development in this area of research with early career scientists.
- Greater knowledge and techniques to further improve the sustainability of flood plain development.
- Preservation of the most important source of animal protein for the Lao population, as well as preservation of an important, traditional way of life.

