

Aquaculture and Climate

Aquaculture currently contributes almost half of the aquatic animal food consumed by humans, and this percentage is expected to grow. A large fraction of global aquaculture production takes place in the tropics and subtropics of Asia, and this industry serves as an important source of employment and food security for rural residents. The contribution of aquaculture to total fisheries production in Thailand, for example, rose from below 20% in 2000 to over 41% in 2010. Understanding the impacts of climate change on aquaculture and the potential role of aquaculture in adaptation planning is improving, but still limited compared to many other agricultural activities. The key research problem addressed by this project is how to improve the capacity of aquaculture to sustainably adapt to changing and uncertain climates.

This research project will focus on Tilapia grown in farm ponds or floating cages in rivers and reservoirs in northern Thailand and will explore both how aquaculture practices should adapt to changing climatic conditions and the value of aquaculture as an adaptation strategy. Researchers will explore historical impacts and future risks of floods and droughts on farms using different risk-management practices; the effects of climate variability on chemical and physical water properties and tilapia production using observational and experimental approaches; and use models to build scenarios to assess future risks from floods and low flows due to climate change. Researchers will also focus on aquaculture as an adaptation strategy, identifying and measuring the contributions of aquaculture to the resilience of households.

These research findings and reviews will be key inputs into a multi-stakeholder assessment of adaptation options for fish aquaculture and pilot adaptation action plans. It is expected that combining the practical experience of water managers and fish farmers with research-based knowledge will yield recommendations useful for practice, policy and planning in water and fisheries sectors in Northern Thailand and in other aquaculture production areas in Asia.

OBJECTIVES OF THE PROJECT:

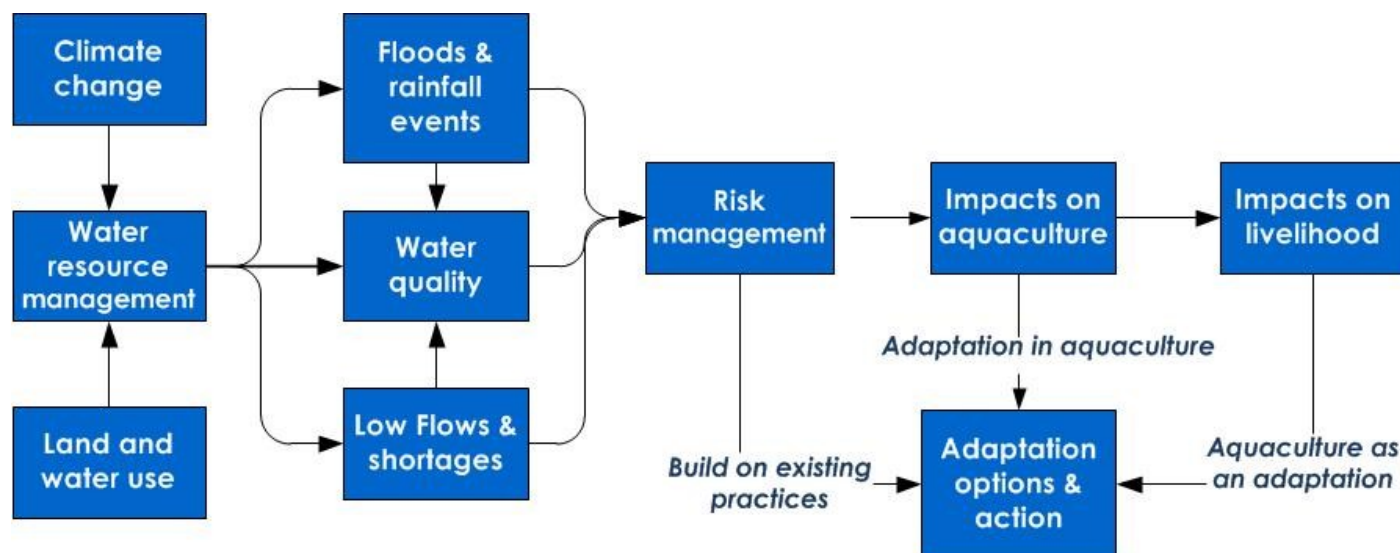
- ◆ Improve understanding of effective ways to reduce flood- and low-flow related losses of aquaculture farms under current climate conditions.
- ◆ Assess risks of flood- and low-flow related losses of aquaculture farms under plausible future climates and watershed management practices.
- ◆ Improve understanding of how the integration of aquaculture into livelihood systems affects the resilience of rural households to climate-related changes in water quality and quantity.
- ◆ Identify effective ways to reduce flood- and low-flow related losses of aquaculture farms as well as build resilience of livelihood systems under plausible future climate scenarios.
- ◆ Engage with key stakeholders throughout the project lifecycle to share research results through presentations, briefings, dialogue and documents.



PROJECT SUPPORT

This project is funded through the IDRC Research Initiative on Water Resources and Adaptation to Climate Change in Asia and LAC with funds from the Government of Canada's fast-start climate change financing, 2011.

Figure: Conceptual framework for the study of adaptation and inland aquaculture



The project is designed to provide opportunities for stakeholders and potential users of research findings to engage in the research and assessment of adaptation options for fish aquaculture; therefore, the outcomes of the project are expected to provide following benefits to fish farmers as well as other stakeholders:

- 1) Improvement of risk management practices to better adapt to a changing climate conditions.
- 2) Knowledge of sensitivities and risks to apply in watershed, policy and planning.
- 3) Knowledge of adaptation options to apply in policy and local planning.
- 4) Better understanding of risks of flood and low-flow related losses under current and future climate.
- 5) Better understanding of effects of aquaculture on adaptive capacity as well as adaptation options.
- 6) Close collaboration among project partners and stakeholders.

