

Climate Change and Aquaculture in Northern Thailand: Risks and Adaptation Options

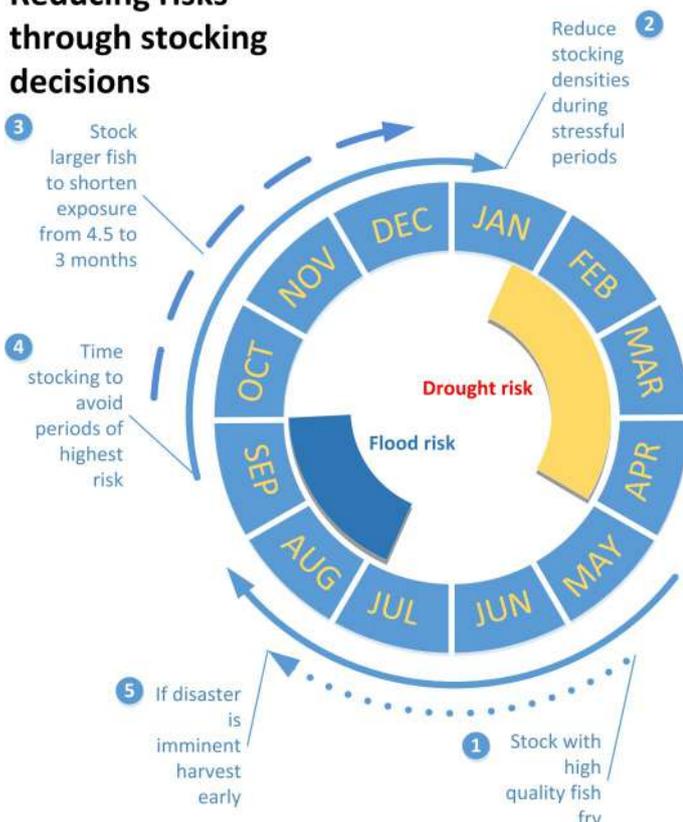
Summary of assessment report findings

Climate-related risks

Fish farmers in Northern Thailand face significant risks from extreme weather events under current climate, which may become more frequent or severe in the future. This brief synthesizes an evaluation with stakeholders of the risks posed by climate variability and change to aquaculture in Northern Thailand, and, the robustness of alternative adaptation options.

The most important climate-related risks to the profitability of inland aquaculture are season, culture-system, and place-specific; meaning that the risk profiles of individual farms vary substantially. Important climate-related risks for river-based cage culture are extreme high and low flows. For earthen pond culture, floods, droughts, and heavy rains were three important risks. For cages in reservoirs, rapid temperature changes and prolonged cloud cover were risks of greatest concern. Hatcheries worry about heat waves, cold spells, and having sufficient clean water.

Reducing risks through stocking decisions



Management of risks

Climate-related risks are managed at multiple spatial scales. Existing risk management practices and strategies at the farm level include site selection, adjusting stocking densities, and providing aeration. At the watershed and community level, the sharing of information is key; from early warnings of imminent extreme weather, through to sharing of rearing knowledge. At the sector level are schemes for compensation following disasters, as well as national policies related to standards and zoning.

Strengthening climate risk management practices in inland aquaculture requires attention be given to short-term reactions, mid-term tactics, and long-term strategies. Timely reactions to imminent threats might involve moving cages, supplying aeration, or harvesting a crop early. Tactics include a stocking calendar, so as to avoid highest risk periods, or storing water in an extra pond in preparation for the dry season. Long-term strategies are followed for years or decades, and range from diversification of income sources through migration to work, to research in alternative species and rearing techniques.

Non climate-related risks – like interest rates, rising prices of fish feed, or a fall in fish demand and prices – must also be dealt with by fish farmers. Some risk management practices help deal simultaneously with several different risks. It is important that managing climate-related risks does not inadvertently inflate other risks.

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Making decisions in an uncertain future

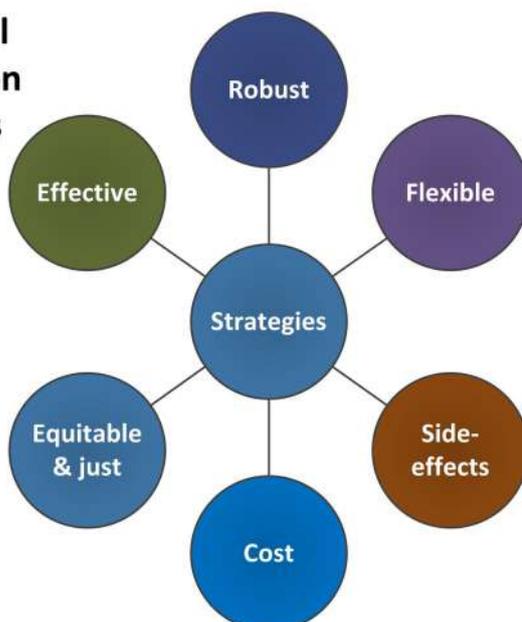
Exactly how climate will change in Northern Thailand in the future is not known with much precision. This high level of uncertainty means that it is important for measures taken today to be robust, flexible, and if possible, no regret actions. Scenarios are used in this assessment to allow analysis despite uncertainties. Four climate change scenarios were combined with alternative assumptions about the future demand for farmed fish and water, in order to create a broad set of plausible futures in which to test specific adaptation strategies. The benefits of pursuing specific, long-term strategies like investing in new technologies or infrastructure, establishing insurance or improving early warning systems, is shown to vary across scenarios; that is, no strategy is perfectly robust or worthwhile under all conditions. At the same time, several strategies are low regret, and could be combined with others to develop flexible and robust adaptation pathways for inland aquaculture.

Climate-related risks to fish farms are significant today; some are likely to become even more serious under future climate change. Fortunately, good practices in risk management exist which can help in the short-term, and in the long-term there is a set of low regret, robust and flexible options worthwhile considering.

Recommendations for policy and planning

1. Strengthen the provision of weather and climate information to fish farmers;
2. Adjust existing aquaculture development policies, plans, and strategies to take into account climate;
3. Increase awareness of the importance of the aquaculture stake in inland water resources management;
4. Enhance the sharing of good risk management practices among fish farmers;
5. Collaborate with private firms and fish farmers to provide new risk sharing options;
6. Establish and implement a zoning policy for aquaculture;
7. Promote and support the improved regulation and management of pollution that enters rivers used for aquaculture;
8. Invest in research and development on climate-resilient aquaculture technologies and rearing practices;
9. Make use of understanding of risk perception in communication; and
10. Draft a new climate and water strategy for inland aquaculture.

Successful adaptation strategies satisfy multiple criteria



The foundation of the assessment was a set of multi-disciplinary research studies, farmer surveys, interviews with officials and experts, reviews, and stakeholder engagement activities undertaken as part of the AQUADAPT project. The work was carried out with the aid of a grant from the **International Development Research Centre (IDRC)** in Ottawa, Canada.

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