

TOPIC AREA

POLICY DEVELOPMENT



GUIDANCE AND POLICY RECOMMENDATIONS FOR SUSTAINABLE SNAKEHEAD AQUACULTURE AND AQUATIC RESOURCE MANAGEMENT IN CAMBODIA AND VIETNAM

ASIA PROJECT: CAMBODIA & VIETNAM

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HC Project PI: So Nam, Inland Fisheries Research and Development Institute

Policy Development/Activity/16PDV01UC

Collaborating Institutions and Lead Investigators

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Objective

The objective of this activity is to provide science-based guidance and policy recommendations to government and farmers and households, including vulnerable subpopulations such as women and children, on sustainable snakehead aquaculture in Cambodia and Vietnam.

Significance

In April 2016, the Government of Cambodia lifted the decade-old ban on snakehead fish farming following a request from the Ministry of Agriculture to allow farmers to fish. Signed by Bun Uy, a secretary of state at the Council of Ministers, the statement said the decision to legalize snakehead fish farming again would be accompanied by forthcoming conditions and advice for farmers. In the statement, Mr. Uy said the conditions and advice, to be issued by the Agriculture Ministry, would help farmers sustainably manage and maintain their farms, and keep fish stocks healthy.

This new proposed project, along with the previous AquaFish CRSP and Innovation Lab projects, has been conducting research to support sustainable snakehead aquaculture in the Lower Mekong Basin of Cambodia and Vietnam and the lifting of the snakehead ban in Cambodia. The AquaFish CRSP project produced a number of outcomes, including development of a plant based feed for snakehead fish; recommendations to the government of Cambodia and the private sector for a sustainable snakehead aquaculture industry; value-added products for women from small sized/low value fish such as fish paste and fish sauce; extension/outreach technologies; recommendations for improvements in the trade and marketing system for both capture and culture fish in the region; and recommended policies to improve management of small-sized/low value fish in the Mekong area. Through the AquaFish Innovation Lab research, the laboratory trial and on-farm trial on the use of immunostimulant in snakehead diets based on soy protein concentrate and fish meal, evaluating survival, growth and immunology of fish immunology was completed. The snakehead farmers were all women who were selected with the aim to improve their snakehead rearing technique. The project developed methods for snakehead products conservation and processing (using salt supplemented with and without Bromelain and dried fish processing with and without sugar were done successfully). Once the protocols for snakehead value-added products (fermented and salted dried snakehead products) were in place, the methods were transferred to women

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snakehead farmers in An Giang province through two short training courses with the participation of 60 women farmers. Wild and hatchery-stocked brooders of snakehead were stocked and conditioned in hapas at FARDeC in Cambodia for induced spawning. Induced spawning, weaning experiment and grow-out experiment has been completed. First generation (F1 adapted to formulated feed) of wild snakehead have been stocked and conditioned in hapas at FARDeC. The project has identified commonly consumed-fish and other aquatic resources, aquaculture and its products in Cambodia, and determined the nutritional composition of nutrient dense identified commonly consumed-fish and other aquatic resources by women and children with key micronutrient such as iron, phosphorus and calcium; and macronutrient (i.e., protein and fat). These outcomes have impacted or are impacting both the private and public sectors through improvements in technologies, commercialization of new aquatic products, sustainable aquatic resource management practices, and policies for aquaculture and capture fisheries.

This activity utilizes this broad research on snakehead aquaculture to support the development of sustainable snakehead aquaculture in Cambodia through research based guidance to farmers on feeding, breeding, weaning and rearing/grow-out. The lifting of the snakehead ban in Cambodia in April 2016 will allow for enhanced trade and investment for Cambodian farmers as snakehead is in high demand both domestically and regionally and there will be investment in feed mills, grow-out operations, processing, and other post-harvest activities.

Quantified Anticipated Benefits

- 50 scientists, researchers, resource managers, government officials, and non-government organizations in Cambodia and Vietnam will be better informed on the development of sustainable snakehead aquaculture through research based guidance on feeding, breeding, weaning and rearing/grow-out.
- 500 snakehead farming households in Cambodia will be better informed on the development of sustainable snakehead aquaculture through research based guidance on feeding, breeding, weaning and rearing/grow-out.
- 100 women involved in snakehead aquaculture in Cambodia and Vietnam will be better informed on the development of sustainable snakehead aquaculture through research based guidance on feeding, breeding, weaning and rearing/grow-out and on post-harvest activities including processing.
- Five researchers in Cambodia and Vietnam will be trained and have experience on using economics to analyze specific impacts of cost and profitability of snakehead culture.
- This investigation will provide return benefits to the US by allowing the Lead PI to expand his work in SE Asia on food security and fisheries and climate change and return this information and knowledge to graduate students in the University of Connecticut.

Research Design and Activity Plan

Location

The activity will be undertaken in four provinces of Cambodia (Kandal, Kampong Chhnang, Kampong Thom, and Siem Reap) and four provinces in Vietnam (An Giang, Dong Thap, Vinh Long and Tra Vinh). The geographic area of focus for the four provinces in Cambodia is in and surrounding the Tonle Sap Lake and Mekong-Bassac areas. The four provinces in Vietnam include three on the Mekong River (two of which border Cambodia) and one on the Mekong River on the coast.

Methods

To support sustainable snakehead aquaculture there is a need to provide science-based information to government and aquaculture households and vulnerable populations in order to be able to make informed and deliberate decisions on snakehead aquaculture. As an activity, the purpose is not to generate new information but to disseminate and communicate information generated by the studies in the project.

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Specifically, science-based guidance and policy recommendations. This investigation will provide this information through a suite of different communication methods and approaches for each audience.

Activity 1. This activity will examine the cost and profitability for snakehead culture in different production systems in Cambodia and Vietnam. The activity will build on previous research undertaken under the AquaFish CRSP and Innovation Lab in Cambodia and Vietnam that focused on snakehead value chain analyses to provide a more in-depth understanding of cost and profitability of snakehead culture. The activity will focus on snakehead culture in cage and pond production systems at different scales of production (small, medium, large). An extensive review of past studies will be carried out in relation to production cost and profitability of snakehead culture in Cambodia and Vietnam. The review and desk-based research will help to establish the nature of costs involved in each type of production system *i.e.*, categories of capital and labor used in snakehead culture. Specific information to be obtained will include investment cost, operational/variable input costs (seed, feed, chemical and drug), fixed costs (insurance, permits, license, tax, interest rate on borrowed fund and repair/maintenance etc.), total cost, selling price, gross and net income.

Activity 2. Audience analysis. The identification of target audiences (scientists, researchers, resource managers, government officials, NGOs, farmers, women) and their specific information requirements and methods of receiving information (workshops, trainings) and appropriate communication products (e.g., policy briefs, technical report, journal articles, web media) and the style of communication including scope, where and how to receive information, language, technical content. Focus Group Discussions (FGDs) will be conducted with each audience group to identify appropriate communication channels for information dissemination and their preferences of communication channels.

Activity 3. Project products. The project documents from all of the activities of the AquaFish CRSP and Innovation Lab projects will be reviewed and team members consulted to extract key messages to be presented in the different communication products.

Activity 4. Communication and dissemination strategy. A communication strategy will be formulated and implemented by the host country partners. The communication strategy is a combination of approaches, techniques and messages to reach different audiences. Printed media such as policy briefs, guidelines, posters, leaflets and flyers will be developed for dissemination. At a minimum, the strategy will aim to effectively disseminate the results of the following to key audiences:

- 1) Snakehead feed
- 2) Snakehead feeding strategies
- 3) Processing and value-added products for women
- 4) Improvements in the trade and value chain for both capture and culture fish in the region
- 5) Human nutrition and human health impacts of fish
- 6) Wild and hatchery-stocked brooders of snakehead stocking and conditioning
- 7) Snakehead breeding, weaning, and rearing/grow-out
- 8) Economics of production

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Trainings and Deliverables

- **Final national workshops:** one workshop will be organized in Cambodia to present the final findings of the CRSP and Innovation Lab projects;
- **Policy briefs:** two science based policy briefs in local language;
- **Guidelines/best practices:** two guidelines/best practices documents on sustainable snakehead aquaculture;
- **Posters/leaflets/factsheets:** Information about the project and findings of the project will be prepared, printed and delivered popularly in two posters, two leaflets, and two factsheets in local language;
- **Websites:** The project will utilize IFRaDI, Cantho University and University of Connecticut websites to exchange information;
- **Papers:** at least one paper will be published in either a national or international journal
- **Long-term training:** At least 3 undergraduate students: Cambodia and Vietnam and 1 MSc student on the economics of production of snakehead aquaculture.

Schedule

The starting date is 1 March 2016. The completion date is 28 February 2018. Detailed activities plan as in table below:

| Activities | 2016 | | | | 2017 | | | | 2018 |
|---|------|----|----|----|------|----|----|----|------|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 |
| Collecting and reviewing secondary information on economics of snakehead production systems | | X | X | | | | | | |
| Analysis and write up economics report | | | | X | X | | | | |
| Audience analysis | | | | X | X | | | | |
| Review of project products and identification of key messages | | | | | | X | X | X | X |
| Communication and dissemination strategy | | | | | | X | X | | |
| Development of products | | | | X | X | X | X | X | |
| Dissemination of products | | | | | | | | X | X |
| Final workshops | | | | | | | | | X |