



Success Story

AquaFish CRSP: Sustainable Aquaculture and Fisheries for a Secure Future

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Snakehead Aquaculture Takes a Sustainable Turn in Southeast Asia Less fishmeal for farmed fish — more wild fish for the poor

You can feed a lot of people with 4 to 5 kilograms of fish.

— Dr. So Nam, Inland Fisheries Research & Development Institute



A Vietnamese snakehead farmer serves as a local model for more sustainable aquaculture by feeding his fish pelleted feed with reduced fishmeal content developed by AquaFish CRSP researchers. Photo by Peg Herring, Extension & Experiment Station Communications, Oregon State University

The freshwater fisheries of the Lower Mekong River basin and delta feed millions in Cambodia and Vietnam, countries where the annual per capita food fish consumption averages 50 kg. Largely centered around Cambodia’s Tonle Sap lake, the capture fishery includes high-value fish such as snakehead and over 200 species of small-sized fish (SSF) measuring up to 25 cm at maturity. SSF, which comprise 80% of the annual catch, are traditionally processed into fish paste and sauce. To the millions of poor who live along the Mekong’s riverbanks, SSF are their primary source of protein. However, to the feed industry SSF are “trash fish” — fish of no value for processing into fish and livestock feed products.

Due to a growing human population, the Mekong’s capture fisheries cannot keep up with demand and are declining from overfishing. Expansion of snakehead aquaculture to supply consumer markets threatens the wild fishery by diverting SSF to the feed industry and depleting wild snakehead juvenile populations caught for seed stock. According to Dr. So Nam of the Inland Fisheries Research & Development Institute (IFReDI) in Cambodia, it takes 4 to 5 kilograms of SSF to yield 1 kilogram of farmed snakehead. “You can feed a lot of people with 4 to 5 kilograms of fish,” says So Nam.

To lessen these resource conflicts and their threats to the livelihoods of the poor, Cambodia banned snakehead aquaculture in 2005. Across the border in Vietnam, where hatchery-raised fingerlings were available, there was no ban. However, Vietnamese farmers still depend on Cambodia’s SSF fishery for feed.

AquaFish CRSP researchers in Cambodia and Vietnam joined forces in 2007 to develop sustainable feeding strategies to reduce dependence on SSF and lay the groundwork for a hatchery program in Cambodia. At Can Tho University in Vietnam, researchers working with US collaborators at the University of Rhode Island developed a formulated feed that reduces the SSF fishmeal content without decreasing growth performance and marketability. Starting when the snakehead are 30 days old, farmers can now use a pelleted feed containing 40% plant protein. By 2011, an estimated 33% of Vietnamese farmers in 13 provinces adopted this innovative CRSP feeding strategy. Ten feed manufacturers in the Mekong Delta region now use the CRSP snakehead feed formulation.

In Cambodia, CRSP researchers at IFReDI and the Freshwater Aquaculture Research & Development Center have built a snakehead broodstock collection representative of the Mekong’s genetic diversity. Using these fish, they have started a breeding program to develop domesticated stocks for snakehead hatcheries that will supply fingerlings to Cambodian farmers. Collaborating with CRSP colleagues at Can Tho University and the University of Connecticut at Avery Point, these Cambodian researchers are also developing guidelines for improved water quality and disease control. Their goal is an aquaculture system that can coexist with the region’s traditional SSF fishery. “The government will lift the ban only when research develops a sustainable process to raise farmed snakehead without doing harm to the wild fishery on which so many people depend,” notes So Nam.

