Developing Sustainable Aquaculture Feed Technologies to Reduce Poverty and Increase Food Security in Vietnam, the Philippines, Guyana, and Tanzania

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Introduction

Fish feeds are a major expense for small-scale aquaculture farmers. Ingredients can be costly, particularly protein sources such as fishmeal. Other costs are attributed to feed wastage due to uneaten diets or poor feed conversion efficiency. As a result researchers are interested in developing nutritionally efficient diets and optimal feeding strategies that not only reduce operating costs but also minimize environmental impacts.

Located at Oregon State University, the **Aquaculture & Fisheries Collaborative Research Support Program** (AquaFish CRSP), is currently supporting research on sustainable feed technologies as part of a larger research portfolio. Funded by the United States Agency for International Development (USAID) and participating institutions, AquaFish CRSP strives to enrich livelihoods and promote health through international multidisciplinary partnerships that advance science, research, education, and outreach in aquatic resources.

AquaFish CRSP investigators in Africa, Asia, and Latin America are exploring different sustainable feed technologies, including:

- Replacing fishmeal and other costly protein sources in fish diets with protein from sustainable local sources.
- Optimizing feeding schedules to lower feed input.
- Adopting least-cost formulation and feed manufacturing technologies to develop less expensive and more efficient feeds.

Here we showcase six AquaFish CRSP investigations where US and host country researchers are working together in Vietnam, the Philippines, Guyana, and Tanzania to address sustainable feed technology issues. This work highlights the global role of AquaFish CRSP research in developing sustainable end-user level aquaculture and fishery systems to alleviate poverty and increase food security.

For more information, please visit aquafishcrsp.oregonstate.edu

Species of Interest


Milkfish
(*Chanos chanos)*
The Philippines


Snakehead murrel
(*Channa striata)*
Vietnam


Giant Snakehead
(*Channa micropeltes)*
Vietnam


Pacu
(*Colossoma macropomum)*
Guyana


Nile Tilapia
(*Oreochromis niloticus)*
Guyana, The Philippines, and Tanzania

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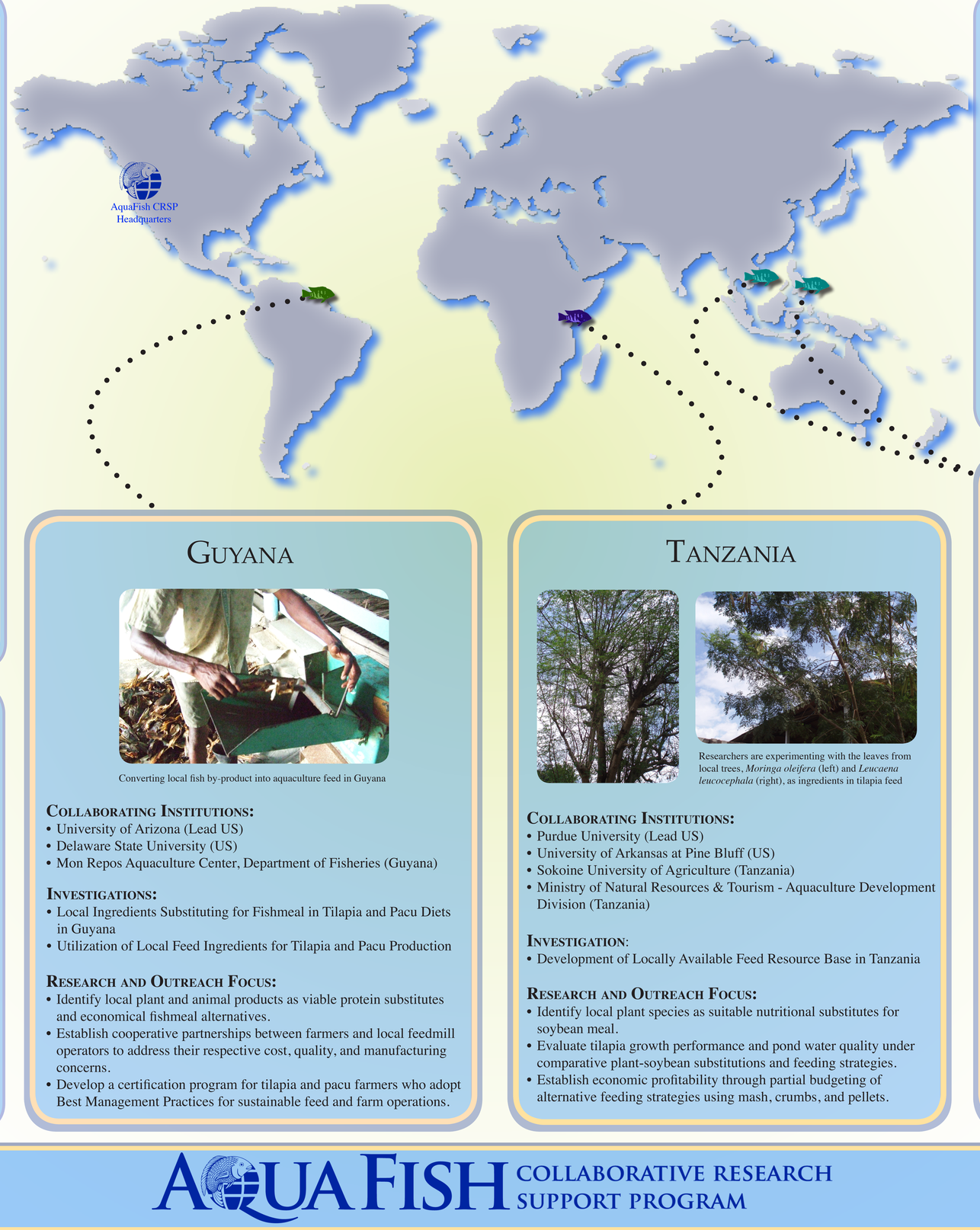


Feeding small-sized marine fish to giant snakehead, grown in floating wooden cages in the Mekong Delta, Vietnam


Stringer of farmed tilapia in Guyana.


Determining fat content of tilapia feed containing locally derived leaf meal in Tanzania


Snakehead murrel cultured in Vietnam and fed with experimental feed

Guyana

Converting local fish by-product into aquaculture feed in Guyana

Collaborating Institutions:

- University of Arizona (Lead US)
- Delaware State University (US)
- Mon Repos Aquaculture Center, Department of Fisheries (Guyana)

Investigations:

- Local Ingredients Substituting for Fishmeal in Tilapia and Pacu Diets in Guyana
- Utilization of Local Feed Ingredients for Tilapia and Pacu Production

Research and Outreach Focus:

- Identify local plant and animal products as viable protein substitutes and economical fishmeal alternatives.
- Establish cooperative partnerships between farmers and local feedmill operators to address their respective cost, quality, and manufacturing concerns.
- Develop a certification program for tilapia and pacu farmers who adopt Best Management Practices for sustainable feed and farm operations.

Tanzania

Researchers are experimenting with the leaves from local trees, *Moringa oleifera* (left) and *Leucaena leucocephala* (right), as ingredients in tilapia feed

Collaborating Institutions:

- Purdue University (Lead US)
- University of Arkansas at Pine Bluff (US)
- Sokoine University of Agriculture (Tanzania)
- Ministry of Natural Resources & Tourism - Aquaculture Development Division (Tanzania)

Investigation:

- Development of Locally Available Feed Resource Base in Tanzania

Research and Outreach Focus:

- Identify local plant species as suitable nutritional substitutes for soybean meal.
- Evaluate tilapia growth performance and pond water quality under comparative plant-soybean substitutions and feeding strategies.
- Establish economic profitability through partial budgeting of alternative feeding strategies using mash, crumbs, and pellets.

Vietnam & The Philippines


Feeding freshwater small-sized fish and fish waste from the Pangasius processing plant to snakehead murrel grown in earthen ponds in Vietnam

Collaborating Institutions:

Vietnam

- University of Connecticut-Avery Point (Lead US)
- University of Rhode Island (US)
- Can Tho University (Vietnam)

The Philippines

- North Carolina State University (Lead US)
- SEAFDEC AQD (Philippines)
- Central Luzon State University (Philippines)
- GIFT (Genetically Improved Farmed Tilapia) Foundation International, Inc (Philippines)

Investigations:

- Alternative Feeds for Freshwater Aquaculture Species
- Feeding Reduction Strategies and Alternative Feeds to Reduce Production Costs of Tilapia Culture
- Alternative Feeding Strategies to Improve Milkfish Production Efficiency in the Philippines

Research and Outreach Focus:

- Develop cost-effective, alternative diets for cultured fish using locally available materials to reduce fishing pressure on baitfish.
- Establish protocols for feed reduction strategies for tilapia and milkfish in the Philippines.

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AquaFish Collaborative Research Support Program

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