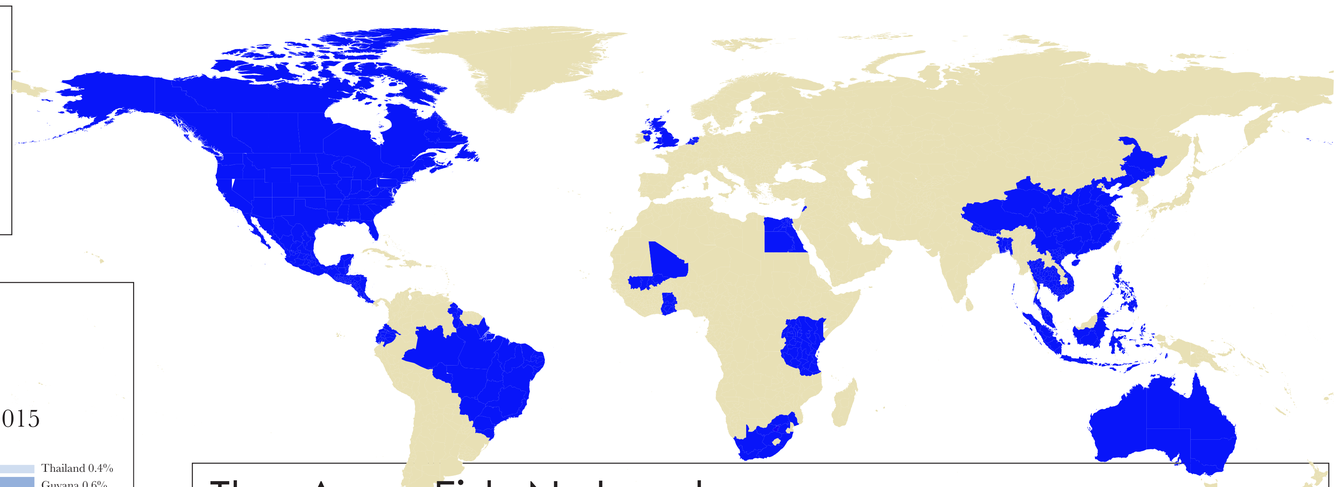
Aquaculture Education for Development: Empowering a Diverse Community of Aquaculture Researchers and Professionals

Stephanie Ichien, Kat Goetting, Caleb Price, and Hillary Egna

AquaFish Innovation Lab | Oregon State University
aquafish@oregonstate.edu | aquafish.oregonstate.edu

Abstract

Building aquaculture educational capacity at the individual, community, and institutional levels among a diverse audience is central to the mission of the AquaFish Innovation Lab. This effort reaches students at nearly every academic level and stakeholders along the aquaculture value chain by mobilizing an interdisciplinary team of researchers who work collaboratively to address crosscutting problems of food security and sustainable aquaculture. Gender equity is an integral theme of this capacity building effort, as AquaFish researchers are deliberate about creating equitable learning opportunities for men and women.



The AquaFish Network

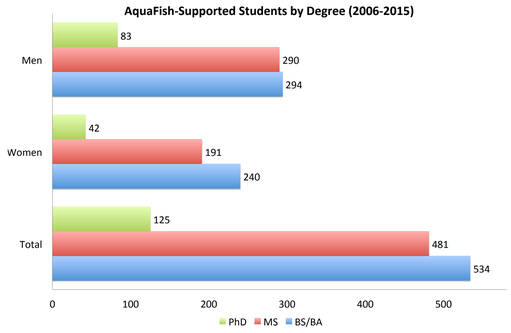
With connections in 40 countries (in blue) around the world, the AquaFish network extends to more than 300 professionals, linking participants to a large global community. This synergistic participation builds additional expert capacity throughout the AquaFish network, consisting of world-class scientists, technical specialists, research administrators, government personnel, and graduate and undergraduate students.

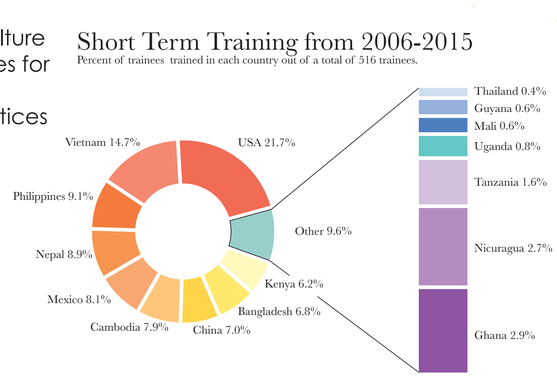
Human Capacity

AquaFish has sponsored and facilitated over 250 trainings or workshops around the world, reaching more than 8,000 participants, one third of whom have been women. A sample of the wide range of topics covered include:

- Record keeping and fish farm business
- Fish harvesting and processing
- Local feed substitutes
- Marketing fish products
- Recirculation in aquaculture
- Value chain opportunities for women
- Best management practices
- Rice-fish culture

Since inception in 2006, AquaFish has supported more than 1,000 students pursuing certificates, Bachelor's and Master's degrees, PhDs, and post doctorate fellowships in a range of disciplines, including nearly 500 women.





Degree areas include:

- Ecology
- Psychology
- Resource Management
- Engineering
- Graphic Design
- Law
- Business Management
- Fisheries
- Applied Economics
- International Business

These long-term trainees constitute a pipeline of educated professionals who move on to careers in government, academia, and private enterprise, further expanding collaborations and networks. Two notable examples:

Wilfrido Contreras-Sanchez completed his graduate work at Oregon State University under the Aquaculture CRSP. He completed his doctoral degree in 2000, focused on developing safe and reliable masculinization techniques for sex reversal in Nile Tilapia. He then served as a research professor at Universidad Juarez Autonoma de Tabasco (UJAT) and immediately started work on building capacity for aquaculture production and research in Mexico. Continuing his collaboration with AquaFish, Wilfrido served as a principal investigator on work for promoting aquaculture for conservation and food security. In 2011, Wilfrido was awarded the Medal of Merit for Environmental Defense from the Congress of Tabasco, Mexico. He is currently the Vice-President of Research at UJAT and continues his efforts in aquaculture and fisheries research.

Wilfrido Contreras-Sanchez scoops young tilapias where they're fed methyltestosterone (MT) to turn them into males. This study tested the ability of bacteria to remove the MT steroid from the water. Photo by Tiffany Woods.

Sunila Rai is a Nepalese fisheries scientist whose graduate education was supported by AquaFish CRSP/ACRSP, earning a Master's (1996) and a Doctorate (2007) at Thailand's Asian Institute of Technology (AIT) in. Sunila's doctoral advisor was Dr. Yang Yi, who himself completed a PhD in Aquaculture Sciences at AIT, supported by PD/A CRSP. Sunila has since served as the Head of the Aquaculture Department and an associate professor at Agriculture and Forestry University (AFU) in Chitwan, Nepal. In 2013, she was appointed the Assistant Dean of Academics at AFU. Sunila is a role model for women in the field of aquaculture science, setting a strong example for other women to not only pursue higher education but to become leaders.

Sunila Rai with her PhD advisor, Yang Yi in 2007 at AIT. Photo courtesy of Sunila Rai.

AquaFish HCPIs from around the world gather in Kenya in an exchange of ideas, techniques, and information through the HCPI Exchange Project. Photo by Jim Bowman.

Women examine water samples at Sokoine University of Agriculture during a workshop in Morogoro, Tanzania. Photo by Caleb Price.

(Above) Sharing knowledge of local fish speceis in Cambodia. Photo by Prum Somany.
(Left) Participants gather around workshop leader, Dr. Charles Ngugi, during a pond construction workshop in Mali. Photo by Jim Bowman.

Institutional Development

AquaFish further expands its educational reach through the development of new curricula and degree programs in the aquatic resources sectors. This element of the AquaFish development effort provides potential for increasing the capacity for institutions to admit more students and improve facilities and to help establish these institutions as leaders in higher education and research.

AquaFish played a pivotal role in the establishment of Master's and PhD programs at the Kwame Nkrumah University of Science and Technology (KNUST) in Ghana. The curriculum for these programs continues to be developed, with new aquaculture and water resources management courses added in 2015.

Ethel Tettey, Masters student, attends to her thesis experiment studying the dietary protein requirements of Claroteid catfish (*Chrysichthys nigrodigitatus*) at the KNUST aquaculture lab. Photo courtesy of Emmanuel Frimpong.

AquaFish participants--rofessors and graduate students-gather near aquaculture demonstration ponds on the Agriculture and Forestry University campus in Chitwan Nepal. Photo by Stephanie Ichien.

In Nepal, a partnership between the Agriculture and Forestry University in Chitwan, AquaFish, and government agencies has helped create the very first Bachelor of Science in Fisheries program in the country, which began in 2014.

In addition to curriculum development, institutional capacity is built through the management of international grants and contracts. Universities in developing nations often require external guidance and training to facilitate intake and administration of international research awards.

The Research Office at BAU, the premier agricultural institution in Bangladesh, now has a mechanism to promote and administer multi-institutional collaborations within Bangladesh. AquaFish's collaboration with host country institutions allows these universities to build the administrative infrastructure necessary to be competitive for future international awards and enables the development of multi-institutional collaborations within the host country.

The Feed the Future Innovation Lab for Collaborative Research on Aquaculture & Fisheries (AquaFish Innovation Lab) is funded under USAID Leader with Associates Cooperative Agreement No. EPP-A-00-06-00012-00 and by the participating US and Host Country partners.