

**FEED THE FUTURE INNOVATION LAB FOR COLLABORATIVE
RESEARCH ON AQUACULTURE & FISHERIES
(AQUAFISH INNOVATION LAB)**

ANNUAL WORK PLAN

1 OCTOBER 2016 TO 30 SEPTEMBER 2017



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AquaFish Innovation Lab
Oregon State University
Corvallis, OR 97331-1643 USA



USAID
FROM THE AMERICAN PEOPLE



AQUAFISH

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The mission of the AquaFish Innovation Lab is to enrich livelihoods and promote health by cultivating international multidisciplinary partnerships that advance science, research, education, and outreach in aquatic resources. Bringing together resources from Host Country institutions and US universities, the AquaFish Innovation Lab emphasizes sustainable solutions in aquaculture and fisheries for improving health, building wealth, conserving natural environments for future generations, and strengthening poorer countries' ability to self-govern.

Cover photo

Nepal 2016, photo by Sunila Rai.

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INTRODUCTION

This Work Plan covers the period from 1 October 2016 to 30 September 2017, and includes descriptions of activities covered in detail in the Implementation Plan 2016 - 2018.

Phase II of the Feed the Future Innovation Lab for Collaborative Research on Aquaculture & Fisheries (AquaFish Innovation Lab) builds on previous successes of earlier Collaborative Research Support Program (CRSP) efforts and makes significant global and regional advances in Asia and Africa. Collaborative research focuses on improving sustainable aquaculture productivity through the development and transfer of innovative technologies and management practices that:

- Address health and nutrition needs especially of women and children;
- Consider natural resource management, climate change, and biodiversity issues with targeted programs that protect native fisheries and the integrity of local and regional water systems; and
- Advance market development by linking small producers to markets and training rural stakeholders in food safety and food quality standards.

As part of the Food Security Innovation Center (FSIC), AquaFish falls under the Program for Research on Nutritious and Safe Foods. This Program “addresses undernutrition, especially in women and children, by increasing the availability and access to nutrient dense foods through research on horticulture crops, livestock, fish and dairy, food safety threats such as mycotoxins and other contaminants and on household nutrition and food utilization” (R. Bertram 12/07/12).

AquaFish shares the Feed the Future (FTF) aim of accelerating progress toward meeting the poverty and hunger Millennium Development Goal. AquaFish works towards this goal by accelerating inclusive agriculture sector growth through improved productivity, expanded markets and trade, and increased economic resilience in vulnerable rural communities. Improvements in nutritional status are anticipated by increasing availability and access to diverse and high quality animal source foods. The ability to access and utilize food must remain stable and sustained over time. Paying attention to cross cutting themes of gender, environment (climate change), and natural resources management is expected to result in development gains across society.

This work plan focuses on project-level activities. Details of work to be conducted by the Management Team can be found in the Technical Application of Modification 8 of the Leader Award. For a list of project travel during this reporting period, please see Appendix 1. The Monitoring and Evaluation Plan, with FY16 FTFMS actuals and FY17 FTFMS targets, is provided in Appendix 2.



ANNUAL WORK PLAN OBJECTIVES

I. Project Implementation

Oregon State University (OSU) received a five-year extension from USAID beginning 31 March 2013 and ending 29 March 2018, under the new USAID-approved name Feed the Future Innovation Lab for Collaborative Research on Aquaculture & Fisheries (AquaFish Innovation Lab). The AquaFish team at OSU is implementing a global research program that is composed of competitively awarded projects that are regionally and thematically linked to the needs and interests of USAID, Host Country institutions, the US university community, policy makers, practitioners, and end-users. The first year of operations revolved heavily around the competitive awards process. Plans were based on broad experience managing numerous competitive awards processes. They were also based on several innovative strategies to keep costs down, support Host Country institutions and researchers while the competitive process was underway, and increase the opportunity for delivering intermediate results.

AquaFish 2013-2015 Implementation Plan

In 2013, a streamlined request for proposals (RFP) was designed for continuation proposals from existing Lead Projects at University of Michigan, North Carolina State University, and University of Connecticut for work in Asia, and from Auburn University and Purdue University for work in Africa. The RFP was vetted at USAID (with the AOR and OAA) as part of the Technical Application and review process. The review process consisted of two types of reviews: technical and programmatic. The *technical reviews* followed an NSF-style peer review process and addressed technical merit as well as collaboration and broader impacts. *Programmatic reviews* represented the final review tier, and were only carried out for proposals with high technical merit. Programmatic reviews were aimed at aligning proposals with AquaFish goals and maintaining portfolio balance. The programmatic review also involved USAID/BFS, especially in regards to country involvement, environmental concerns, gender inclusivity, and FTF alignment. Resulting from this process, 32 investigations were carried out under the 2013-2015 Implementation Plan.

AquaFish 2016-2018 Implementation Plan

Beginning in 2015, existing projects underwent mid-term reviews, and Lead Project Institutions were invited to submit proposals in response to the AquaFish 2015 RFP. Proposals underwent technical and programmatic review, and work that built on and added value to previous AquaFish work was continued. Lead Project Institutions were funded over a two-year Implementation Plan from 2016-2018 (<http://blogs.oregonstate.edu/aquafishcrsp/files/2017/02/IP-2016-2018.pdf>), and projects are taking place in the following countries in Asia and Africa: Bangladesh, Nepal, Cambodia, Vietnam, Ghana, Tanzania, Uganda, and Kenya. Under the 2016-2018 Implementation Plan, AquaFish also initiated an impact assessment project to evaluate outputs and outcomes of feeds research conducted across all program countries since 2006.

The five Lead Project Institutions further partner with US and Host Country Institutions – listed in the Planned Work Section below. Funded Lead Project Institutions have entered into MOUs with partnering institutions, ensuring, among other things, that Host Country investigators and institutions are treated as full and equal partners in the funded project.



II. Planned Work and Locations

Investigation titles and project descriptions are provided below and are expanded upon in the AquaFish Innovation Lab's Implementation Plan 2016–2018.

ASIA PROJECT: BANGLADESH

Enhancing Aquaculture Production Efficiency, Sustainability, and Adaptive Measures to Climate Change Impacts in Bangladesh

US Institutions: North Carolina State University (Lead)

Host Country Institutions: Bangladesh Agricultural University, Khulna University (Bangladesh), Patuakhali Science and Technology University (Bangladesh), Shushilan NGO (Bangladesh)

Investigations

Nutritional Conditioning During Larval Development to Improve Feed Efficiency and Identify Beneficial Gut Flora in Tilapia (16SFT02NC)

Tilapia and Koi (Climbing Perch) Polyculture with *Pangasius* Catfish in Brackish (Hyposaline) Waters of Southern Bangladesh (16IND02NC)

Better Management Practices for *Mola*-Prawn-Carp Gher Farming Integrated with Pond Dyke Cropping for Increased Household Nutrition and Earnings of Rural Farmers in Southwest Bangladesh (16HHI01NC)

Advancing Semi-Intensive Polyculture of Indigenous Air-Breathing Fishes, Koi and Shing, with Major Indian Carps for Enhancing Incomes and Dietary Nutrition while Reducing Environmental Impacts (16MNE01NC)

Dissemination of AquaFish Innovation Lab Technologies for Improving Food Production Efficiency and Livelihoods of the People of Bangladesh (16MNE02NC)

Project Description

Bangladesh, one of the most densely populated countries in the world, has high rates of poverty and widespread malnourishment, particularly among women and children. Sustainable aquaculture in Bangladesh is one solution for increasing food security, augmenting dietary nutrition, and improving the economic livelihoods for its poorest citizens. However, technical, environmental, and economic barriers limit aquaculture production in the country. This project, through five investigations, seeks to address such barriers by developing technologies for enhancing aquaculture production efficiency, intensification, and sustainability to improve household income and nutrition, particularly for low-income farming households. With the hope of increasing feed efficiency and reducing associated costs, researchers will evaluate the effectiveness of nutritional conditioning and characterize the respective changes in gut microbial communities and nutrient absorption in tilapia. To address environmental and economic concerns for the existing farming industries of shrimp and prawn, researchers will continue to assess the potential for farming *Pangasius* catfish in brackish (hyposaline) waters in regions traditionally reliant solely upon shrimp farming. Researchers will also examine a novel polyculture/land-farming strategy, culturing *Mola* (*Amblypharyngodon mola*) with prawns and using pond muds as fertilizer to grow fresh vegetables on unflooded gher-dykes. Lastly, researchers will evaluate the effects of reducing feed and

investigate polyculture technology, particularly in indigenous, air-breathing fishes, such as Shing and Koi (nutrient rich and hardy fish), to enhance incomes and dietary nutrition, while reducing environmental impacts. To maximize the adoption and impact of improved technologies, researchers will hold a series of workshops and trainings, complemented by the distribution of outreach materials.

ASIA PROJECT: CAMBODIA & VIETNAM

Improving Food Security, Household Nutrition, and Trade Through Sustainable Aquaculture and Aquatic Resource Management in Cambodia and Vietnam

US Institutions: University of Connecticut- Avery Point (Lead), University of Rhode Island

Host Country Institutions: Inland Fisheries Research and Development Institute (Cambodia), Can Tho University (Vietnam)

Investigations

Pellet Feed Improvements Through Vitamin C Supplementation for Snakehead Culture (16SFT01UC)

Sustainable Snakehead Aquaculture in Cambodia (16IND01UC)

Genetic Diversity of Striped Snakehead (*Channa striata*) in Cambodia and Vietnam (16QSD01UC)

Enhancing Food Safety and Household Nutrition of Women and Children Through Aquaculture and Capture Fisheries in Cambodia and Vietnam in the Dry Season (16FSV01UC)

Guidance and Policy Recommendations for Sustainable Snakehead Aquaculture and Aquatic Resource Management in Cambodia and Vietnam (16PDV01UC)

Project Description

The productive Mekong fisheries are essential to the food security and nutrition of the 60 million people of the Lower Mekong Basin. Fish, from capture and culture, are a significant source of income and food security in Cambodia and Vietnam. The rapid growth of freshwater aquaculture in both countries represents an opportunity to improve the livelihood of their residents. This project builds on past AquaFish work through five integrated investigations that support the development of sustainable aquaculture, enhancement of trade, and improvement of aquatic resource management, with a focus on sustainable snakehead aquaculture after the ban of snakehead farming was lifted in Cambodia in April 2016. To address the sustainability of the popular snakehead industry, researchers will work to develop alternative cost-effective feeds, compare growth performance and survival rate of different snakehead strains, improve value-added processing techniques typically undertaken by women, conduct an economic assessment, and develop policy recommendations for sustainable snakehead production. A household survey will explore the availability of fish, as well as perceived versus actual benefits of consuming fish. The results of these efforts will inform strategies and policies that address nutritional deficits, particularly for women and children in Cambodia.

ASIA PROJECT: NEPAL

Advancing Aquaculture Systems in Nepal for more Social and Environmental Sustainability

US Institution: University of Michigan (Lead)

Host Country Institutions: Agriculture and Forestry University (Nepal)

Other Collaborations and Linkages: Fisheries Research Center, Nepal Agricultural Research Council, Directorate of Fisheries Development (Nepal)

Investigations

A Comparison of Monoculture and Polyculture of Tilapia with Carps for Pond Production Systems in Nepal (16BMA03UM)

Developing New Systems for Periphyton Enhancement in Farmers' Ponds (16BMA04UM)

Improving Seed Production of Sahar (*Tor putitora*) in Chitwan, Nepal (16QSD02UM)

Outreach to Increase Efficiency of Aquaculture in Nepal (16HHI03UM)

Project Description

Nepal is a poor country with many undernourished or even malnourished residents and low levels of education, with primary schooling being the highest level of education for most residents. As a result of this poverty, most planning documents produced by the government, as well as outside organizations, concentrate on human health and nutrition as the main focus for future development of aquaculture in this region. The primary focus of this project is to improve food security and nutrition for rural communities in Nepal through a suite of investigations on small-scale aquaculture that consider environmental management for sustainable aquatic resources use. Outreach programs for rural farmers and their families will be continued, as well as expanding school ponds for education of rural youth and women's groups. To improve efficiency of production systems and reduce effluents discharged during harvest, researchers are exploring ways to enhance periphyton growth in existing ponds. Production efficiency is also being addressed through an investigation on the polyculture of carp with Nile tilapia (*Oreochromis niloticus*) and sahar (*Tor putitora*). Researchers will also focus on enhancing the production of native fish species, with particular attention to sahar, an economically important, high-valued indigenous fish species in Nepal. By incorporating sahar in on-farm trials for improving culture techniques, researchers hope to expand seed production, a major bottleneck to aquaculture development in Nepal.

AFRICA PROJECT: KENYA & UGANDA

Aquaculture Development in Kenya and Uganda: Advancing Cost-Effective Technology, Market Assessment, and End-User Engagement

US Institutions: Auburn University (Lead), Alabama A&M University, University of Arizona

Host Country Institutions: Makerere University (Uganda), University of Eldoret (Kenya)

Other Collaborations and Linkages: National Fisheries Resources Research Institute (Uganda), Fisheries Training Institute

Investigations

Development of Low-Cost Captive Breeding and Hatching Technologies for the African Lung Fish (*Protopterus aethiopicus* and *P. amphibius*) to Improve Livelihoods, Nutrition, and Income for Vulnerable Communities in Uganda (16IND03AU)

Implementing and Assessing Cell-Based Technical and Marketing Support Systems for Small and Medium-scale Fish Farmers in Uganda (16FSV02AU)

Assessment of Price Volatility in the Fish Supply Chain in Uganda (16MER02AU)

Women in Uganda Aquaculture: Nutrition, Training, and Advancement (16HHI04AU)

Water, Water Quality, and Pond Bottom Soil Management in Ugandan Aquaculture (16BMA05AU)

Project Description

Poor families in developing countries typically spend 50 to 70 percent of their income on food. When quality food becomes too expensive, women tend to modify their consumption, often turning to cheaper alternatives that lack in essential nutrients. To increase income and reduce the prevalence of undernutrition, enhancing access to fish and sustainable aquaculture is important. This project will build on previous AquaFish achievements to address obstacles to the development and growth of aquaculture in Uganda and Kenya, such as working with industry to ensure the supply of quality seed and feed to enable income generation for small-scale fish farmers. Researchers will develop low-cost captive breeding and hatching technologies of African lungfish (*Protopterus aethiopicus* and *P. amphibius*) that will introduce new opportunities for farming popular native species that are less vulnerable to a changing climate than many non-native species. To increase income for fish farmers and improve (and expand) markets of farmed fish, researchers will assess price volatility in the fish supply chain in Uganda, in addition to creating a cell-phone network that will connect people throughout the aquaculture value chain. With a goal of mitigating negative environmental impacts of aquaculture, researchers will measure various metrics of water quality in farmed water-bodies and evaluate the need for water quality amendments. This project will also train and support women in aquaculture. With the help of institutional partners and industry, researchers will hold a series of capstone events, including the annual fish farmer symposium in Uganda, that will train women on the nutritional value of new species and improve women's access to information about the entire value chain of aquaculture.

AFRICA PROJECT: GHANA & TANZANIA

Aquaculture Development and the Impact on Food Supply, Nutrition and Health in Ghana and Tanzania

US Institutions: Purdue University (Lead), Virginia Polytechnic Institute & State University, University of Arkansas at Pine Bluff, University of Hawaii at Hilo

Host Country Institutions: Kwame Nkrumah University of Science & Technology, Sokoine University of Agriculture, University of Dar es Salaam (Tanzania)

Other Collaborations and Linkages: Western Indian Ocean Marine Sciences Association (Tanzania), Farmer Line (Ghana)

Investigations

Experimental Pond Unit Assessment in Tanzania (16BMA01PU)

Optimizing the Use of Commercial Feeds in Semi-Intensive Pond Production of Tilapia in Ghana; From Nursery to Grow-Out (16BMA02PU)

Increasing Productivity of Nile Tilapia (*Oreochromis niloticus*) Through Enhanced Feeds and Feeding Practices (16SFT03PU)

Fish Consumption and Implications for Household Nutrition and Food Security in Tanzania and Ghana (16HHI02PU)

Enhancing the Functionality and Applicability of Fish Market Information System (FMIS) to Marine Artisanal Fisheries in Ghana (16MER01PU)

Project Description

In sub-Saharan Africa, fish is an important source of protein, essential micronutrients, and minerals in the diet of most households. Thus, fish and their sustainable production are major contributors to food security and improved livelihood in Ghana and Tanzania. However, supply of fish is currently low,

causing limited consumption levels. Through five investigations, this project builds on previous AquaFish work to enhance the various facets of aquaculture and its contribution to food supply, nutrition, and health in Ghana and Tanzania. The cost of quality feed frequently limits aquaculture production; hence, researchers continue working to develop cost-effective diets from locally available ingredients (e.g., earthworm, maggot meals) and evaluate the profitability of such feeds in comparison to commercial feeds. To train educators, students, and fish farmers in determining better methods of feeding, fertilizing, and managing water quality, the project will compare fertilization and feeding strategies and evaluate the physical, chemical, and biological characteristics of ponds during grow-out. To better inform and empower stakeholders along the fish-value chain and more efficiently support markets, researchers will train farmers and fishermen on the use of a cell-phone-based information system and broaden its applicability to include marine fisheries. Through a household survey on dietary diversity and an analysis of household consumption practices, researchers plan to formulate policy measures that improve aquaculture and fisheries practices in order to increase household food security



III. Travel

New travel identified in Appendix 1 is for trips needed to attend meetings in Africa and Asia. These meetings require broad participation from US and HC institutions and include:

- AquaFish Africa Regional Meeting, FY17
- AquaFish Asia Regional Meeting, FY 17

Appendix 1 also includes trips already approved via the AquaFish Phase II proposal and previous Annual Work Plans. Trips have been identified based on the best available information and new trips are submitted in this document for written approval from the AOR, where needed.



APPENDIX 1: TRAVEL

Table A-1 lists international trips that will be taken in FY 2017 for the AquaFish Innovation Lab CA/LWA No. EPP-A-00-06-00012-00. Some trips listed are already approved via the AquaFish Phase II proposal and previous Annual Work Plans. Table A-1 provides information in compliance with ADS 303.M17, and includes: “the number of trips, the number of individuals per trip, and the origin and destination countries or regions.” The Management Office, through an online monitoring system, formally tracks international travel.

Destination Country or Region	Origin Country or Region	Number of Trips	Number of Travelers per trip	FY
Uganda or other AquaFish Africa Regional Meeting Site	Africa Region	1	1	2017
	Ghana	1	7	2017
	Kenya	1	5	2017
	Tanzania	1	5	2017
	Uganda	1	4	2017
	USA	1	15	2017
Nepal or other AquaFish Asia Regional Meeting Site	Bangladesh	1	11	2017
	Burma	1	2	2017
	Cambodia	1	8	2017
	Nepal	1	8	2017
	Philippines	1	3	2017
	Thailand	1	1	2017
	USA	1	11	2017
	Vietnam	1	5	2017
South Africa (WAS 2017)	Africa Region	1	2	2017
	Bangladesh	1	2	2017
	Ghana	1	7	2017
	Kenya	1	5	2017
	Tanzania	1	5	2017
	Uganda	1	4	2017
	USA	1	15	2017
Nepal	USA	1	1	2017
Nepal	USA	1	1	2017
Nepal	USA	1	1	2017

AQUAFISH ANNUAL WORK PLAN: 2016-2017

Destination Country or Region	Origin Country or Region	Number of Trips	Number of Travelers per trip	FY
Bangladesh	USA	1	1	2017
Bangladesh	USA	1	1	2017
Bangladesh	USA	1	1	2017
Tanzania	USA	1	1	2017
Ghana	USA	1	1	2017
Ghana/Tanzania	USA	1	1	2017
Ghana	USA	1	1	2017
Ghana	USA	1	1	2017
Tanzania	USA	1	1	2017
Uganda	Tanzania	1	3	2017
USA	Ghana	1	3	2017
Tanzania	Ghana	1	2	2017
Cambodia	USA	1	1	2017
Vietnam and Cambodia	USA	1	1	2017
Cambodia	USA	1	1	2017
Cambodia	USA	1	1	2017
Vietnam and Cambodia	USA	1	1	2017
Cambodia	Vietnam	1	1	2017
Cambodia	Vietnam	1	1	2017
Asia Region	Vietnam	1	2	2017
Cambodia	Vietnam	1	6	2017
Vietnam	Cambodia	1	2	2017
Vietnam	Cambodia	1	8	2017
Vietnam	Cambodia	1	1	2017
Vietnam	Cambodia	1	1	2017
Vietnam	Cambodia	1	1	2017
Vietnam	Cambodia	1	2	2017
Vietnam	Cambodia	1	1	2017
Uganda	USA	1	1	2017
Uganda	USA	1	2	2017
Uganda	USA	1	2	2017
Uganda	USA	1	1	2017
Uganda	USA	1	1	2017
Uganda	USA	1	1	2017
Uganda	USA	1	1	2017

AQUAFISH ANNUAL WORK PLAN: 2016-2017

Destination Country or Region	Origin Country or Region	Number of Trips	Number of Travelers per trip	FY
Uganda	USA	1	1	2017
Kenya	USA	1	1	2017
Thailand	USA	1	1	2017
Ethiopia	Kenya	1	2	2017
Kenya	Uganda	1	1	2017
Ethiopia	Uganda	1	1	2017
Kenya	Uganda	1	1	2017
USA	Uganda	1	1	2017
Thailand	Uganda	1	2	2017
Kenya	Uganda	1	1	2017
Mexico	USA	1	2	2017
Peru	USA	1	3	2017
Brazil	USA	1	1	2017
Burma	USA	1	2	2017
China	USA	1	1	2017
Senegal and Ghana	USA	1	2	2017
Zambia or Africa Region	USA	1	2	2017
Vietnam and Cambodia	USA	1	2	2017
Bangladesh	USA	1	1	2017
Uganda	Kenya	1	1	2017
Vietnam and Cambodia	USA	1	1	2017
USA	Bangladesh	1	1	2017
USA	Ghana	1	1	2017
USA	Kenya	1	1	2017
Bangladesh	USA	1	1	2017
Kenya	Uganda	1	3	2017
Nepal	USA	1	1	2017
Uganda	USA	1	1	2017
Cambodia	Vietnam	1	1	2017
Vietnam	Cambodia	1	1	2017
Kenya	USA	1	1	2017
Uganda	USA	1	2	2017



APPENDIX 2: MONITORING & EVALUATION PLAN

Submitted to USAID 6 September 2013

Approved by AquaFish AOR, USAID 9 September 2013

AquaFish works towards achieving development impacts by meeting key targets, measured as indicators and benchmarks of progress. Benchmarks and milestones provide a means to explore different measures of performance than more quantitative indicators, such as the metrics designed by USAID for reporting under FTFMS (Feed the Future Monitoring System). Formal milestones, benchmarks, and indicators were finalized after review and approval of all subprojects.

A. KEY DEVELOPMENT TARGETS: MILESTONES AND BENCHMARKS

The following conceptual framework helps ensure that targets are adequately addressed across the global portfolio, and for facilitating feedback and continuous learning in order to improve processes and outcomes. The proposed targets, indicators, and milestones are estimated and may change upon subcontract review and award. The AquaFish gender strategy will continue to ensure strong programmatic commitment toward gender inclusion. Gender is both integrated into the four targets and also highlighted independently.

Research Target

Produce end-user aquaculture and fisheries research results that promote sustainable intensification of production systems, enhance food safety and nutrition, increase international trade opportunities, and contribute to responsible aquatic resource management.

Program-wide Research Milestones

- (1) Developed and adopted innovative and appropriate technologies that increase profitability and environmental stewardship in aquaculture and fisheries.
- (2) Addressed biodiversity conservation issues to ameliorate threats to biodiversity and developed technologies and strategies to protect habitat and populations.
- (3) Continuously funded research projects that meet or exceed the expectations of external peer-review panels.
- (4) AquaFish activities and outputs improved the availability of and access to nutrient dense foods.
- (5) Engaged local stakeholders in research design, implementation, and results reporting through active participation.

Year 1 Benchmarks:

- a. Request for Proposals approved by USAID and widely advertised for new projects with submitted proposals externally peer-reviewed.
- b. Favorably reviewed proposals have activities initiated in a timely manner.
- c. Identified partners for gauging nutrition status and change. With or through the partners, established measurable baselines for the targeted groups for fish production levels, income, and diet.

Years 2-5 Benchmarks:

- a. 1 innovative aquaculture and fisheries technology or strategy developed and disseminated throughout each region.

- b. AquaFish activities remain locally appropriate by receiving regular input through the Regional Centers of Excellence and Development Theme Advisory Panels.
- c. Established baselines and produced measurable increases in farm productivity, farmer incomes, market access, and export value, achieved following adoption of AquaFish recommendations and technologies.
- d. Threats to biodiversity resulting from aquaculture activities ameliorated, and biologically significant areas positively impacted.
- e. Using baseline information, make positive changes for generally improved household (or targeted group) access to high quality foods.

Capacity Building Target

Focus AquaFish investments on building local capacity in aquaculture and aquatic resource management and ensuring long-term program impacts at local and national levels through strategic informal and formal training opportunities. Integrate items related to gender.

Capacity Building Milestones - Regional

- (1) Forged professional and managerial relationships between US and Host Country researchers and institutions.
- (2) Established a track record of successful formal long-term training of Host Country and US students and researchers.
- (3) Delivered relevant short-term training opportunities that provide positive Host Country societal benefits beyond the life of the AquaFish.
- (4) Identified gender issues in aquaculture and fisheries and adopted gender program-wide integration policies.

Year 1 Benchmarks:

- a. Gender integration strategies adopted within all sub-awards.
- b. Regional Centers of Excellence continued within the AquaFish regions for research activities (i.e., Asia, Africa, and Latin America and the Caribbean).
- c. Formal Memoranda of Understanding adopted between all US and Host Country partners.

Years 2-5 Benchmarks:

- a. Partnerships strengthened among US and Host Country universities, NGOs, NARS, and USAID Missions through Associate Awards.
- b. At least 100 degree seeking men and women enrolled through formal long-term training opportunities in US, Host Country, and Regional universities.
- c. Equal numbers of women and men trained through short- and long-term training opportunities.
- d. Numerous train-the-trainer workshops convened to provide Host Countries with highly skilled extension specialists.
- e. At least 30 workshops convened over the course of this 5-year award and encouraged equal participation from women and men.

Information Dissemination Target

Disseminate AquaFish research results to foster broad application of results among local stakeholders within governmental and non-governmental organizations, private sector, as well as for end-users, and the general public.

Information Dissemination Milestones

- (1) Successful diffusion of AquaFish research results and technologies between countries within a region having comparable social and environmental conditions.
- (2) Increased awareness of local stakeholder constraints and opportunities related to responsible aquaculture and fisheries management.

- (3) Applicable extension activities associated with each research project conducted to ensure wide dissemination of research results.
- (4) AquaFish results and technologies for farm operations adopted and policies for responsible aquatic resource management created.
- (5) AquaFish research published in regional, national, and international peer-reviewed journals.

Year 1 Benchmarks:

- a. Dissemination efforts have continued through Aquanews, EdopNet, and the searchable online publication database.
- b. The importance of extension evident through integration of at least one outreach activity within each funded project.
- c. Research adoption encouraged by prioritizing the use of on- and off-farm trials to conduct research.

Years 2-5 Benchmarks:

- a. Intra- and inter-regional diffusion of AquaFish results and technologies accomplished.
- b. Training manuals with local and regional scopes published following completion of AquaFish research projects.
- c. Continuous academic output of AquaFish data as publications within recognized journals and presentations provided at regional, national, and international forums.

Gender Integration: Cross-Cutting Target

AquaFish is dedicated to improving gender inclusiveness in the aquaculture and fisheries sectors. Gender integration is implicit and interwoven into the above research, capacity building, and information dissemination milestones and benchmarks requested by USAID in its original RFA. Additional explicit guidance, in the form of program-wide gender integration initiatives, is provided below.

Year 1 Initiatives:

- a. Require that all funded projects address gender inclusiveness within their planned scope-of-work.
- b. Seek out USAID review of projects' gender inclusiveness plans and respond by improving plans prior to project implementation.

Years 2-5 Initiatives:

- a. Collect disaggregated gender data from individual research and outreach projects funded by AquaFish.
- b. Analyze disaggregated data on an annual basis to gauge gender inclusiveness success and take appropriate action as indicated through data analysis.
- c. Involve field projects in monitoring and evaluating gender integration as the program progresses with time. Evaluate the effects of specific projects on gender and ensure that any possible negative effects due to gender bias are mitigated.
- d. Focus one component of a lessons learned and synthesis assessment specifically on the social context and impact of AquaFish research and outreach activities on the lives of women.
- e. Tailor specific extension and technical services related to sustainable aquaculture and aquatic resource management to women producers.
- f. Engage extension specialists who are sensitive to diversity issues and access to resources of underrepresented groups and women will be included as an integral part of their delivery team to ensure women farmers and fishers feel welcome in AquaFish training opportunities.
- g. Promote the participation of women in formal and informal education and training opportunities provided through AquaFish. AquaFish has set a 50% benchmark for training women in formal and informal education. In addition, the 50% benchmark applies to attracting and retaining women scientists and administrators in all AquaFish activities, as project researchers, advisory group members, and managers.

B. USAID FEED THE FUTURE INDICATORS AND MONITORING SYSTEM

AquaFish reports under USAID's various impact reporting frameworks to achieve outcomes that have meaning for stakeholders, including Missions, Host Country decision-makers, and end-users. Target and Actual indicator metrics reported through the Feed the Future Monitoring System (FTFMS) for FY16-FY17 are presented in Table 1.

Table 1. AquaFish Feed the Future Monitoring System 4.5.2 Indicator actuals for FY16 and FY17 targets.

Indicator Number	Indicator	2016 Actuals	2017 Targets
4.5.2(6)	Number of individuals who have received USG supported long-term agricultural sector productivity or food security training		
	Total	158	174
	Female	79	87
	Male	79	87
4.5.2(7)	Number of individuals who have received USG supported short-term agricultural sector productivity or food security training		
	Total	526	786
	Female	265	393
	Male	261	393
4.5.2(11)	Number of food security private enterprises (for profit), producers organizations, water users associations, women's groups, trade and business associations, and community-based organizations (CBOs) receiving USG assistance		
	Total	34	37
	New	18	3
	Continuing	16	34
4.5.2(39)	Number of new technologies or management practices in one of the following phases of development: (Phase I/II/III)		
	Total	18	16
	Phase 1 Number of new technologies or management practices under research as a result of USG assistance	4	7
	Phase 2 Number of new technologies or management practices under field testing as a result of USG assistance	6	5
	Phase 3 Number of new technologies or management practices made available for transfer as a result of USG assistance	8	4