

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

ANNUAL WORK PLAN

1 APRIL 2013 TO 30 SEPTEMBER 2014*

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

**End date extended to coincide with Federal Fiscal Year, USAID annual funding obligation period, and USAID annual reporting period.*



USAID
FROM THE AMERICAN PEOPLE



AQUAFISH

Program activities are funded in part by the United States Agency for International Development (USAID) under CA/LWA No. EPP-A-00-06-00012-00 and by participating US and Host Country institutions.



AquaFish Innovation Lab Management Team
Oregon State University
216 Strand Hall ♦ Corvallis, Oregon 97331-1643 ♦ USA



TABLE OF CONTENTS

INTRODUCTION	4
ANNUAL WORK PLAN OBJECTIVES	5
<i>I. PROJECT START-UP & IMPLEMENTATION.....</i>	<i>5</i>
<i>II. PLANNED WORK AND LOCATIONS.....</i>	<i>6</i>
<i>III. TRAVEL</i>	<i>11</i>
APPENDIX 1: TRAVEL	12
APPENDIX 2: MONITORING & EVALUATION PLAN.....	15



INTRODUCTION

This Work Plan covers the period from 1 April 2013 to 30 September 2014, and includes descriptions of activities that will be covered in detail in the *Implementation Plan 2013–2015*. The Implementation Plan will be published in Fall 2013 after projects have been fully reviewed. In order to synchronize timing of reporting and annual funding with the Federal Fiscal Year, the end date of this initial reporting period under AquaFish Phase II is 30 September 2014.

AquaFish Phase II, “Feed the Future Food Security Innovation Lab for Collaborative Research on Aquaculture & Fisheries (AquaFish)” builds on previous successes of earlier 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 recently formed 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 aquacultural 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.

In March 2013, AquaFish was granted a five-year extension of its current Leader Award.* First-year funding (USAID’s FY 2012 funds) was obligated on 27 March 2013 in the amount of \$3,700,000. This work plan focuses on project-level activities. Details of work to be conducted by the Management Team and pre-approved travel can be found in the Technical Application of Modification 8 of the Leader Award. For a list of project travel during Implementation Plan 2013-2015 (excluding Management Team travel already approved by the AOR), please see Appendix 1. The Monitoring and Evaluation Plan, with Year 1 benchmarks and FTFMS targets, is provided in Appendix 2.

* Upon receipt of the extension award (March 2013 to March 2018), the name of the program was changed by USAID from AquaFish CRSP to AquaFish Innovation Lab.



ANNUAL WORK PLAN OBJECTIVES



I. PROJECT START-UP & IMPLEMENTATION

After a two-year waiting period of significantly reduced funding that resulted in staff reduction, the Management Team has begun to fill needed positions to maintain the high-quality global research portfolio moving into AquaFish Phase II.

The AquaFish team at OSU will implement 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. Our plans for the first year of operations revolve heavily around the competitive awards process. These plans are based on broad experience managing numerous competitive awards processes. They are also based on several innovative strategies to keep costs down, support Host Country institutions and researchers while the competitive process is underway, and increase the opportunity for delivering intermediate results by the third year.

Continuation Proposals - This streamlined RFP is designed for continuation proposals from current 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. These Lead Project Institutions will further partner with other universities including University of Hawaii Hilo, University of Arizona, Virginia Tech, University of Arkansas at Pine Bluff, University of Rhode Island, and Alabama A&M. Additional universities may also be involved. The RFP was vetted at USAID (with the AOR and OAA) as part of the Technical Application and review process. Proposals are currently under review. Work is expected to begin mid- Summer 2013.

Burma Proposals - This competitive RFP, which closes in July, is designed to attract proposals for work in Burma. This RFP responds to USAID's request to AquaFish to conduct work in Burma in Phase II. Because this is a new country for AquaFish, the RFP was vetted through the USAID AOR who sought input from the USAID Mission in Burma. The continuing goal is to attract proposals that will create collaborative partnerships between the United States and selected Host Countries for Global Research, Capacity Building, and Institutional Development. Work is expected to begin Fall 2013.

The review process consists of two types of reviews: technical and programmatic. The *technical reviews* follow an NSF-style peer review process and address technical merit as well as collaboration and broader impacts. *Programmatic reviews* represent the final review tier, and are only carried out for proposals with high technical merit. Programmatic reviews are aimed at aligning proposals with AquaFish goals and maintaining portfolio balance. The programmatic review also involves USAID/BFS, especially in regards to country involvement, environmental concerns, gender inclusivity, and FtF alignment.

Funded Lead Project Institutions are required to enter 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. Full project details will be published in the *Implementation Plan 2013–2015*.



II. PLANNED WORK AND LOCATIONS

The project descriptions submitted to date are provided below and will be expanded upon in the AquaFish Innovation Lab's *Implementation Plan 2013–2015*. The complete *Implementation Plan 2013–2015* will be released in the Fall of 2013 after the projects have been fully reviewed.

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 (Bangladesh); Southeast Asian Development Center (Philippines); Central Luzon State University (Philippines).

Bangladesh is the most densely populated country in the world, with 40% of the population living in abject poverty. Fifty percent of women are malnourished, with over 40% of children under the age of five showing moderate to severe stunting. Finfish are an important source of nutrition, comprising > 60% of the dietary protein for most people. Accordingly, aquaculture in Bangladesh is considered a high food security priority for enhancing dietary nutrition and improving the economic livelihoods for its poorest citizens. Aquaculture production in Bangladesh faces significant problems which directly threaten the lives and economic livelihoods of local farmers, including: limited production of nutrient-rich foods available for direct consumption, poor productivity and high mortality rates in marine shrimp (cash crop), excessive and costly feed inputs leading to poor economic return, poor pond management leading to low water quality and environmental degradation, limited diversification of aquaculture products, and a poor understanding of the value chain for seafood products. This project will address these problems, including those centered in the high priority regions of Southwest Bangladesh.

Feed is the most costly aspect of fish farming, representing over half of the total production cost for tilapia, and is even higher in the farming of indigenous, air-breathing fishes (Shing and Koi) currently produced by monoculture. This project will incorporate reduced-feeding protocols, in combination with polyculture production of popular Indian carp species, into current practices of tilapia, Shing, and Koi farming. Technologies promoting a more cost-effective and sustainable method of Shing/Koi farming, fishes rich in iron and other minerals, will contribute toward alleviating malnutrition common in rural women and young children, such as iron-deficient anemia. This project will also investigate novel metagenomic approaches to identify gut microbial communities linked to enhanced feed conversion of tilapia, to lay the framework toward development of probiotic supplements for improving fish growth.

This project will also examine “Best Management Practices” for shrimp farming as well as assess the potential for farming *Pangasius* catfish in brackish (hyposaline) waters in regions traditionally reliant solely upon shrimp farming. This project will also test a novel polyculture/land-farming strategy, whereby Mola (*Amblypharyngodon mola*), a small indigenous fish with high vitamin A content, is cultured with prawns and pond muds are used as fertilizer to grow fresh vegetables on unflooded gher-dykes. Currently, 38% of rural children in Bangladesh suffer from chronic vitamin A deficiency. For many women-led households in coastal Bangladesh, the sale of mudcrab (*Scylla serrata*) constitute their sole economic livelihood. Currently, the economics of mud-crab culture are not understood, and local communities and government support may advance the production and marketing methods through better participation. This project will conduct a value-chain analysis on mud-crab farming by women in coastal Bangladesh to identify how this industry can be further developed for their benefit.

CAMBODIA & VIETNAM

Addressing the Impacts of Climate and Non-Climate Change on Fisheries and Aquaculture in Cambodia and Vietnam

US Institutions: University of Connecticut (Lead), University of Rhode Island.

Host Country Institutions: Inland Fisheries Research and Development Institute (Cambodia); Cantho University (Vietnam).

This project focuses on poverty alleviation and food security improvement through sustainable aquaculture development and aquatic resources management in Cambodia and Vietnam; especially in the context of climate and non-climate drivers of change. The work undertaken through this project will be sustained after the life of the project by the partners in Cambodia and Vietnam and with a number of partner organizations and projects.

In Cambodia, freshwater aquaculture production has increased rapidly over the last two decades, with an annual average growth rate of about 20 percent. In 2010, aquaculture represented 12 percent of total inland fisheries production. In Vietnam, the annual growth of aquaculture has been about 10-13 percent during the last decade. The Mekong Delta region of Vietnam often contributes about 55-60% of the total aquatic production and more than 60% of total aquatic production for export of the whole country. Any adverse impacts to the fisheries and aquaculture sector in the region will therefore have implications for the region's economic development, for poverty reduction, and for global as well as regional food security. Importantly, it must be recognized that these two countries are highly vulnerable to climate change because of their low capacity to respond and adapt. Climate change is likely to have negative impacts on capture fisheries systems already stressed by overexploitation and pollution and also likely to impact the productivity and viability of aquaculture operations.

Past studies of AquaFish CRSP produced a number of outcomes, including development of a plant based feed for snakehead fish, recommendations to government and the private sector for a sustainable snakehead aquaculture industry, value-added products from small-sized/low value fish such as fish paste and fish sauce, extension/outreach technologies, recommendations for improvements in the 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. These outcomes have impacted or are impacting both the private and public sectors through improvements in technologies, commercialization of new products, sustainable aquatic resource management practices, and policies for aquaculture and capture fisheries. For example, the snakehead feed developed by the project is now being made commercially in Vietnam and 10,000 farmers are using it. The vision of this project is poverty alleviation and food security improvement through sustainable aquaculture development and aquatic resources management in Cambodia and Vietnam; especially in the context of climate and non-climate drivers of change. This vision takes into account the need to address under-nutrition, especially in women and children, by increasing the availability and access to nutrient dense foods through research on fish.

This project will address this issue through six separate but complementary investigations on fish value chains, development of feeds and feeding strategies and processed products, sustainable snakehead aquaculture systems, estimating carrying capacity for aquaculture, food and nutrition security vulnerability of women, and policy and outreach. The work undertaken through this project will be sustained after the life of the project by the partners in Cambodia and Vietnam and with a number of partner organizations and projects including the WorldFish Center – Cambodia office, Integrated Pest Management CRSP, Cambodia HARVEST project, the Network of Aquaculture Centers in Asia (NACA), Mekong River Commission, and the Southeast Asian Fisheries Development Center-Aquaculture (SEAFDEC-AQD). The research to be undertaken through this project has been identified as high priority by the Cambodian government. It is expected that the government, through IFREDI and FiA, will continue to fund these research areas and seek additional donor funding.

NEPAL

Development of More Efficient and Environmentally Sustainable Aquaculture Systems for Nepal

US Institution: University of Michigan (Lead).

Host Country Institutions: Agriculture and Forestry University (Nepal); Institute of Agriculture and Animal Science (Nepal); Directorate of Fisheries Development (Nepal).

Nepal is a poor country; most residents are at best educated at the level of primary schooling, and many are undernourished or even malnourished. 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. This focus is long standing. In 1976, Rana and Rajbanshi developed a National Plan for Development of Aquaculture in Nepal, which focused on increasing production of household ponds and other systems that would provide nutrition to poor households as the main concept. Subsequent plans in Nepal, including the Fisheries Perspective Plan (GoN 2000), the Strategic Vision of Aquaculture Research (NARC 2010), and evaluations by FAO (2013) all maintain nutrition for poor families as the main focus. Throughout the poorer countries of Asia, small indigenous species of fish (SIS) are promoted as a means to provide health benefits for poor consumers. The benefits of their consumption include increased intake of calcium and vitamins (such as vitamin A) because the fish are generally consumed whole. In addition, these fish, when cultured or captured, are generally consumed in the home rather than sent to market, so they provide direct nutrition. While SIS can be caught from natural waters, they have not been well incorporated into aquaculture production systems. For example, the polyculture systems, which are the mainstay of commercial aquaculture in Nepal, largely use 5-7 carp species, all targeted on large carp species sold to market. While SIS could be incorporated into these polyculture systems — possibly without any loss of yield for the large carp species — this has seldom been done, and there is no research basis to indicate whether such incorporation would be helpful or damaging to overall production. Over the first two years of this grant, our project will focus on this incorporation of SIS into polyculture systems to determine if it is a viable means to increase food production for poorer households.

Since the 1970s aquaculture development in Nepal has focused on utilizing marginal agricultural lands, such as gholes (flooded areas with marginal agricultural potential), to serve as aquaculture sites for poor households. As a result of outreach conducted in the Terai (the low elevation plains area of Nepal), numerous household ponds have been built in these marginal agricultural areas, and the management of those ponds with cages has been promoted as a means to substantially improve nutrition of poor households. Such outreach to extend aquaculture into gholes has been promoted in all of the aquaculture plans for Nepal, and yet the success of these systems and their effects on household nutrition remain uncertain. This is the project's second main focus; to evaluate the success of household ponds in increasing fish consumption by women and children in poor households, and to then determine if this increased consumption leads to improvements in health as measured by World Health Organization standards of nutritional status for children.

A third area of focus for this project is the enhanced production of native species, particularly sahar, a cool water species indigenous to Nepal. Again, all of the aquaculture planning documents described above had a focus on fish production in colder regions of the country. While these plans generally called for trout culture, sahar may be a more successful alternative because it is a native species, valued by local inhabitants, and important as a target of restoration. This project will incorporate sahar in on-farm trials, as well as to expand sahar seed production to other regions of the country. In addition to sahar, this project will work to establish aquaculture systems for another indigenous species, the stinging catfish.

KENYA & UGANDA

Aquaculture Development in Kenya and Uganda: Indigenous Species, Training, and Water Science

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

Host Country Institutions: Makerere University (Uganda); NaFiRRI (Uganda); University of Eldoret (Kenya); Ministry of Fisheries Development (Kenya).

This project endeavors to solve or clarify some bottleneck or unknown dimension that limits the advance of fish culture in Uganda and Kenya. Whether it be the reproductive control and managed grow out of a new species such as lungfish, the established practice of tilapia culture under diverse and changing local circumstance, or new insights on how to reach and engage fish farmers with practical information through their cellphones, this project is committed to practical, tangible results.

Ensuring the supply of quality fingerlings for local farms is a fundamental task in both Uganda and Kenya. Training, research, and outreach focused on growing a spatially balanced distribution of seed stock producer clusters will foster the development of the tilapia industry. Readily available quality fingerlings will facilitate producer motivation for timely restocking for increased production and enhance availability of supply. Developing and stimulating the network of fingerling producers also will foster peer-to-peer technical support, market development, and other forms of mutual support.

Aquaculture development is building in Uganda as at least one large commercial farm is using cage culture to produce daily truckloads of tilapia destined for export to Congo. The medium and small-scale sector is advancing through the endeavors of project-developed and supported Annual Fish Farmer Conference and Trade Show that has become a focal event for the industry. Project-trained trainers continue to hold events and work with producers throughout the country. Tilapia remains a readily marketed and popular consumer item, particularly in locales away from Lake Victoria and other large water bodies. Yet serious deficiencies in production practice, value chain development, and species alternative remain. Research is needed to demonstrate and clarify optimal timing and strategies for producing tilapia and clarius for food and baitfish. New cell-phone based systems for market development, management guidance, and seedstock coordination present real possibilities for augmenting the value captured by producers in the marketing chain. New species, particularly lungfish, offer the advantages of known consumer acceptability associated with a popular indigenous species, yet can only be expanded through research that unlocks the reproductive process to foster seedstock development for the species and identifies viable cage culture production regimes.

In Kenya, national policies have promoted fish culture through the subsidized distribution of fingerlings and the coordination of feed supplies. The government has also promoted creation of thousands of small farm ponds so that many new farmers have access to ponds and need technical guidance. This project will contribute to capacity building of university and extension to train these new farmers.

The graduate students that will conduct research and organize practical activities such as training events and guidance conferences will learn from these experiences as well and contribute to the advance of the industry. The project seeks to support a small subset of individuals for U.S. training, but also supports graduate students at the host country institutions who will engage in studies, trials, and training events in ways that will advance their projects but also build each nation's human capacity for aquacultural development.

GHANA & TANZANIA

Aquaculture Production and Human Health, Nutrition, and Food Supply 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 (Ghana); Sokoine University of Agriculture (Tanzania); University of Dar es Salaam (Tanzania); Western Indian Ocean Marine Sciences Association (Tanzania).

African governments acknowledge in National Development Plans that urgent poverty reduction measures are needed to achieve the UN Millennium Development Goals, with governments most focusing on national poverty eradication strategies and improvements in food nutrition and security. Fish has always been an important part of the diet of the people of the continent but until recently fish has been largely harvested from the wild. Total fish output in some African nations such as Nigeria and Egypt continue to grow at accelerating rates and fish cultivation has become part of many rural agricultural enterprises. This has been encouraged by expansion of NGO developmental activities on aquaculture, improved aquaculture production technologies, recognition of over exploitation of natural fisheries, and increased nutritional requirement of a rapidly growing population. These factors combine to make aquaculture an economically attractive agricultural production alternative in sub-Saharan Africa.

Previous AquaFish CRSP work has focused on a broad range of issues targeting poverty reduction and increased productivity. In Tanzania, for example, lower cost feed alternatives were identified from leguminous tree species to replace the more costly soybean meal used in tilapia diets. Through training in hatchery techniques and management, Kenya farmers now have an additional aquaculture enterprise of raising catfish fingerlings and selling as bait to the longline fishing industry on Lake Victoria. Traders in baitfish from natural catches are now engaged in fish farming that has enabled year-round supply of baitfish. Training in supply chain management has enabled the development of new market opportunities for foodfish producers in Kenya and Ghana as well as new markets for baitfish producers in Kenya. Farmers have acquired knowledge about the environmental effects of their activities and are therefore implementing broadly focused environmental BMPs on their farms, especially in Ghana and Kenya. Studies that analyzed tilapia value chain provided valuable information needed for the improvement of tilapia trade through market intelligence. Similarly, consumer preference studies for farmed fish provided information for the development of consumer-driven aquaculture production in Ghana and Kenya.

The vision of this project is to build on previous work to enhance the profitability of the aquaculture industry in sub-Saharan Africa through physical and human capacity development; enhanced market information sharing and trading; improved nutritional qualities of fish and consequently human nutrition; growth of a whole chain of activities from farm to the consumer; better management of native fish and shellfish species. Results from the various investigations will help to achieve the goals of improving human nutrition, efficiency in the value chain, increased incomes for producers and traders of aquaculture products, diversified production systems, enhanced nutrient, and reduction in postharvest losses through efficient market information sharing mechanisms.

This project involves knowledge generation and physical and human capacity development. Student participation in research activities is designed to create a framework such that all additional materials and investment by this project are viewed as part of quality improvement of the Aquaculture Sciences program. Involvement of students means involving a set of other faculties such as graduate committee members. This will facilitate joint planning and management of the additional equipment and investments and also create continuity, as other students outside the program will continue to use the additional facilities.



III. TRAVEL

Travel identified in Appendix 1 is taken from projects currently under review but expected to be approved and on the ground by 1 July 2013. Trips listed in Appendix 1 have been identified based on the best available information and are submitted in this document for written approval from the AOR to avoid project delays.

Some trips listed in Appendix 1 will occur outside of this reporting period, but are included here because they will be part of the two-year *Implementation Plan 2013–2015* and are have been budgeted within each AquaFish subproject proposal.

Appendix 1 also includes trips needed to conduct AquaFish organizational meetings that require broad participation from US and HC institutions. These meetings include:

- Africa Regional Meeting, Ghana, July 2013
- Project Orientation Meeting, Washington DC, September 2013
- Asia Regional Meeting, Vietnam, December 2013
- Annual Meeting (with aquaculture/ fisheries professional meeting), Seattle, February 2014
- Annual Meeting (with aquaculture/ fisheries professional meeting), Korea, May 2015

AquaFish will continue to work with the AOR to obtain country clearance prior to travel to Nepal and Cambodia.



APPENDIX 1: TRAVEL

Table A-1 lists international trips that will be taken as part of *Implementation Plan 2013-2015* for the AquaFish Innovation Lab CA/LWA No. EPP-A-00-06-00012-00. 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.” Travel is formally tracked by the Management Office through an online monitoring system.

Destination Country or Region	Origin Country or Region	Number of Travelers	FY
Vietnam and Cambodia	USA	1	2013
Ghana (Africa Regional Meeting)	Kenya	2	2013
	Tanzania	3	2013
	Uganda	2	2013
	USA	8	2013
USA	Uganda	1	2013
Ghana and Tanzania	USA	1	2013
Nepal	USA	1	2013
USA	Ghana	1	2013
USA (Project Orientation Meeting)	Bangladesh	1	2013
	Burma	1	2013
	Cambodia	1	2013
	Ghana	1	2013
	Nepal	1	2013
	Uganda	1	2013
Vietnam and Cambodia	USA	1	2014
Israel or other ISTA, AFAF, scientific conference location	Asia Region	2	2014
	Kenya	1	2014
	USA	3	2014
Cambodia	Vietnam	5	2014
Vietnam	Cambodia	3	2014
Kenya	USA	1	2014
Vietnam and Cambodia	USA	1	2014
Vietnam (AquaFish Asia Regional Meeting and WAS scientific conference)	Bangladesh	3	2014
	Burma	2	2014
	Cambodia	3	2014
	Nepal	3	2014
	Philippines	2	2014
	Uganda	1	2014
	USA	8	2014
Vietnam and Cambodia	USA	2	2014
Bangladesh	Philippines	2	2014
Bangladesh	USA	2	2014
Kenya	Uganda	1	2014

AQUAFISH ANNUAL WORK PLAN: 2013 - 2014

Destination Country or Region	Origin Country or Region	Number of Travelers	FY
USA (AquaFish Annual Meeting and WAS scientific conference)	Africa region	3	2014
	Asia region	5	2014
	Bangladesh	2	2014
	Burma	2	2014
	Cambodia	2	2014
	Ghana	4	2014
	Kenya	2	2014
	Nepal	3	2014
	Philippines	2	2014
	Tanzania	3	2014
	Uganda	2	2014
Vietnam	2	2014	
Vietnam	Cambodia	3	2014
Cambodia	Vietnam	2	2014
Nepal	USA	1	2014
Uganda	USA	1	2014
Cambodia	Vietnam	3	2014
Burundi	Kenya	1	2014
Burundi	Uganda	1	2014
Nepal	USA	1	2014
Vietnam	Cambodia	2	2014
Kenya	USA	1	2014
Tanzania	USA	1	2014
Vietnam and Cambodia	USA	3	2014
Australia or other professional scientific conference	Africa region	4	2014
	Asia region	4	2014
	Bangladesh	2	2014
	Kenya	2	2014
	Uganda	2	2014
	USA	6	2014
Ghana and Tanzania	USA	1	2014
Ghana	USA	2	2014
Uganda	USA	3	2014
Nepal	USA	1	2014
Uganda	USA – subprojects	3	2014
Tanzania	USA	2	2014
Vietnam and Cambodia	USA	1	2015
Cambodia	Vietnam	3	2015
Vietnam	Cambodia	2	2015
Vietnam and Cambodia	USA	2	2015
Bangladesh	USA	1	2015
Bangladesh	Philippines	2	2015
Uganda	Kenya	1	2015
Vietnam and Cambodia	USA	1	2015
USA	Bangladesh	1	2015
USA	Ghana	1	2015
USA	Kenya	1	2015
Vietnam	Cambodia	1	2015

AQUAFISH ANNUAL WORK PLAN: 2013 - 2014

Destination Country or Region	Origin Country or Region	Number of Travelers	FY
Bangladesh	USA	2	2015
Cambodia	Vietnam	1	2015
Kenya	Uganda	3	2015
Nepal	USA	1	2015
Uganda	USA	2	2015
Cambodia	Vietnam	1	2015
Nepal	USA	1	2015
South Korea or other WAS 2015 conference location (AquaFish Annual Meeting)	Bangladesh	2	2015
	Burma	2	2015
	Cambodia	4	2015
	Ghana	2	2015
	Kenya	2	2015
	Nepal	5	2015
	Philippines	2	2015
	Tanzania	3	2015
	Uganda	2	2015
	USA	12	2015
	Vietnam	2	2015
Vietnam	Cambodia	2	2015
Vietnam and Cambodia	USA	1	2015
Bangladesh	USA	1	2015
Ghana	USA	1	2015
Kenya	USA	1	2015
Nepal	USA	1	2015
Uganda	USA	3	2015
Vietnam and Cambodia	USA	1	2015



APPENDIX 2: MONITORING & EVALUATION PLAN

AquaFish works towards achieving development impacts by meeting key targets, measured as indicators and benchmarks of progress. In addition to the benchmarks and performance indicators for USAID's key targets, four thematic indicators were developed by the Development Themes Advisory Panel (DTAP) in alignment with AquaFish's four themes. Benchmarks and milestones provide a means to explore different measures of performance than either the more quantitative thematic impact indicators, or the metrics designed by USAID for reporting under FTFMS (Feed the Future Monitoring System). Formal milestones, benchmarks, and indicators will be finalized after all subprojects are reviewed and approved.

A. PERFORMANCE INDICATORS BY DEVELOPMENT THEME

DTAP A: Improved Health and Nutrition, Food Quality, and Food Safety of Fishery Products

- *Number of aquaculture products developed to improve food safety or quality*

DTAP B: Income Generation for Small-Scale Fishers and Farmers

- *Number of new technologies developed*
- *Number of institutions with access to technological practices*
- *Number of (people) trained in use of technological practices*

DTAP C: Environmental Management for Sustainable Aquatic Resources Use

- *Number of management practices developed or adopted to improve natural resource management*
- *Number of hectares under improved natural resource management*
- *Number of management practices developed to support biodiversity*
- *Number of people trained in practices that promote soil conservation and/or improved water quality*

DTAP D: Enhanced Trade and Investment for Global Fishery Markets

- *Number of new markets for aquatic products*
- *Number of aquatic products available for human food consumption*

DTAP=Development Theme Advisory Panel

B. 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.

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.

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.

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.

C. 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 FY2012 are presented in Table 1. Also included are preliminary estimates of FY2013 indicator targets. Formal FY2013 indicator targets will be set after all subprojects are reviewed and approved.

Table 1. AquaFish Feed the Future Monitoring System 4.5.2 Indicators for FY2012 (targets and actuals) and FY2013 (targets).

Indicator Number	Indicator	2012 Target	2012 Actual	2013 Target
4.5.2(2)	Number of hectares under improved technologies or management practices as a result of USG assistance			
	Total	9,794	9,983	9,983
	Continuing	9,794	9,794	9,983
	New	0	189	0
4.5.2(6)	Number of individuals who have received USG supported long-term agricultural sector productivity or food security training			
	Total	106	109	19
	Female	51	52	9
	Male	55	57	10
4.5.2(7)	Number of individuals who have received USG supported short-term agricultural sector productivity or food security training			
	Total	182	287	23
	Female	74	125	4
	Male	108	162	19
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	25	26	0
	New	0	1	0
	Continuing	25	25	0
4.5.2(39)	Number of new technologies or management practices in one of the following phases of development: (Phase I/II/III)			
	Total	13	17	3
	Phase 1 Number of new technologies or management practices under research as a result of USG assistance	8	4	3
	Phase 2 Number of new technologies or management practices under field testing as a result of USG assistance	3	6	0
	Phase 3 Number of new technologies or management practices made available for transfer as a result of USG assistance	2	7	0