

## HYDROLOGY, WATER HARVESTING, AND WATERSHED MANAGEMENT FOR FOOD SECURITY, INCOME, AND HEALTH IN UGANDA: SMALL IMPOUNDMENTS FOR AQUACULTURE AND OTHER COMMUNITY USES

### INTRODUCTION

The goal of this AquaFish CRSP project is to provide research results to increase the knowledge base for developing use guidelines for water resources that work in the African context. Much of the research on small-holder aquaculture in developing nations has focused on integration of aquaculture with other activities on small farms. Our approach is to consider how to integrate aquaculture into watershed management schemes that focus on capturing overland flow in one or more small impoundments for multiple uses, e.g., community water supply, aquaculture, livestock watering, small-scale irrigation, etc. This study uses climatic and hydrological variables, as well as topographic and geologic features, to develop a procedure for identifying sites where such schemes can be implemented. Basic data needed for the modeling and engineering activities are being gathered on precipitation, evaporation from water surfaces, temperature, and evapotranspiration. These data will be complemented by information drawn from case studies of aquaculture water use and management. With this information, the CRSP team will refine hydrologic models and propose appropriate layout and engineering guidelines for designing and constructing small impoundments and water conveyance systems. Watershed management practices for protecting the quality and quantity of the water source will also be delineated. Other components of the project focus on how aquaculture can be interwoven with other water uses in environmentally and socially sound ways. The CRSP team will offer guidance to stakeholders in community approaches for managing water resources for multiple land uses and land owners, developing reasonable procedures for allocating water for different uses, and optimizing benefits to surrounding communities. Given the critical role women play in small-scale aquaculture, the CRSP team will promote gender integration in training and outreach. The hope is that this work will prepare a trained cadre of business-sensitive technical personnel who can work with capable farmers to advance aquaculture productivity in Uganda.

Notable accomplishments include: (1) developing a suite of software approaches to assess water availability and promote wetland protection in communities with competing aquaculture and other water usage needs; (2) working with small-scale farmers to guide their adoption of cage aquaculture as a new income-generating enterprise; (3) assessing the commercial potential for small-scale aquaculture enterprises and availability of local markets; and (4) establishing a successful model for an annual farmers symposium that serves as a national training activity that offers networking opportunities and a forum for information exchange and technology transfer.



Collecting data for investigating the effects of watershed-water quality-aquaculture interactions on quantity and quality of water from small catchments in South Africa and Uganda.

### INVESTIGATIONS

Effects of Watershed-Water Quality-Aquaculture Interactions on Quantity and Quality of Water from Small Catchments in South Africa and Uganda

Surface Catchment Development and Sustainability Evaluation for Multipurpose Water Supply for Meeting Aquaculture and Other Water Needs

Evaluation and Improvement of Production Technology in Uganda: Case Studies of Small-Holder Cage Culture in Watershed Reservoirs and as an Alternative Livelihood For Fishers

Market Assessment and Profitability Analysis of Aquaculture Enterprises in Uganda

Training and Outreach in Uganda and Surrounding Nations



Participants in the Third Annual Fish Farmers Symposium and Trade Show gather for a photo in January 2010 (above). The theme of the event was "Dealing with the Challenges of Building an Aquaculture Industry" and was sponsored by AquaFish CRSP and the Walimi Fish Farmers Cooperative Society (WAFICOS). AquaFish CRSP also sponsored the 2011 Fourth Annual Fish Farmers Symposium and Trade Show held in January 2011.

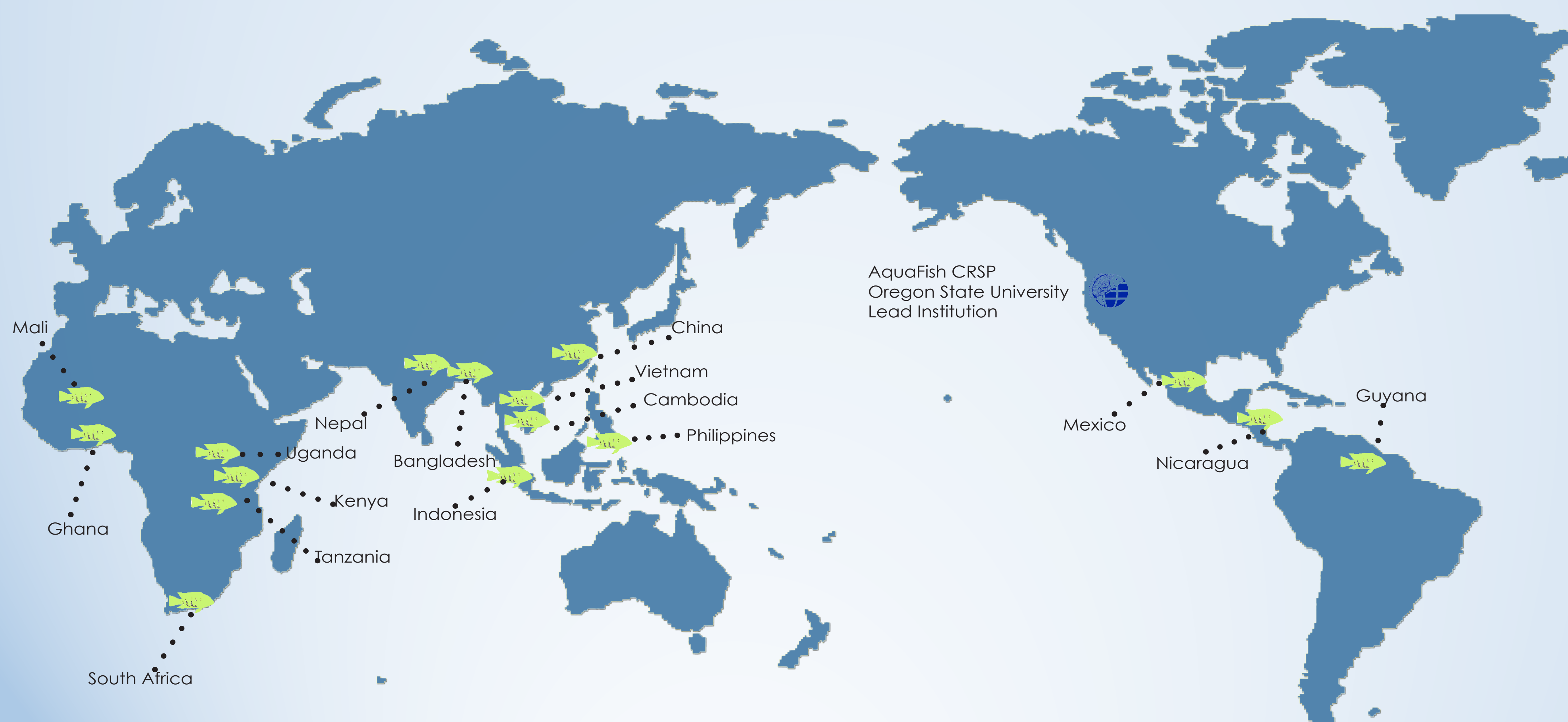
The 158 participants of the Third Annual Fish Farmers Symposium and Trade Show had the option of participating in a one-day field tour to various aquaculture-related establishments that included farms and feed and fish-net manufacturing plants (field tour at right). In 2011, three optional field tours were offered to the 150 participants. There was also a special tour after the event for 11 Kenyans who were interested in learning about aquaculture in Uganda.



Dr. Joseph Molnar, AquaFish CRSP US Lead Principal Investigator from Auburn University, visits a fish farm in Uganda to collect data and meet with project collaborators in 2010.



### GLOBAL AQUAFISH CRSP ACTIVITIES



### COLLABORATING INSTITUTIONS

AUBURN UNIVERSITY

UNIVERSITY OF GEORGIA

ALABAMA AGRICULTURAL & MECHANICAL UNIVERSITY

UGANDA NATIONAL FISHERIES RESOURCE RESEARCH INSTITUTE (NAFIRRI), UGANDA

MAKERERE UNIVERSITY, UGANDA

STELLENBOSCH UNIVERSITY, SOUTH AFRICA

GULU UNIVERSITY, UGANDA



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