



# PD/A CRSP SIXTEENTH ANNUAL TECHNICAL REPORT

## THE INFLUENCE OF FISH CULTURE TECHNOLOGY, EXTENSION METHODOLOGY, AND SOCIOECONOMICS ON SUCCESS OF FISH CULTURE ON LIMITED-RESOURCE FARMS

*Eighth Work Plan, Adoption/Diffusion Research 2 (ADR2)  
Progress Report*

Leonard L. Lovshin  
Department of Fisheries and Allied Aquacultures  
Auburn University, Alabama, USA

Upton Hatch  
Department of Agriculture Economics and Rural Sociology  
Auburn University, Alabama, USA

Norman Schwartz  
Department of Anthropology  
University of Delaware  
Newark, Delaware, USA

### ABSTRACT

The governments of Panama and Guatemala installed family and community fish pond projects to improve household nutrition and economic well-being in the 1980s. Financial assistance to both countries to support the construction and installation of fish ponds was provided by USAID. This research team made a rapid evaluation of 39 family fish ponds and 21 community fish ponds in Guatemala and Panama, respectively, during June 1998. The rapid evaluation of fish pond sites was followed at a later date by interviews with active and non-active project participants to learn the reasons for sustainability or abandonment of fish ponds. Of the 39 family fish ponds visited in Guatemala, 14 were abandoned, 20 were poorly cared for and were considered underutilized, and 5 were well cared for. In Panama, 6 community pond projects were abandoned and 15 were still utilized. Of the projects still utilized, 6 no longer cultured fish and grew only rice in some ponds and 9 continued to culture fish. Only 2 of the 9 projects culturing fish were considered well-managed, while the 7 remaining projects had average or poor fish pond management. Data from 46 household interviews in Guatemala and 114 household interviews in Panama are being entered into a computerized database for further evaluation. A final report will be available by early 1999.

### INTRODUCTION

The United States Agency for International Development (USAID) funded projects in Panama and Guatemala during the 1980s that studied the nutritional and economic impacts of fish culture on rural families and communities. Staff members in the Department of Fisheries and Allied Aquacultures at Auburn University provided technical assistance in fish culture to the governments of Panama and Guatemala during this period. Many of the family ponds in Guatemala and all the community fish ponds in Panama were integrated with livestock to increase fish yields. Investigators returned to Panama and Guatemala 14 and 10 years, respectively, after the termination of USAID and Auburn University participation to determine the status of the fish pond projects.

### METHODS AND MATERIALS

Thirty-nine randomly selected family fish pond projects in Guatemala and all 21 cooperative fish pond projects in Panama were visited from 8 June to 3 July 1998. Visits to fish pond projects were coordinated by host country collaborators in Guatemala and Panama. Sites were rapidly evaluated by the investigators during visits to determine the status of the fish ponds. Follow-up interviews with fish pond project participants were performed by host country collaborators during July and August 1998. Forty-six household interviews

from five provinces were completed in Guatemala and 114 household interviews from 20 communities with fish ponds were completed in Panama. Additionally, profiles on the services and facilities, social/political organization, changes in local economic conditions, and fish culture technology diffusion were collected in 20 Panamanian communities containing fish pond projects. Economic data were collected not only to assess individual incentives for aquaculture but also the effects of "external" factors on incentives. External factors included other crops grown, other livestock operations, non-farm cash opportunities, the seasonality of cash needs and sources, and the motivation to pursue aquaculture. Also, the farming system at each site was documented to determine how aquaculture complemented or competed with the other activities of the system. Unfortunately, no fish harvest data from projects in Guatemala nor Panama were recorded by participants and thus, these data were not available for a cost/benefit analysis. At present, data collected from questionnaires are being entered into a computer database for further analysis.

### RESULTS AND DISCUSSION

Preliminary analyses based on rapid site evaluations were made on 21 and 39 projects in Panama and Guatemala, respectively. Fourteen family ponds were without care and water and were considered abandoned in Guatemala. Twenty

ponds still contained water and a few fish but were not directly important to household food supply and were considered underutilized. Five ponds were still well-attended, stocked with fish, and considered important to the household. None of the family ponds visited was integrated with livestock. Many ponds poorly utilized to grow fish were more important as water storage reservoirs for crop irrigation and livestock watering during the dry season. Principal reasons for abandonment or underutilization of the fish ponds were fish theft, lack of water during the dry season to fill ponds, lack of fingerlings to stock ponds, and death, ill health, or emigration to the US of the adult male household member.

In Panama, 6 community fish pond projects were abandoned while 15 were still utilized. Of the 15 pond projects still in use, 6 had turned some of their fish ponds into rice paddies and no longer cultured fish. Nine communities still cultured fish in some of their ponds and fertilized their ponds with manures collected from animals raised next to the ponds. Only two of the nine projects still culturing fish were considered well managed and one of these projects was controlled by a church and not community members. Principal reasons for abandonment and underutilization of fish ponds were organizational and financial problems with project groups, lack of water to fill ponds in the dry season, pond leakage and seepage, inability to obtain bank loans to

purchase livestock and livestock feeds, and land ownership disputes.

Further insights into the reasons for success or failure of fish pond projects in Panama and Guatemala will be obtained when interview data are processed. A draft of the final report should be ready before mid to late December 1998 and the completed final report by 1 February 1999.

#### ANTICIPATED BENEFITS

The goal of PD/A CRSP research is to improve animal protein sources in less developed countries. Results of CRSP research must be transferred to farmers in order to attain this goal. What are the elements that insure that new technology will be accepted and sustained by target farmers? What have we learned from past small-pond fish culture projects that will assist CRSP researchers and host country governments to design appropriate research and outreach activities? At present, the CRSP is directing research toward limited-resource farmers interested in feeding their families and selling excess fish for cash. Reevaluation of fish culture projects with limited-resource farmers may demonstrate that research efforts should be targeted at resource-rich farmers who sell their entire crop for cash if fish supplies in developing countries are to be significantly increased.