



# PD/A CRSP SIXTEENTH ANNUAL TECHNICAL REPORT

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## TRAINING

*Eighth Work Plan, Kenya Research 4 (KR4)  
Final Report*

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## ABSTRACT

Training of farm personnel and university students at Sagana Fish Farm, Sagana, Kenya, was undertaken under the Eighth Work Plan to ensure the success of the overall project in Kenya. Training was planned and carried out in three main areas:

- a) Training of station field personnel in fish sampling, fish handling, and fish transport;
- b) Training of technicians in the areas of water, soil, and feed sampling, in laboratory glassware cleaning, and in computer operation; and
- c) Training of university students in a variety of topics relevant to aquaculture in Africa.

Sagana field crew members received approximately 100 hours of practical instruction in seining techniques, seine maintenance, fry harvest for sex reversal, fish handling, and stratified sampling. Fish survival in between-pond transfers at Sagana has improved markedly as a result of this training, increasing from less than 30% at the beginning of CRSP involvement at Sagana to a current level of 95 to 100%. Laboratory technicians have received training on water quality analyses, proper washing of glassware, lab safety, and equipment maintenance. All water quality analyses and sampling procedures called for in standard CRSP sampling protocols are now carried out routinely by the lab staff.

Four M.S. students and one undergraduate student received stipends during the 1997-98 reporting period. Three of the M.S. students finished their research in April, and all three will file an "intention to submit" form to their university by the end of July 1998. The fourth student will continue his studies under activities planned under the Eighth Work Plan. One student used data obtained during her studies at Sagana to make an easy-to-follow feed schedule for workers at the station and trained two laborers in procedures for the production of all-male tilapia fry. Three more undergraduates have arrived at Sagana for practical training.

Individuals trained under this activity are already contributing to improved daily farm operations at Sagana, as reflected in greatly improved fish survival after transport, and are conducting analyses in the laboratory. University students have had first-hand experience with farm operations, have worked on real-world aquaculture problems as part of their studies, and have increased their understanding of how to plan and conduct aquaculture research. They should be able to apply what they have learned as they finish their university studies and move out into various parts of the aquaculture sector in Kenya. These benefits will continue to accrue as this type of training continues at Sagana under subsequent work plans.

## INTRODUCTION

Training of Kenyan personnel and university students at Sagana Fish Farm was planned as part of the Eighth Work Plan because the development of these participants' capacities to successfully carry out routine farm operations and to plan and conduct aquaculture research is critical to the overall success of the Kenya project. Training was planned and carried out in three main areas:

- a) Training of station field personnel in fish sampling, fish handling, and fish transport;

- b) Training of technicians in the areas of water, soil, and feed sampling, in laboratory glassware cleaning, and in computer operation; and
- c) Training of university students in a variety of topics relevant to aquaculture in Africa.

## FIELD CREW TRAINING

Approximately 100 hours of practical instruction was provided to the seine crew and their supervisors on seining techniques, seine maintenance, fry harvest for sex reversal, fish handling,

and stratified sampling. The crew learned the techniques but often neglected to apply what they had learned when the resident researcher was not present. Consequently, a new crew was trained between April and June 1998. Members of this new crew were selected for their abilities to work without supervision when necessary. Fish survival in between-pond transfers at Sagana has improved markedly as a result of this training. Survival rates were less than 30% before training of the first crew, increased to 50 to 100% after training of the first crew (depending on the presence or absence of the resident researcher), and has now reached 95 to 100% with the second crew, whether or not the resident researcher is present.

#### LABORATORY TECHNICIAN TRAINING

James Karuri (lab technician) and Thomas Ndegwa (lab assistant), as well as all M.S. students working at Sagana Fish Farm, have received training on water quality analyses, proper washing of glassware, lab safety, and equipment maintenance. All water quality analyses and sampling procedures called for in standard CRSP sampling protocols are now carried out routinely by the lab staff. The lab staff will next learn some analyses of feeds and soils that can be done with equipment currently on hand. Mr. Karuri, the lab technician, and Mr. Maina, the computer operator, can now make standard curves and calculate concentrations.

#### UNIVERSITY STUDENT TRAINING

Four M.S. students and one undergraduate student received stipends during the 1997-98 reporting period. Three of the M.S. students finished their research in April 1998, but a few analyses are still needed before their theses can be completed. All three students will file an "intention to submit" form to their university by the end of July 1998. The fourth M.S. student (Soil Sciences, University of Nairobi) is awaiting approval of funding for the irrigation/fish production experiment submitted as part of the Ninth Work Plan before beginning his research. He has received instruction in pond

soil sampling techniques and has helped in the sampling and analysis of soils for Experiment 3 of the Eighth Work Plan.

Judy Kimamo, undergraduate at Jomo Kenyatta University of Agriculture and Technology (JKUAT), finished a three-month practical training session during which she followed the tilapia sex-reversal process, calculated treatment costs, made growth curves, and recorded survival over the treatment period. She then used her data to make an easy-to-follow feed schedule for workers at the station and trained two laborers in procedures for the production of all-male tilapia fry.

Three more undergraduates have arrived at Sagana for practical training: George Thuku, Moi University, from 11 to 31 May 1998; Winifred Sena Kaki, Moi University, 11 May to 23 June 1998, and Paul Wamwea Wabitah, from Kenyatta University, from 20 May through 31 August 1998. Additional graduate students are scheduled to begin their research after July 1998.

#### ANTICIPATED BENEFITS

Individuals trained at Sagana are already contributing to improvements in daily farm operations at the farm, including pond-side operations such as seining, fish handling, and sampling, in addition to conducting analyses in the laboratory. These benefits are already being seen at Sagana, for example, in the increased fish survival observed after transport around the farm. University students who work at the farm are gaining first hand experience with farm operations that they might not otherwise have been exposed to, have worked on real-world aquaculture problems as part of their studies, and have increased their understanding of how to plan and conduct aquaculture research. They should be able to apply what they have learned as they finish their university studies and move out into various parts of the aquaculture sector in Kenya. These benefits will continue to accrue as this type of training continues at Sagana under subsequent work plans.