



PD/A CRSP NINETEENTH ANNUAL TECHNICAL REPORT

DEVELOPMENT OF TRAINING MODULES FOR AQUACULTURE EXTENSION WORKERS AND UNIVERSITY STUDENTS IN KENYA

*Ninth Work Plan, Feeds and Fertilizers Research 6 (9FFR6)
Final Report*

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ABSTRACT

A series of five highly successful short courses was conducted by the Kenya Project of the PD/A CRSP for Kenya Fisheries Department personnel during the period of the Ninth Work Plan. Activity leaders responsible for planning and carrying out these short courses felt constrained by a lack of training materials relevant to the aquaculture situation in Kenya. Although they were able to develop some materials and to borrow others for use in these courses, they did not have teaching modules specifically suited to Kenya on topics such as pond construction, composting, pond production of mixed-sex tilapia, fish nutrition, or production by species, all of which are key for the type of training currently needed in Kenya.

This activity was proposed to begin work on the development of such training modules. A faculty member from the Moi University Department of Fisheries spent eight weeks at Auburn University, Alabama, while beginning to develop training modules for use in future training sessions in Kenya. Three complete modules were developed, and work on nine others was begun. A digital camera and a new computer, to be used for continued work on module development back in Kenya, were provided. Over 1,800 slides and photographs suitable for use in training courses were digitized and saved to disk for further work in Kenya. While in the US, the participant was also able to attend and participate in the annual conference of the World Aquaculture Society (Aquaculture America 2001) and the Annual Meeting of the PD/A CRSP, as well as to visit commercial fish-farming operations in western Alabama. This activity was conducted between 16 January and 15 March 2001.

INTRODUCTION

Lack of technical training has been cited as a major reason for the low output of fish ponds in Kenya. This lack has been observed at all levels, from extension agents working in the field through university undergraduate and graduate students to upper-level fisheries officers in the Kenya Fisheries Department. It was this lack that led to the development of a training program undertaken by the Kenya Project under the PD/A CRSP Ninth Work Plan (9ADR3), which sought to improve training and to provide a cadre of trainers with extensive practical fish production experience (see "Aquaculture training for Kenyan fisheries officers and university students," 9ADR3; pp. 155–158 of this report). Under that activity Karen Veverica and Charles Ngugi conducted a series of five short courses, in which they trained officers of the Kenya Fisheries Department in pond construction, pond management, and commercial fish farming and developed training materials relevant to the needs and level of education of their trainees. However, Veverica and Ngugi often felt constrained by the lack of materials relevant to Kenya's

situation. Although they were able to borrow some training modules from faculty at Auburn University (AU), they did not have teaching modules on topics such as pond construction, composting, pond production of mixed-sex tilapia, fish nutrition, and production by species, all of which are needed for training in Kenya.

It was therefore proposed that Ngugi spend six weeks at AU developing modules for training Fisheries Department extension officers and undergraduates in the Moi University (MU) Department of Fisheries. In addition, he would use the opportunity to further develop his computer skills and to work with AU faculty with experience in areas of module development, use of equipment and facilities, literature searches, and downloading extension files from the Internet.

The overall objective of this activity was to increase the capability of the Department of Fisheries at MU to contribute to sustainable utilization of aquatic natural resources through the development of aquaculture.

More specific objectives of the activity were to:

- 1) Develop educational materials such as extension bulletins to be used for training fisheries extension workers and university students;
- 2) Develop teaching modules for dissemination of research information to producers;
- 3) Learn how to use software and hardware needed for making teaching aids, e.g., digitizing slides and photos, using presentation programs; and
- 4) Search and retrieve information from the library and download and transfer extension bulletins for use in preparation of course modules.

METHODS AND MATERIALS

This activity provided funds and mentoring to allow one faculty member from the MU Department of Fisheries (Eldoret, Kenya) to travel to AU to work with experienced professionals there to learn the technical skills needed for the preparation of training modules for use in training courses in Kenya, both at MU and in the Kenya Fisheries Department.

Ngugi spent approximately eight weeks in the US between January and March 2001 working on this effort. At AU he was provided with office space at the main office of the Department of Fisheries and Allied Aquacultures, given tours of AU's extensive fish-culture facilities, and given access to library facilities on the main campus. He was supported and guided in his efforts at AU by Len Lovshin, Tom Popma, and Veverica, along with several other faculty and staff members there. Training and presentation modules previously developed at AU were used as models for his work. Jim Bowman of the Oregon State University (OSU) Department of Fisheries and Wildlife also provided guidance, as well as overall administration of the activity.

The activity also provided material support in the form of a state-of-the-art computer and printer, a digital camera, and start-up supplies (diskettes, CDs, transparencies, etc.) to begin the process of module preparation and for continued use in the development of training materials after Ngugi's return to Kenya.

RESULTS AND DISCUSSION

Ngugi departed Kenya on 16 January, arriving at AU the following day. During his first week there he met Lovshin and Popma and began planning the details of his work at AU. Veverica gave him a tour of AU's Fisheries Research Unit, and he made arrangements to audit the Fish Hatchery Management course given by Ron Phelps.

During the period of 22 to 27 January, Ngugi traveled with other members of the PD/A CRSP to Orlando, Florida, to attend the annual conference of the World Aquaculture Society (WAS) and the Annual Meeting of the PD/A CRSP. At the WAS meetings he was able to view posters, attend many presentations, meet with a number of professionals in the field, and view products and services displayed by the numerous exhibitors present. After the WAS conference he learned about other CRSP projects, got to know other CRSP participants, and developed a better understanding of the overall CRSP program by participating in the Annual Meeting.

Back at AU Ngugi rapidly settled into the task of learning the necessary computer skills and beginning to develop training

modules for Kenya. The project provided a Dell™ Pentium® III 800 MHz computer with a color printer and Zip and CD-RW drives to help with the effort. Also provided were an Olympus digital camera and basic supplies for both the camera and the computer system. These items were purchased through OSU, delivered to Ngugi at AU, and taken back to Kenya (MU) to be available for continued module and training material development there.

Lovshin and Popma continued to work closely with Ngugi throughout his time at AU. They assisted him in getting started with the modules and allowed him to use or adapt their existing modules as necessary for the Kenyan situation. Veverica provided input as needed and in addition provided numerous opportunities for Ngugi to participate in and learn from aquacultural research activities taking place at the AU Fisheries Research Unit.

While at AU Ngugi learned to use the software programs needed for downloading materials from the web, for preparing presentations, and for making overhead transparencies to go with those presentations. As part of module development, he required a variety of photographs on various global aquaculture activities. Consequently, he was given access to photographic slides of fish and aquaculture by many individuals. He digitized 145 slides from Bowman and 235 slides from Popma. Veverica gave him over 155 photographs taken from Kenya, Cameroon, and Rwanda, and she also gave him 173 slides from these countries to digitize. Lovshin gave him nine CDs with over 800 slides to copy and use back in Kenya. Ngugi also copied slide presentations on fish hatchery management from Phelps. In all he digitized and saved over 1,800 slides from various sources, including downloading some from the Internet. Other sources of materials included Southern Regional Aquaculture Center (SRAC) fact sheets, the Fish Hatchery Management course given by Phelps, Carrying Capacity and Aquaculture Production by Popma, and Food and Agriculture Organization documents.

Through these efforts Ngugi was able to develop three complete training modules while in Auburn. They are:

- Introduction to Aquaculture—An Overview,
- Pond Construction—Site Selection, and
- Pond Management and Maintenance.

In addition to these complete training modules, Ngugi began work on a number of others, which will be adaptations of existing modules for the Kenyan situation. These are listed, along with the name of the original author of each:

- Fish Yield (Len Lovshin)
- Bait Minnows (Len Lovshin)
- Marine Shrimp (Len Lovshin)
- Golden Shiner (Len Lovshin)
- American Oyster (Len Lovshin)
- Atlantic Salmon (Len Lovshin)
- Channel Catfish (Len Lovshin)
- Crawfish (Matt Parker)
- Striped Bass (Mark Reddy)

He also received 18 other presentations from students and friends that he met in Orlando and at AU, including ones on culture of tilapia, carp, black bass, and trout.

During the first week at AU after the WAS and PD/A CRSP meetings, Ngugi was joined by Nancy Gitonga, Director of the

Kenya Fisheries Department and host country Principal Investigator (PI) for the Kenya Project; David Liti, a CRSP researcher from the MU Department of Zoology; and Jim Bowman, US Regional Coordinator for the Kenya Project. This group, along with Kenya Project researchers Veverica and Popma, spent a full day discussing Kenya Project progress and problems and outlining plans for proposals for the PD/A CRSP Tenth Work Plan. The group also took a full-day tour to catfish farms, a feed mill, and a fish processing plant in western Alabama.

Ngugi departed Auburn to return to Kenya on 13 March, arriving back in Eldoret on 15 March. He feels that his AU visit was very productive, informative, and educative. He gained immensely from the visit, attending numerous departmental seminars, workshops, and classes. It gave him the opportunity to meet and interact with world-renowned authors and publishers such as John Jensen (Head of the Department of Fisheries and Allied Aquacultures), Bart Green, Popma, Lovshin, and Claude Boyd, among others. Through this activity a new state-of-the-art computer, loaded with the most recent software, was acquired for use in training-course development back in Kenya; this computer will be very useful to the faculty and students of the MU Department of Fisheries.

ANTICIPATED BENEFITS

This activity has already led to the development of three new training modules to be used in training courses at several levels in Kenya. Additional modules are planned and are being worked on by Ngugi in Kenya. The activity has provided MU faculty, and in particular Ngugi, with improved computer operation and course preparation skills, which will lead to the preparation of better training materials and improved dissemination of aquaculture information to extension workers and university students. Ngugi will be able to pass on some of his new computer skills to colleagues at MU. In line with PD/A CRSP objectives, linkages between research and extension workers in Kenya are being strengthened. This activity has also provided Ngugi with additional international exposure, both at AU and at the WAS conference in Orlando.

Training modules will provide extension workers and fish farmers with better information on pond construction and management. This will lead to improved fish production and poverty alleviation for the rural communities. This will spin off small-scale commercial fish production operations that will improve farmers' incomes and serve to standardize the information given to farmers.

