

African Site Evaluation and Development Planning

Interim Work Plan, Africa Study 1

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Introduction

Under Work Plan 7, Study C, a site-selection strategy was developed to begin the process of replacing the site at Rwasave, Rwanda. That site was lost because of the outbreak of war and civil violence in 1994. To guide data collection, fifteen site evaluation criteria were developed with assistance from the ME and Technical Committee of the PD/A CRSP. USAID site-selection criteria were incorporated into the process.

Additional site visits were accomplished and developed into formal evaluations under the present study. The Sagana Fish Culture Farm in Kenya was recommended as a prime site during the PD/A CRSP Annual Meeting in January 1996. A proposal to develop a CRSP site at Sagana in cooperation with the Kenya Ministry of Tourism and Wildlife and its Department of Fisheries was submitted to the government of Kenya. A development plan for that station was also outlined.

Materials and Methods

The following outlines the strategy for site evaluation:

- Establish site evaluation criteria with input from the Technical Committee and include criteria found in the BIFAD guidelines.
- Gather information on potential sites from CRSP members, agency publications, interviews, USAID Strategic Objectives, USAID Missions, and other sources.
- Visit most promising sites, using the evaluation criteria as a template for gathering information in-country.
- Recommend a site after committee interaction.
- Submit the site recommendation to the ME for administrative review and to the Technical Committee for technical review.
- The final selection of the site will be made by the ME.
- Initiate the required Memoranda of Understanding with host country entities.

Activities conducted through September 1996:

- Spring, 1994: Developed country and site evaluation criteria.
- Summer, 1994: Reviewed USAID mission programs, mission closures, and mission strategic objectives.
- November, 1994: Visited Sagana Fish Culture Farm and sites in Mombasa, Kenya. The proposed visit to Malawi was delayed by USAID/Malawi.
- Spring, 1995: Prepared a preliminary proposal for involvement at Sagana, Kenya.
- Summer, 1995: Reviewed USAID '96 Congressional Presentations, with emphasis on strategic objectives (1995 strategic objectives for all sub-Saharan African countries had been reviewed in 1994).
- August, 1995: Consulted with Boyd Haight, of Aquaculture for Local Community Development Program, Food and Agriculture Organization (ALCOM/FAO), on potential aquaculture sites in the Southern Africa region.
- September, 1995: PD/A CRSP was contacted by Rwandan government regarding the re-establishment of a project at the Rwasave Station, Butare, Rwanda.

- September, 1995: Conducted a site evaluation in Niger following the InterCRSP workshop in Niamey, Niger.
- October, 1995: Consulted with ALCOM/FAO and SADC (Southern Africa Development Community) personnel during the ALCOM meeting in Harare, Zimbabwe.
- October, 1995: Conducted country/site evaluations in Zimbabwe and Kenya. During site evaluations in Kenya, the Sagana site and the Kibos site, near Kisumu, were visited.
- November, 1995: Consulted with ALCOM and SADC personnel in Lilongwe, Malawi, during ALCOM Technical Conference on extension.
- November/December, 1995: Conducted country/site evaluations in Malawi, Kenya, and Tanzania (Domasi, Bunda College, Sagana, Kingolwira, Sokoine University.)
- September, 1996: Evaluated Senegal and Ghana in conjunction with an InterCRSP meeting. Additional meeting attended with Kenyan officials to facilitate processing of our proposal.

In addition, information gathering included discussions with USAID personnel in Washington, DC and in each country visited, and with FAO and other aquaculturists familiar with Africa. We also searched the literature on aquaculture potential, research priorities, geo-climatic conditions, etc., for countries of interest in the extensive ALCOM library and other in-country sources.

Results

Step-by-step evaluations of the major sites investigated are available. The following summarizes the results of the evaluations:

The Sagana Fish Culture Farm, Kenya

Site Characteristics

This site appears to satisfy the selection criteria for a prime research site and is the most promising site. The farm is large and has more than enough pond space for CRSP activities—approximately 20 ha of 150 ha on the farm are ponds. It is well staffed with about 65 staff members on site. The water supply is reliable and abundant throughout the year. Some modification of facilities (i.e., reparation of ponds and chemistry lab) may be required, but work could begin with minimum delay. *Oreochromis niloticus* (Turkana origin, volcani strain) and *Clarias gariepinus*

are presently at the station. Good opportunities exist for collaboration with both the Kenya Department of Fisheries and the Belgian Kenya Project, with potential to work with Kenyan universities and other projects in Kenya, including the Lake Basin Development Authority, and FAO.

This site reasonably represents the environmental conditions, specifically the geo-climatic factors in which tilapia are cultured across Africa. Approximately 45,000 ponds are reported to exist in Kenya, although 25,000 may be a better estimate of the number of ponds in operation. Subsistence-level, semi-intensive, and intensive aquaculture is practiced in Kenya. There is an extension service for aquaculture; however, management recommendations for semi-intensive pond aquaculture are lacking. Information regarding the profitability of aquaculture is also lacking.

Transportation to and from Kenya is relatively easy. Establishing a project in Kenya requires approval at several governmental levels; the Ministry of Finance and Ministry of Tourism and Wildlife have approved our preliminary proposal and the USAID Mission outlook is favorable.

Conclusions

Sagana Fish Culture Station was recommended as the African prime site during the Annual Meeting, and a proposal was submitted to the Kenyan Government.

Bunda College of Agriculture, Malawi

Site Characteristics

This site meets some but not all criteria for a companion site. Malawi is developing as an important regional center for aquaculture and offers opportunities to interact with countries within SADC, with ALCOM, ICLARM, (International Center for Living Aquatic Resource Management), and Malawian institutions. FAO's program through ALCOM is focused on SADC countries, thus a companion site within SADC opens collaborative opportunities across Africa.

A major drawback to working in Malawi is that *Oreochromis niloticus* cannot be used for culture. A large variety of other tilapias are available, although the two species commonly cultured (*O. shiranus* and *Tilapia rendalli*) are not important culture species in other African countries.

There is a possibility of conducting collaborative research at either Domasi and/or Mzuzu from the Bunda College site. A great deal of interest and enthusiasm exists at Bunda College, although the staff seems to have a heavy workload. The pond facilities at the College are adequate, but water supply is limited during the dry season.

Conclusions

Bunda College is recommended to be considered as a potential companion site.

The Domasi Experimental Fish Farm, Malawi

Site Characteristics

This site meets many of the criteria for a prime site; however, it is already the prime site for ICLARM. ICLARM may be interested in some level of collaboration although the designated ponds are small when compared to CRSP requirements (167 m²), and chemical fertilizer work is discouraged. Additionally, Japan has already located a project there.

Conclusions

Domasi experimental Fish Farm is not recommended as either a prime or companion site at this time, although some collaborative work may be initiated if Bunda College is established as a companion site. The project, however, should maintain contact with ICLARM in Africa.

Kingolwira Aquaculture Center and Sokoine University of Agriculture, Morogoro, Tanzania

Site Characteristics and Conclusions

Presently neither of these sites are suitable for CRSP research; however, the potential for regional outreach in Tanzania is high. Kingolwira Aquaculture Center is still under development, and recently a new water system and four ponds were constructed at that site. These recent developments improve opportunities for collaboration at some level in the future.

Sokoine University is just beginning to develop an aquaculture program; there is much enthusiasm and the potential for collaboration is high. There is a possibility for comparative research of *O. niloticus* and *O. shiranus* and/or *T. rendalli* (culture species that are available in Malawi) at a small government station near Songea, not far from Lake Malawi. We recommend that the project

continue to communicate with aquaculturists in Tanzania for potential future collaboration.

The Kibos Fingerling Production Center near Kisumu, Kenya

Site Characteristics

This site is a production, research, and training facility of the Lake Basin Development Authority. The Kibos Fingerling Production Center is at a higher elevation (1400 m) than Sagana, and both *Clarias* and tilapia (*O. niloticus*) are cultured here. Classroom facilities are available for presentations to extension agents and farmers. Efforts here are concentrated on *Clarias* reproduction and rearing and the extension of developed methodologies. The station is rather small with about 14 ponds in use; all water for the station is pumped from wells. The station emphasizes an intensified, small-scale aquaculture approach with extension as a major component. David Campbell of FAO is the Chief Technical Advisor for the Lake Basin Development Authority (LBDA), which operates Kibos. Thus, this site could potentially influence the large project area of the LBDA in Western Kenya near Lake Victoria.

Conclusions

This site is probably not suitable as a prime site because of facility limitations, water source, and overall size. It may be suitable as a companion site because studies and extension work there with tilapia and *Clarias* would complement the CRSP program. Its connection with the LBDA, FAO, UNDP, and the Belgian Survival Fund offers potential cooperative opportunities. If not a companion site, cooperation at this site at a less formal level may be beneficial. For the present, we recommend that Kibos be listed as a potential companion site.

Zimbabwe

Zimbabwe is no longer under consideration due to USAID Mission restrictions. In addition, drier climate and present drought conditions appear to decrease aquacultural potential. The presence of ALCOM offices in Zimbabwe is an incentive for continued communication with the ALCOM coordinator.

Other countries

Zambia—Not under consideration due to USAID Mission restrictions.

Uganda—Recently suggested to have high aquaculture potential; however, we have been unable to evaluate this site.

Niger—Visited in conjunction with another activity: very dry; low potential.

Guinea—Not under further consideration at present.

Ghana—A recent visit offered new encouragement to consider Ghana as a potential companion site. There appear to be good opportunities for collaboration, and the country has considerable potential to develop its aquaculture industry. An active governmental aquaculture development program is in place, and a potential site exists at Akosombo, near Volta Lake.

Discussion

The government of Kenya, through its Ministry of Finance and its Ministry of Tourism and Wildlife, recently approved our preliminary proposal and invited the PD/A CRSP Africa Project to submit a draft Memorandum of Understanding to formalize working relationships at the Sagana Fish Culture Farm. Collaboration with both the Kenya Department of Fisheries and the Belgian aquaculture project will have to be negotiated. USAID/Nairobi support is encouraging.

Development requirements at Sagana include the renovation of at least 12 ponds and the chemistry laboratory. The existing chemistry laboratory is small and requires remodeling for safety and functionality. Plentiful land space and water supply are positive factors for development requirements. All the Rwanda research and office equipment and the vehicle were lost in the war and need to be replaced. A preliminary list of needed items has been compiled.

Anticipated Benefits

Kenya offers a number of advantages as a prime site. It is a transportation and communications center for Eastern Africa, so communication, travel, shipping, and purchasing are simplified. Sagana Fish Culture Farm has plentiful water and land space and is located in an area supporting small-holder aquaculture. It would be an ideal location to manage companion or collaborating

sites in locations such as Malawi, Ghana, or Tanzania. The process of site evaluation and characterization has opened opportunities for the PD/A CRSP Africa Project to cover a broad region

across Sub-Saharan Africa. The continued allocation of resources and effort into collaboration with other sites should be encouraged to enhance the connections established during this study.