



PD/A CRSP NINETEENTH ANNUAL TECHNICAL REPORT

DECISION SUPPORT FOR POLICY DEVELOPMENT: PLANNING CONFERENCES FOR COLLABORATING RESEARCHERS, PUBLIC AGENCIES, AND NONGOVERNMENTAL ORGANIZATIONS WORKING IN AQUACULTURE

*Ninth Work Plan, Adoption/Diffusion Research 7 (9ADR7)
Final Report*

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ABSTRACT

The project focused on identifying and developing methods to create an enabling environment for sustainable development of aquaculture in Honduras. Honduras has a large network of nongovernmental organizations (NGOs) operating at the village level, an exceptional educational institution in Zamorano with commitment to extend training and knowledge in aquaculture, and an established in-country sustainable-development electronic network operated by Red de Desarrollo Sostenible-Honduras (RDS-HN). We developed the concept of training the trainers (NGOs working with farmers at the village level) by bringing together Zamorano and RDS-HN and developing a Web-based Information Delivery System for Tilapia (WIDeST). In this approach WIDeST captures the already-developed electronic information technology network and capacity of RDS-HN while providing easy-to-use information developed by Zamorano. Furthermore, it provides a way to connect local NGOs, farmers, and decision-makers so they can exchange information and make informed decisions. The WIDeST provides information on tilapia production and related topics, natural resources of Honduras, contact information for NGOs, and chat-room facilities for conducting virtual forums and discussions. The email facility enables the user to ask questions and get answers from an expert. Since its inauguration session in March 2001, the website has had more than 6,800 hits, and more than 300 individuals have formally registered to receive information. The participants at training and workshop sessions have found this to be an easy and useful approach, and they have provided strong encouragement for adding new information. The number of individuals already reached, as evidenced from the numbers of visits to the website, strongly indicates that this may be a way to build the capacity of local institutions to develop an environment that enables farmers to adopt aquaculture as an alternative on their farms.

INTRODUCTION

The concept of an enabling environment has been identified as a key prerequisite for sustainable aquacultural development (Shehadeh and Pedini, 1997). Experiences in natural resource management initiatives for the hillside regions of Latin America (CIAT, 1997) suggest that creating partnerships among stakeholders involved in managing or using natural resources is part of the process of fostering an enabling environment. Another aspect is to adopt an integrated decision-making framework for use in such environments (Nath et al., 1999).

Implementing small- and medium-scale aquaculture on a widespread and sustained basis is a long-term process (Harrison, 1991; Molnar et al., 1991). Consumer demands and dietary preferences are not obstacles to fish culture in Honduras, nor are sales problems necessarily a reason for abandoning ponds. Tilapia is widely accepted as a consumer item. In a 1996 survey, a majority of Honduran farmers noted "my understanding" as the major obstacle to obtaining larger harvests from their ponds (Molnar et al., 1996). Thus, there exists an opportunity for sustainable development of small- and medium-scale aquaculture in Honduras.

The “Red Nacional de Acuicultura” (National Aquaculture Network) created by the Food and Agriculture Organization (FAO) in 1992 was an effort to integrate international institutions and the private and public sectors of Honduras. Among the participants were Dirección General de Pesca y Acuicultura (DIGEPESCA), Universidad Nacional Autónoma de Honduras (UNAH), Escuela Agrícola Panamericana El Zamorano, Escuela Nacional de Agricultura (ENA), Agricultural School John F. Kennedy, Peace Corp Honduras, Federación de Productores y Exportadores (FPX), Asociación de Acuicultores de Honduras (ANDAH), and Instituto Nacional de Agricultura (INA). In place for about a year, FAO organized the network with the intention of eventually withdrawing in favor of Honduran management. Unfortunately, leadership problems caused most organizations to suspend participation, and FAO moved on.

We realized the need for a systematic method for enabling communication to reawaken the dialogue. In this context the University of Georgia and its collaborators from Zamorano and Auburn University identified that a successful approach for developing is one in which the following three already existing elements in Honduras are brought together for effective communication and organized decision-making.

- 1) Host Country Nongovernmental Organizations (NGOs). Currently numerous NGOs in Honduras are extending advice to small- and medium-scale farmers and are keenly interested in providing information on aquaculture systems. However, they need information and educational materials.
- 2) Escuela Agrícola Panamericana El Zamorano is a well-established academic institution with outstanding programs in agricultural sciences. In addition to educating students, Zamorano has active programs for and a commitment to extending knowledge to local farmers.
- 3) The Red de Desarrollo Sostenible–Honduras (RDS-HN). RDS-HN was created with an initial grant from the United Nations Development Programme (UNDP) in response to the 1992 Earth Summit, which mandated assistance to “developing” countries for establishing in-country Sustainable Development Networks (SDNs). These networks were envisioned to provide infrastructural support for rapid communication through electronic information technology. The RDS-HN was among the first to establish a network and now provides Internet services to over 700 customers and hosts numerous websites in such areas as forest and natural resource systems. Similar SDNs have been created in other Latin American countries, e.g., Costa Rica, Dominican Republic, Nicaragua, Panamá, Guatemala, Haití, México, Guyana, Bolivia, and Colombia. Together these SDNs can constitute a formidable information network to facilitate contact and exchange among farmers, government organizations, NGOs, and private entrepreneurs.

Thus, we believe there is a unique opportunity for capacity building and institutional strengthening for aquaculture in Central and South America by providing an enduring method that integrates NGOs, Zamorano, and RDS-HN into a team. In this team Zamorano leads in providing current knowledge on aquacultural systems; RDS-HN leads in making the knowledge accessible to the users via electronic information technology; and the NGOs use the knowledge to educate and advise small- and medium-scale farmers on aquacultural systems. In other

words, the task in this project was to identify and implement those methods that will provide information to small- and medium-scale fish farms to ensure that they can be sustained as productive enterprises in Honduras.

The objective of this project was to create an enabling environment for developing linkages among organizations and to build institutional capacity for providing information expeditiously to small- and medium-scale farmers for sustainable development of aquaculture. This report presents a new approach with the use of electronic information technology for developing a Web-based Information Delivery System for Tilapia (WIDeST). The complementary training sessions provided information to NGOs and farmers about aquacultural systems and introduced them to the use of WIDeST. This approach diminishes the dependence of small- and medium-scale farmers on technical assistance from outside sources. It will enable host country NGOs and private firms to provide services, and it will enable Zamorano to provide technical assistance locally. This approach could fortify the partnerships between Zamorano, RDS-HN, and host country NGOs and their ability to sustain aquaculture development in Honduras.

METHODS AND MATERIALS

Sample and Data Collection

The first meeting of the collaborative investigators took place in Honduras at the inception of the project to discuss the objectives and timetable of activities. The meeting was devoted to our understanding of local capacity and familiarizing ourselves with the host country activities. In Zamorano we toured facilities, met key faculty and administrators, and assessed outreach capacity of the institution. We visited 12 national and international NGOs, extension agents, governmental officials, and policy-makers to evaluate their interest and capacity in aquaculture. We visited Comayagua research station in El Carao, a site of earlier work supported by the PD/A CRSP, to evaluate the possibility of utilizing these facilities for training. And we visited small, medium, and large farms to understand their farming decisions and their perceived limitations for adopting aquaculture.

Based on the observations of the first meeting, a working session was set up with RDS-HN to discuss in detail the capacity of electronic information technology in Honduras and the role it could play to meet the project objectives. As a result of these discussions it was concluded that a method should be developed to make information available to local NGOs and extension agents and that they in turn train small- and medium-scale farmers in aquacultural systems. It was also concluded that the method should have features to receive questions and comments from farmers, NGOs, and others to identify stakeholder needs and provide timely responses.

Developing Web-based System

The method selected was to develop a WIDeST. The WIDeST entailed developing a partnership between RDS-HN and Zamorano for reaching out to NGOs, extension agents, and farmers via the website, focus groups, training meetings, and printed documents to increase awareness of the website as a source of information. Additional features to be included were capacity to conduct electronic meetings through a chat facility, a whiteboard for posting questions and observations for public

viewing, and links to other significant websites with pertinent information on aquaculture as well as on resources in Honduras.

To receive input from stakeholders, a workshop was arranged in Zamorano with 87 participants who were directors and coordinators of NGOs, farmers, educators, representatives of government agencies, and decision-makers with interest in tilapia. An overview of the concept of WIDeST was presented, and the participants provided inputs identifying the content and needs for making this method successful. Also, a questionnaire assessed the interest and judgment of stakeholders on the web-based approach in general and WIDeST in particular. The response was highly supportive.

RDS-HN, in collaboration with Zamorano and project investigators, was engaged in developing the WIDeST. A formal announcement of the website and exposure to the decision-makers was also planned. The target time was set for the first quarter of the 2001, followed by a formal training session on the use of the WIDeST towards the end of the project in July 2001. It was anticipated that during this project, the website will become useful but much improvement will be needed in having more complete information about tilapia, pond design, methods of assessing availability of water and other resources, and ease of use. Also, a lack of time and resources may hamper our ability to make available in Spanish some critical materials currently available only in English.

RESULTS AND DISCUSSION

The beginning project meeting with all co-principal investigators in Honduras led to the following observations:

- There is a large network of NGOs in Honduras operating at the village level.
- These NGOs do not have good communication among themselves and linking them could increase the effectiveness of their work.
- Many NGOs are interested in adding technical assistance capabilities in tilapia culture.
- NGOs and governmental policy-makers are interested in water, water harvesting, and hillside stabilization, which directly impact aquaculture development.
- The Comayagua research station in El Carao can be an appropriate site for training NGOs technicians and extension personnel.
- The current limited capacity of fingerling production is an impediment to aquaculture development.
- Women and children play key roles in farm families and are key to aquaculture development.
- Home consumption and local markets are primary outlets for small-scale aquaculture.
- There is a need for a manual with simple instructions for pond siting, design, and construction for local use.
- RDS-HN, with its electronic information technology network, can be an important NGO in developing communication among various extension agents and decision-makers.
- Innovative methods for delivering information are needed that are developed through significant input from the stakeholders and that permit informed decision-making at the local level.

These observations and the follow-up discussions with RDS-HN helped us reach the conclusion that using the electronic information technology capacity of RDS-HN and the excellent

educational capacity of Zamorano in partnership can be an effective way to develop aquaculture in Honduras. This approach will also enable local NGOs to develop aquaculture and institutional capacity of the host country.

A website has been developed and is hosted by RDS-HN. It can be accessed at <acuacultura-ca.org.hn>. The following welcome statement conveys the overall purpose of the website, the collaborators, and the source of support.

Acuacultura CA is the result of an important collaboration among several universities and the Sustainable Development Network Honduras. Our purpose in establishing this interactive website was to provide a versatile linkage point to assist NGOs and individuals to attain success in small-scale fish culture projects utilizing low-cost inputs.

The materials presented in the website are from diverse sources. They have been selected with the objective of providing information comprehensible to persons with some training in the agricultural and natural sciences, possibly beginning fish culturists.

In addition, the website offers the possibility to establish a fluid communication between persons with an interest in learning about fish culture and experts in the different fields of aquaculture. The universities collaborating on this work are: the University of Georgia and Auburn University, both of the USA, and Zamorano in Honduras. The principal source of financing for this website comes from the Pond Dynamics/Aquaculture Collaborative Research Support Program of USAID.

The website is organized to provide information on tilapia in the following 11 categories. These categories may change as more is learned about the needs of the farmers and decision-makers. Currently more than 100 documents are available. Also an Excel-based pond design model developed in another activity of this project provides users the ability to estimate the watershed size, the available water based on local rainfall estimates, and the design of pond for their local conditions.

- 1) Ponds Includes information on methods for assessing watershed and water availability, pond design, and management of ponds for fish culture.
- 2) Biology of Tilapia Includes introductory materials on history, fish biology, and reproductive biology.
- 3) Fingerling Production Includes information on fingerling production, sex reversal, transportation, and other related subjects.
- 4) Grow-out of Tilapia Includes information on all aspects of tilapia production.
- 5) Pathology and Disease Includes information on fish diseases and control methods.
- 6) Water Quality and Aquaculture Has four subcategories in aquaculture, fertilization, fish culture, and polyculture.
- 7) Product Quality Includes fish quality, processing, and controls.
- 8) Production Systems and Costs Includes information on economics of fish production systems.
- 9) Tilapia and Development Includes subcategories in host country policy and agreements, relevant projects and current research, and a description of WIDeST.
- 10) News and Events Provides a place to make users aware of interesting information and useful upcoming activities.
- 11) Fish Gallery Provides a location to present attractive specimens of fish for visual recognition and satisfaction.

The website provides a chat room to conduct meetings and exchange information. The project leaders used the chat room on several occasions to discuss the content of the website when participants were in two locations in Athens, Georgia, two locations in Auburn, Alabama, in Zamorano, and at the RDS-HN Tegucigalpa location in Honduras. The real-time conversations provided an excellent means to interact. This facility will be useful for holding stakeholder meetings and discussions with experts and decision-makers. It will not only provide information on tilapia but will also permit users to communicate those needs that hamper the development of aquaculture.

The WIDeST was formally inaugurated on 3 March 2001 on the Zamorano campus. The participants included representatives of government agencies and NGOs, farmers, extension agents, and educators from Zamorano. The activity included an explanation of the WIDeST and a description and demonstration of the website, a hands-on exercise for the participants, and a chat session in which participants asked questions and an expert responded in real-time. The participants quickly learned the use of the website as well as the use of chat-room facilities. The participants, without exception, provided great encouragement to move faster in this direction and include materials that will be useful to commercial farmers. However, this project is focused on small- and medium-scale farmers, and this need can be met only with a more focused support perhaps in a separate but complementary project.

Since its inauguration, the website has had more than 6,800 hits, more than 300 individuals have registered to access documents available to registered guests only, nearly 25 emails have been sent to the webmaster, and nearly 30 emails with questions have been sent to experts. This is a reasonable response at this time with little publicity and general awareness of the website. The final meeting with stakeholders in August to be held in conjunction with the Sixth Central American Symposium on Aquaculture in Tegucigalpa will provide an opportunity to describe the project and the web-based system. The scheduled hands-on exercises and the exposure to the conference participants will add to our understanding and assessing the value of a web-based approach for institutionalizing aquaculture in Honduras as well as in other developing countries.

CONCLUSIONS

An enabling environment for sustainable aquacultural development will require a partnership between Escuela Agrícola Panamericana El Zamorano and the national and international NGOs in Honduras. In this partnership Zamorano will lead in providing scientific and technical information through training workshops and literature for the electronic information technology network for NGOs, decision-makers, and farmers. The NGOs will then work directly with small- and medium-scale farmers to develop aquaculture on their farms. This "training the trainer" concept is being institutionalized through a web-based information exchange system. In this system, information from the farmers is also shared with other farmers and users. Furthermore, this system will enable the identification of needs for and impediments to the sustainable development of aquaculture in Honduras and

perhaps in developing countries throughout Central and South America.

In this project, the WIDeST was developed with a host country NGO, RDS-HN, and is accessible at <acuacultura-ca.org.hn>. This website has already received much attention. Furthermore, the participants at the training workshops and inauguration events provided enthusiastic encouragement. Since developing countries lack conventional communication and transportation infrastructures, the electronic communication network is a powerful way to bridge the gap. Providing information through the web to local NGOs, extension agents, and decision-makers helps them make informed decisions. Access to information and an ability to make informed decisions are fundamental to building the capacity of local institutions. The work in this project is beginning a new approach that appears very feasible. Additional work and longer experience with this approach are needed before its impact can be fully measured.

ANTICIPATED BENEFITS

The partnership between Zamorano and RDS-HN is expected to enable host country NGOs to increase their capacity to train farmers in aquaculture development. The web-based system will increase communication among NGOs, decision-makers, farmers, Zamorano, and other researchers. This will increase our capacity to provide useful information to farmers. Also, needs for developing the enabling environment for developing aquaculture in Honduras will increase. Finally, this work could serve as a model for other Central and South American countries to utilize their in-country Sustainable Development Networks (SDNs), which were established with an initial grant from the UNDP.

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