

# PROGRESS OF THE MANGROVE-FRIENDLY SHRIMP CULTURE PROJECT

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## INTRODUCTION

The Aquaculture Department (AQD) of the Southeast Asian Fisheries Development Center (SEAFDEC) implemented in 1998 a five-year Mangrove-Friendly Aquaculture Program covering the culture of various organisms (fishes, crustaceans and mollusks) that could have effects on the mangroves. Upon the recommendation of the 22<sup>nd</sup> SEAFDEC Program Committee in 1999, the Program was revised to focus on the effects of shrimp culture on mangroves and was placed under the FCG collaborative mechanism.

Thus, starting in early 2000 the Program on the Promotion of Mangrove-Friendly Shrimp Aquaculture in Southeast Asia: Mangrove-Friendly Shrimp Culture Project was implemented giving due focus on shrimp and adopting the major approaches, namely verification and pilot demonstration, research, training, and information dissemination.

The improved practices in shrimp culture in Thailand and in the Philippines served as basis for the technology verification and demonstration activities. These experiences were documented in the form of state-of-the-art manuals.

## MANGROVE-FRIENDLY SHRIMP CULTURE PROJECT

The Mangrove-Friendly Shrimp Culture Project (MFSCP) aims to develop sustainable culture technology packages on shrimp farming that are friendly to mangroves and the environment, and to disseminate such packages to the region through actual demonstration and training. MFSCP includes verification and pilot demonstration, research, training and information dissemination activities. Verification and pilot demonstration have been conducted in Thailand, the Philippines, Vietnam, Myanmar, Cambodia, and Malaysia.

Research activities have been conducted at AQD to further refine mangrove-friendly shrimp culture technologies that have been carried out by AQD as well as in other countries such as Thailand. Training sessions which are either formal session at AQD or on-site in specific countries have been programmed in order to hasten the transfer of developed technologies. The training sessions include practical work and field visits to successful mangrove-friendly shrimp operations. In addition, skills development sessions have also been conducted at the pilot project sites. As part of information dissemination, manuals and other information materials have been published and disseminated to the region. The Manual on *Best Management Practices for Mangrove-Friendly Shrimp Farming*, published in 2003 is being translated into major languages in the region. In order to assess the extent of implementation of the Project, seminar-workshops have been convened by the Project. Reports on the seminar-workshops have been submitted to the SEAFDEC and ASEAN member countries. A mangrove webpage, [www.mangroveweb.net](http://www.mangroveweb.net) has been operational since 2001. The webpage includes information about the Project, mangroves in general and mangrove resources in the region as well as some information on shrimp culture. Initial report on the project was presented during the Regional Seminar-Workshop on Mangrove-Friendly Shrimp Aquaculture held in Bangkok, Thailand in June 2003.

## VERIFICATION AND PILOT DEMONSTRATION



### **Philippines: verification and refinement of intensive shrimp culture techniques**

Activities to verify and demonstrate the low/partial discharge and closed recirculating systems for environment-friendly shrimp farming in different climatic and environmental conditions in the Philippines will be continued until the end of the Project in March 2005. The project sites are located at AQD's Dumangas Brackishwater Station, BFAR Demonstration and Training Centers (Batangas, Bohol, Lanao del Norte), and in ponds of the private sector.

### **Songkhla, Thailand: Integrated Physical and Biological Technologies for Water Recycling in Shrimp Farms**

Activities to evaluate the Integrated Physical and Biological Technologies for Water Recycling in Shrimp Farms were implemented at the Coastal Aquaculture Research Center in Songkha, Thailand.





### **Chantaburi, Thailand: Impact Assessment of Seawater Irrigation System for Intensive Shrimp Farming**

Activities to assess the impact of the Seawater Irrigation System for intensive shrimp farming were implemented at the Kung Krabaen Bay Fisheries Development Study Center in Chantaburi, Thailand.



### **Surat Thani, Thailand: Assessment of effluents from shrimp farming in mangroves and coastal resources (commercial scale)**

This study was originally implemented in Phuket, Thailand. However, due to the new focus of the site in Phuket, the study was transferred to Surat Thani and the focus is on the commercial scale shrimp farming.



### **Vietnam: Verification of semi-intensive shrimp culture techniques**

Activities to adopt semi-intensive shrimp farming were conducted in Cat Hai District, Hai Phong, Vietnam, until 2003. Selection for another site in southern Vietnam was undertaken.

### **Myanmar: Verification of semi-intensive shrimp culture techniques**

Activities to adopt semi-intensive shrimp farming were conducted in Kyauktan, Yangon, Myanmar.



## Cambodia: Verification of semi-intensive shrimp culture techniques

The technology validation run was conducted using a privately owned 1.0 ha pond located at Kabalromeas, Tropiang Saingke Commune, Kompot, Cambodia. The activity was however, aborted in March 2004 because of technical constraints.



The Project's Pilot Demonstration Site in Cambodia

## Malaysia: Verification of semi-intensive shrimp culture techniques

Activities to adopt semi-intensive shrimp farming at Johor Bahru, Malaysia was conducted from September 2004 to March 2005.



## RESEARCH

### Nutrient cycles in intensive shrimp ponds

Conducted at AQD's Dumangas Brackishwater Station in the Philippines, the activity studied the nutrient dynamics, environmental impacts and waste inputs resulting from an integrated closed recirculating intensive farming system. A quantitative estimate of the physical and biological processes of nutrients from shrimp ponds versus treatment ponds has been established.



### Capacity of mangroves to process shrimp pond effluents

The performance of constructed mangrove wetland (CMW) and natural and impounded mangrove wetland (IMW) in treating aquaculture waste was evaluated. Results provided evidence that mangroves can remove significant levels of nitrogen and solid wastes from shrimp pond effluents.

### Evaluation of probiotics and waste digesters used in the grow-out of tiger shrimp, *Penaeus monodon*

The study aims to assess the use of waste digester to progress mineralization or bioremediation and probiotics for bioaugmentation and control of luminous bacteria.

### Economic studies on mangrove-friendly shrimp farming

#### (1) Philippines



ment-friendly shrimp farming in mangrove  
es and improvement of mangrove functional  
stems for intensive culture and bio-filtering  
ed to contribute to the knowledge of policy  
systems.

mangrove or environment-friendly shrimp  
ation on the effectiveness and benefit to the  
pared with other shrimp culture farms in the

## TRAINING

### Formal and On-site Training

Training sessions, either formal at AQD's Tigbauan Main Station in Iloilo, Philippines or on-site in specific host countries, are conducted in order to hasten the transfer of developed technologies. The training sessions at AQD include practicals on actual pond grow-out culture at AQD's Dumangas Brackishwater Station also in Iloilo, Philippines as well as field visits to successful mangrove-friendly shrimp operations. In addition, skills development sessions have also been conducted at the pilot project sites, to disseminate the technologies developed to the local communities near the pilot project sites.

Four formal training sessions have been conducted under the MFSCP. The first session was from 17 September to 5 October 2001 with 9 participants from ASEAN member countries. The resource persons were from the Department of Fisheries of Thailand and from AQD. A field trip to various project sites in Thailand was conducted with the collaboration of the Department of Fisheries of Thailand. The second session was conducted from 7 July to 27 August 2002 with 10 participants. The resource persons were from the Department of Fisheries of Thailand and from AQD.

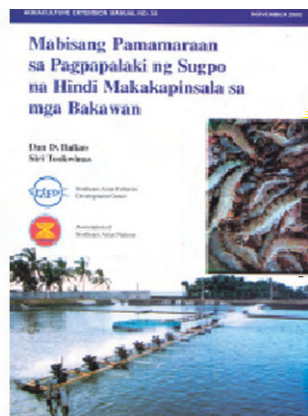
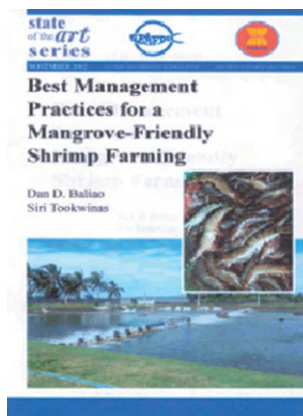
The third formal training session was on 23 October-11 November 2003, with nine participants with resource persons provided by AQD. The fourth session was conducted from 21 October to 9 November 2004 with eight participants from Cambodia (1), Indonesia (1), Philippines (2), Malaysia (1), Myanmar (1), Thailand (1), and Vietnam (1).

On-site training sessions on mangrove-friendly shrimp aquaculture have also been conducted in Hai Phong, Vietnam in 2001; in Yangon, Myanmar in 2002; in Binh Dinh, Vietnam December 2004; and in Sihanoukville, Cambodia also in December 2004.

Workshops have also been conducted in order to monitor and assess the progress of activities of the Project: the Planning Workshop on Mangrove-Friendly Shrimp Culture Project, Iloilo City, Philippines, 12-13 May 2000; Mid-Project Workshop on Mangrove-Friendly Shrimp Culture Project, Bangkok, Thailand, 3-4 September 2001; Regional Seminar-Workshop on Mangrove-Friendly Shrimp Aquaculture, Bangkok, Thailand, 24-27 June 2003; and the Regional Technical Consultation for the Development of Regional Code of Practice for Responsible Aquaculture in Mangrove Ecosystems, Tagbilaran, Bohol, Philippines, 25-27 August 2004.



## INFORMATION



### Translation of Manual on Best Management Practices for Mangrove-friendly Shrimp Farming

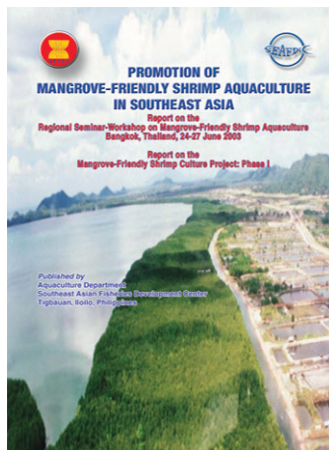
Translation of the Manual into Bahasa Indonesia, Filipino, Thai, Vietnamese, and Burmese was started in late 2004. Translation of the Manual into Khmer is also being considered.

## Promotion of Mangrove-friendly Shrimp Aquaculture in Southeast Asia

Published in February 2004, the publication includes: (1) Report on the Regional Seminar-Workshop on Mangrove-Friendly Shrimp Aquaculture (Bangkok, Thailand, 24-27 June 2003); and (2) Report on the Mangrove-Friendly Shrimp Culture Project (Phase I).

### Mangrove website

The mangrove webpage, [www.mangroveweb.net](http://www.mangroveweb.net) has been in operation since 2004.



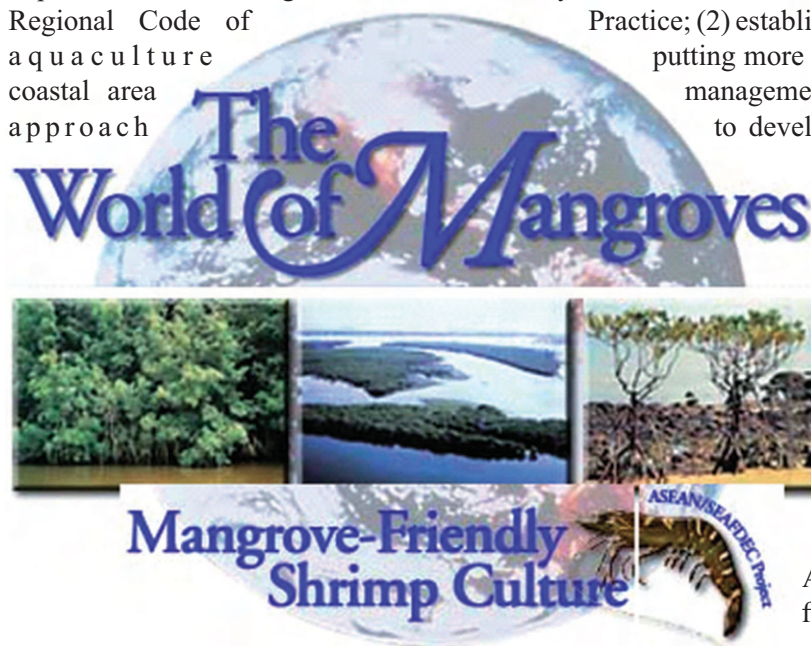
### Other information materials

Other information materials on mangrove-friendly aquaculture (to be compiled as Information Tips) are being produced.

## FUTURE ACTIVITIES

### Regional Technical Consultation for the Development of the Code of Practice for Responsible Aquaculture in Mangrove Ecosystems

The Regional Technical Consultation for the Development of the Regional Code of Practice for Responsible Aquaculture in Mangrove Ecosystems was convened by AQD in order to: (1) come-up with the draft Regional Code of Practice; (2) establish legal framework for the use of non-land based putting more emphasis on the integration of aquaculture into management; and (3) develop strategies for an integrated to development and sustainable use of aquaculture in mangroves and other aquatic ecosystems.



The forty-one participants representing the SEAFDEC-ASEAN Member Countries and regional organizations as well as from SEAFDEC in the Regional Technical Consultation are expected to work together to come up with the final draft Regional Code of Practice for Responsible Aquaculture in Mangrove Ecosystems. The first draft developed during the Consultation has been circulated to the SEAFDEC and ASEAN member countries for comments. The final Code will be published in mid-2005.

### Other Activities

Other Project activities shall mostly be wrapping up of the ongoing activities until mid-2005. In addition, the final Regional Code of Practice for Responsible Aquaculture in Mangrove Ecosystems will be printed, and the End-of-Project Workshop is planned to be convened in mid-2005.