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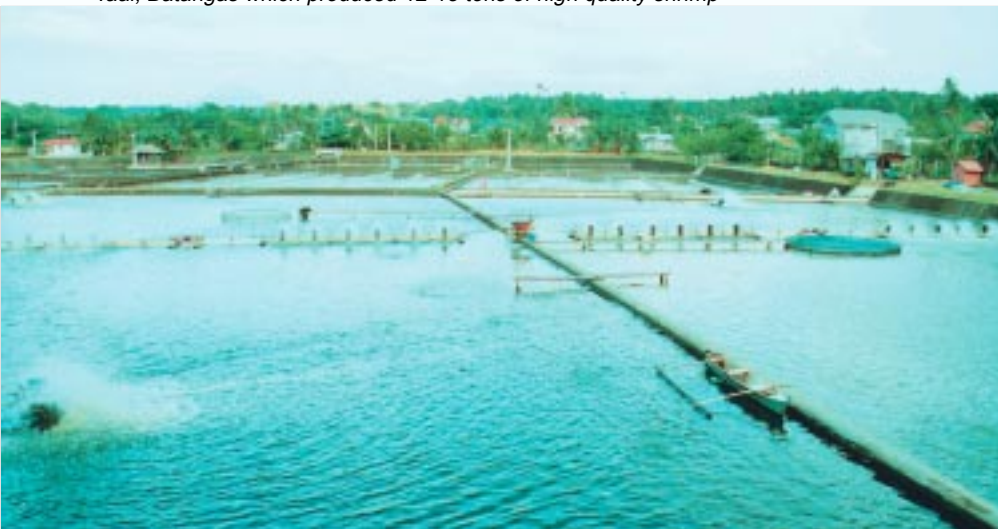
Shrimp: 1 problem, 4 solutions

A P30 billion industry, direct employment to some 180,000 Filipino voters. This is the tiger shrimp industry in the Philippines, which is feeling hopeful these days as it assembles its stakeholders again after four years. (The last shrimp congress was held in Iloilo City in 1998). There had been one problem, shrimp farmers had no way to combat the diseases, specifically the more virulent strain of luminous bacteria spawned by self-generated pollution and irresponsible use of chemicals and antibiotics, that devastated their farms.

"It was impossible to produce the tiger shrimp *Penaeus monodon* and come out a winner," says a farmer. "We had to downsize our family shrimp operations in 1996, and let go of the best trained people in shrimp production." That was then. Things have changed. R&D institutions have field-validated and packaged environment-friendly shrimp farming techniques. Progressive fishfarmers have similarly tried their own solutions.

In July's *Shrimp Congress 2002* in Bacolod City attended by nearly 500 industry players, workable solutions were presented and discussed. What were these?

The SEAFDEC/AQD environment-friendly shrimp techno-demonstration farm in Taal, Batangas which produced 12-15 tons of high quality shrimp



□ **ENLISTING TILAPIA TO COMBAT SHRIMP DISEASE** As shown by SEAFDEC/AQD, FYD International and the Negros Prawn Producers Cooperative (membership controls some 3,000 ha), tilapia is raised in a separate headwater reservoir and inside the shrimp pond but enclosed with a net. AQD has verified that water from tilapia ponds consistently has zero or very negligible luminous bacterial count.

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Disease diagnosis using molecular biology or DNA-based techniques at SEAFDEC/AQD biotechnology laboratory



Introducing SEAFDEC's regional fish disease project

The Regional Fish Disease program of SEAFDEC, which implements the three-year project for the *Development of fish disease inspection methodologies for artificially-bred seeds*, is implemented by SEAFDEC/AQD under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) collaborative mechanism, with funding from the Government of Japan-Trust Fund.

The program was developed considering that aquaculture production in Southeast Asia (SEA) has grown rapidly over the past 10 years. However, this rapid and generally uncontrolled progress spawned infectious diseases that frequently threaten the sustainability of aquaculture in the region. Moreover, the safety of consumers has become an important issue when some aquaculture products were found to contain chemical residues like pesticides. Thus, it becomes urgent and necessary to develop disease control and monitoring systems for chemical residues in aquaculture products.

The project aims to promote disease-free aquaculture in SEA and healthy and wholesome trading of aquaculture products including seeds for aquaculture;

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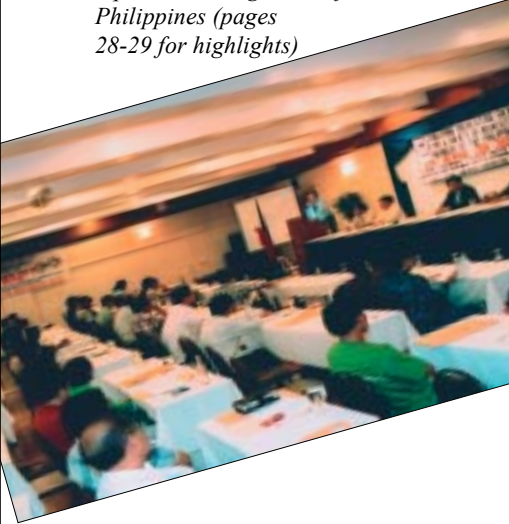
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The shrimp congress was held back-to-back with the meetings of the Philippine Aquaculture Society and the Society of Aquaculture Engineers of the Philippines (pages 28-29 for highlights)



Curious participants take a look at SEAFDEC/AQD's environment-friendly shrimp farm model at the exhibit. See also pages 7 and 8 for a summary of product presentations at the congress



Yep, during the field trip hosted by FYD for the participants to their farm south of Bacolod City, some tilapias were cooked! Tilapia harvest can augment income from shrimp

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Tilapias are omnivorous and filter-feed on the algae that bloom with organic enrichment, and when inside the shrimp pond consume the sludge which invariably form. In effect, they take out the excessive nutrients and maintain good water quality. Tilapia slime is also said to be bactericidal against luminous bacteria, Philippine shrimp's most recent killer, but the mechanism of how this is possible is not yet clear. However, AQD researchers have isolated bacterial, fungal and algal colonies from the "greenwater" of shrimp and tilapia, and found that some of the metabolites these isolates produce can inhibit *Vibrio harveyi*.

By whatever name this technology is known -- AQD calls it environment-friendly schemes or mangrove-friendly shrimp culture; FYD calls it TIPS or tilapia-water integration in prawn systems; and the Negros Prawn Producers Cooperative, "greenwater technology" -- it involves more than tilapia. Among others, there should be re-assignment of ponds (e.g. head and tail reservoirs); use of filter boxes; crop rotation (to break the life cycles of pathogenic organisms); biological pre- and post-treatment other than tilapia (use of probiotics, use of filamentous algae, oysters and mussels); long-arm paddlewheels, sludge collectors and substrates; and stocking of fry that have been checked for pathogens. The use of high quality feeds and the right feeding scheme are also important, and AQD, for the former, has successfully tested a less polluting formulation in tanks and ponds.

For queries on the technical aspect of this new technology, join *Aquafarmers' Corner* on the internet by visiting the AQD website at <http://www.seafdec.org.ph>.

□ DIAGNOSE SHRIMP DISEASE QUICKLY AND ACCURATELY DNA-based tests are much discussed, with the PCR used on fry to exclude from stocking those batches shown to have known viral killers like monodon baculovirus and most recently, the white spot syndrome virus (WSSV). One good news is that the Philippine government has put-up PCR-based laboratories all over the country: Cebu, Zamboanga, Cagayan de Oro, Davao, Iligan, Buenavista (Agusan del Norte), and Maribojoc (Bohol). This is in addition to existing units at AQD in Iloilo and in the BFAR central office in Quezon City. Eight more BFAR offices are programmed to receive PCR facilities. The government is also collaborating with UP Los Baños and the University of Hawaii to develop farm-based quick detection kit (dipstick method). Likewise, SEAFDEC has a regional fish disease project.

But a premium must be put on prevention. "Do not translocate shrimp from foreign countries," an expert emphatically advised. "Even if certified-free of known viruses, there could be other unknowns riding on it."

Lessons can also be learned from Japan's comprehensive prophylaxis strategy against viruses which include: (1) proper farm management (disinfect, maintain good water parameters, feed right), (2) use screened, virus-free stock, (3) use quick and accurate diagnosis (like PCR), and (4) administer immunostimulants, viral inhibitors, probiotics.

□ DEALING WITH MARKET REQUIREMENTS: FOLLOW THE CODE! The congress focused on antibiotic residues, noting, for example, that 300 parts per trillion (ppt) detection limit for chloramphenicol (CAP) has been settled by the European Com-

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mission based on current analytical methods. This is just one type of residue. What's a farmer to do?

Follow the government's "Code of Practice for Sustainable Shrimp Farming"! The Code guides and summarizes the primary environmental and social responsibilities of the aquaculture industry and recommends management practices. Good environments within and around shrimp farms mean decreased risk of diseases and non-use of therapeutic agents and other chemicals. And export-quality shrimp.

The Code is available from the Bureau of Fisheries and Aquatic Resources, and has been prepared in cooperation with SEAFDEC, Philippine Council for Aquatic and Marine Research and Development, and the Negros Prawn Producers and Marketing Coop, Inc. These institutions have signed a commitment to promote shrimp farming in the Philippines.

It should be noted that the UN's Food and Agriculture Organization wrote a global code for sustainable fisheries, SEAFDEC has regionalized it for Southeast Asia, and the Global Aquaculture Alliance has written one for shrimp farming. The latter is the blueprint of the Philippine code of practice.

The Code addresses the following issues: (1) guiding principles for responsible aquaculture; (2) mangroves; (3) site evaluation; (4) design and construction; (5) feeds and feed use; (6) shrimp health management; (7) therapeutic agents and other chemicals; (8) general pond operations; (9) effluents and solid wastes; and (10) community and employee relations.

□ PARTNERSHIP OF GOVERNMENT AND THE PRIVATE

SECTOR Filipino shrimp farmers want to emulate Thailand's and China's successes. Thai government support is crucial to their industry which is mostly family shrimp farms less than 2 ha in size. This support comes in the form of infrastructure, technology, diagnostic services and product promotion. China's recovery was mainly due to leaving their farms fallow for five years after disease devastation.

Not that the Philippine government and R&D institutes are not doing anything. They are. But shrimp farmers worry about financing and product promotion so much so that the Philippine National Shrimp Congress, registered as Philippine Shrimp Inc. (to cover all sectors), has discussed resolutions asking the government to:

- abolish the Power Purchase Adjustment because this increases the cost of production
- study the repackaging of Philippine shrimp as "green shrimp" and promote it in traditional and new markets like Europe
- venture into massive information dissemination on the principles of Global Aquaculture Alliance and environment sustainability, and give official acknowledgment to existing farms and production clusters that already observe the Code of Practice for Sustainable Shrimp Farming
- reevaluate the business viability of shrimp culture and to create new financial schemes for shrimp farming

- fully implement FAO Series 207, 2001 and its related laws and regulations which ban the importation of foreign shrimps (spawners, larvae, fry, juvenile or adult) as these could be carriers of pathogenic microorganisms and therefore pose a threat to the industry
- establish a regular program on extension, training, technology demonstration, equipment upgrading, and policy formulation to support the industry's development; the research and development direction will be formulated by both private and government sectors and the country's research institutes
- recognize PHILSHRIMP Inc. as the sole legitimate and official body to represent the industry in the country

The shrimp congress was held back-to-back with the meetings of the Philippine Aquaculture Society and the Society of Aquaculture Engineers of the Philippines. Both societies also urge closer partnership between private and government sectors. ###

INTRODUCING FISH DISEASE PROJ ... FROM PAGE 1

and develop standardized diagnostic methods for important diseases of aquacultured organisms in Southeast Asia and establish a surveillance system.

The project has the following components:

- Research to develop standardized diagnostic methods for the region, disease control husbandry techniques, and monitoring methods for residual chemicals in aquaculture products
- International workshop for the regionalization of the standardized diagnostic methods, as well as disease control husbandry methods
- Hands-on training on diagnostic methods for important viral diseases in the region
- Development of a surveillance system for disease problems in the region

The implementation of the project started upon the dispatch to AQD of a fish disease expert, Dr. Yasuo Inui, by the Government of Japan in 2000. At the start of the project, AQD solely conducted the research and development activities. However, to make the project more efficient and more relevant to the region, the Department of Fisheries-Thailand was asked to collaborate in the implementation of the project starting in 2001. The three agencies in Thailand involved in the project are Aquatic Animal Health Research Institute (AAHRI), Marine Shrimp Research Development Center (MSRDC), and Samutsakhorn Coastal Aquaculture Development Center (SCADC). Other agencies will also be invited to collaborate during the later part of the project, especially in the establishment of the regional network.

To date, the ongoing research subjects are the establishment and standardization of diagnostic methods, biology and pathogenesis of disease agents, disease prevention and control, and establishment of evaluation methods for residual pesticides in aquaculture products. The project had convened with Office International des Epizooties (OIE) a seminar/workshop on "Disease control in fish and shrimp aquaculture in Southeast Asia: diagnosis and husbandry technique" late last year. - CBL