# Realizing green aquaculture

By **AP Surtida**

The world population exceeds six billion and is still growing. Obviously, food security becomes a question. How do you feed the growing population when ocean catches seem to have reached their limit? The catch is declining for about a third of major commercial fisheries. Collapsing fisheries will directly hurt about a billion people, particularly in Southeast Asia.

Aquaculture, apparently, is the answer. Aquaculture now contributes 19% to total world fish production. It is growing at an extraordinary rate of 8.8% per year since 1986 compared to only 0.7% for capture fisheries production (Williams & Bimbao 1998).

For the Philippines, aquaculture has the highest annual growth rate with 5.42% followed by commercial fisheries (4.47%) and municipal fisheries (1.54%). As a result of aquaculture's contribution, total fishery production has jumped from 26.4% in 1988 to a high of 34.6% in 1997 (Yap 1999).

Aquaculture is on a roll. As management guru Peter Drucker predicted in a New York Times interview, the new century's most exciting industries will no longer be the Internet, but fish farming.

But with the growing global awareness and militance on environmental issues, aquaculture has been fingered as one of the culprits in environmental degradation, particularly the destruction of mangrove forests for shrimp farming. Aquaculture has been getting a bad name. But recently the industry struck back. A letter of the Global Aquaculture Alliance (GAA) to Fish Farming International (February 2000 issue) said they want to set the record straight with facts.

*Excerpts:*

"The UN World Commission on Environment and Development defines sustainable development as: meeting current needs without compromising the ability of future generations to meet theirs.

Not all environmentalists agree. Randal O'Toole of the environmental 'think-tank', the Thoreau Institute, divides the environmental movement in two: preservationists and conservationists.

Preservationists say 'nature knows best and should be preserved at any cost. Sustainability means 'no impact', so neither aquaculture nor any other system of food production has much growing room.

Conservationists are more realistic. Their goal is to maintain ecosystems through collaborative management by public and private stakeholders at a local level.

Clearly, aquaculturists are also conservationists. In most areas, water rights are publicly held, and access to space requires farmers to engage in a permitting process.

Regardless of their leanings, environmental groups make an important contribution by alerting the public to risks. However, as they proliferate and compete for public attention and funding, they tend to reduce facts to 'soundbites'."

*On the assertions that shrimp farms pollute and destroy habitats, GAA answers*: "To the consumer, pollution conjures up visions of smoke stacks, toxic waste, etc. But shrimp farm waste is natural algae and organic matter: neither toxic nor illegal."

*On the assertion that it destroys habitat, GAA says:* "This refers to mangroves. Early shrimp farmers were actually encouraged by governments to tap mangrove areas, but they soon learned that the poor drainage and acidic soils were not well-suited for pond construction.

"It is far better to build farms on higher ground and leave man-

*A typical semi-intensive pond is sited above the mangrove area; R&D institutions are improving wastewater management so it won't negatively impact the downstream mangrove areas*

grove areas intact to help recycle discharge and protect farms from erosion and storms. Shrimp farmers recognize their value and are leading mangrove conservationists.

"In Honduras for example, high altitude imaging shows that the area of mangroves in the vicinity of shrimps farms actually increased in the last 10 years."

*On the allegations that the Indian government ordered 100 shrimp farms to close - GAA answers:* "This is misleading. In 1995, shortly after shrimp farming began in India, a kind of shrimp disease began passing through many farms. In 1996, the Indian Supreme Court ruled to close all shrimp farms within 500 meters of the high-tide line.

However, the decision was later stayed before it could take effect. The government proposes to introduce an aquaculture bill with environmental safeguards for sustainable development. Meanwhile, the farms are learning to manage the disease, and production has increased to 70,000 tons a year."

The GAA advises aquaculturists to recognize the need of seafood buyers and consumers to be better informed. From an environmental perspective, aquaculture dovetails with conservations goals more than any standard agricultural practices.

The GAA's beef against environmental groups is that they tend to exaggerate the facts and appeal to emotion and that their soundbite judgements are not supported by facts.

While nature's integrity continues to be compromised in many areas throughout the world due to urbanization and rapid increases in population and industrialization, more governments are reconsidering and restoring various ecosystems, including tropical rain forests, mangrove forests and wetlands.

In Southeast Asia for example, wherein top aquaculture-producing countries are situated, governments are coming-up with mangrove-friendly shrimp culture technology.

For one, the SEAFDEC member countries are initiating shrimp culture practices which can be considered friendly not only to mangroves but also to the environment in general.

In the face of existing realities, SEAFDEC redefined mangrove and mangrove-friendly: Mangrove should refer not only to the trees but also to the biota generally associated with a mangrove ecosystem which includes the various organisms which make the mangrove as their habitat for part or all of their life stages.

Mangrove-friendly should refer to practices which have no adverse impact on the mangrove ecosystem from the development up to the operation stage.

In the case of existing shrimp farms which are already built on mangrove areas, being mangrove-friendly should mean that its continued operation should not further affect any existing mangrove negatively and that such farms take positive steps towards mangrove restoration particularly along the shoreline or river banks.

A project which SEAFDEC has started in April 1998 and to run until December 2002 (titled "Development of mangrove-friendly shrimp culture technology") has the primary objective of developing sustainable shrimp culture technology packages. SEAFDEC will conduct research and verification runs on this project.

The research areas will include the following: nutrient cycles of both semi-intensive and intensive shrimp farming; the use of "green water" (microbial/phytoflora); capacity of mangroves to absorb nutrients; and use of probiotics or bioaugmentation.

The technology generated will be disseminated through regional training programs. Position papers will be provided to member governments on policies and regulations to make shrimp culture environment-friendly.

In the Philippines, the government professes a new sensitivity to ecological issues and this hasn't gone unnoticed. In the October 4, 1997 issue of *New Scientist*, Clive Wilkinson, coordinator of the Global Coral Reef Monitoring Network writes: "Poor villages in southern Philippines have set aside some 25 percent of their reefs as protected reserves. The US, on the other hand, designated only 5 percent of the whole Florida mangrove/reef tract. For them, the idea of reserves flies in the face of the 'right to carry a spear gun and go fishing anywhere.'"

And if it's any indication, witness these Mangrove Forest Management Laws Rules and Regulations - Provisions of P.D. 705 as amended otherwise known as the Revised Forestry Code of the Philippines.

•Conversion of mangrove areas into fishponds. Conversion of thickly vegetated mangrove areas into fishponds *shall no longer be allowed.* All mangrove swamps released to the Bureau of Fisheries and Aquatic Resources (BFAR) which are not utilized, or which have been abandoned for five (5) years from the date of such release shall revert to the category of forest land in accordance with existing laws and regulations.

• Prohibition in the issuance of license and permit. The granting and renewal of mangrove timber license or permit of any kind that authorizes the cutting or debarking of trees for commercial purposes in areas outside the coverage of the Fishpond Lease Agreement (FLA) and mangrove plantation shall no longer be allowed.

And more laws -- Sec. 47 of Article III, Philippine Fisheries Code of 1998 (RA 8550):

• A code of practice for aquaculture shall be established. This will outline the general principles and guidelines for environmentally-sound design and operation to promote the sustainable development of the industry. Such code shall be developed by the Department of Agriculture (DA) through a consultative process with the DENR, the fishworkers, FLA hold-

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water and fuel.

Before a product is placed inside cold storage facilities, it has to go through contact plate freezing. According to Engr. Elmer Figuracion, chief of the Ice Plant and Refrigeration Divison, the procedure charges P2,800 per freezing cycle of about 3-4 hours. When the inner body temperature of the product drops to a range of about –18°C to -40 °C or lower, this may now be transferred to the cold storage area which charges about P1,988 per $m^2$ per month. The facility consists of two rooms each capable of storing 250 metric tons at –35°C. Engr. Figuracion noted that with the decline of the prawn industry, the facility is not as fully occupied as it should be. While the first room is exclusively for marine products; the second is rented out to distributors of poultry and meat products.

The processing zones, on the other hand, are divided into two: open (uncovered) space which is rented out at P20 per $m^2$ per month and covered space, at P90 per $m^2$ per month. The engineer mentioned four processing plants operational at this time.

We had a chance to tour the facility of one such plant: AFI, which also has offices in Cebu and Tagig in Metro Manila. AFI is a fish processing and exporting company that specializes on Japan-bound *aso-os* fillets. It gets its fish mainly from Estancia and Banate fishers. After scaling and cleaning, the fish are packed and block frozen at 550 g each.

This is but a brief prologue to the long account that constitutes the story of the fish trade industry. But one really interested in aquaculture should not be content with just this mere introduction. Aside from knowing how to farm his products well, he should also know how to market them successfully. He should don a pair of rubber sneakers (or slippers) himself and get out one day, to savor the smells, the sights, the sounds of the very wet and squishy fish market. ###

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ers, fishpond owners, fisherfolk cooperatives, small-scale operators, research institutions and the academe, and other potential stakeholders. DA may consult with specialized international organizations in the formulation of the code of practice.

At least in the Philippines, the future of aquaculture looks green. But to really make an impact in the greening of our planet, the governments of both developed and underdeveloped nations should strive to stamp out poverty globally.

As the late Indira Gandhi at the first Earth Summit in Stockholm said: "Poverty is the greatest polluter. Poor people in developing countries contribute to ecological destruction through everyday practices such as firewood burning. They are not being malevolent, they are simply living off the cheapest resources available.

"Galloping poverty is a global challenge, not just one for developing nations. Everything is interconnected these days - the rich, the poor, the environment and the economy."

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make a profit. In other words, before production, know your market wherein profit is certain and impressive.

**7. Failure to provide for behavioral and environmental needs of the fish.** Usually, livestock are kept safe, warm, and comfortable. But aquaculture farms seldom take care of aspects such as presence of too much noise, rough and unnecessary handling, and unsuitable water temperature. Seldom noticed, these factors are usually causes of poor growth, low conversion ratio, low resistance to disease, and poor survival.

**8. Lack of business experience.** Again, experts agree that well meaning owners who are hardworking and well-trained as fisheries biologists are seldom competent to meet the normal problems of management of a business. ###