Whither aquaculture?

Aquaculture is reputed to be the fastest growing food production sector in the world. The total world fish production from capture fisheries is projected to plateau at 60 million tons by the year 2000. With the estimated world population growth rate of 2.0%, an increasing demand for fishery products is likely to continue. The consequent shortfalls in the global supply of fish is expected to be produced by the aquaculture sector.

The world aquaculture production more than tripled by weight from 10.4 million to 34.1 million tons, and by value from US$13.1 to 46.5 billion between 1984 and 1996. In the Philippines, aquaculture production in 1997 reached 957,546 tons valued at PHP 27.4 billion. Aquaculture's contribution is approximately 35 percent of the total fisheries production in the country and has been steadily increasing over the last ten years (Figure 1, page 32). The Philippine population has an estimated annual per capita consumption of 29-36 kg.

Taking into account the projected post harvest losses of 30%, and the inclusion of fishery products that are not directly consumed as food (e.g., seaweed), even the projected total fish production of 3.424 million tons by year 2004 may not be sufficient to meet the demands of the growing population.

Aquaculture, with a projected growth of 8.7% per year is expected to contribute 42% to the total fish production target by 2004 (Figure 2).

In the past, aquaculture development in the Philippines and the region, while augmenting the food supply, also became an environmental menace, largely because resource management was not included in the overall production scheme. There is, therefore, a need for a paradigm shift to ensure that production is both profitable and sustainable. At the same time, the industry must continue to improve culture systems and culture strains, and develop techniques for the cultivation of other aquaculture species, to survive intense competition in the global market and to attain the food security agenda of the government.

The National Integrated Research Development and Extension Program (NIRDEP) has put in place a research development and extension (RDE) program in aquaculture for the period 1999-2004. The responsible agency is the Aquaculture RDE Network composed of state colleges and universities of fisheries (the Institute of Aquaculture and the Marine Science Institute, both of the University of the Philippines System; the Freshwater Aquaculture Center of the Central Luzon State University; Mindanao State University at Naawan) and the Bureau of Fisheries and Aquatic Resources.

CONTINUED ON PAGE 32, INSIDE

SEAFDEC

Better life through aquaculture

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SEAFDEC
Aquaculture
Department
P.O. Box 256
Iloilo City 5000
Philippines

E-mail:
devcom@aqd.seafdec.org.ph/

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Agrikulturang MakaMASA
Makapagbagong Programa Tungo sa Masaganang at Maunlad na Agrikultura at Pangisdaan

SEAFDEC Aquaculture Department supports the Philippine government's ***Agrikulturang MakaMASA*** *program. This is the banner program of the Estrada Administration for modernizing the agriculture sector.*
The goals of the program for the fisheries sub-sector are: (1) food security through sustainable development and management of fisheries resources; (2) socio-economic upliftment of subsistence fisherfolk; and (3) fisherfolk empowerment. The program components are as follows:

- **fisheries production**
- **conservation and management**
- **fisheries training and extension services**
- **fisheries information and marketing support**
- **research and development in fisheries**
- **fisheries infrastructure**
- **rural finance for fisheries**
- **program organization and management for the fisheries sector**

WHITHER AQUACULTURE? *CONTINUED FROM THE BACK COVER ...*

Aquaculture network RDE program (1999-2004)

Improvement of aquaculture systems
- Breeding and seed production
- Health management
- Efficient feeds and feeding strategies
- Bio-physical systems and engineering design

Development of improved strains and new species for aquaculture
- Genetics and biotechnology
- Culture management technologies

Reduction of environmental impacts of aquaculture
- Development of water quality and food safety standards
- Assessment and evaluation of impacts of aquaculture practices on the environment
- Development and evaluation of environment-friendly aquaculture practices

Establishment of database for aquaculture resources
- Inventory of aquaculture resources
- Valuation of aquaculture resources

Formulation of appropriate regulations and policies for aquaculture
- Impact assessment studies of the aquaculture industry
- Policy analysis concerning aquaculture industry

Extension
- Production of information, communication and education (IEC) materials
- Training/upgrading of aquaculture manpower
- Establishment of technology-demonstration farms
- Pilot testing and verification

The projected aquaculture production target of 663,000 mt by 2004 (see Table 1) for finfishes and crustaceans may prove highly optimistic unless the problems affecting the industry are addressed.

Last February 10, the University of the Philippines Visayas (UPV), during its Fisheries Week hosted a round table discussion on fisheries in the coming millennium and invited stakeholders in the industry to participate.

Dr. Crispino Saclauso, director of the UPV Institute of Aquaculture and technical team leader of NIRDEP for aquaculture, presented a situational report, as well as future projections for the industry (the essence of his message is the subject of this article) during the said conference.

At a later date, SAA visited with him to gather additional information on the aquaculture situation of the country.

"We can actually increase production not in terms of area, but in terms of improving aquaculture technologies," he remarked, noting that the destruction of mangroves in the past to make way for aquaculture ponds has created pitfalls, directly or indirectly, for the fisheries situation in general.

"While some farmers are producing 3 mt/ha/yr, others are only producing 500-800 kilos, averaging that, that's only about 1.2 mt/ha/yr (reported statistic for 1995)." He also cited a BFAR report that said that out of 239,000 constructed fishponds in the Philippines, about 96,000 ha (or 40%) is unproductive. Thus, it is most proper to dispense with unprofitable aquaculture methods and instead, find ways to develop already existing ponds using high yielding and yet environment-friendly techniques.

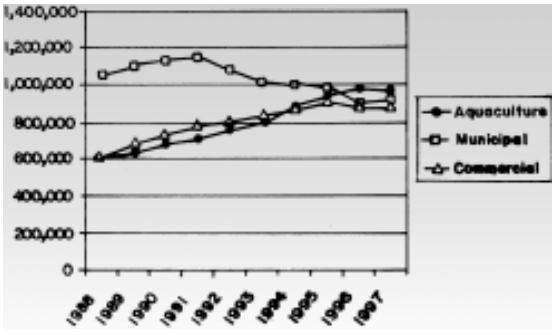
He also noted that there are available areas for limited expansion: marine open water system for fish cages and pens. Citing from the Fisheries Code he said that cage and pen structures, should not take up more than 10 percent of the municipal waters in any given area.

Some questions on issues concerning industry directions were raised by Dr. Saclauso.

The moral issue on how important, how safe are genetically modified organisms. What will their effects be, in terms of modifying the genetic pool of indigenous species of organisms?

How safe are our interventions? "The reason why we have a lot of diseases is because we don't put into perspective the significant role environment plays in the production system. We have been dumping a lot of things into the environment without really knowing the consequences of inputs that we've been throwing into the system-e.g. bioremediation-it's not a question of whether the person could do it, it's a question of whether the person knows the consequence of what he did. What we usually do when we encounter problems is come up with remedial measures-but we don't know the effects of remedies that we offer in terms of overall intervention in the ecosystem. What we see, in probiotics, for instance, is improvement of prawn production at the end of the culture period. We don't know the other actions of probiotics in the system-we don't know how safe was our intervention."

Figure 1. Fish production trend by sector, 1988-1997



Dr. Crispino Saclauso, head of the Institute of Aquaculture, UP - Visayas

His advice for would-be aquaculture investors?

"I think they should first examine what all these things are about. They should not just embark on aquaculture without understanding the intricacies of the business.

"Some think there is money in fisheries, but they don't understand the intricacies of the business, so they fail. Others put up facilities in areas not suitable for aquaculture, so again, they fail...

"It's just a matter of infusing practical plans for something that you thought about and always bearing in mind the importance of protecting the resource base on which aquaculture depends." **-- By NJ Dagoon**

Figure 2. The Philippines' targetted total fish production divided by sectors in 2004 (a consolidation of NEDA and BFAR figures)

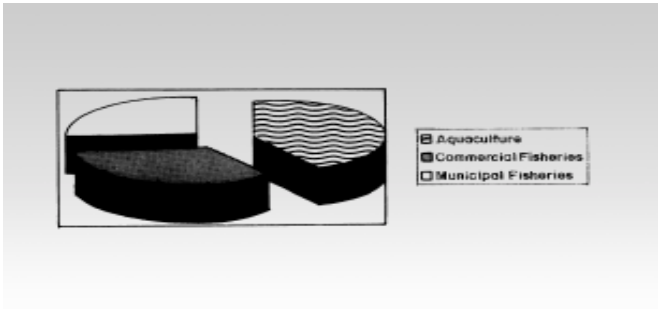


Table 1. Projected aquaculture production, 1999-2004

Culture system / species	Highest production attained (year)	Actual		Projected					Growth rate
		1997	1999	2000	2001	2002	2003	2004	
Brackishwater fishpond									
Milkfish	214,000 (1991)	147,000	160,524	175,292	191,419	209,330	228,788	250,000	11.20%
Shrimp	90,000 (1994)	40,000	46,600	54,289	63,247	73,682	85,840	100,000	20.00%
Tilapia	14,000 (1991)	6,000	7,980	10,613	14,116	18,774	24,969	33,000	33.00%
Freshwater									
Tilapia	48,000 (1992-93)	39,000	44,538	50,862	58,085	66,333	75,452	86,000	14.20%
Carp	0.53 (1992)	0.29	0.55	1,039	1,965	3,713	7,018	13,000	89.00%
Fish cage, pen									
Tilapia		43,000	49,106	56,079	64,042	73,136	33,522	95,000	14.20%
Milkfish	82,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	0.00%
Marine cage									
Milkfish		1,500	2,020	5,302	9,967	16,738	85,227	66,000	13.00%
SUBTOTAL	448,000	296,500.29	330,768.55	373,476	422,841	481,706	560,816	663,000	14.33%
Seaweeds	631,400 (1996)	627,000	644,180	661,830	679,964	698,596	717,737	731,500	2.74%
Oyster-mussel	43,400 (1993)	30,000	30,000	30,000	30,000	30,000	30,000	30,000	0.00%
TOTAL	1,122,800.53	953,500.29	1,004,948.55	1,065,306	1,132,805	1,210,302	1,308,553	1,424,500	16.98%