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Milkfish culture in the Philippines

Aquaculture Department, Southeast Asian Fisheries Development Center

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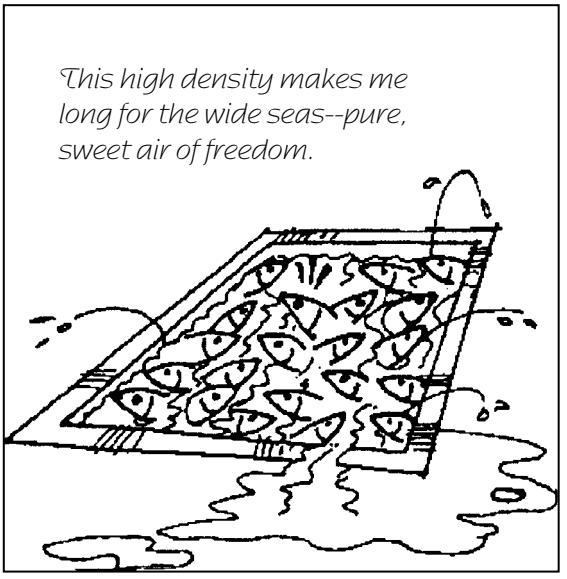
Milkfish culture in the Philippines

Milkfish farming is a centuries-old tradition that can be regarded as the backbone of Philippine aquaculture. Of the over 200,000 hectares of brackishwater ponds, more than half (about 114,000 ha; see p. 18, this issue) are milkfish ponds. In 1993, the Department of Agriculture estimated a total yield of about 250,000 metric tons of milkfish. In comparison, tilapia yield -- the second most important produce -- is less than half that of milkfish.

Fish and fishery products are the most important protein source in the Filipino diet. Per capita consumption is about 40 kilograms per year compared to 17 kg per yr for all other meats. But there is alarming evidence that capture fisheries can not sustain its present production because of indiscriminate fishing activities and pollution. Aquaculture, which supplies 30% of fish produce, would have to play a bigger role.

There is little prospect in expanding the brackishwater farming area without sacrificing our mangrove resources. Milkfish farms, therefore, will move towards high-density culture systems. (The term "high-density culture" refers to any or all culture systems other than traditional or extensive. Please refer to upper table next page.



Note that each culture system differs significantly in production cost, productivity, and profitability.)

High-density systems entail augmenting food supply and maintaining the desired water quality. These measures increase production cost (lower table, next page). The choice of production system depends on technical and economic factors.

Until the late '80s, high-density systems were not economically attractive to farmers. In 1987, research conducted at the University of the Philippines' research center in Leganes, Iloilo successfully demonstrated the technological and economic feasibility of raising milkfish at grow-out densities of 7,000-12,000 fingerlings per hectare. (The modifications by SEAFDEC/AQD of the traditional method fall under modified extensive and semi-intensive systems; pages 9-15, this issue.) By the late '80s a number of private companies have made initial gains in raising the stocking density to 10,000-20,000 per ha with infusion of Taiwanese intensive culture methods. Since then, technology has evolved and progressed rapidly. Many commercial farms are now operating at densities of 20,000-30,000 per ha.

An important catalyst to the industry's expansion is the improved market price of milkfish which made the use of feeds economically viable to farmers and commercially attractive to feed manufacturers. Much of the industry's remarkable progress can be attributed to the growing number of experienced shrimp farmers that are shifting to intensive milkfish culture due to the widespread disease problems in cultured shrimp.

Are high-density systems sustainable? They could be, if pitfalls from the rise and fall of the tiger shrimp culture are avoided.

Excerpted from **Technical and economic considerations in high-density milkfish culture** by P.S. Cruz. Paper presented at the Annual Meeting of the Society of Aquaculture Engineers Philippines, Inc. 1995. Iloilo City. The article is part of a book to be published by Kabukiran Enterprises, Inc., Davao City. For more information, contact: P.S. Cruz, Prominence Inn, 158-C, Singcang, Bacolod City.

Important management differences between traditional and high-density culture systems

Culture system	Optimum stocking density/ha	Biomass yield/ha/ crop (kg)	Food supply	Water quality management
Traditional or extensive	2,000-3,000	700 1,000	exclusively natural food	tidal, with a water depth 50 cm or less
Modified extensive	4,000 6,000	1,000-2,000	mainly natural food with supplemental energy-rich feed	tidal, with a minimum water depth 80 cm
Semi-intensive	8,000-12,000	2,000-4,000	mainly protein-rich feed with some natural food	tidal, with supplemental pumping and a minimum water depth 100 cm
Intensive*	>20,000	4,000-12,000	exclusively complete feed	pumping with aeration and a minimum water depth 120 cm

*Coastal farms appear to be better suited for high-density culture than inland estuarine farms. Recent experiences in coastal ponds utilizing pure seawater show that acceptable weight gains of 3-5 grams per day are attained, contrary to the common belief of poor growth under saline conditions. (The Department of Agriculture was successful in demonstrating milkfish culture in marine pens. Refer to AFN March-April 1992. - Ed.)

Typical measures for increasing pond carrying capacity through water quality management

Management measure	Approximate fixed cost per hectare	Effect on productivity
Increase efficiency of water change by increasing gate width, providing separate drain, and improving position of gate	P15,000-30,000	increase by 20-30%
Increase pond water volume by deepening the pond	P40,000-50,000*	increase by 30-50%
Increase pond water volume and capacity for water exchange with the use of a pump	P15,000-25,000**	increase by 100-300%
Increase pond water volume and capacity for water exchange with a pump, and augment DO supply with aerators	P115,000-125,000***	increase by at least 600%

* Cost for deepening from 50 cm to 70-80 cm

** Assuming no dike heightening necessary and a pump cost of P150,000-200,000 for a 10 ha area

*** Assuming two diesel powered aerators at P50,000/unit in addition to the pump.