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Socioeconomics of tilapia culture in Asia

By Renato Agbayani

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An FAO-commissioned review of some 700 publications, from the late '70s to 1997, on the socioeconomics of aquaculture in Asia-Pacific shows that tilapia is the second (shrimp is first) most-studied aquaculture commodity (Agbayani et al 1997). The studies proved that tilapia culture has contributed significantly to the region's food security and employment generation.

Tilapia took some time to be accepted as table fish. Muddy taste, unappealing color, and stories about it being bred in unsanitary waters are among the reasons why tilapia was initially shunned. But the introduction of more palatable species (*Oreochromis niloticus*) and development of better-tasting and faster-growing strains (e.g., Genetically Improved Farmed Tilapia or GIFT) and low prices eventually paved the way for acceptance. Starting in the 1980s, demand for tilapia has increased.

In 1995, Asian farmers produced 650,000 tons of tilapia and other cichlids, or 4.1% of the region's total aquaculture production (FAO, 1996). Tilapia has become a preferred species for monoculture or polyculture with other freshwater species in freshwater and brackishwater ponds and lakes, and for integrated fish farming systems.

In the Philippines, the introduction in the 1970s of *O. niloticus* resulted in the rapid development of the tilapia industry and in the consequent decline of tilapia prices by 20% (Escover 1987; Bimbao and Smith 1988).

Hatcheries have proliferated along the lakes of Laguna and Rizal provinces. Yater and Smith (1985) analyzed the hatcheries' economic viability and Escover (1987) studied their impact on rural households, labor utilization, seasonal variations and sources, and costs-and-returns.

The profitability of tilapia cage culture in Laguna Lake has been proven by the studies of Aragon et al (1985), Gonzales (1994) and Guerrero (undated), and in Mindanao by Oliva (1985). There are significant differences, however, in the production and economic parameters (labor use, costs, incomes) depending on the farm size, integration of operation (some farmers have their own hatcheries), and use of non-cash labor. Among the problems that gravely erode the profitability of tilapia farming are poaching, lack of or insufficient capital, lack of or inadequate technical know-how, typhoons, flooding, and water pollution (Oliva 1985; Lazaga & Roa 1985).

Marketing studies reveal that tilapia trading is profitable, too (Bimbao et al 1994, 1996; Bimbao & Dey 1977; Regaspi et al 1997). From the farm, tilapia is distributed through one to four intermediaries before it reaches the end-consumer. The usual marketing problems are low market prices, erratic supply, low demand, poor quality and spoilage due to long travel from the farms to the markets.

Since 1983, annual tilapia production in the Philippines has increased at an average of 9%. In 1995, production was 81,182 tons. Production in freshwater bodies is 42% and the rest in brackishwater. Prices have increased by 1.44% annually since 1983.

In Bangladesh, Gupta et al (1992) undertook a survey on the socioeconomic impact and farmers assessment of Nile tilapia culture. The study revealed that 70% of tilapia produced is consumed on-farm,

thus improving the nutrition of farming families. The average return on investments (ROI) is 343%.

In India, Mitra et al (1989) traced the social acceptance and analyzed the economic returns of tilapia culture in West Bengal. Formerly shunned, tilapia has eventually gained acceptance due to its low price and good taste of new strains. The culture process of tilapia is adaptable to sewage-fed bheries, low-saline ponds and paddies. In another study in India, Nitihamyong et al (1991) compared the different culture systems of tilapia (monoculture, polyculture with snakehead, and integrated with pig and snakehead) in terms of growth, production costs-and-returns. Production in the integrated systems using multiple harvest techniques has the highest output. In economic terms, however, the monoculture of tilapia has the highest returns.

In Sri Lanka, production trials in 1982 were low (Galapitige 1982). An evaluation of economic returns of tilapia culture was conducted and recommendations were made to improve production.

In Thailand, the common commodity mix of integrated fish farming are tilapia-chicken, tilapia-catfish-chicken, tilapia-catfish-carp-chicken, and tilapia-catfish-pig. A study by Pinnoi (1985) revealed that the tilapia-catfish-chicken system yields the highest profit. The stocking density and farm area are important dependent variables in fish production models. Wages and feed are not considered important. The culture of tilapia in small-scale hapa nets (8 m³) in village ponds has increased the farmers' incomes by 20% (Middendorp 1987). A recent study of Dey et al (1997) confirmed the profitability of the polyculture of tilapia, carp and other freshwater species.

In Vietnam, a socioeconomic assessment of tilapia culture by Chung (1997) showed that improved strains such as GIFT,

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Thai and Egyptian have better performance in terms of growth and productivity. Some 78% of farmers engage in polyculture of tilapia with different species of carps, catfishes, and barbs in small ponds. Tilapia farmers obtain higher pond productivity and gross margins compared to non-tilapia growers. In view of the socioeconomic benefits to small farmers, the Vietnamese government has launched a national breeding program for tilapia (Thien et al 1997) and developed policies that address issues and problems such as ineffective extension programs and credit facilities.

In Bangladesh, trial runs of GIFT showed that yield is significantly higher than those of red tilapia and other existing strains (Hussain and Mazid 1997). A socioeconomic survey by Dey et al (1997) showed that actual and potential GIFT farmers are small-scale operators with farm area of less than 0.4 ha.

SEAFDEC/AQD recognizes the socioeconomic importance of tilapia culture in the economies of Asian countries. It has, therefore, given priority to the transfer of culture technology through its Technology Verification Program. Its pilot project is cage culture of tilapia in small water impoundments in Bingawan, a landlocked municipality of Iloilo in central Philippines. The project has been successful and AQD is poised to replicate it in other landlocked areas to help provide cheap source of protein and generate employment for the rural folk.

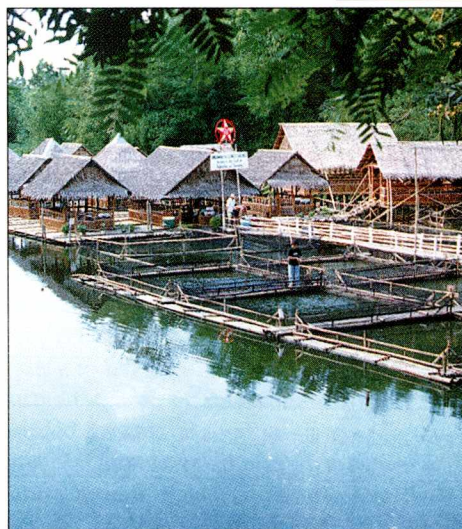
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AQD's pilot project on tilapia culture is in Bingawan, Iloilo in cooperation with the local government of Bingawan and the Bingawan Multi-purpose Cooperative.



AQD receives a plaque of appreciation from the Bingawan government for its tilapia TVP.

Partial harvest of tilapia on March 11, 1998.



Literature citations are given in full in the paper of RF Agbayani, ET Belleza and EC Agbayani. 1997. *Aquaculture Economics in Asia and the Pacific*. In Charles et al (eds) *Aquaculture Economics in Developing Countries; Regional Assessments and an Annotated Bibliography*. FAO Fisheries Circular No. 932. Rome.