

CAGE CULTURE OF TILAPIA IN LAGUNA DE BAY

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## Introduction

The culture of tilapia in net enclosures in Laguna de Bay is a recent development. It started in 1974 when a few enterprising fishpen operators tried to culture Tilapia mossambica in nursery compartments of their pens after the milkfish fingerlings have been released in the grow-out compartments.

Tilapia culture in fishpens, however was discontinued due to poor harvests. In almost all cases, the fish escaped by burrowing under the bottom line of the fence net.

With the success of raising tilapia in floating cages in Lake Bunot, San Pablo City the culture of this species in Laguna de Bay was revived, but this time in cages and not in fishpens.

## Tilapia Cages in Laguna de Bay

Tilapia is cultured in Laguna de Bay in fish cages constructed similarly as the fishpen, except for the net flooring which prevents the fish from burrowing into the mud bottom and escaping. The net resembles an inverted mosquito net and is tied securely to bamboo poles staked firmly on the lake bed.

The framework of the cage is made of bamboo poles braced together by lashing bamboo horizontally about 1 1/2 m above the water level.

The cage net (mesh size = 0.5 - 2.5 cm) is made of either nylon or polyethylene materials. The upper rim of the net is tied to each pole one meter above the water level and the bottom line is tied about 30 cm below the lake bottom.

The fish cages range in size from 50-200 m<sup>2</sup> and are arranged in clusters or modules of from two to twenty units. They are located in places protected from the strong winds at water depth of not less than two meters.

## Sources and Production of Fish Seeds

T. mossambica and Tilapia nilotica are the principal species cultured in fish cages. Of the two, preference is given to the latter in view of its faster growth and larger size.

T. mossambica fingerlings are purchased mostly from brackish-water ponds in Malabon, Rizal and in Bulacan Province where the fish is considered a nuisance in milkfish ponds. It is quite difficult to obtain fingerlings from this source as they are available only after the milkfish are harvested.

T. nilotica fingerlings are obtained from nursery ponds along the edges of Laguna de Bay, principally in the towns of Calamba, Los Baños, and Bay, Laguna where production of T. nilotica fingerlings is fast becoming an industry. Production is undertaken by small-scale operators in nursery pond areas of 200-300 m<sup>2</sup>. Larger areas are now being devoted to tilapia fingerling production in these localities. The practice is likely to spread to other places around the lake.

Fingerlings are produced by breeders stocked in fertilized nursery ponds after predators have been removed. Breeders are stocked at a density of 2/m<sup>2</sup> and a sex ratio of one male to two females. Supplemental feeds consisting of rice bran are given when the supply of natural food is low.

As soon as fry appear, they are scooped and placed in hapa nets inside the nursery ponds where they are grown to fingerling size. Fry are given supplemental feeds until they are big enough to be distributed to fish cage operators.

#### Rearing to Marketable Size

Tilapia fingerlings (3-4 cm long) are transported from nursery ponds to fish cages in oxygenated plastic bags or in tin tubs (500 l. cap). They are usually stocked at a rate of about 20-25/m<sup>2</sup>. A higher stocking density of 50/m<sup>2</sup> can be used provided supplemental feeding is given. Stocking is done early in the morning or late in the afternoon.

The fish subsist mainly on natural food in the water. Supplemental feeds consisting of fine rice bran and kangkong (Ipomoea reptans) leaves are given when natural food is scarce. Fine rice bran is broadcast in minimal amounts in the morning while the kangkong leaves are placed in patches in the cages so as not to interfere with the free movement of the fish. Feed supply is replenished after much of it has been consumed by the fish.

Tilapia fingerlings reach marketable size (10 pcs/kg) in 4-5 months when stocked in February or March. However, if the rearing period goes through the cold months of December and January, seven to eight months of rearing is needed before the fish can be harvested.

### Harvesting and Marketing

Harvestable fish are first concentrated in one corner of the cage by pulling the net up after having been loosened from the bamboo frame. They are bailed out with long-handled scoop net into tin tubs or styrofoam boxes filled with water at 20 percent of their capacity. The containers are then covered with polyethylene nets or with wood to prevent the fish from jumping out. The water in the container is changed every so often. The fish can be kept alive in this condition from 4-6 hours after which they become weak and die.

Tilapia are marketed alive to command higher price. Live tilapia costs about twice as much as the dead fish. Dead fish are packed with ice for storing when they cannot be marketed within the day.

### Problems of the Tilapia Cage Industry

The following major problems beset the tilapia cage industry in Laguna de Bay and are constraints to its expansion and development:

- 1) Lack of standard breed that will give optimum production performance - There are four species of tilapia that have been imported into the Philippines, namely: T. mossambica, T. nilotica, T. zillii, and T. aurea. Except for T. aurea which are now kept for breeding purposes, the rest have found their way into wild waters and have interbred and crossbred, resulting in populations which cannot be identified genetically and production performance which cannot be evaluated.
- 2) Lack of fingerling supply - There is a general lack of fingerlings to supply the needs of tilapia cage operators in Laguna de Bay. As a result, the cages that have already been set remain unstocked for months. This situation has discouraged prospective investors from going into tilapia cage farming in the lake.
- 3) Insufficient methods of producing seed fish - For lack of information on improved techniques in hatchery and nursery operations, production of fingerlings has been inefficient and the economic profitability of this venture is still doubtful.
- 4) Lack of information on proper nutrition - There is a dearth of information on the kinds, levels, and methods of feeding that will stimulate accelerated production of tilapia. The practice of allowing the fish to subsist only on natural food makes the present culture methods inefficient and most often uneconomical.

5) Lack of information on the proper fish cage design and construction - At present, tilapia fish cages vary in design and materials used. It is important that design and construction be standardized to effect efficient and economical culture operations, considering the harsh weather conditions and maximum longevity of the cages.

6) Lack of marketing facilities and imperfection of the market - Tilapia commands high prices when sold alive. For lack of facilities, like live-fish wells and tanks in market places, the fish die before they are sold. Thus a limitation is placed on the amount of fish that can be marketed. There is a need to develop various ways of processing tilapia.

#### Conclusion and Recommendation

The tilapia cage industry in Laguna de Bay is still in its infancy. It has developed through the years without the benefit of modern technology. Presently, it is beset with numerous problems, a good number of which are technical in nature. Research studies must therefore be undertaken to solve, or at least alleviate, these problems. The industry will certainly benefit from packaged technology resulting from these resources.