

## Introduction

The Philippines (in 1990) is considered the world's largest grower of the fish from farming which produces 76,143 metric tons of tilapia and contributed 22% of the total fish production of the country from aquaculture. At present, the culture of tilapia is still expanding industry in the country. It is grown in about 14,500 hectares of freshwater ponds about 500 hectares of fish cages in lakes and reservoirs throughout the Philippines.

There are over a thousand small-scale hatchery operators in the country with areas ranging from 500 m<sup>2</sup> to 50,00 m<sup>2</sup> with an annual estimated production of over 500 million fingerlings. The production, however could not cope up with the demand and still the big problem of the industry that is availability of seeds/fingerlings. As long as the demand for fingerlings exist, a well manage hatchery is a lucrative business.

## Broodstock Selection and Management

The key to good hatchery management is obtaining and maintaining good quality broodstock. The best quality broodstock can be found in any Research and Development Institutions most especially at the National Freshwater Fisheries Technology Center.

Maintaining good quality breeders denotes: preventing introduction of other tilapia species (most especially *Tilapia mossambica*) into the brood pond to avoid genetic contamination, eliminating fish that have questionable characteristic; avoiding random introduction of breeders from different sources, and draining the brood ponds completely and eliminate all stocks during pond conditioning to avoid inbreeding depressions.

## Hatchery Methods

There are many hatchery methods that can be followed or adopted, from the simplest to the more complicated one. However, the choice of method

is dependent on financial and technical capability of the farmer.

### 1. Open Pond Methods

#### A. Fingerling Collection Method

The method utilizes small backyard hatcheries as well as large commercial hatcheries. The pond serves both as spawning and rearing pond. Breeders are stocked into the ponds and allowed to spawn naturally at controlled interval. The fingerlings are collected on the 30<sup>th</sup> day after stocking up to the 45<sup>th</sup> day which is also the total collection (draining) of the pond. Fingerling harvested ranges from #24 to #17. The weight of breeders ranges from 50 grams to 1,000 grams.

Stocking Method of Breeders	Sex Ratio (male:female)	Stocking of Breeders
Weight Method	1:3	100-200 kg/ha
Set Method 1 set = 1 male: 3 female	1:3	1 set per 5-7 m <sup>2</sup>
Number per Unit Area	1:3	1 breeder/ 2-4 m <sup>2</sup>

#### B. Fry Collection Method

This method use an open pond with smaller and shallower in dimension (200-1200 m<sup>2</sup> at water depth of 40 cm – 60 cm). Breeders were stocked after through pond preparation. Fry collection will start on the 10<sup>th</sup> day after stocking up to the 21<sup>st</sup> day where in the pond will drain. The breeders will be conditioned and the ponds will be prepared. Collected fry were stocked in a nursery ponds were they reared to fingerling size tilapia. The stocking densities ranges from 1-6 breeder per square meter at 3:1 to 5:1 (female:male) ratio and weight 50g to 250 grams per breeder.

### 2. Hapa Method

A hapa (net enclosures or bitinan) is made of fine-mesh netting, may vary in size depending on the purpose for which it will be used: for fry and fingerling production or for conditioning prior to

dispersal, a hapa, measuring 3m x 3m x 1.5 is the most common used in fry/fingerling production. It is usually installed in ponds, lakes or along river banks with slow moving current

The stocking densities range from 4–5 breeders per m<sup>2</sup> at sex ratio of 3:1 to 7:1 with weights ranging from 50 grams to 250 grams.

Feeding is one of most important aspect in hapa method because of inadequate natural food due to limited space. Breeders were fed with commercial or formulated diet at 3-5% of the total body weight per day.

Two weeks after stocking of breeders, fry collection starts and the collected fry were stocked in hapa, tank or pond for rearing up fingerling size.

### 3. Tank Method

Tilapia can also be spawned in concrete tank however, provisions of dissolve oxygen should be considered (installed agitators, blower and a compressor) and maintain good water quality parameters.

Stocking density ranges from 7-14 breeders per square meter at 3:1 to 7:1 sex ratio and weight of breeder ranges from 50 grams to 1 kgs. The depth of water should remain from 50 cm. to 70 cm.

Collecting of fry and feeding of breeders are similar to those in the hapa method.

## Hatchery Pond Preparation

1. **Pond drainage** – drain the pond completely to collect all the fishes and eliminate predators and other unwanted species.
2. **Leveling of pond bottom** – just after the pond draining, levelling of the pond follows. Pond bottom should be leveled to slope toward the drainage structure to ensure complete drainage.
3. **Application of insecticides** – if predrarots are present, apply insecticides immediately after pond leveling or draining.

4. **Pond drying** – (pond drying crack) is essential especially when mud deposit in bottom is already thick. This will enable toxic gases/substances to escape from the pond.
5. **Basal application of fertilizer** –organic fertilizer should be applied at the rate of 2,000 kg/ha. Inorganic fertilizer (16-20-0) should be applied at the rate of 100 kg/ha during or immediately after pond filling.
6. **Filling the pond with water.**

### Fertilization and Feeding

Fertilizers stimulate the plankton growth which is the natural food of the fish. Fertilization may be appropriate if measurement indicates low levels of nitrates and phosphates, water is transparent and water is turbid with suspended soil particles. However, fertilization may not be recommended in soils containing high levels of nutrients sufficient to support plankton bloom. At NFFTC, organic fertilizer is applied basal at 2,000 kg per hectare and monthly application of 3,000 kg per hectare.

Feeding of the breeders is highly recommended in hapa and tank method of hatchery production and important in open pond method if fertilization is not being followed. Breeders are being fed at the rate of 3-5 % of the body weight with commercial or formulated feeds with high protein content.

### Conditioning of Breeders

After the breeding cycle (parallel with pond preparation) breeders should be conditioned to restore vigor and energy depleted during the breeding process.

Male and female breeders should be separated and fed with high protein diet at 10-20% of body weight 1-2 weeks.

### Routine Management Activities

Aside from the fertilization, feeding, water quality maintenance and other routinary activities

should be undertaken for a sound hatchery management;

1. Farm records (inputs and outputs). Record keeping is important for a good management. It enables the manager to know the detailed record of his input.
2. Maintenance of daily log book. Logbook for daily observations should be maintained, such as the number of mortalities, draining, stocking dates and other observable records for reference. Status of stocks are monitored through quarterly inventory and recorded accordingly.
3. Carry out routinary activities.

As part of good management the following activities are observed and recorded daily for both pond and tanks.

1. Checking water level (at least 40 cm)
2. Activities of fish (fish gasping at the water surface for oxygen)
3. Checking of water supply (inlet and outlet structure)
4. General color of the pond water
5. Growth of aquatic weeds, usual erosion, damaged water lines
6. Mortalities of stocks

For more information please call or write to:

#### The Project Manager

BFAR-NFFTC  
 CLSU, Muñoz, Nueva Ecija  
 Tel No. (044) 4560-671/4560241  
 Fax no. (044) 4560-671  
 E-mail address:nfftrc@mozcom.com

# TILAPIA HATCHERY MANAGEMENT



Breeding Hapas



Conditioning Hapas

## NFFTC Technology and Information Services



Bureau of Fisheries and Aquatic Resources  
 National Freshwater Fisheries Technology Center  
 CLSU Compound, Muñoz, Nueva Ecija  
 Department of Agriculture