



## FFS Key messages on Fish Production in ponds

Using the experience gained from some five years' experience of implementing Farmer Field Schools under the Blue Gold Program, five booklets were prepared in August 2018 covering: nutrition, homestead gardening (vegetables and fruits), poultry, **fish** and beef fattening. The purpose of these booklets was to ensure that all FFS participants had a reference containing the key messages (in Bangla) for their own use, as a recap for what they had learnt, but also as a tool for sharing their learnings with neighbours and friends. The importance of passing on messages to neighbours and friends was actively promoted during the FFS sessions as a contribution to Blue Gold's horizontal learning ambition.

This note provides a translation in English of the key messages from the fish booklet used in the homestead Farmer Field School (FFS) interventions<sup>1</sup> by the Blue Gold Program.



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<sup>1</sup> Trainers, please note that there are separate Blue Gold FFS [training modules](#) (in Bangla) covering Homestead Vegetable Gardening, Poultry Rearing, Homestead Fruit Farming, Beef Fattening, Fisheries and Market Orientation and Value Chain Development (MOVDC). These may be obtained from the file library through the wiki Lessons Learnt Report of the Blue Gold Program via the URL: [Blue Gold Program Wiki \(bluegoldwiki.com\)](#). Specifically the fisheries FFS training module is available via: [https://www.bluegoldwiki.com/index.php?title=File:TM\\_fisheries\\_FFS\\_16apr\\_19.pdf](https://www.bluegoldwiki.com/index.php?title=File:TM_fisheries_FFS_16apr_19.pdf)

## Messages to share with your neighbours and friends

### Introduction

In the FFS fish module the most important topics you learned were:

- 1) Pond preparation
- 2) Protect fish
- 3) Sunlight
- 4) Pond cleaning
- 5) Liming
- 6) Fertilizing
- 7) Check natural feed
- 8) Quality fingerlings
- 9) Stocking ratio
- 10) Stocking density
- 11) Feeding
- 12) Feeding trays
- 13) Fertilizing when needed
- 14) Liming when needed
- 15) Fish diseases
- 16) Partial harvesting
- 17) Final Harvesting
- 18) Record keeping
- 19) Vegetables on dyke
- 20) Networking

This booklet is an overview of messages which you can share with your neighbours. Invite them to see your pond so they can see it in practice.

### Prepare your pond at the start of the season

Pond preparation is essential for good production. It protects the fish and reduces diseases. Always prepare your pond properly at the start of the season.

Pond preparation involves:

- Repair the pond dyke before stocking
- Remove big trees (except coconut) from the dykes to allow sunlight
- Remove aquatic vegetation
- Remove unhygienic soil from the bottom
- Make the pond bottom soil plain flat
- Use lime in proper dose (1 kg/decimal)
- Use fertilizer (Urea 200 gram/decimal, and TSP 100 gram/ decimal)
- Use organic manure (Cow dung 3 - 5 kg per decimal, or Compost 5 – 8 kg per decimal)
- Prepare the dykes for vegetables growing

## Protect your fish

Because of heavy rainfall and flooding fishes can escape from the pond.

Don't let your fish escape:

- Make higher pond dykes to protect the fish during flooding periods.
- If needed, surround your pond by nets to prevent escaping.

## Allow sunlight in your pond

Sunlight is needed for the growth of plankton, which is food for your fish.

Sunlight is also needed to make the water warmer, which is good for fish production.

Large trees around the pond stop sunlight. Cut large trees that are shading the pond. Instead you can grow small trees such as drumstick, or grow vegetables.

## Keep the pond clean

Aquatic vegetation, such as water hyacinth stops the sunlight. Sunlight is needed to maintain the water temperature and for the growth of plankton.

Floating vegetation also absorbs the natural feed from the water.

Remove most aquatic vegetation so that the sun can reach the water.

With proper pond cleaning you will have more fish production.

## Use lime during pond preparation

Lime is needed for removing the turbidity of water.

Lime is also needed for maintaining the pH balance in pond water. Ideal pH of a fish pond is 7.5

During pond preparation, lime also kills harmful germs.

If you use lime with proper dose during pond preparation the production capacity of the pond will be increased.

## Fertilize during pond preparation

Fertilizer should be applied 5-7 days after liming.

Fertilizing the pond with cow dung, urea and TSP will increase the production of natural feed in pond. Natural feed is phytoplankton and zooplankton.

Use organic and inorganic fertilizer always in a recommended dose.

The recommended dose is:

- Organic manure (cow dung): Use 3 - 5 kg per decimal during pond preparation.
- Instead of organic manure you can also use 5 - 8 kg compost during pond preparation.
- Inorganic fertilizer: Use 200 gm urea, and 100 gm TSP per decimal.

If you fertilize your pond you will get more fish production.

You can increase production even more by adding supplementary feed.

## Check the availability of natural feed

A good pond has natural feed available for the fish. By checking the natural feed in pond water you can decide what to do to ensure balance feed.

There are 2 easy ways to check natural feed:

- Use a drinking glass:
  - Use a transparent drinking glass (half liter) with pond water and observe it in sun light.
  - You have enough natural feed if you see 8-10 zooplanktons in the water.
  - With less number of zooplankton, natural feed is not sufficient and you should fertilize your pond.
- Use your own hand:
  - Keep your arm in the water up to elbow and then observe your palm.
  - If you cannot see the palm, you know that food is available and no fertilizer is required.
  - If your palm is visible in the water, you can conclude that there is a lack of natural food and you should fertilize your pond.

If there is sufficient natural feed you don't need to fertilize the pond, so you can save some money.

If there is not enough plankton you can use fertilizer.

## Use good size and quality fingerlings

For good production it is needed to use the right size and good quality of fingerlings:

- Carp should have a minimum size of 4 inch (10 cm)
- Tilapia should be at least 2 inch size (5 cm)

Undersized fingerlings are not good for fish culture.

Quality of fingerlings is important for survival and growth of fish.

Always use fingerlings from a nursery you can trust.

When buying fingerlings collectively you can get a better price.

If you use good size and quality fingerlings the pond will be more profitable.

## Use proper stocking ratio

The habitat of all fish species is not the same. For a mixed culture pond, use fish species that occupy the 3 layers of the pond.

- Upper layer: Silver carp, Catla
- Mid layer: Rui
- Bottom layer: Mrigel, Common carp, Pungus, Shrimp

- Tilapia, Rajputi and Grass carp move from mid to upper layer

Recommended ratio of fingerlings:

- Upper layer species : 35%
- Mid layer species: 25%
- Bottom layer species: 25%
- Other species: 15%

If you use proper stocking ratio, your pond will be more productive.

## Use proper stocking density

Stocking density is important.

If you use too few fingerlings the production will be low.

If you stock too many fingerlings they will grow slower. It takes a long time before they are big enough for harvesting. Too many fish leads to oxygen deficiency, diseases and other problems.

For semi intensive culture a good stocking density is 45 - 50 fingerlings per decimal.

Measure your pond so that you know its size (in decimal).

An example of stocking ratio and density for a perennial pond is to stock per decimal:

- 11 Silver carp
- 6 Catla
- 10 Rui
- 6 Mrigel
- 4 Common carp
- 6 Tilapia
- 2 Grass carp
- 4 Rajputi

If you use a proper stocking ratio and stocking density you are making optimum use of your pond and you will have a higher production.

For a seasonal pond select mainly quick growing fish like GIFT Tilapia and Rajputi.

## Use supplementary feed for higher production

Fish can be produced by using natural available feed in the pond. But by using supplementary feed the production and profit can be increased.

You can make your own supplementary feed or you can buy commercial feeds.

For homemade fish feed you can use:

- 15 % rice bran
- 15% wheat bran
- 20 % dried grinded duck weed
- 40 % oil cake (mustard, sesame, sunflower)
- 10 % molasses

Commercial feed is more expensive than homemade feed. But good commercial feed has a proper balance of nutrients for maximum fish production.

The amount of supplementary feed needed depends on the size of the fish and the stocking density.

Consult your extension worker or experienced farmers for advice on feeding rates.

## **Use feeding trays**

Feeding tray is important to supply the supplementary feed.

The feeding tray reduces the loss of feed. It also protects the water from pollution of feeding sediment.

A feeding tray is made of bamboo, and looks like a basket which hangs in the water.

One tray is enough per 5 decimal of pond area.

Fix the feeding basket at different depth (layer) of water, so that fish from different layer can it easily.

## **Fertilize your pond to maintain natural feed**

Fertilizing the pond with cow dung, urea and TSP will increase the production of natural feed in pond. Natural feed is phytoplankton and zooplankton.

Use organic and inorganic fertilizer always in a recommended dose.

The recommended dose is:

- Organic manure (cow dung): Use 1 kg per decimal per week, or use 2 kg compost per decimal per week.
- Inorganic fertilizer: Use 100 gm urea, and 50 gm TSP per decimal week.

If you fertilize your pond you will get more fish production.

You can increase production even more by adding supplementary feed.

## **Use lime when needed**

Lime is needed for removing the turbidity of water.

Lime is also needed for maintaining the pH balance in pond water. Ideal pH of a fish pond is 7.5

During pond preparation, lime also kills harmful germs.

If you use lime with proper dose during pond preparation the production capacity of the pond will be increased.

If you use lime before the winter season it will protect fish from diseases.

## **Prevent fish diseases**

Fish diseases can cause fish mortality. If fish are not healthy they will not grow properly.

Germ of diseases can enter the pond in different ways:

- flood water
- homestead polluted water
- germ bearing nets
- germ bearing fingerlings

Other causes of fish diseases are:

- overstocking of fingerlings
- use of poor quality feed
- water pollution
- lack of oxygen
- low pH

Fish diseases can be prevented by proper management, including:

- proper pond preparation
- proper stocking density
- avoiding pollution of the water
- use of quality feed

If you can avoid fish diseases your pond will have higher production.

## **Practice partial harvesting**

The growth of different fish species is not the same.

Large fish should be harvested and small fish should be kept in the pond to continue their growth.

Partial harvesting should be done considering the fish size and its market value.

By partial harvesting you can save money as the supplementary feed is only needed for the smaller fish that are kept in the pond.

## **Harvest all fish at the end of the season**

Final harvesting will help you to know the total production of fish.

Harvesting through dewatering will be helpful as it allows you to repair the pond, and remove bottom soil. The dried up condition of the pond will destroy harmful organism. The pond can be well prepared for the next season.

Perennial pond is better for good production of fish because water will be available round the year. But minimum 3-4 ft depth of water in dry season and 8 ft in monsoon is better for more production.

## **Keep records of inputs and outputs**

Make sure that you are aware about all income and expenses. This helps you to calculate the profitability of your pond.

In a notebook write down:

- Fish culture related costs:
  - cost of pond preparation
  - cost of fingerlings
  - cost of supplementary feed
  - transport costs
  - etc.
- The house hold consumption of fish (kg) and estimate the value (Taka)
- The quantity of fish sold (kg) and money received (Taka)

At the end of the season then calculate the net benefit of your fish pond.

## Grow vegetables around the pond

Make efficient use of your pond area by growing vegetables on the dyke of the pond.

Use trellis (Macha) to grow gourds or cucumbers above the water at the edge of the pond.

Other vegetables that can be grown on dykes are: tomato, brinjal, drumstick, bottle gourd and bitter gourd.

Don't use pesticides on these vegetables as they will kill your fish. Instead, use pheromone traps (to control fruit flies) and other Integrated Pest Management (IPM) methods if needed.

In your notebook also write down the expenses and income from vegetables.

## Share and look for information

Share your knowledge with your neighbours and friends.

Write down the names and mobile numbers of persons who can provide more information about fish production:

### DOF officers:

- |          |         |
|----------|---------|
| 1) Name: | Mobile: |
| 2) Name: | Mobile: |

### FFS facilitators / Contact farmers / Resource farmers:

- |          |         |
|----------|---------|
| 1) Name: | Mobile: |
| 2) Name: | Mobile: |
| 3) Name: | Mobile: |

### Fingerling suppliers:

- |          |         |
|----------|---------|
| 1) Name: | Mobile: |
| 2) Name: | Mobile: |
| 3) Name: | Mobile: |



**Fish feed suppliers:**

- |          |         |
|----------|---------|
| 1) Name: | Mobile: |
| 2) Name: | Mobile: |
| 3) Name: | Mobile: |

**Fish buyers:**

- |          |         |
|----------|---------|
| 1) Name: | Mobile: |
| 2) Name: | Mobile: |
| 3) Name: | Mobile: |