

# Training Manual of Freshwater Aquaculture in Indian Sundarbans

**Progyan Foundation for Research and Innovation (PFRI)**  
**A Subsidiary Research Organ of South Asian Forum for Environment (SAFE)**  
**(An ISO 14001:2015 Certified Organization)**

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## Fisheries Activity Calendar at a Glance

### Step 1: Pond preparation

#### 1.1 For the ponds where complete de-watering is possible

Timeline	Activities
April 15-May 15	• Complete de-watering of pond.
May 15-20	• Leave the pond for sun drying.
May 20-27	• Removal of top soil layer upto 3-4 inch.
May 28	• Liming @ 20-30 kg/ bigha. In case of acidic pond water (pH<6.5) the application of lime may be up to 40 kg/Bigha.
May 29-30	• Leave the pond 2-3 days
May 31	• Apply dry cow dung slurry @600-700 kg/ bigha.
June 1-2	• Leave the pond for 2 days for sun dry.
June 3	• Fill the pond with fresh water (Desirable depth will be 4 to 5 ft).
June 4-10	• Leave the pond for phytoplankton growth. Wait until the pond water become light greenish in colour. If light greenish colour does not appear, apply urea 4-5 Kg/Bigha. Dip down your hand up to your elbow. If the the middle finger is not visible, then it can be assumed that the pond is ready for stocking of fingerling.
June 11	• Stock the fish fingerlings as per proper scientific guidelines.

## 1.2 For the pond where complete de-watering is not possible

Timeline	Activities
May 15	<ul style="list-style-type: none"> <li>• Eradication of aquatic weeds as well as all complete removal of the bushes and shrubs around the embankment of the pond.</li> </ul>
May 16	<ul style="list-style-type: none"> <li>• Apply Mohua oil cake (MOC) 100kg/ bigha.</li> </ul>
May 17-23	<ul style="list-style-type: none"> <li>• Leave the pond for 7 days.</li> </ul>
May 24	<ul style="list-style-type: none"> <li>• Liming @ 20-30 kg/ bigha. In case of acidic pond water (pH&lt;6.5) the application of lime may be up to 40 kg/ bigha.</li> </ul>
May 25-27	<ul style="list-style-type: none"> <li>• Leave the pond for 3 days</li> </ul>
May 28	<ul style="list-style-type: none"> <li>• Apply dry cow dung slurry @600-700 kg/ bigha.</li> </ul>
May 29-30	<ul style="list-style-type: none"> <li>• Leave the pond for another 2-3 days</li> </ul>
May 31	<ul style="list-style-type: none"> <li>• Fill the pond with fresh water (Desirable depth will be 4 to 5 ft).</li> </ul>
June 1-2	<ul style="list-style-type: none"> <li>• Leave the pond for phytoplankton growth. Wait until the pond water become light greenish in colour. If light greenish colour does not appear, apply urea 4-5 kg/ bigha. Dip down your hand up to your elbow. If the the middle finger is not visible, then it can be assumed that the pond is ready for stocking of fingerling.</li> </ul>
June-3	<ul style="list-style-type: none"> <li>• Stock the fish fingerlings as per proper scientific guideline.</li> </ul>

## Step 2: Stocking of Fish Fingerlings

- i. Stocking of fingerlings in early morning is preferable.
- ii. The ideal size for stocking of rearing pond is 3- 4 inch.
- iii. Keep the fingerlings in a aluminium hundi. Float the hundi in the pond and wait four to five minutes before the liberation of fingerlings at the pond.
- iv. Sterilization of fish seed with potassium permanganate is very much essential to reduce the sudden outbreak of diseases.
- v. Apply 1 teaspoon of potassium permanganate in the water containing the fish seed (just before 30-40 sec) before releasing the fish fingerling in the pond water.
- vi. Do not stock the fingerlings during heavy rainfall or extreme sunny weather.
- vii. Do not release the fingerlings in the pond immediately after transportation from any place.
- viii. Do not apply potassium permanganate directly in the pond water.

**Table 1. Fingerling stocking density**

Type-I (Only IMC)	Pond Water area (Bigha)	Species ratio (Catla: Rohu: Mrigal = 4:3:3)					
		Catla	Rohu	Mrigal			
	1	400	300	300			
Type-II (IMC with minor carp)	Pond Water area (Bigha)	Species ratio (Silver carp: Catla: Rohu: Mrigal: Cyprinus carp: Grass carp = 2:1:3:1.5:1.5:1)					
		Silver carp	Catla	Rohu	Mrigal	Cyprinus carp	Grass carp
	1	200	100	300	150	150	100

Maximum allowable stocking density = 1200nos. fingerling/ bigha

## Step 3: Application of Fish Feed

- i. Application of fish feed is mandatory for a good growth rate.
- ii. Homemade fish feed with simple ingredients is useful like ready-made fish feed.

### 3.1 Homemade feed preparation

- i. Rice bran: Mustard oil cake=1:1
- ii. In addition, blood meal, or the byproduct of drying fish from the market, may be added
- iii. Soak the rice bran mustard oil cake in water overnight to make a dough. Make balls and apply them to the pond by scattering or feeding trays fixed in the pond. The tray should be placed 1–1.5 feet below the water surface.
- iv. To obtain the best result, the application of fish feed should be **regular** and at the **same time**.
- v. The application of feed will be as per the body weight of the fish.
- vi. The feeding percentage will depend on the average weight of fish that is calculated by 25-30 days intervals of netting operation.

**Table 2. Fish feed calculation**

Weight of fish	Feed percentage (%)
100 gm	4-5
500 gm	2-3
1 kg	1-2

**Table 3. Fish feed according to the age of fish**

Culture period	Daily fish feed
1 <sup>st</sup> month	800 gm
2 <sup>nd</sup> month	1 kg
3 <sup>rd</sup> month	1.2 kg
4 <sup>th</sup> month	1.6 kg
5 <sup>th</sup> month	2 kg
6 <sup>th</sup> month	2.4 kg
7 <sup>th</sup> month	2.8 kg
8 <sup>th</sup> month	3.2 kg
9 <sup>th</sup> month	3.6 kg
10 <sup>th</sup> month	4 kg
11 <sup>th</sup> month	4.4 kg
12 <sup>th</sup> month	4.8 kg

#### **Step 4: Compulsory Routine Activities for the Fish Farmers**

- i. Daily inspection of the aquaculture pond by the fish farmer is required. Any unusual fish behaviour or the color of the fish pond should be observed.
- ii. Regular application of lime at the interval period of 25-30 days is desirable to maintain the p H of the pond water.
- iii. Netting operation in a month is desirable to release the obnoxious gas of the pond bottom and exercise the fish.
- iv. Regular sampling at the interval of 15-20 days of fish should be done to check the growth rate and outbreak of any diseases.
- v. In cloudy days, it should be observed carefully whether the fish gasp at the upper layer of the pond. If gasping continues, the pump set will be started immediately to raise the oxygen level in the pond.
- vi. To check the pH of the pond with the help of pH paper at a regular interval of 15 days is mandatory.