

Marketable Fish Production: Seasonal Ponds

It was common to believe that fish cannot be cultured in seasonal ponds. However, fish can be produced in any pond of any size, anywhere in Orissa, provided that the water quality is good enough. A small (0.02-0.05 ha) and shallow (depth 1.0-1.5 m) pond that retains water for two months can be used for raising fry. A larger (0.04-0.2 ha) and deeper (1.5-2.0 m) pond holding water for three to four months can be used for fingerling production.

Culture of Medium Carps in seasonal ponds

If a pond holds water for about six months it can be used for producing so-called Medium Carps such as:



Gonius (*L. gonius*)



Reba (*Cirrhinus reba*)



Bata (*Labeo bata*)

Medium Carps are marketable at a much smaller size and are highly suitable for culture in seasonal ponds. Medium Carps which mature when only one year old can be easily produced and are commercially available from certain hatcheries and farms.

Culture of Catla, Rohu and Mrigal in seasonal ponds

To make use of a seasonal pond for Catla, Rohu and Mrigal:

- Stock spawn at a low density and sell some at the early fry and fingerling stage and rear the rest to marketable size
- Stock early fry at a low density and raise advance fingerlings, sell a part of these and rear the rest to marketable size
- Stock advanced and stunted fingerlings as early as possible and harvest 300 to 500 g fish



Pond preparation

It is good to prepare the pond a month or two before the rains.

A seasonal pond has neither aquatic weeds nor predatory or weed fishes. However, weeds will develop as soon as a pond fills up and fish will enter if the inlets and outlets are not screened.

Bushes and shrubs that have grown during the dry period should be removed manually before the rains as these will create problems during netting and would rot in the pond.

To avoid the growth of plants in the dry season that take away the soil nutrients, you can broadcast summer *moong* or *dhaincha* as soon as the pond starts drying up. These plants stop others growing, help to improve the status of soil nitrogen and save on the cost of manures. They can be ploughed in before the rains start.

Liming and manuring

Slightly acid soils are common in Western Orissa. Adding lime at least three weeks before the rains can improve the soil. Liming will reduce acidity and will reduce the amount of mud at the pond bottom. It will destroy parasites. It is particularly useful before fertilizing the water. Quick lime (CaO), which is used for whitewashing houses, can be used at 300 kg/ha. Quick lime can be spread as a powder or dissolved in water and, when cool, broadcast over the entire bottom including the corners and crevices.

Seven days after liming, the pond can be manured with raw cow dung at 10,000 kg/ha (or a mixture of 5,000 kg of cow dung and 2,500 kg of poultry manure/ha) spread uniformly all over the pond bottom. Instead of manure, *mahua* oilcake, which is plentiful in Western Orissa, can also be used as manure. This will also kill predatory or weed fish entering the pond with the first rain. The toxic effects of the cake will go away after about ten days. Assuming an average level of 25 cm of water in the pond with the first rain, 750 kg/ha of good quality *mahua* oilcake would be sufficient.

An alternative method which is possible, even as the rains start, is to fertilize with urea at 25 kg/ha followed a day later by 50 kg/ha of bleaching powder with 30% chlorine. This will kill fish and pathogens but will become safe within seven days. Then, to maintain a high nutrient level in the pond, a mixture of raw cow dung (1,000 kg/ha) and poultry manure (500 kg/ha) can be added.

Stocking the pond

The pond should be stocked with fingerlings as soon as the toxic effect of *mahua* or bleaching powder is gone and when plankton production is high. To test when to stock, try the following:

- The water color should be brown.
- Fix a hapa in the pond and add 20-25 fry or early fingerlings and observe for 24 hours. If there are no deaths, the pond may be stocked.
- Put your hand in the water up to the elbow. If your hand is visible there is not enough plankton - add more manure in small doses.

To harvest marketable fish in four to five months, stunted fingerlings (100-125 mm) or juveniles (150-175 mm) or advanced fingerlings can be stocked at 4,000 to 5,000 fingerlings/ha. A shallower pond (1.5 m) should be stocked less than a deeper one (2 m and above).

Supplementary feeding



Groundnut cake (left) and rice bran (right)

How to measure the feed:

For good growth, you can fertilize about every two weeks with 500 kg of cow dung and 250 kg of poultry manure/ha. It may not be possible to fertilize ponds and tanks used for drinking water or for washing. In such cases fish growth will be less.

You can supplement the food that is in the pond after manuring by adding finely ground soya bean, groundnut or mustard oilcakes - for protein, and rice or wheat bran - for carbohydrate and energy. Mixing equal weights of oil cake and bran is about right to feed in the morning and evening, 3% of the body weight for the first two months and then reduced to 2% by September.

Small fingerlings weigh about 10g, so the total weight of 4,000 stocked will be 40 kg. Three percent of 40 kg is 1.2 kg (or 1,200 g), so you can begin by adding 600 g in the morning and evening. Every month capture a sample of fish and weigh these to calculate the new quantity to feed.

Average individual fish weight (in g) x expected number surviving x 3/100 = feed required daily in g

The feed should be soaked in water and placed in baskets or trays suspended just below the water surface, at least one basket for each 0.1 ha of water area. This way the fish always gather at the same place (and are easy to catch for weighing) and the quantity of feed eaten can be easily seen (if a lot remains, feed less; if it is all taken, feed more).

Health care

Look out for unusual fish behavior - it may be a warning that something is wrong

Fish rubbing along the sides of the dykes or the poles fixed for hanging feed baskets, or swimming in an unusual manner not noticed before, can often mean infection by parasites.

- Manuring and feeding should be immediately suspended and the fish examined for parasites or any other disease infection. The nearest Fisheries Officer may be approached for advice and direction before mortality sets in.

Fish coming to the surface gulping air, especially in early morning, may be due to low dissolved oxygen.

- Manuring and feeding should be immediately suspended. Beating the water with sticks or swimming by a number of persons may relieve the situation. Or spray a solution of potassium permanganate on the water surface evening or morning.

Harvesting

When the water level starts falling and reaches an average depth of 1 m, harvesting should be done. If the pond is large, the fish may be harvested in two or three installments so that it could be easily marketed. Manures should not be applied in the last month. Once the pond is partially harvested, feeding should also be proportionately reduced and no feeding should be given on the morning the pond is to be netted.

A production of 2,000 kg/ha should be expected.

Harvesting teams can charge a lot or take a large part of the stock. You may be able to lease fishing nets and other equipment and harvest your pond yourself.



Inspecting the hauls from drag nets





If you harvest a lot of fish together you can hold them for sale in a large hapa such as this one.



Useful Contacts

Other Better-Practice Guidelines

There are many more Better-Practice Guidelines in this series.

You can get more copies of this and other Better-Practice Guidelines from your local One-stop Aqua Shop, STREAM India Communications Hub, from the STREAM Regional Office or from the STREAM Website.

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We would like your feedback about these Better-Practice Guidelines. You can let us know by phoning, emailing or writing to the Communications Hub Manager at your STREAM Country Office.

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