Spawn Production in Hatcheries

Modern hatcheries are made of permanent masonry, concrete or fiberglass. These pictures show a new fiberglass hatchery in Nuapara district of Orissa.

A Modern Hatchery

A modern hatchery has four parts:

- breeding/spawning pool,
- hatching/incubation pool(s),
- spawn collection chamber and
- overhead storage tank or water supply system

A larger hatchery may have:

- broodstock ponds and
- nursery-rearing ponds

A smaller hatchery may:

- buy adults from others for spawning
- link with a network of farmers who have nursery ponds

The hatchery in Nuapara has four pools: one breeding pool and three incubation or hatching pools. It also has a separate spawn collection chamber and an overhead water storage tank.

Before you set up a hatchery, you need to make sure you have a suitable site prepared.

Ask yourself these questions:

- Is the site easy to reach?
- Is there a bore hole or a clean water source?
- Is there an electricity supply?
- Is the site prone to flooding?

There is a flat working space around tanks with sunken valves (the cover of this one has been removed. A flat space is easy and safe to work in.

The hatchery pools

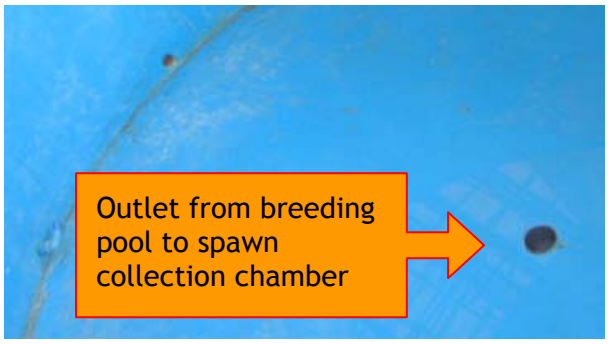
This hatchery has a storage tank which feeds water into the hatchery pools.

This breeding pool is 2m wide. You could put up to 12 kg of broodfish in here.

The *water storage tank* contains a supply of clean water. This feeds into the hatchery pools when it is needed.

The *breeding pool* is circular.

On the bottom, in the center, there is an outlet. When the fish have bred, the fertilized eggs flow through this outlet into the spawn collection chamber.



Outlet from breeding pool to spawn collection chamber

The *spawn collection chamber* is located at a level lower than the hatching pool. It is usually a rectangular cistern.

When the outlet of the breeding pool is opened, the spawn drains into the spawn collection chamber.

A hapa is usually fixed in the chamber. This makes it easier to collect the spawn for transfer to the hatching pool and to drain the surplus water.

It is much easier to collect the spawn when you use a hapa in the spawn collection chamber.

Here the hatchery staff are rinsing the sides of the hapa so that they don't waste any eggs.

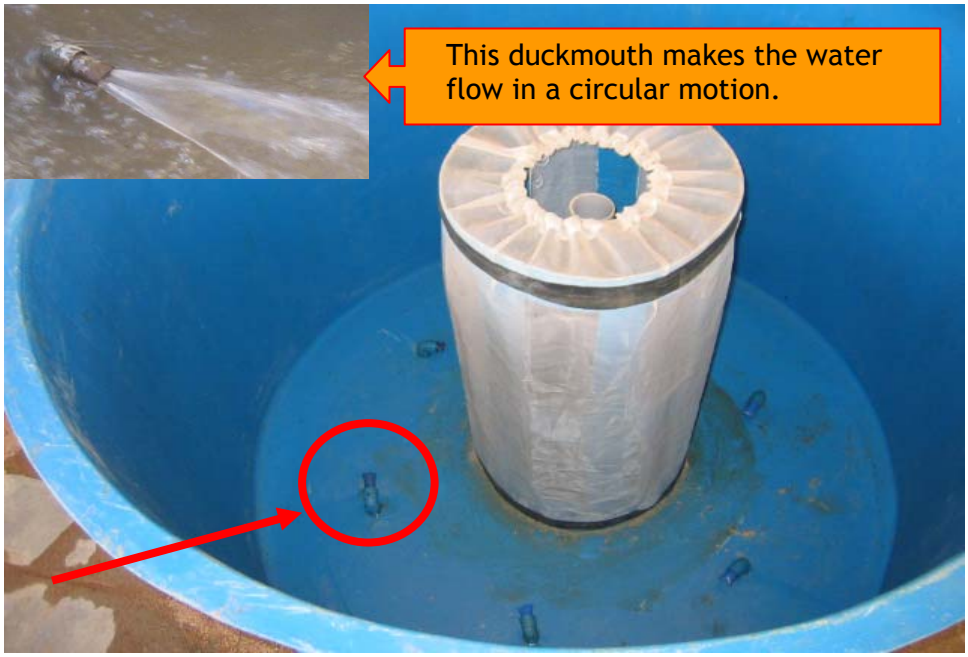
They want to get all the eggs they can.

The hatching pool is smaller than the breeding pool.

Water enters the hatching pool through duckmouths. These create a flow and keep the eggs moving.

The net around the overflow stops the eggs washing out of the pool.

In the center of the pool, there is a central outlet pipe for draining the surplus water.



This duckmouth makes the water flow in a circular motion.

Can you see the 'duckmouths' on the bottom?

Spawning and hatchery management

The broodstock pond is prepared by liming and fertilization. By January/February, it should be stocked with catla, rohu and mrigal.

The brood stock should be 2-3 years of age and 1.5-4.0 kg in weight.

Before putting the broodfish in the pond, they should be dipped in potassium permanganate solution.

Every fortnight, the pond should be netted to check the condition of the fish.

From the end of May or early June, breeders can be selected for spawning.

These are carefully transferred to the breeding pool.

The water in the breeding pool should be about 1 m deep. The broodfish should be stocked at about 3-4 kg/m3.

In a breeding pool that measures 2m across, there is just over 6m^3 of water, so you can stock up to 12 kg of fish. In a breeding pool that is 3m across, you can stock up to 28 kg of fish.

How much should I feed the broodfish?

Normally, you feed them at 2% of the weight of the fish, but from the beginning of May, you reduce this from 2% to 1% of the weight of the fish.

Make a mixture that is half rice bran and half groundnut oilcake.

Give them half of it soaked in the morning and the other half powdered in the evening.

The broodfish should be left in the breeding pool for 4-6 hours to acclimatize. After this, the females are taken out, injected and returned to the pool.

Four to six hours after this, the females are injected again. The males are also injected at this time, if necessary.

"Ovaprim" is an inducing agent. It helps fish to spawn.

Three to four hours after the second injection, the duckmouths are opened to create a circular current inside the pool. A shower head above the tank simulates the rain.

When the fish have spawned, the eggs are transferred to the hatching pool. At this time the fertilization rate should be checked.

The hatching pool can hold about 7 or 8 lakh of eggs/m3 of water for hatching.

Hatching takes 16-20 hours. The broken egg shells pass out through the nylon netting.

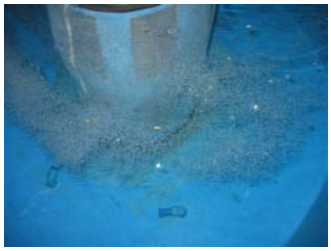
After 72 hours the hatchlings (spawn) are collected in the Spawn Collection Chamber.

The spawn is measured to determine the quantity obtained.

The spawn can now be reared in the nursery.

This hatching pool is 1 m wide and can hold 20 lakh of eggs.

The spawn stays in this pool until it's big enough to go into the nursery pond.



Measuring the fertilization rate

Humans ask lots of questions, unlike fish.

How do I measure the fertilization rate of the eggs?

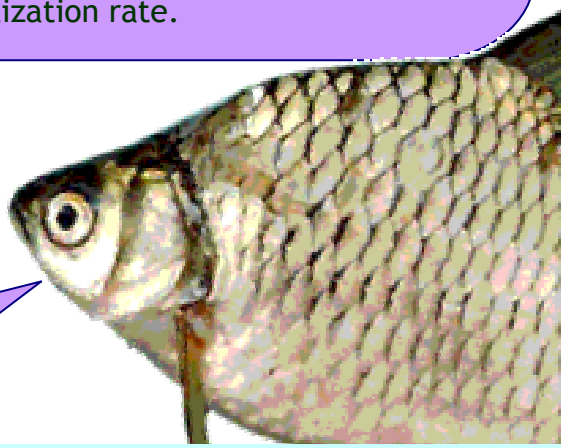
First of all, take three random samples. Each one should have about 250 eggs. Look at these carefully in a Petri dish or a glass plate.

The good eggs are transparent. The bad ones are opaque.

The percentage of good eggs in each dish is determined and the average of the three gives the percentage or the fertilization rate.

Why is it so important to measure the fertilization rate?

Collect some eggs in a glass dish like this and count the good eggs and the bad eggs.



Well, this step is important and necessary because it tells us how much spawn is available for stocking in the nurseries.

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.

www.streaminitiative.org

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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