

Spawn Production in Hapas

Indian major carps - catla, rohu and mrigal - spawn naturally in rivers but can be artificially spawned to produce fish seed for culture. "Hapa hatcheries" have been used for a long time. They are the simplest and cheapest way for breeding and seed production of fish on a small scale in rural areas.

Hapa hatcheries

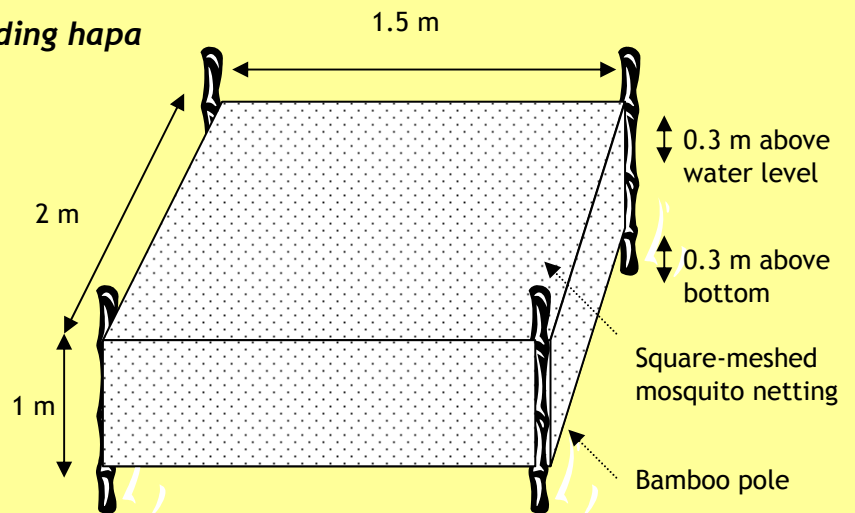
Hapa hatcheries are simple. They have a *breeding hapa* and a series of *hatching hapas*.

The *breeding hapa* is a box-like enclosure (2 m x 1.5 m x 1.0 m) stitched out of square-meshed mosquito netting cloth and tied on to bamboo poles fixed in ponds or tanks so that about 0.3 m is above the water level while its bottom is 0.3 m above the pond bottom.

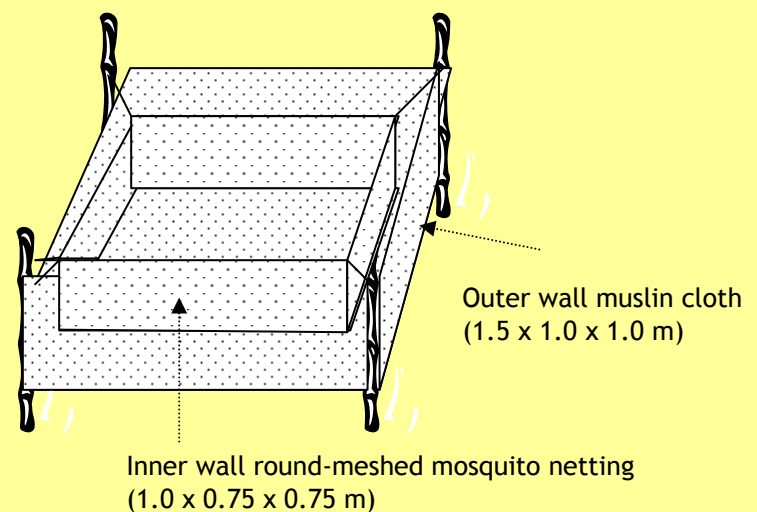
Normally the hapa has a plain cloth cover on the top. This has an opening on the wide side for inserting and removing the broodfish. The hapa is held tight by tying the four corners both above and below the water line.

Hatching hapas are double-walled. The outer wall (1.5 x 1.0 x 1.0 m) is made of muslin cloth and the inner wall (1.0 x 0.75 x 0.75 m) of round-meshed mosquito-netting.

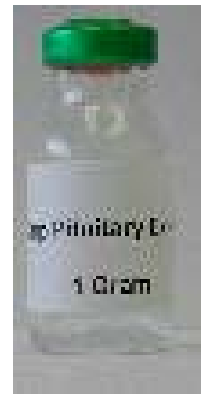
Breeding hapa



Hatching hapa



Spawning the fish



Below the brain of a fish is a gland called the pituitary, which controls the spawning of fish. It is removed, crushed in distilled water and injected into the fish muscle to stimulate the fish to spawn. You can also buy chemicals such as Ovaprim (from Syndel Lab, Canada, which is marketed by Glaxo in India), Ovotide (from Haemmo Pharma, Mumbai) and Wova-FH (from Wockhardt, Mumbai).

The spawning operation should be undertaken on a cool, rainy day.

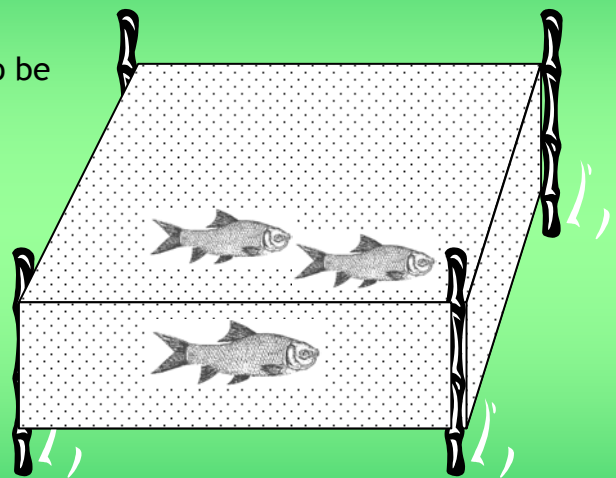
The fish should be carefully selected. Males should be fully mature (1.5-2.0 kg in weight and 2+ years in age) and should ooze milt at the slightest pressure on the belly. Females (2.5-3.5 kg in weight and 3+ years in age) should have a bulging abdomen and swollen, reddish vent.

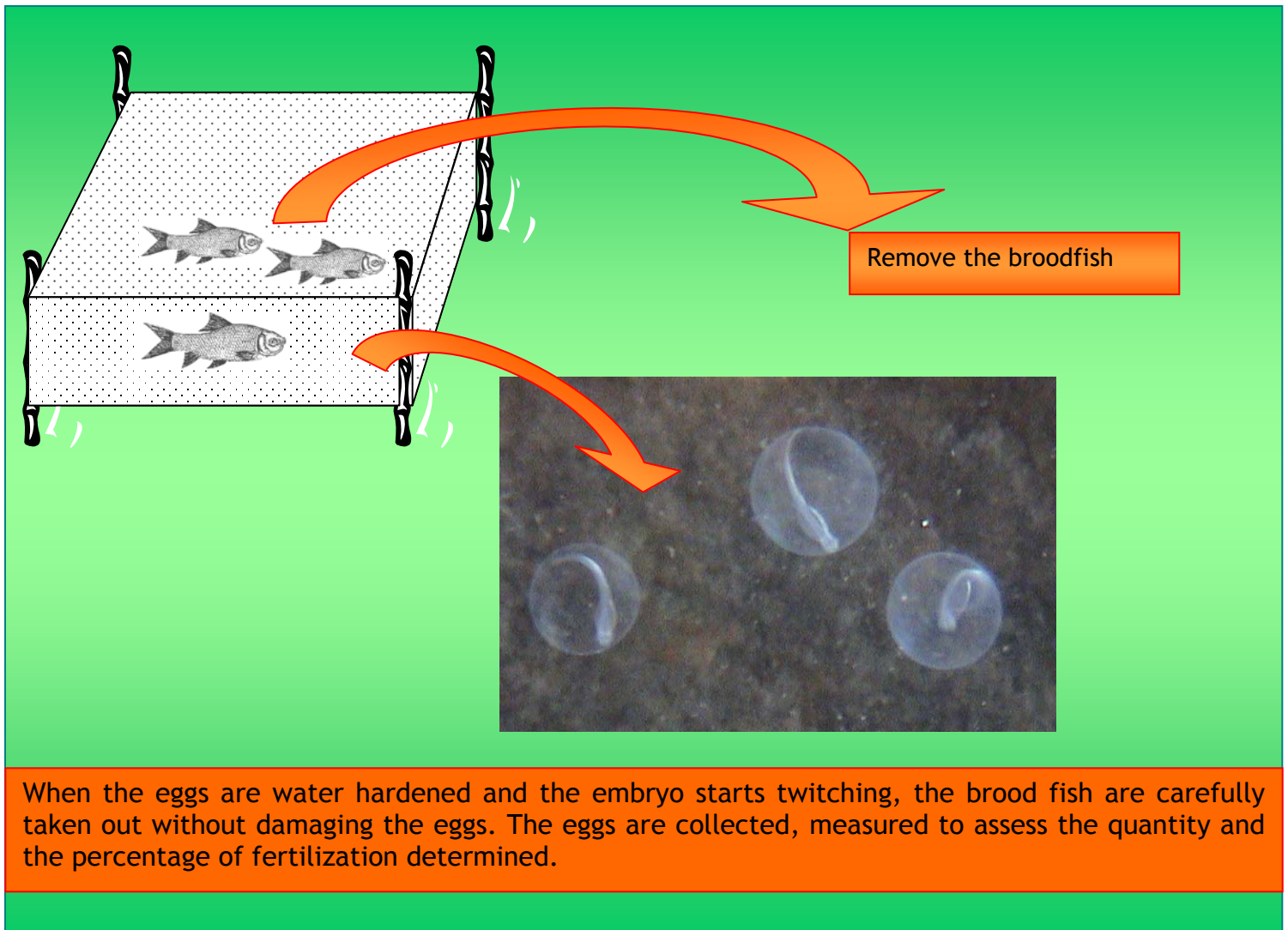
The fish are kept in the breeding hapa with two males to each female, preferably 1:1 by weight. After four to six hours, the female is injected with a first dose of crude pituitary extract at 3-4 mg extract/kg body weight in the evening.

Four to six hours later, the female is given a second injection at 6-8 mg/kg. At this time, the male may also be injected at 2-4 mg/kg depending on the condition of the brood fish and the weather.

If the weather is cloudy and cool and rain is expected, then the dose can be low, say 2 mg/kg, but if it is warm rather than cool the dose could be higher, say 4 mg/kg. The males and the females are released back in the hapa where they usually spawn within six hours.

So 14-18 hours after placing in the hapa the fish spawn.





When the eggs are water hardened and the embryo starts twitching, the brood fish are carefully taken out without damaging the eggs. The eggs are collected, measured to assess the quantity and the percentage of fertilization determined.

Testing the eggs

Take a 10 ml container, fill it with eggs and pour them gently into a shallow dish. Count the total number of water-hardened eggs in a sample. Those which are transparent are good eggs but those that are white and opaque are dead. Repeat this two more times with two more 10 ml lots of eggs.

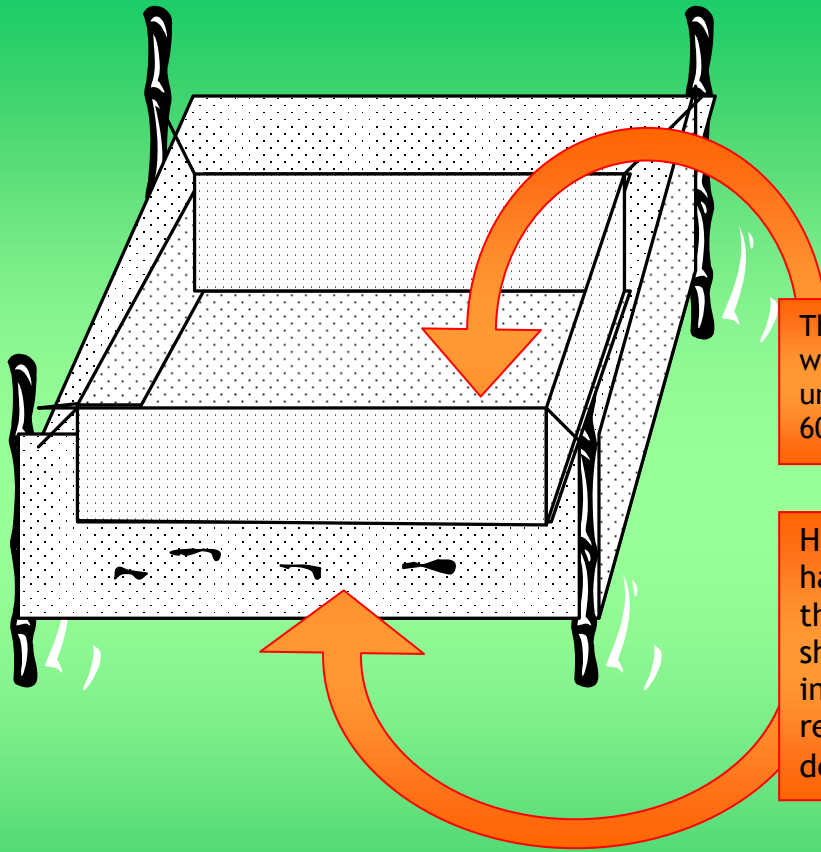
You can work out how many good eggs you have in total by measuring the total volume of eggs:

$$\text{Total number of eggs} = \frac{\text{total volume of eggs (ml)}}{10 \text{ ml}} \times \text{average number of eggs in 10 ml}$$

To know the percentage of good eggs:

$$\text{Percentage of good eggs (or fertilization)} = \frac{\text{Number of good eggs in the sample}}{\text{Total number of eggs in the sample}} \times 100$$

{Depending on the size and age of brood fish, there are often around 20 Indian major carp water-hardened eggs/ml and 500 Indian major carp spawn/ml.}



The eggs are then transferred to the double-walled hatching hapas where they are uniformly spread over the inner hapa, 60,000-75,000 in each hapa.

Hatching takes 18-24 hours when the hatchlings wriggle out of the meshes of the inner hapa (leaving behind the eggshells) and collect in the outer hapa. The inner hapa should be carefully untied and removed before egg shells start to decompose.

The hatchlings have a large yolk sac which provides the necessary food for the young to grow. This sac is fully absorbed within 72 hours. Before this the hatchlings are collected and measured, both to determine the hatching rate and the total quantity of the spawn (the same way the eggs were tested above). The spawn is either sold to others for rearing or stocked in 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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