

STEPS OF HATCHERY OPERATION

Clean the breeding and hatching pools by 5 ppm KMnO_4 solution and then by water before the hatchery operation.

Close the outlet valve of breeding pool and then fill it with water. Fix a clean cotton hapa inside it.

Collect fish brooders male to female ratio in 1:1, transport them to breeding pool, place them in hapa and run the shower for conditioning.

After 1-2 hours of conditioning, inject the brooders with suitable inducing agents and dose, release them to the breeding pool, remove the hapa and run the shower.

After 4-5 hours of injection, allow the flow/ circulation of water in the breeding pool, open the outlet valve, allow the water to pass from breeding tank through the hapa of the eggs/ spawn collection tank to outside. If eggs released from the fishes, they are collected and removed by the hapa in the eggs/ spawn collection tank. The water current is created in the breeding pool by regulating the water flow through the inlets and outlet.

In hatching pool fix the screen on the FRP socket, fix the PVC drain pipe in the center of the tank to drain excess water, the height of the drain pipe in the pool is maintained at 0.9 m so that up to that height water level can be maintained, give water circulation in the egg incubation chamber through duck-mouths (inlets).

Collect the released eggs from the egg/ spawn collection tank by hapa time to time, measure them, release them in the egg incubation chamber of the hatching pool. The egg release generally stops within 8-10 hour from injection.

Remove the brooders from breeding pool once the breeding is over, they may be released to the pond after dipping them in 5 ppm KMnO_4 , clean the breeding pool by KMnO_4 solution and then by water.

On release of eggs maintain the flow rate in the hatching pool in such a way that the eggs float in the water (can be checked by putting light from a torch from the top of water), periodically check the eggs/spawn, clean the filtering mesh by a brush with long handle from the side of inner chamber to avoid water choking.

On 4th day from the egg release, collect the spawn through hapa in the eggs/ spawn collection tank by opening the outlet valve connected to the outer wall of the hatching pool.

After spawn removal the hatching pool and the eggs/ spawn collection tank are cleaned by KMnO_4 solution and then by water.

To avoid direct sun light to the pools and tank, over the hatchery unit a shed may be erected.

CAPACITY OF HATCHERY OPERATION

Hatchery of one million spawn production means one breeding pool associated with one hatching pool. Similarly hatchery for two million capacity means one breeding pool with two hatching pools and three million capacity includes one breeding pool with three hatching pools. In the case of one, two and three million spawn capacity hatcheries, 1.0-1.2 million spawn can be harvested in 4th, 2nd and everyday respectively.

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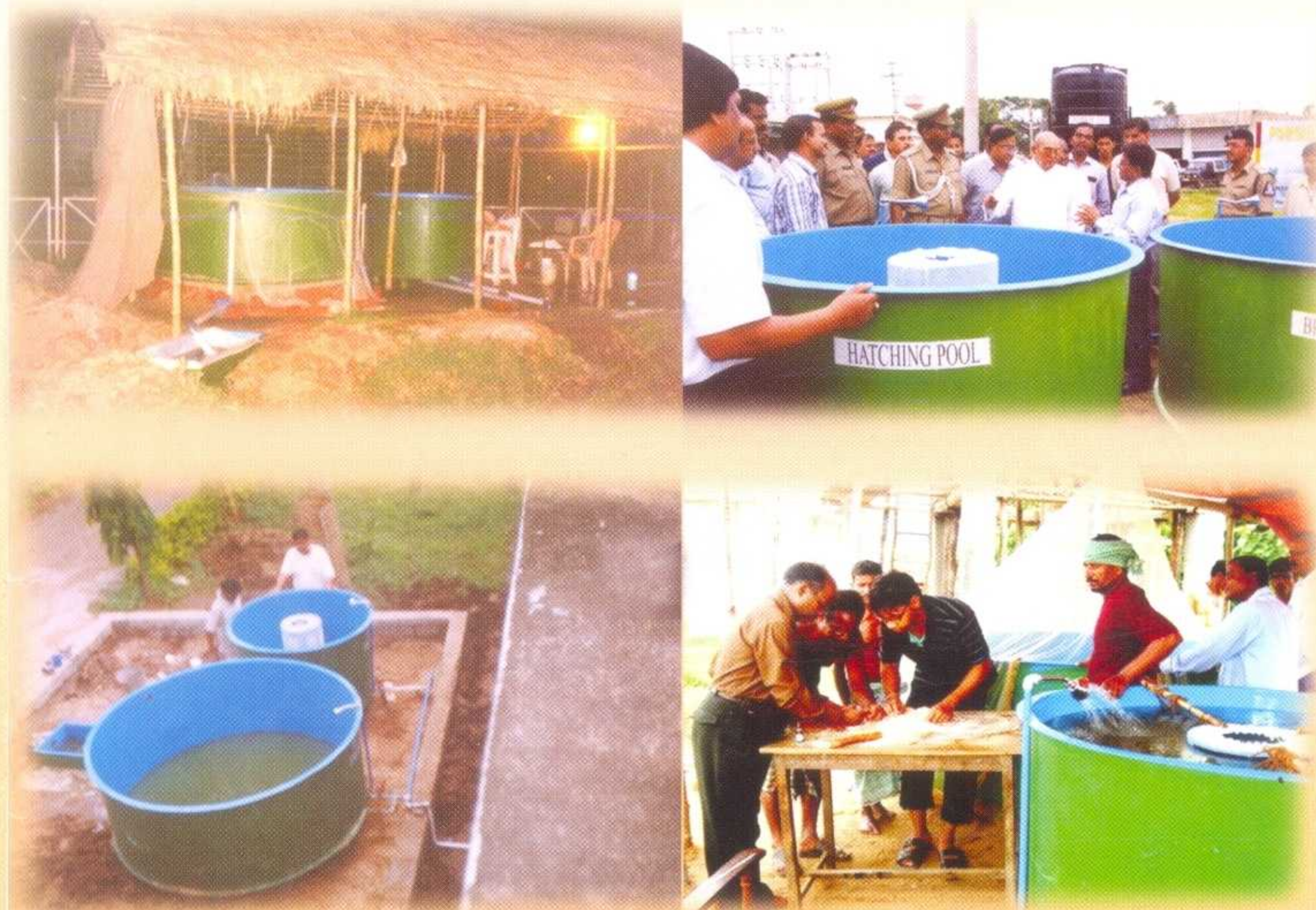
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PORTABLE FRP CARP HATCHERY: A CIFA PRODUCT



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INTRODUCTION

Breeding and hatching of carps are undertaken traditionally using bundhs, hapas and recently by cement circular hatcheries. Once installed, the cement structured hatcheries can not be shifted from place to place. The innovation of portable FRP carp hatchery is adding a feather to the blue revolution in the country by producing fish seed at the farmers' field. The transportation of seed from different far off places to the farm site involving substantial cost is getting reduced by introduction of this hatchery.



Carp hatchery fully made up of fibreglass reinforced plastics (FRP) has been designed and developed by AICRP on APA, CIFA, Bhubaneswar and the technology got commercialized for first time in 2006 and for second time in 2013. The system is so designed that it creates the environment suitable for fish breeding in the field conditions for 20-24 kg of carps (male to female ratio and weight to be



approximately equal) in one operation. In one run 1.0-1.2 million spawn can be produced from the system. In lean season the system can be used for ornamental fish rearing or common carp breeding or water storing. The unit can be operated by unemployed youth, Grampanchayat and Cooperative Society on self-operational/ rental basis.

The system has the following benefits:

1. Portable in nature
2. Easy to install and operate
3. Low water consumption during fish breeding and spawn (fish seed) production
4. Easy to repair
5. Requires less space for installation
6. Less weight
7. Durability of the product for 15 years.



PRODUCT DESCRIPTION

The system consists of four major parts i.e. Breeding/ spawning pool, Hatching/ incubation pool, Egg/ spawn collection chamber and Overhead storage tank/ water supply system.

BREEDING/ SPAWNING POOL

- The breeding pool is cylindrical in shape with 2.15 m diameter, 0.9 m height and 3,409 l capacity (operational capacity 2950 l).
- The bottom of the pool is with uniform slope (1:22) towards outlet at the centre. The wall thickness varies 4.2 – 6.0 mm.

- To provide water circulation/ flow, 5 numbers of 15 mm diameter rigid PVC elbows are fitted at the bottom of the sidewall at equal spacing. Five numbers of rigid PVC nipples 15 x 75 mm are fitted with elbows in the same direction. A single point water inlet of 25 mm diameter is also fitted at the sidewall of the bottom.
- All the water inlet pipes are interconnected and fitted with individual full-way valves to control the flow of water.
- One- shower is provided at the top of the tank to sprinkle and aerate the water.
- The water supply to the pool comes from the overhead tank placed at a minimum height of 3.3 m.



HATCHING/ INCUBATION POOL

- The pool is cylindrical in shape with 1.4 m diameter, 0.98 m height and 1,200 l net egg incubation volume (water volume of the pool 1275 l).
- It consists of egg incubation chamber, FRP inner chamber, water supply system and accessories.
- The FRP inner chamber of the tank is with 0.4 m diameter and 90 cm height, covered with nylon bolting cloth of 0.25 mm mesh to filter the excess water to the drain.
- Six numbers of RPVC (15 mm diameter) duck-mouths are fitted at the bottom of the hatchery at 45° in between outer and inner chamber at equal distances to get required water flow for the eggs.



- It also has drainage outlets fitted at the centre and at the outer chamber.
- The carp eggs are introduced in the outer chamber of the system and water flows continuously through the duck-mouths. The excess water flows continuously through the cloth of the inner chamber to the outlet pipe.
- The eggs hatch out in 14-18 h and remain in the pool for 72 h.
- The spawn is collected from the hatching pool through PVC hose pipes/ spawn collection tank. It has the capacity of hatching 1.0-1.2 million eggs per operation.
- Flow rate in pool during operation is maintained at 0.3-0.4 l/ sec.



EGGS/ SPAWN COLLECTION TANK

- This is a rectangular tank of size 1.0 x 0.5 x 0.5 m with capacity of 250 l.
- Its wall thickness is 3 mm and it is reinforced with MS angle of 25 x 25 x 5 mm at all sides from the bottom in a height of 0.35 m.
- The water level in the tank is maintained at a height of 0.45m (net water volume 225 l).
- To drain the excess water, PVC pipe of 63 mm diameter and 150 mm length is fitted at a distance of 38.7 cm from the bottom. Cotton inner hapa of the tank size is fixed inside it to collect eggs/ spawn from breeding/ incubation pool, respectively.



WATER STORAGE TANK

- Water storage tank of minimum capacity 2000 l is required to operate the hatchery unit.
- The breeding pool and hatching pool are connected to the water storage tank separately or together in the same water line.
- One 1.0 HP pump set is required to fill the storage tank periodically to supply water to hatchery continuously.

SPECIES SUITABLE FOR BREEDING

The system is suitable in field conditions for breeding of carps viz.,

Rohu (*Labeo rohita*),
Catla (*Catla catla*),
Mrigal (*Cirrhinus mrigala*),
Kalbasu (*Labeo calbasu*),
medium and minor carps,
Silver carp (*Hypophthalmichthys molitrix*),
Grass carp (*Ctenopharyngodon idella*),
Common carp (*Cyprinus carpio*),
Silver barb (*Puntius sp.*), etc.

