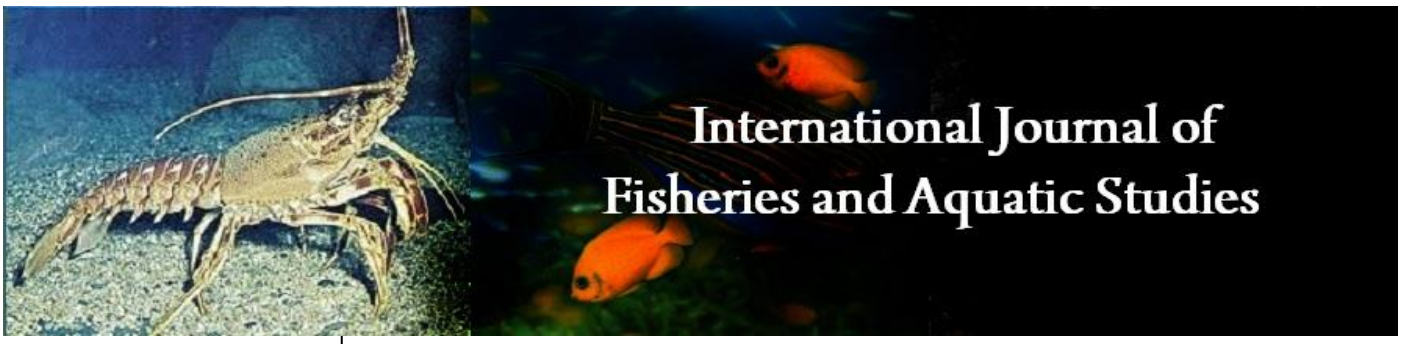

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Fish seed production and hatchery management at Bhimpur National Seed Farm, Banswara, Rajasthan

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Abstract
Fish production in India occurs successfully and contributes GDP in fish farming agriculture. Fish seed is the most important for farmer's profit and sustainable development. Fish seed quantities, quality and supply chain is basic and foremost for sustainable aquaculture. For fish seed culture optimum stocking density of fingerlings shall be required every year. In intensive fish culture hatchery management is essential. in effective hatchery management we need to know basic elements about hatchery construction, fish farming, fish rearing and their breeding process e.g., hormone in fish spawning, hypophysation and compounds used for induced breeding. This paper give detail about fish farm in southern Rajasthan demand, resources and maintenance. Fish farm management, seed quality, induced breeding and fish agriculture helped to meet the demands of the fish seed in Tribal region.

Keywords: Fish seed production, hatchery management, induced breeding hypophysation, nursery management, sustainable aquaculture

Introduction
In Banswara, Rajasthan fish production and its demand is growing in recent years. Mahi dam is largest water body in Vagad region. All varieties of fishes occurred in mahi dam. Environment for fish production in southern Rajasthan is excellent. The need for the production of quality fish seed for stocking the fish ponds and natural water bodies has indeed increased steadily (Brain and Army, 1980) [2]. For fish production collection, selection and manipulation of breeders required. The numbers of nursery, rearing and production ponds for a hatchery depend on the number of fry and fingerlings expected from the hatchery (Ayinla and Nwadukwe, 1988) [4]. The knowledge about water quality parameters like ph, alkalinity and DO, feed (natural and artificial), resistance to diseases in fish is required most. For successful production of fish water quantity, transportation and fish food demand is necessary.

Materials and Methods
Area of study: The government fish seed production centre at Bhimpur (Banswara) was established in the year 1972-1973 for major carp. (Fig. 1. & 2.) Bhimpur fish farm is situated in southern part of Rajasthan.

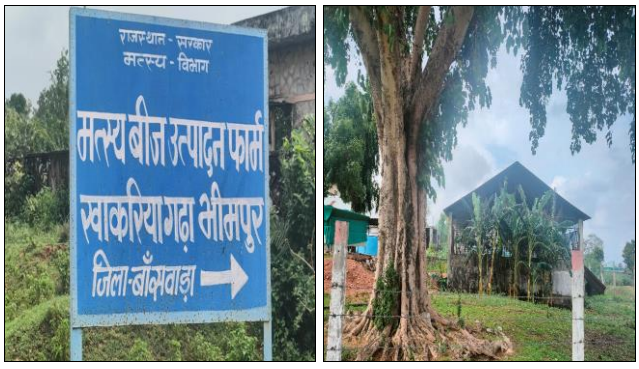

Fig 1 and 2: Fish Seed Production farm

In hatchery for labeo and pangasius species well growth, environmental factors are very suitable. The breeding of labeo and catla is performed in farm and fry and fingerlings are distributed to the farmers. Pangasius is also favourable fish seed for farmers. Composite culture is in best practice for fish seed and food for people. Some of these fishes are.

- Labeo Rohita.
- Catla catla.
- Pangasius pangasius.
- Tilapia mossambica.

Hatchery construction

Hatchery needs flowing water with affordable temperature during the breeding season. The hatchery tanks or pond provide stimulating environment to ripe brooders for induced spawn. Pipes for outlet and inlet water system serves for regulating the water level. A fish farming centre divided into different fish ponds.

1. Breeding pond
2. Hatching ponds
3. Nursery ponds
4. Rearing pond.

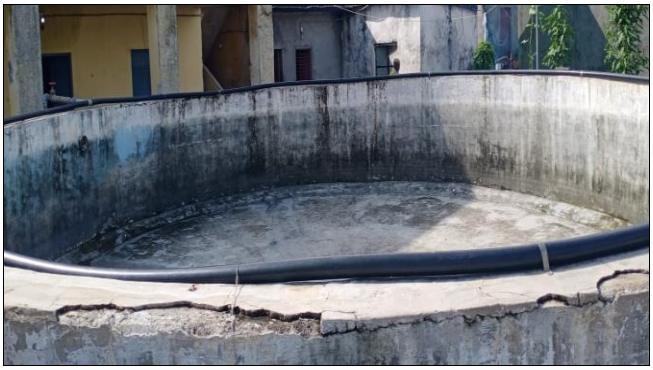

Fig 3: Breeding pond

Breeding pond

Ponds of size oval shape with 1.0 to1.5 meter and depth 2.0 to 5.5 with cemented uniform side slope and bottom with liming and fertilizing (exposed with sun) with controlled pipe system for complete drainage of inlet and outlet of water were selected (Fig. 3). Air and sunlight exposure needed for proper movement and healthy environment. Its surrounding should be getting sufficient wind action and exposure to bright day light for 6-8 hrs in a day for at least 2-3 months from January to February onwards. This quantum of exposure and a moderate range of water temperature (27-32 ºC) seem to be optimum and quite inductive for rapid growth of gonad of fish. Proper selection of brooder fish for induced breeding is the first step. Female healthy breeders of Catla, rohu, mrigal, grass carp and common carp of above 2 years age group and weight range are normally up to 2 kg selected.

Hatching ponds

These are the small tanks usually of 8x4x2 feet and are used for hatching the fertilized eggs. These are located near the brood pond. (Fig. 4) A continuous but slow flowing water is desirable for aerating the eggs. The tanks are fixed up with happa called hatching happa made of coarse cloth of mosquito curtain cloth. For survival and growth of eggs and larvae, physicochemical and microbial parameters of water should be tested properly.

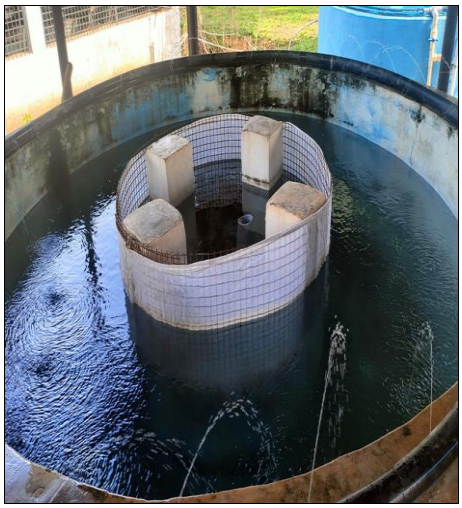

Fig 4: Hatching pond

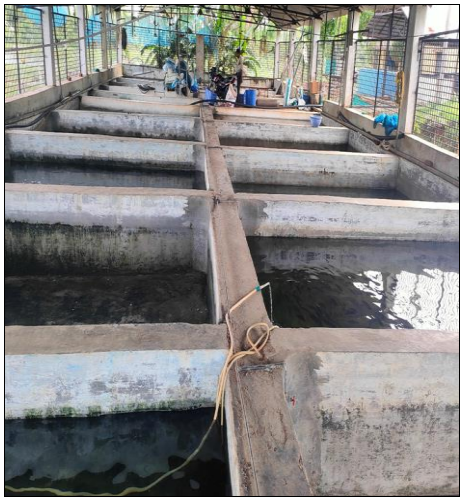

Fig 5: Nursery pond

Nursery pond

These are 50x50x4 feet. Young fry about 3 to 5 days old are transferred from spawning ponds to nurseries, where they remain for about 30 days. (Fig. 5) This involves the collection of male and female gametes for artificial fertilization or the collection of fertilized eggs from spawning mats, heaps and spawning receptacles; incubation of fertilized eggs, hatching and maintenance of hatchling (Nwadukwe *et al*., 1991) [4].

Rearing pond – such ponds may be seasonal or perennial of 90x30x4 feet in size and are used for rearing advanced fry for 2-3 months. (Fig. 6.).

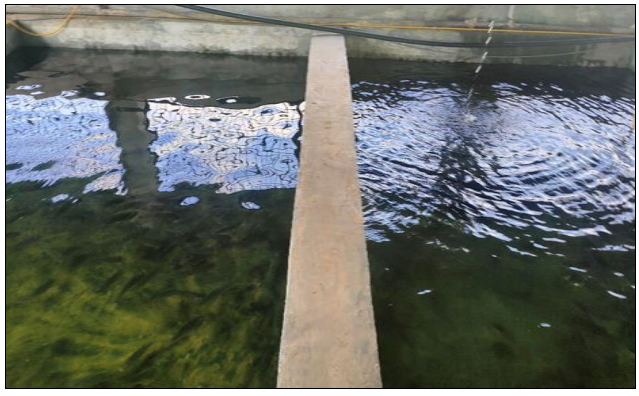

Fig 6: Rearing pond

Stocking pond

Stocking pond size may be 300x88x6 feet or about an acre. (Fig. 7.) Stocking of fingerlings of various major carps in the ratio of 3:3:4 (Catla, Rohu and Mrigal) is done successfully with a survival rate of 70-80%. While stocking, the principle to be kept in mind is that the area of $1m^2$ is needed to attain an average weight of 1 kg per year.

Fig 7: Stocking pond

Aerators and Diffusers

Aeration is important for hatchery systems. This instrument is in available in floating and static pumps and used to circulate the oxygen into water. (Fig. 8. & 9.).

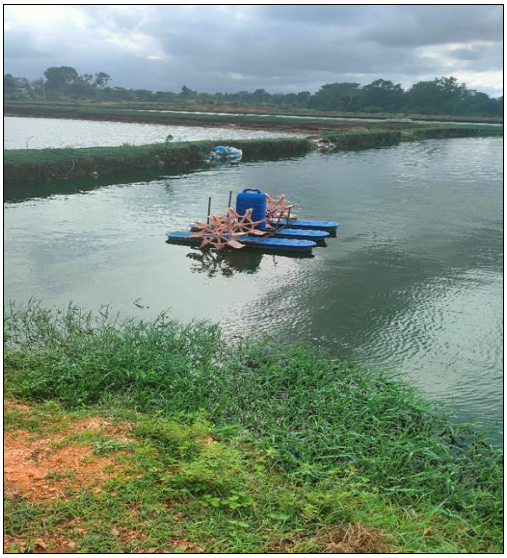

Fig 8: Aerators and Diffusers

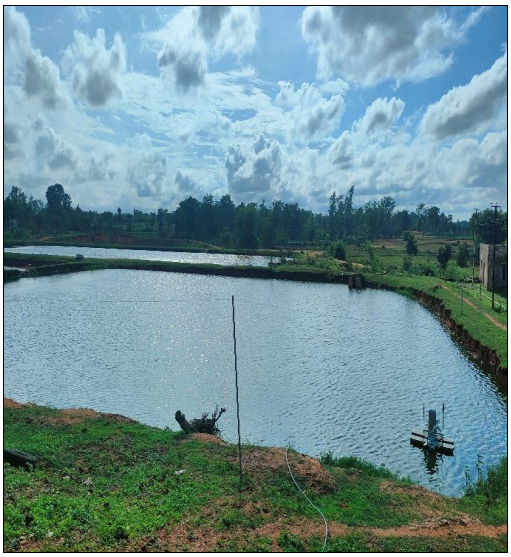

Fig 9: Aerators and Diffusers

Fish Feed

Three types of food used in fish ponds: natural food; supplementary feeds, and complete feeds.

1. Natural food: Natural food is found naturally in the pond. It may include plankton (Spirulina, Oscillatoria, and chlorella), worms, insects, snails, aquatic plants (Hydrilla, Vallisneria, Najas, Utricularia, and Eichhornia) and fish. Their abundance greatly depends on water quality.

2. Supplementary food: The mixture of rice, pulse, oil cake, cattle dung, fish meal is fed to Catla, Rohu, Mrigal and Common carp. This mixture is available in terrestrial plants, kitchen wastes or agricultural by-product. Fish food must be easy to eat and digest. Feeding increases fish production from the water body and makes farming profitable. For better results Feeding with powered cotton-seed, containing vitamin-E promotes gonadal maturity in fishes.

3. Complete food: This mixture is made of selected ingredients to provide all the nutrients necessary for the fish to grow well. These feeds are quite difficult to make on the farm and are usually quite expensive to buy. (Fig. 10 & 11).

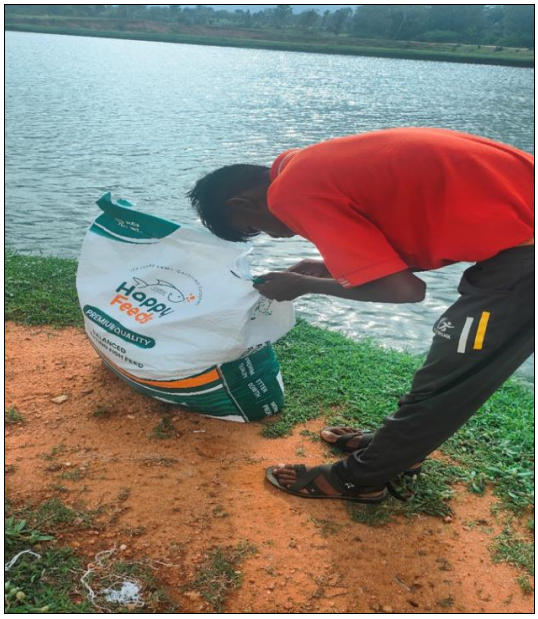

Fig 10: Fish food

Fig 11: Fish food

Breeding

Induced breeding produces seed of much greater consistency and fish can be spawned on demand when it matures. It also provides ample opportunities for stock improvement by selective breeding. In hatchery farming brood stocks are maintained in separate ponds. Brood fishes are injected with inducing hormones in hapa breeding (Fig. 3. Breeding pond). Both the males and females are injected synthetic hormones (Ovaprim or Ovatide). These synthetic hormones are administered @ 0.1-0.4 ml/ kg female and 0.2-0.4 ml/kg male.

Fish Seed Hatchery

The source and means of procuring fish seed directly influence the production of fish from fish culture. It provides for fish eggs to develop and hatch by maintaining proper water temperature, oxygen levels, disease control, food and protection from predators. The production of eggs, larvae and fingerlings in a hatchery depends on the number of hatch able eggs, survival and growth rates of the larvae (Charo and Oirere, 2000) [3].

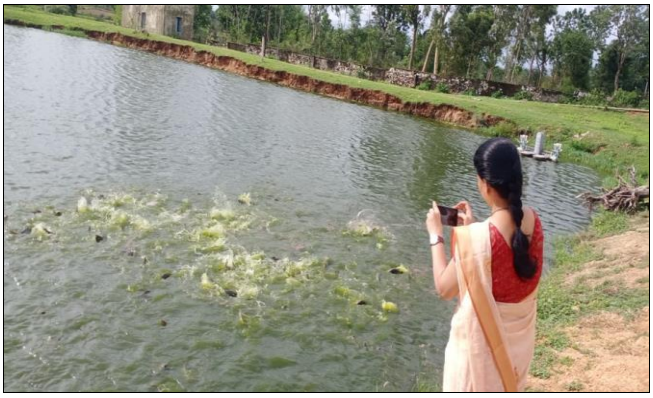

Fig 12: Fish pond - pangasius

Results and Discussion

Complete hatching facilities of fish farm are needed to produce the fish seed. Natural conditions and proper management can obtain higher percentage of brood stock. Separate fish ponds with plenty of water, food and physicochemical parameters (ph, alkalinity and dissolved oxygen) for rearing of offspring obtained breeding, monitoring, growth and maturation in desired fish seed in adequate quantities are needed.

Conclusion

Fish food is very important for India's growing population. Fish farming earning is beneficial for unemployed people. Fish is important for health. In fish hatchery requirement water and transportation facilities availability is necessary. Fish farm employee must have knowledge of pond construction and management, expert in induced breeding and hypophysation. Fish seed distribution provide good opportunity to farmers to produced fishes in hatchery.

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