Portable Carp Hatchery: Journey so far

The portable fibreglass reinforced plastic (FRP) carp hatchery, one of many technologies of CIFA, has created major impact in the freshwater aquaculture in the country. Twenty three years of long journey of collaboration between All India Coordinated Research Project on Application of Plastics in Agriculture and Central Institute of Freshwater Aquaculture of ICAR has produced several farmer friendly aquacultural technologies and gadgets for field use. Portable carp hatchery technology was offered to the nation on 14 July 2006 by His Excellency the Governor of Odisha, Shri Rameshwar Thakur. Within a short span of five years, the technology has gone to almost all parts of the country located in the diverse agro-climatic zones like coastal plains, rainfed regions and hilly regions. The performance of this technology across these diverse settings is quite remarkable. It is being seen as a major intervention to produce sufficient seed to sustain aquaculture growth in the country. The technology is a rallying point for the development of the hatching, nursing, rearing and culture system of carps. While the hatchery is able to generate enough income to breakeven in three years times, the indirect benefit to the small and marginal farmers form seed production and table fish production is immense. The responses of the diverse stakeholders are the keys to further upgrade and adapt to the changing environments and the institute has taken the responses as inputs to further strengthen the R & D on this crucial aspect of the aquaculture.

भाकृअनुप
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Towards Blue Revolution
25
CIFA
1987 - 2012

All India Coordinated Research Project
on
Application of Plastics in Agriculture

COOPERATING CENTRE
CENTRAL INSTITUTE OF FRESHWATER AQUACULTURE
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TECHNOLOGY IN BRIEF

The FRP Carp Hatchery System (for production of 1.0 million spawn per operation) consists of four major parts ***i.e.***

- Breeding/ spawning pool
- Hatching/ incubation pool
- Egg/ spawn collection chamber, and
- Overhead storage tank/ water supply system

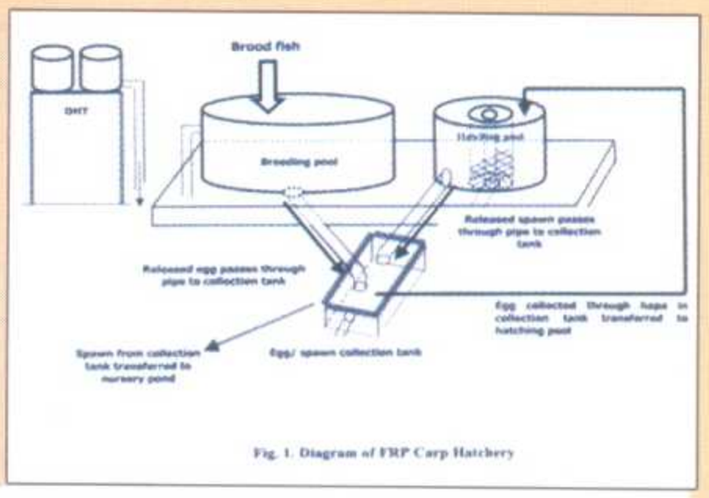

Fig. 1. Diagram of FRP Carp Hatchery

The Breeding pool is of 2.15 m diameter, 0.9 m height, 1:22 bottom slope and 3409 l capacity (operation capacity: 2950 l). To provide water circulation inside the breeding pool 5 numbers of 15 mm dia rigid PVC elbows, carrying nipples fitted 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 inter connected and fitted with individual full way valves to regulate the flow of water. One or two showers are provided at the top for better aeration. The flow rate during egg collection is maintained 1-1.5 l/sec. The system is suitable for fish breeding of 10-12 kg of carps in single operation.

The Hatching or incubation pool is of 1.4 m diameter, 0.98 m height, 1400 l total volume and 1200 l net egg incubation volume with a FRP inner chamber (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), water supply system through six numbers of 15 mm dia duck-mouths fitted at the bottom of the hatchery at 45° angle. It also has drainage outlets fitted at the center and at the outer chamber of the pool. It has the capacity of hatching 1.0 - 1.2 million eggs per operation. The flow rate in the pool during operation is maintained at 0.3-0.4 l/sec.

The Eggs/ spawn collection tank is rectangular with size 1.0 X 0.5 X 0.5 m with water holding capacity of 250 l. The water level in the tank is maintained at a height of 0.45 m (net water volume 225 l) by fixing the drainpipe of 63 mm diameter 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.

The Water storage tank (not supplied with the unit) 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.

SPREAD OF TECHNOLOGY

The five years is quite a small period for assessing success of any technology. But within a short span of time, the dissemination has been quite remarkable. Presently 126 sets of the hatchery (up to June 2011) have already been established across the country. In the year 2010 as high as 44 sets are being established. Cumulatively, the growth rate is very fast with each passing year as indicated from the sharp rise in the curve (Fig-1). There is growing confidence of the technology adopters from the date of commercialization of the technology in 2006.

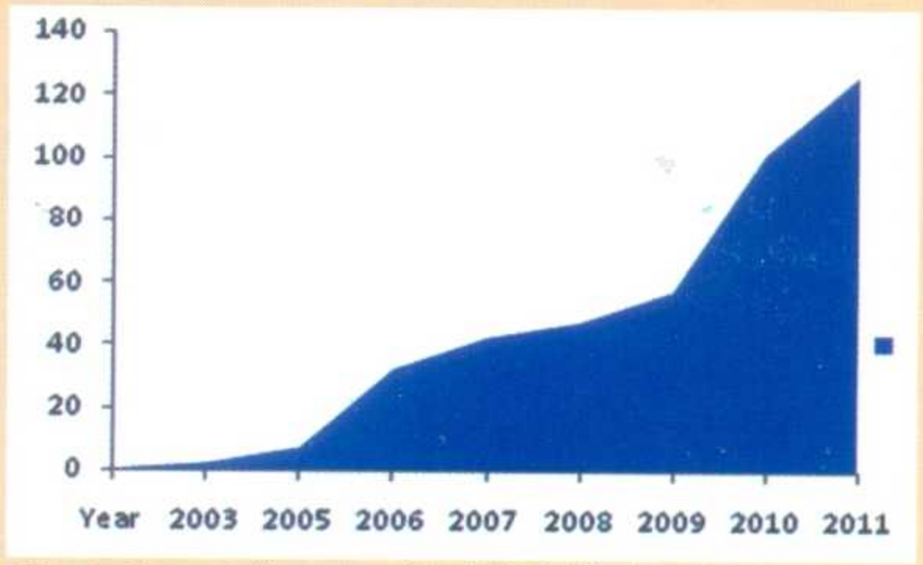

Fig-1. Cumulative growth of Portable hatcheries in India

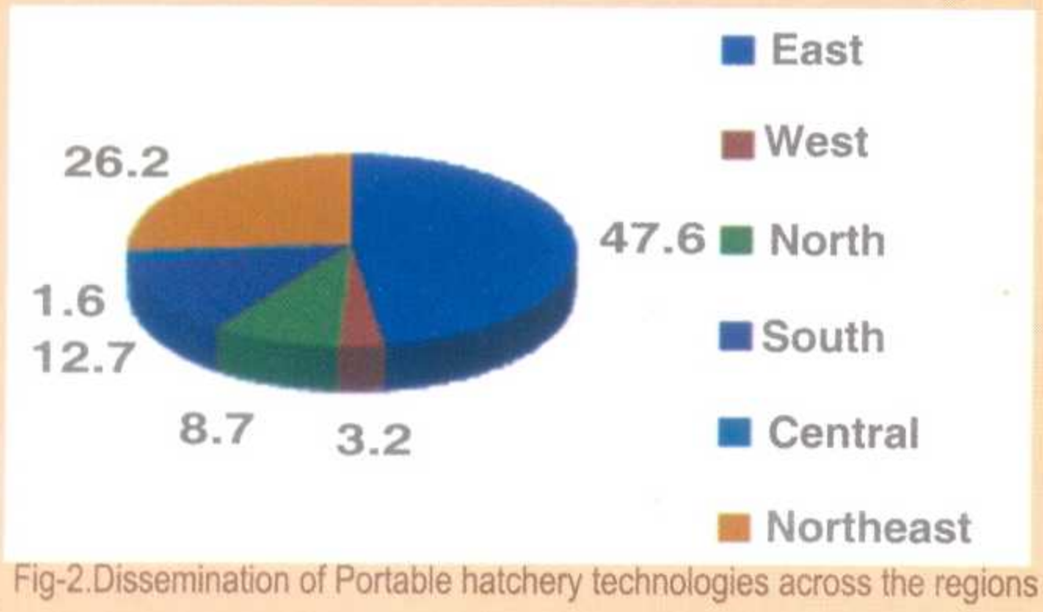

Fig-2.Dissemination of Portable hatchery technologies across the regions

Geographically, every region of the country has been touched upon. The eastern region which is the traditionally aquaculture rich region is also the largest beneficiary of the technology accounting to 46.7 % of the installations (Fig-2). Northeast is next important region to which the technology has penetrated and as now most of the hilly states are being able to produce seed through establishment of the portable hatchery. The other regions of the country are also getting benefit from the technology as evident from growing demand in these parts.

The beneficiaries and end users of the technology are very diverse. Most important end-users are the KVKs and regional centres and headquarters of ICAR institutes, SAUs and Universities, where the expertise for operating the hatchery is available. The state governments in many states have established in their own state to produce seed for their region. Few NGOs like Ramakrishna Mission, Sahavagi Vikash Abhijan, West Utkal Agriculture centre and HESCO are producing large numbers of seed to supply to the nearby localities. The corporate house like Amalgamated Plantation Private Limited (A unit of Tata Tea) has come forward to produce seed for their own requirements. But, the most important end-users are the individual entrepreneurs who run the hatchery for commercial purpose and they are able to generate income to sustain their family. Therefore, the hatchery technology is giving benefits to all sections of the society.

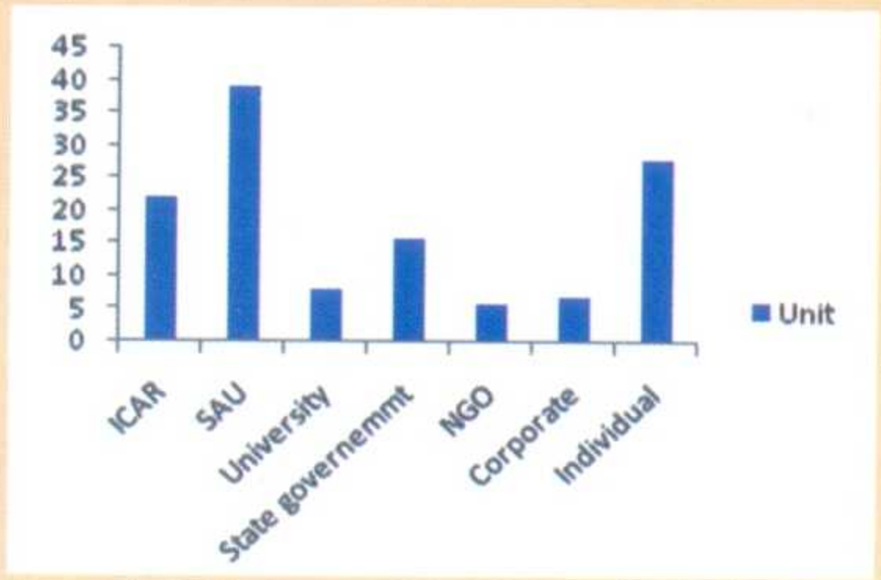

Fig. 3. End users of Portable carp hatcheries

SOURCE OF INFORMATION ON TECHNOLOGY

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CIFA (2004) Portable FRP carp hatchery. In : CIFA Technologies, Central Institute of Freshwater Aquaculture (ICAR), Bhubaneswar: 22-23.

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NCPAH (2005) Portable FRP carp hatchery : An aid for rural aquaculture. Proceedings International Conference on Plasticulture and Precision Farming, NCPAH, Ministry of Agriculture, Govt. of India, November 17-21, 2005, New Delhi, India : 515-522.

ICAR (2006) Portable plastic hatchery for carps. In : Fish Farming and Technologies for the North Eastern Region: Pond to Plate. Indian Council of Agricultural Research, New Delhi : 39-42.

Mohapatra, B. C. (2006) Application of plastics in aquaculture with special reference to portable hatcheries. In : Aqua-Tech 2006 and National Conference on Innovative Techniques and Remedies in Fishery Science, Dr. Ambedkar College, Deekshabhoomi, Nagpur, 16-17 January 2006.

Mohapatra, B.C. *et el*. (2008) Portable FRP carp hatchery technology : Successful adoption in India. Fishing Chimes, 28 (4) : 48-52.

CIFA (2006, 2008 & 2011) Leaflets on "Portable carp hatchery : A CIFA product" (In English, Hindi & Odiya). Published by CIFA, Bhubaneswar, Odisha.

AWARDS AND RECOGNITION

2004 - Letter of Appreciations from Fisheries Division, Indian Council of Agricultural Research, New Delhi.

2005 & 2007 - Letter of Appreciations from NR International for successful establishment of hatcheries in Bilenjore and Diptipur under Western Odisha Rural Livelihoods Project (WORLP), Bhubaneswar.

2006 – Special Appreciation from Central Institute of Freshwater Aquaculture (CIFA), Bhubaneswar.

2008 - The Scroll of Honour to Dr B. C. Mohapatra from Watershed Development Mission, Government of Odisha for dedicated services for aquaculture development in Western Odisha.

2009 - Life Time Achievement Award to Dr B. C. Mohapatra from the Diocese of Sambalpur, for dedicated services to the fish farming communities of Western Odisha.

WORKSHOP AND TRAINING

- Workshop on "Portable hatchery for better carp seed production" at CIFA, Kausalyaganga, Bhubaneswar during 31 August - 1 September, 2007, jointly organized by CIFA, Odisha Watershed Development Mission (OWDM) and NR International, UK. Around 41 senior officers and experts from state government and WORLP project participated.
- ICAR Special Training Programme on "Portable carp hatchery: Its installation and operation" for Subject Matter Specialists (Fisheries) of Krishi Vigyan Kendras of Zone-VIII, Bangalore (comprising Kerala, Tamil Nadu, Karnataka and Pondichery) during 11-13 March 2009 at CIFA, Bhubaneswar, Odisha.
- Stakeholder's Meet on "Dissemination of FRP carp hatchery technology for SC/ST farmers of Odisha" conducted at CIFA, Kausalyaganga on 3 June 2010. Twenty identified beneficiaries participated the meet.
- More than 200 people have been trained on the technology in various programmes conducted by different organizations.

RESPONSES SO FAR

The institute has to be congratulated for developing the FRP portable hatchery and live fish transportation tanks"..... (QRT report of CIFA for the period 2003-2008 under the Chairmanship of Dr M. V. Gupta, World Food Prize Laureate).

The KVK system will be further strengthened through ..... additional demonstration units of ....., portable carp hatchery .....(Press Release of Cabinet Committee on Economic Affairs (CCEA) dated 26 December 2008).

With an investment of about Rs 70,000 the newly developed portable carp hatchery can provide over 2 crore of seed in 20 batches in a season during July-September. ..... (National Agricultural Scenario, Ministry of Agriculture, Government of India. In: http:/dacnet.nic.in (2007-08).

WUAC now has the opportunity to improve its ministry to poor people locally by producing and supplying bigger fingerlings much earlier than normal after the monsoon breaks..... (Web News of Operation Agriculture, UK in 2008).

Installation of FRP carp hatchery and induced fish breeding in some tribal districts of North-East Hill region would help in enhancing the seed production to at least 50% more."..... (Report of the Working Group on Agriculture Research and Education for the Eleventh Five Year Plan (2007-2012), Government of India, Planning Commission).

All the centers should work to propagate the technologies developed in the line of efforts made by Bhubaneswar center for propagation of FRP Carp Hatchery ..... (ICAR Reporter, October- December 2007, Page 8).

We congratulate you and entire team for developing portable FRP carp hatchery, which is convenient for production of fish seed at low investment and also movable..... (Associate Dean, College of Fishery Science, Udgir, Latur, Maharashtra State).

The operationalization of the portable hatchery unit at Bilenjore is a wonderful example of multi-agency collaboration. We in WORLP believe that this will have a great positive impact on the overall development of freshwater aquaculture in the western Orissa region. This in turn has the potential to contribute to enhancement of livelihoods of the poorest sections of Western Orissa..... (NR International, UK, 2007).

The installation of portable hatchery would help in the dissemination of breeding technology as well as to ease out the constraints of the poor farmers in meeting their demand to some extent for adoption of aquaculture ..... (Director, ICAR-RCER, Patna).

One of the outstanding achievements of CIFA in recent years is the standardization and successful popularization of portable Fiberglass Reinforced Plastic Carp Hatcheries. This breakthough deserves to be acclaimed as an excellent follow-up development to the introduction of the epoch making induced breeding technology in 1957. Many in India have already incorporated the portable hatchery technology in their seed production working systems, with a sense of gratitude to CIFA. The hatchery model introduced being portable, there is the advantage of taking it to the places concerned where hatchery operations would have to be conducted..... (Editorial: Fishing Chimes, 28(4) July 2008).

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