

MARKET OF FISH SEEDS AND FINGERLINGS IN WEST BENGAL, INDIA – AN EMPIRICAL ANALYSIS

Debabrata Lahiri, Indian Institute of Technology, Kharagpur, India, debabratal@yahoo.com

ABSTRACT

In India, while West Bengal has been the largest consumer of fish due to typical fish eating population. Due to many constraints regarding production of fish it has not been the largest one. But it has been the largest producer of fish seed and seedlings as compared to other States of the country. Most of the seeds for sweet water fish are produced in tanks and ponds artificially. After production of the seeds, it is packed in polythene bags packed and put in tins. The seedlings are transported to distant places in aluminum vessel. Transportation of fingerlings to distant places are generally done by itinerant traders. The job of transportation of fingerling has been labour consuming as water in aluminum vessels has to be continuously shaken in order to maintain the level of dissolved oxygen. Water has to be changed periodically to maintain the dissolved oxygen level. In view of the above the study intends to analyze the following objectives:

i) To study the different types of market functionaries engaged in seed marketing; ii) Nature of marketing and marketing margins obtained by each of them.

The study had been conducted among 250 farmers having various size of tanks/ponds in the districts of 24-Parganas (South) and Bankura district of West Bengal.

Keywords: Fish seeds, Fingerlings, Golders, Patilwallahs, Dallals, Goleder employees,
Independent nursery ponds

Introduction:

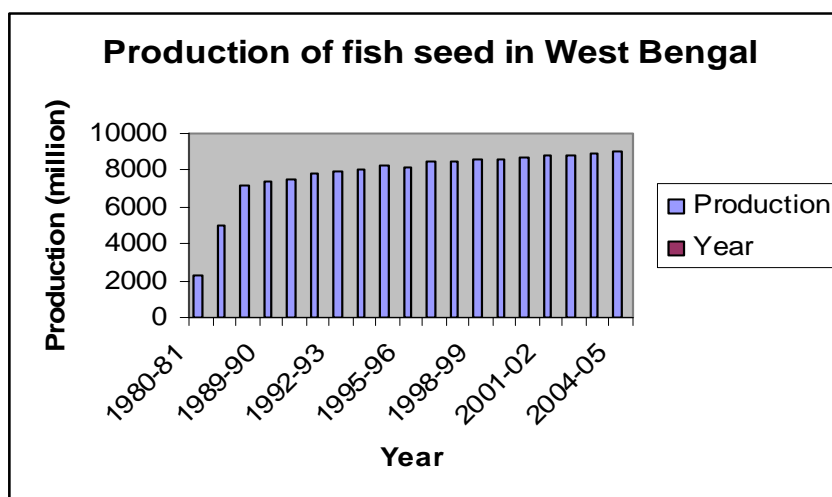
In Asia-Pacific region 95.00 per cent of inland finfish produced had been of non-carnivorous 'cheap' varieties. Of this 'cheap' non-carnivorous 82.00 per cent comprised of carps (FAO-2000). Of these, Indian Major carps (IMC) comprising of rohu (*Labeo Rohita*), catla (*Catla Catla*) and mrigal (*Cirrhina mrigala*) has been the primary fish species cultured with exotic carps, catfish and tilapias. Tilapias had been the other main contributors. Successful food-fish production has been largely dependent on availability of quality fish seed among other factors associated with on growing among which marketing has been the most important one. Deficiencies in fish seed supply within India has been anticipated eleven year ago with the level of production estimated as being able to satisfy less than half of custom and consumer demands at the time (Pathak 1990).

West Bengal has been one of the important fish seeds producer states in India. The production of fish seed from has increased from 2300 to 8500 million from 1980-81 to 1997-98. This means there has been an increase in 369.56. Details have been given in Table 1.

Table 1: Production of fish seed in West Bengal

Sl. No.	Year	Production (million)
1.	1980-81	2300
2.	1985-89	5000
3.	1988-89	7200
4.	1989-90	7400
5.	1990-91	7552
6.	1991-92	7844
7.	1992-93	7891
8.	1993-94	8000
9.	1994-95	8216
10.	1995-96	8180
11.	1996-97	8435
12.	1997-98	8500
13.	1998-99	8575
14.	1999-2000	8630
15.	2000-01	8700
16.	2001-02	8780
17.	2002-03	8826
18.	2003-04	8910
19.	2004-05	8980

Source: Economic Reviews, Government of West Bengal



Successful food-fish production has been largely dependent on availability of quality fish seed among other factors associated with on growing among which marketing has been the most important one. Deficiencies in fish seed supply within India has been anticipated eleven year ago with the level of production estimated as being able to satisfy less than half of custom and consumer demands at the time (Pathak 1990)

Of the total pond resources in India, 37.00 per cent has been occupied by West Bengal. Further, 70.00 per cent of which has been utilised for fish culture. From time memorial the state had been 'rice-fish' society producing about 3 million tonnes of fish per year. The state has also been a major supplier of fish seed to other states of India (Morrice et.al 1998).

After production of fish seed, marketing of it has been the most important one as a number of people have been engaged as functionaries for livelihood generation. There has also been various ways of marketing fish seed for near and distant places. Also the production of fish has differed from natural breeding to induced breeding. Production technology has also been different.

Objectives:

In view of the above the main objectives of the study has been to find out:

- i) To study the different types of market functionaries engaged in seed marketing;
- ii) Nature of marketing and marketing margins obtained by each of them.

To discuss the issues related to fish seed marketing the paper has been thrown in the following headlines:

- (i) Background of seed production;
- (ii) The market functionaries (herein known as actors);
- (iii) Hatchling origins;
- (iv) Hatchery seed distribution;
- (v) Fish seed marketing;
- (vi) Fish seed distribution:
 - (a) Local fish seed distribution;
 - (b) Distribution to distant places.

Background of fish seed production:

Fish seed production began to develop as private sector enterprise clusters at either ends of Jessore road which has been linking West Bengal and Bangladesh. Jessore (now in Bangladesh) had established itself as suitable location for fish seed production for a variety reasons like easy market, high density of boars and ponds, easy access to materials (pituitary glands, insecticides and nets). Skilled manpower, (especially nursery operators, collection of pituitary glands,) and commercial atmosphere plays an important role in marketing hatchlings, fry and fingerlings..

The actors:

Based on the production of fish there are two types: (a) hatcheries and (b) nurseries. Hatcheries, generally induces the brood carp to produce seeds and hatch them. In nurseries the small fingerlings has been nursed. Generally three types of produces have been found in markets which are (a) hatchlings, (b) fry and (c) fingerlings. The intermediary which sells the three type of produce has been (a) Dallals (b) Goleaders (c) Patilwalahs. These products have been distributed in *hundies* (big aluminium vessels) by slinging them by means of a bamboo stick or by bicycles. It has been easier to take the products in *hundies* because continuous aeration is required. Continuous aeration is done by splashing water by hand. When supply requirements have been larger *hundies* are taken by trucks by the Patilwalahs.

Fingerling sale prices showed a variation between producers as did the profit margin from business ranging Rs. 20,000-60,000 per year. The average margin from business had been around Rs 34,000 to 42,000.

Hatchling origins:

Hatchling has been purchased directly from private nurseries and from fish seed markets. Among the main markets of fish seeds hatchlings have been purchased from nearly hatcheries such as:

- (a) **Naihati fish seed market:** From local hatcheries and as well as from Chakda about 15 kilometres away;
- (b) **Nurseries of Hooghly:** Purchased hatchlings from Pandua, Balagarh, Bankura district and Mogra;
- (c) **East Calcutta Westland Nurseries (ECW):** From Naihati and Mogra;
- (d) **Midnapore nurseries:** From Simlapal, Ramsagar (Bankura district) and Debra (Government hatchery within Midnapore);

Hatchery seed distribution:

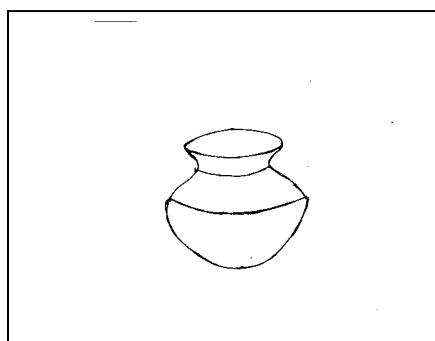
Hatchling has been transported by air to other states by nursery operators or directly to fish seed traders (Patilwalahs). Hatchling have been measured in bowls (locally known as *batis*) on site and packed in plastic bags containing tube well water and injected with oxygen prior to sealing in card board boxes for transportation to nearest

airport. Stocking of hatchlings in plastic bags varies in quantities depending upon the duration of journey.

Generally, following are the thumb rule for adjusting density of hatchlings versus duration of journey

- (i) 40 ml hatchlings for 24 hours journey;
- (ii) 30 ml hatchlings for 40 hours journey;
- (iii) 20 ml hatchling for 60 hours journey;

Only few operators have their own transport to deliver hatchlings in *hundies*, tanks and card board boxes. Most of the hatcheries rely on Patil Wallahs and to a lesser extent on Golegars. Hatchlings taken to Naihati Fish Seed Market and independent nurseries have been transported mostly by Patil Wallahas. Needs of East Calcutta Wetlands has been large which has been meet by Golegars and Dalalls.



Stocking density of Patilwallahs and Golegars had been different to a great extent as per following:

- (a) Patilwallahs generally stock 10 kg if 0.2 gram fry per *hundi*;
- (b) While Golegars each transport consignment consist of 5,00,000 fries (100kg) per 1460 litre tank. Each truck consists of 2-4 tanks.
- (c) Some Golegars also transports fries in *hundies* in track. Generally 50-60 *hundies* are transported each time in a truck.

Fish seed marketing:

Fish seed (including hatchlings, fry and fingerlings) travels through a variety of channels and methods to growers, both locally within West Bengal and to various parts of the country.

The market functionaries involved are Golder, Golder employees, Patilwallahs and Dallals. The marketing channel has been given in Fig 1.

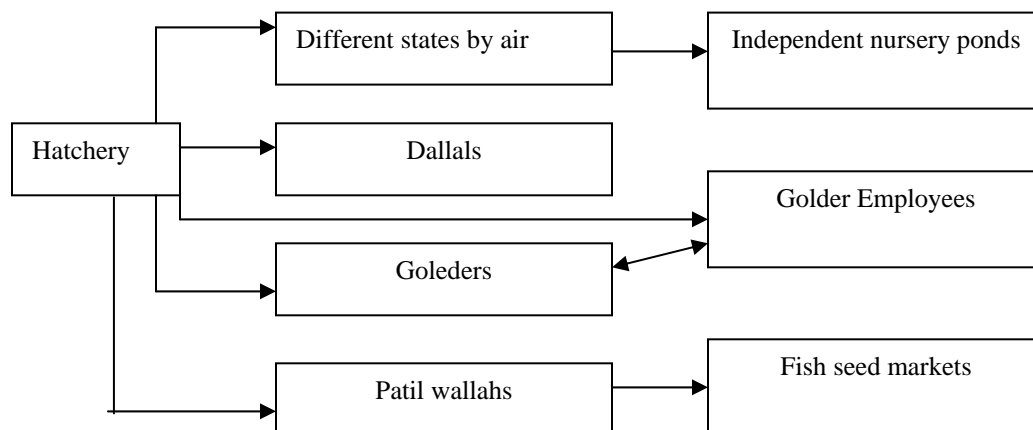


Fig 1: Marketing channel of fish seeds

The trucks have been often unable to deliver the consignment directly to the ponds and thus individuals to the employed or Patilwallahs had also been employed.

The Golder usually has business relationship with Dallals. Dallals had also been found to be involved in getting brood stock between producers and as well as fish seed transaction. Some Dallals does significant business in getting brood stock. Thus the Dallals play a key role in fish seed distribution and production also. The Dallals, generally receives 20-25% commission from producers and purchasers depending upon the development stage of fish. Due to close proximity to fish seed producers the Goleaders and Dallals have been able to examine fish seed quality and provide true account of the value of stock. Owners of the nursery often did not know the destination of their seeds, fry and fingerlings.

Fish seed distribution:

Fish seed are distributed from hatcheries as hatchlings and from nurseries as fry and fingerlings. In some place nurseries are either part of the hatchery business or operate independently

Fry and fingerlings have been primarily distributed by Goleaders in West Bengal and its adjoining states. The Goleaders generally stock fry and fingerlings in 1460 litres tank at different densities. Table 2 gives the details:

Table 2: Stocking density of fry and fingerlings by Goleaders during transportation

Sl. no.	Fish stage	Fish weight Range(g)	No. of fish per Tank (x 1000)	Fish biomass per tank (kgs)	Stocking density (gms/litre)
1.	Fry	4-6	70 - 80	320 - 420	220-290
2.	Fingerlings	8-10	45 - 50	400 - 500	270-310
3.	Fingerlings	16-25	8 – 12.5	200	140

Local fish seed distribution:

Local fish seed distribution within West Bengal has been done in a variety of ways as per following:

- (i) Local distribution has been carried out by Goleaders spanning from April to July. The distribution includes fry and fingerlings;
- (ii) Patilwallahs also had been involved in distribution of small quantities to nearby destination;
- (iii) Midnapore district receives half of the supply approximately, ranging from 20-25 trucks per day i.e. 20-25 million seeds;
- (iv) 5 % seeds goes to Maldah, Bardwan and Howrah;
- (v) 15% seeds to Murshidabad;
- (vi) 10% seeds to 24-Paraganas(North)
- (vii) 10% seeds to North of Maldah
- (viii) The longest journey by trucks has been for 1-2 days;

Distribution to distant places:

Assam, Bihar, Uttar Pradesh has been the states where hatchlings, fry and fingerlings had been transported by trucks and also by air. In these distant places, generally small size of hatchling and fry are sent ranging from 0.2 to 0.5 grams/each. Of these States, the Assam receives the earlier supply maximum amount ranging from 50-62 million fry/day (45 trucks/day). This states receives supply from middle of March to middle of May consisting about 37 per cent of the total supply. As the demand of the state slows down supply to other states commences and remains up to middle of October. Hatchlings are sent by air and the fry by trucks in *hundis*. However, in these states the Goleaders distributes most of the fry and fingerlings. Uttar Pradesh and Bihar receives 14-15 per cent of the supply. Other states like Rajasthan and Punjab receive less than 10 per cent of the supply by truck. Transportation by

air takes about less than one hour and by truck 1 to 4 days. There has been also a preference in distribution by the type of fish:

- (a) Among the IMCs *mrigal* is not distributed to any other states;
- (b) However, *rohu* and *catla* had been received in 6 states;
- (c) Cat fish had been the only species which goes to Andhra Pradesh;
- (d) *Clarias sp.* Species only goes to Haryana;
- (e) Grass carp and Common Carp has been received only by Karnataka;

Summary and conclusions:

In West Bengal production of fish seed, fry and fingerlings have been increasing as it has not only a good market within the state but also outside the state. In production both traditional and Chinese cistern method has been in practice. In marketing apart from nurserymen it has created livelihood generation to many functionaries such as Goleders, Goleder employees, Dallals and the Pitwallahs. Among these market functionaries the Patilwallahs does the most tedious job by transporting the fry and fingerlings to distant places even outside the state. Fish seed which are transported by air to outside the state does not also require any sophisticated technology. Since it has been a lucrative business the policies of the Government should to provide market infrastructure facilities, sheds etc. to the functionaries. These infrastructural facilities has been absent in the markets.

References:

- Bunting, S.W., Kundu, N and Mukherjee, M 2001: Renewable Natural Resources-Use in Livelihoods at the Calcutta Peri-Urban Interface: Literature Review. DFID, U.K. pp. 37
- Casavas, I 1993: Aquaculture Development and Environmental Issues in the Developing Countries of Asia , in R.S.V. Pulin, H. Resenthal, & J.L. Maclean (eds), Environment and Aquaculture in Developing Countries, International Centre for Living Resources, Germany, pp. 74-101
- Immnik, A., Dutta, G., Kumar, B. and Little, D 2001: Fry Supply Across West Bengal, *Aquaculture News*, Institute of Aquaculture, University of Stirling, Stirling, Vol. 37, pp 13-14
- Kundu, N. (1994): Planning the Metropolis, A Public Policy Perspective, Minerva Associates Ltd. , Calcutta, India, pp. 54
- Little, D.C., Benoy, B Chowdhuri, N.I and Morrice, C 1995: Down the Jessore Road Fish Hatchery Development in West Bengal and Bangladesh (field work notes)
- Pathak, S.C. 1990: Commercial Success of Fish Seed Hatchery Projects – Issues Involved in P. Keshavanath & K. V. Radhakrishnan (eds), Carp Seed Production technology: proceedings of the workshop on carp seed production technology 2-4 September, 1998. Asian Fish Soc., Mangalore, India. 53-56 pp
- Ranadhir, M., Gupta, S.D. and Reddy, P. V. G. K 1990. Economics of Carp Seed Production. In: P. Keshavanath & K. V. Radhakrishnan (eds), Carp Seed Production technology: proceedings of the workshop on carp seed production technology 2-4 September, 1998. Asian Fish. Soc., Mangalore, India. 82-88 pp
- Roy, S. 2000. Ecological sustainability and metropolitan development – the Calcutta experience. In : B. B. Jana, R. D. Banerjee, B. Guterstam & J. Heeb (eds), Waste Recycling and Resource Management in the Developing World. University of Kalyani, Kalyani , India. 293-302 pp
- Singh, N. K., Lall, R., Shankar, R. and Banerji, S.R.1990. Phase wise exercises in establishing World Bank aided carp hatcheries in Bihar and review of their operational efficiency. In: P. Keshavanath & K. V. Radhakrishnan (eds), Carp Seed Production technology: proceedings of the workshop on carp seed production technology 2-4 September, 1998. Asian Fish Soc., Mangalore, India. 61-68 pp;

Tripathi, S.D. & Khan, H. A. 1990. Carp seed production technology – a review. In: P, Keshavanath & K. V. Radhakrishnan (eds) Carp Seed Production technology: proceeding of the workshop on carp seed production technology 2-4 September, 1998. Asian Fish. Soc., Mangalore, India. 53-56 pp