

Present status and fish seed production of the hatcheries of six upazilas of Rajshahi District

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Abstract: An investigation was conducted during the period from March to December, 2009 to know the status and fish seed production of the hatcheries of six upazilas of Rajshahi district. All the hatcheries were established during 1968 to 2003. The occupations of the hatchery owners are hatchery business and others. Training status of the hatchery owners shows that in maximum cases they had no training and other cases had short term training, consulting with UFO etc. Funding source was self and loan, land ownership was own and lease. Fish disease occurs seldomly. The area of hatchery buildings ranged from 5 to 33 decimals. The water carrying capacity of overhead tanks ranged from 9091.90 to 409135.5 liter. The volume of each cistern ranged from 1.73 m³ to 3.93 m³. The volume of circular breeding and hatching tanks, varied from 2.48 m³ to 4.02 m³ and 1.72 m³ to 3.14 m³. The volume of each incubation tank (bottle) ranged from 1.52 m³ to 1.08 m³. The number of permanent workers ranged from 2 to 6 in all seasons. Six native species (rui, catla, mrigel, calibaush, bata and gonia) and six exotic species (silvercarp, bighead carp, grass carp, common carp, Thai pangus and Thai puti) were used for seed production. Two types of hormonal injections, such as Pituitary Gland (PG) and Human Chorionic Gonadotropin (HCG) were used for this purpose. Average fry production were for rui, 140.38 ± 127.02 kg, catla, 37.25 ± 29.24 kg, mrigel, 105.63 ± 54.84 kg, calibaush, 13.50 ± 5.75 kg, gonia, 32 ± 0 kg, bata, 166 ± 113.27 kg, silvercarp, 132.38 ± 96.32 kg, bighead carp, 120.71 ± 116.62 kg, grass carp, 31 ± 11.53 kg, common carp, 140.83 ± 93.83 kg, Thai pangus, 10 ± 0 kg, Thai puti, 42.33 ± 33.71 kg was recorded in some surveyed private hatcheries. The total fry production in some surveyed hatcheries ranged from 85 to 1698 kg with an average of 662.75 ± 513.83 kg.

Keywords: Hatchery, fish seed production, induced breeding, inducing agents, fish fry.

Introduction

Bangladesh is an agrarian country. Fisheries is one of the major components of agricultural activities and plays a vital role in nutrition, employment, income generation and foreign exchange earning. The availability of fish seed is an essential prerequisite for fish culture. The main sources of fish seeds in Bangladesh are spawn produced in government and private hatcheries, and some collected from rivers. In 2007-2008, the number of government fish hatcheries or fry production farms were 112. In 2007-2008, the number of private fish hatcheries were 873. Rajshahi is one of the richest district of Bangladesh in respect of its vast, diverse and unique fisheries resources in the form of physical, biological and others. Rajshahi district consists of 9 upazilas which are Paba, Puthia, Mohonpur, Durgapur, Bagmara, Bagha, Godagari, Tanore and Charghat. In Rajshahi district the number of public hatcheries are two and private hatcheries are thirty. But now few private hatcheries are closed. Nowadays due to the degradation of ecological balance, natural resource of fish seeds are destroyed. So, hatchery is now the main source of fish seed production. The term "Hatchery" is considered in broadest sense as a facility where fish fry and fingerlings suitable for stocking in growth ponds are produced in artificial manner by the process of induced breeding technique. Induced breeding is a technique whereby ripe brood fishes are stimulated by treating them with inducing agents to breed in captivity. The stimulation promotes a timely release of eggs and milt from ripe

breeders. It is now used as a widely accepted means of artificial propagation to overcome constraints in fish seed supply particularly for species that do not breed in captivity.

Materials and Methods

This study deals with twenty two hatcheries, their status and production rate of fish seeds of six upazilas (Paba, Puthia, Mohonpur, Durgapur, Bagmara and Bagha) of Rajshahi district during the period of March to December, 2009. The study was survey based, survey method was used to collect data. For data collection, a reasonable size of sample was considered. Firstly, a survey schedule was prepared and the data of status and seed production rate of the hatcheries were collected by survey and interview methods. The collected data were checked, summarized and scrutinized carefully. Some data were collected by observation and picture methods also. Data were also collected from district and upazila fishery offices. Data were analyzed and presented for statistical justification

Results and Discussion

The two public and twenty private hatcheries were scattered at Paba, Puthia, Mohonpur, Durgapur, Bagmara and Bagha upazilas of Rajshahi district. All the hatcheries were established during 1968 to 2003. The list of the surveyed hatcheries, their addresses, their establishment years and total fry production of some hatcheries are shown in the [Table-1](#).

Table 1. Hatcheries, sites, establishment year and total fry production of some hatcheries (*Public hatcheries).

Sl. No.	Name of the hatchery	Upazila	Year of establishment	Total fry production (kg) (Recorded in 2009)
*1	Rajshahi Matshow Beej Utpadon Khamar	Paba,	1968	85
2	Mashud Matshow Hatchery	Paba,	1993	1000
3	Anand Matshow Hatchery	Paba,	1997	600
4	Sarkar Matshow Hatchery	Paba,	1994	-
*5	Puthia Matshow Beej Utpadon Khamar	Puthia	1969	107
6	Mullata Hatchery	Puthia	1993	-
7	Shuvo-Irin Matshow Prokolpo Hatchery	Puthia	1994	1260
8	Atique Matshow Hatchery	Puthia	2003	-
9	Duivai Sonali Matshow Hatchery	Mohonpur	1997	680
10	Faisal Agro Fisheries	Mohonpur	1993	710
11	Merina Matshow Hatchery	Bagmara	1995	-
12	Bani Matshow Hatchery	Bagmara	1997	-
13	Bahi Bhai Matshow Hatchery	Bagmara	1991	1043
14	Monika Hatchery	Bagmara	1989	1698
15	Manchur Matshow Hatchery	Durgapur	1993	-
16	Amagachi Carp Hatchery	Durgapur	1992	-
17	Bhai Bon Matshow Hatchery	Durgapur	1992	-
18	Inni Matshow Prozonon Khamar	Durgapur	1993	202
19	Ibne Salam Matshow Hatchery	Durgapur	1994	98
20	Zahid Matshow Hatchery	Durgapur	1994	-
21	Sarker Matshow Hatchery	Durgapur	1993	-
22	Seba Agro Company Ltd.	Bagha	2002	470
Minimum		85.00	Total	7953
Maximum		1698.00	Mean ± SD	662.75±513.83

Occupation, training status, fund source, land category ownership and occurrence of fish diseases in the hatcheries: Among the surveyed hatcheries, 42.87% owners depended on hatchery business only, 20.80%, hatchery business and service, 30.58%, hatchery business and agriculture and 5.75%, depended on hatchery business and others.

About 38.16% hatchery owners had no institutional training, 19.56% had short term training, 15% consulting with UFO and 27.28% gathered knowledge through personal communications.

Regarding source of fund, 40.62% hatchery owners had their fund, from own sources; 29% got fund from own source, loan from relatives, friends and banks, 21.29%, owners got fund; from banks, own source and NGO's and 9.09% got fund from Govt.

It was found that 47.62% hatchery owners used their own land and leased land; 52.38% of them used their own land.

During the investigation it was observed that, there were seldom attack of fish disease in 70.76% of hatcheries and the rest 29.24% of the hatcheries were free from diseases.

Physical status of the hatcheries: Hatcheries are formed by different small units. Different parameters of the surveyed hatcheries are as follows-

The area of 22 hatchery building ranged from 5 to 33 decimals. The water carrying capacity of the overhead tanks ranged from 9091.90 to 409135.5 liter. The number of cisterns varied from 3 to 10 and volume of each cistern ranged from 1.73 m³ to 3.93 m³. The number of circular breeding and hatching tanks in different hatcheries varied from 1 to 5 and 1 to 3 and their volume varied from 2.48 m³ to 4.02 m³ and 1.72 m³ to 3.14 m³. The number of incubation tanks (bottles) ranged from 3 to 13 and volume of each bottle ranged from 0.52 m³ to 1.08 m³. The number of permanent workers ranged from 2 to 6 in all seasons of each hatchery.

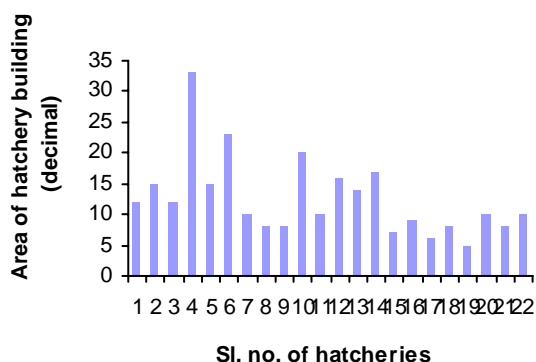


Fig. 1. Area of hatchery building of different hatcheries.

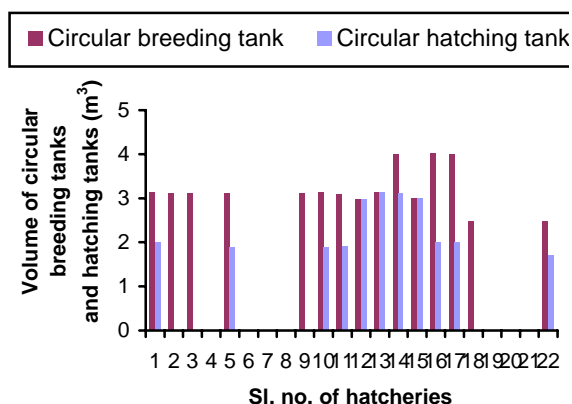


Fig. 2. Volume of circular breeding and hatching tanks of different hatcheries.

Biological status: Fish species: It was observed that, 12 fishes were used for hatching purpose, among them 6 were native and 6 fish species

were exotic. Native species were, rui (*Labeo rohita*), catla (*Catla catla*), mrigel (*Cirrhina mrigala*), calibaush (*Labeo calbasu*), bata (*Labeo bata*), gonia (*Labeo gonius*) and exotic species were; silver carp (*Hypophthalmichthys molitrix*), bighead carp (*Aristichthys nobilis*), grass carp (*Ctenopharyngodon idella*), common carp (*Cyprinus carpio*), Thai pangus (*Pangasius sutchi*) and Thai puti (*Puntius gonionotus*).

Induced breeding: The observed hatchery owners used mainly two types of hormones for induced breeding. Such as Pituitary Gland (PG) and Human Chorionic Gonadotropin (HCG).

Fish seed production: The production rate of fish seeds depend on weather, water quality, brood fish selection, proper dose of hormonal injection and expert hatchery operations.

Total production of fry of some surveyed hatcheries and species wise fry production of some surveyed private hatcheries are shown in Table-1 and Table-2 For producing fish seeds, 873 hatcheries have been established in Bangladesh (DoF, 2009). At present, there are two public and about thirty private hatcheries in Rajshahi district. All the hatcheries were established during 1968 to 2003. (Mohsin, et al., 2010). According to Hasan and Ahmed, (2002), three Indian, major carps (rui, catla and mrigel) and three exotic carps (silver, grass and common carps) were the dominant fish species cultured in most hatcheries of Bangladesh.

Table 2. Showing the annual production capacity (kg) and the species wise fry production (kg) of some of the surveyed private hatcheries (informations of other hatcheries were not available).

Sl. no. of hatchery	Annual production capacity	Fry production of native species					Fry production of exotic species						
		Rui	Catla	Mrigel	Calibaush	Gonia	Bata	Silvercarp	Bighead carp	Grass carp	Commoncarp	Thai Pangus	Thai Puti
7	2000	190	55	185	-	-	290	225	150	40	45	-	80
9	1200	85	35	90	-	-	40	60	90	-	280	-	-
10	1800	100	30	130	10	-	90	70	60	-	220	-	-
13	1100	175	15	155	-	-	130	260	155	18	110	10	15
14	1800	420	28	134	12	32	280	232	353	35	140	-	32
18	500	40	30	45	22	-	-	40	25	-	-	-	-
19	350	23	5	26	10	-	-	22	12	-	-	-	-
22	600	90	100	80	-	-	-	150	-	-	50	-	-
Total	9350	1123	298	845	54	32	830	1059	845	93	845	10	127
Minimum	350	23	5	26	10	32	40	22	12	18	45	10	15
Maximum	2000	420	100	185	22	32	290	260	353	40	280	10	80
Mean	1168.75	140.38	37.25	105.63	13.50	32	166	132.38	120.71	31	140.83	10	42.33
±SD	±647.49	±127.02	±29.24	±54.84	±5.75	±0	±13.27	±96.32	±116.62	±11.53	±93.83	±0	±33.71

More or less similar observation was found in this study. The fish seeds are produced in the hatcheries by the process of induced breeding through inducing agents. Mainly two types of inducing agents (PG and HCG) were used in the surveyed hatcheries. Fontenel, 1955; Atz and Pickford, 1959; Tang *et al.*, 1963; Ali, 1967; Chaudhuri, 1976; Bhowmick, *et al.*, 1978; Jhingran and Pullin, 1985; Mirza, *et al.*, 1993; Verdia, 1994; Alam and Bhuiyan, 1999; Bhiyan *et al.*, 2007; Bhuiyan, *et al.*, 2008 etc. also adopted the similar practice. From the investigational study, it was observed that the production of fish seeds are not sufficient than production capacity. More or less similar observation was found in the study of Islam, *et al.*, 2002; Hossain and Siddique, 2009. The annual production capacity (Kg) of some of the surveyed private hatcheries ranged from minimum 350 to maximum 2000 kg. The total production of fry of some surveyed hatcheries were lowest 85 to highest 1698 kg

Apart from some adverse socioeconomic and other impacts, fish hatcheries contribute a remarkable part of inland fish production in Bangladesh. Emphasis should be given on expansion of hatchery facilities to supply high quality fish seeds required to support aquaculture development. More future works are necessary on different aspects of fish seed production. The government and NGOs should provide all modern facilities in connection with the quality fish seeds production in Bangladesh. The present work gives an account of the fish seed production of the hatcheries of Rajshahi district

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