

## **Non- Conventional Methods of Fish Culture**

Assam is endowed with a vast expanse of open inland waters in the form of riverine fisheries and beels. Culture of fish and shellfishes in pens and cages can not only help in boosting the fish production of the state but also it can helps in uplifting the economic status of the poor people of the state.

**1. Pen Culture:** Pens are enclosures a blocking device which acts as a barrier preventing the entry of undesirable animals and fishes ensuring the safety of the cultured stock. The system ensures higher survival rate and better yield. The farming system can be operated in the marginal areas of the large water bodies and could be considered as an eco-friendly type as it does not interfere with other activities or pollute the environment. The pens are constructed by split bamboo and interlacing them with either can strips, coconut or nylon twines. Bamboo screens thus constructed are erected in an ideal site (where ingress and egress of water is not extreme) over the framework of bamboo poles where pen screens are strongly fixed. The screens except the shore side cordon the entire area under the pen operation.



**Fig: Photograph showing the series of pens under operation the marginal areas of the beels of Assam.**



**Fig: A single pen in operation in the marginal areas of beels of Assam.**

**2. Cage culture:** The culture of fish in cages has shown the possibilities production of carp seeds and production of table fish through monoculture of high priced air breathing fishes like- magur, singhi, etc. and freshwater prawns.

Some of the advantages of cage culture of fishes are-

- It provides private ownership in public waters.
- In this type of fish culture control of competitor species of fishes and also predators is easy.
- Cost of construction of cage is less.
- Initial expenditure of this fish culture practice is less.
- High yield of fish.
- Good economic return.

**i) Types of cages:**

- a) Floating (convenient for water bodies where depth of water is more than 5m).
- b) Fixed (convenient for water bodies where depth of water is less than 5m).

**ii) Shapes of cages:**

- a) Rectangular (more convenient).
- b) Square.
- c) Round.

**iii) Cage construction:**

The cages can be constructed using locally available bamboo at cheaper price. But PVC pipe may also be used for cage construction. From practical experience it is seen that the body of the cages of required size and shape can be constructed readily available bamboo and nylon ropes. Inside the bamboo frame a well stitched inner hapa or nylon cloth cage with a closable lid is tied. The success of fish culture in cages depends upon the aeration and the sunlight penetration in cages, which is again, depends upon the mesh size of the bamboo woven main cage and also on the mesh size of the inner nylon cage. Cleaning of bamboo cage and the inner nylon cage from time to time on need basis is essential for good growth of fish. The cages constructed by this way with matured bamboo may last for 3- 4 years, while the matured seasoned bamboo made cage may last for 8- 10 years.

SUCCESS STORY OF COMMUNITY (SHG) PARTICIPATED TRIALS ON CAGE AQUACULTURE  
CONDUCTED BY THE COLLEGE OF FISHERIES, ASSAM AGRICULTURAL UNIVERSITY, RAHA  
AT BAJIAGAON BLOCK OF NAGAON DISTRICT OF ASSAM.

Sponsored by: The District Rural Development Agency, Nagaon, Assam.

Results of the first trial:

**Duration: 45 days (20<sup>th</sup> May, 2005 to 6<sup>th</sup> July, 2005).**

1. Total 5 numbers of bamboo cages (Plate-1) specially designed for high intensity water circulation and light penetration were installed on 10<sup>th</sup> May, 2005 in the following sites at Bajiagaon Block, Nagaon, Assam.
  - A. 3 numbers at Era Kolong River (Plate-2):  
Specification: 3m X 2m X 1.5m X 3 = 27 m<sup>3</sup> area.
  - B. 2 numbers at Kanuamari Beel (Plate-3):  
Specification: 4m X 2m X 1.5m X 2 = 24 m<sup>3</sup> area.



**Plate:1: Photograph of a bamboo cage under construction.**



**Plate:2: Photograph of cage under operation at Erakolong river, Nagaon.**



**Plate:3: Photograph of cage under operation at Kanuamari beel, Nagaon showing 1 inner net cage.**

2. 2.5 cm to 3.0 cm fish fry (Plate-4) of rohu (20%), catla (20%), Mirika (25%), silver carp (25%) and grass carp (10%) were stocked in the following densities on 20th May, 2005 in all the cages.



**Plate:4: Photograph showing size of the fish seed released in the cages during trial.**

- A. Cages at Era Kolong : @225 nos./  $\text{cm}^3 = 225 \times 27 \text{ cm}^3 = 6075 \text{ nos.}$
  - B. Cages at Kanuamari Beel : @ 270 nos/  $\text{cm}^3 = 270 \times 24 \text{ cm}^3 = 6500 \text{ nos.}$
3. During the 45 days of rearing period of the fishes (average individual weight= 0.4 gms.) were fed daily with the following feed at specific dose.
    - A. For 1<sup>st</sup> 10 days: Rice polish + oilcake (1:1) @ 5% of the total body weight.
    - B. For rest 35 days: Rice polish + oilcake (1:1) @ 10% of the total body weight.
    - C. Agrimin were provided @ 0.3% of the total body weight in the entire period along with the food daily.

4. On 7<sup>th</sup> June, 2005 (after 28 days of rearing) a test netting was done and a very encouraging result regarding the growth achievement of the individual species are found.
5. Based on the observations made during test netting all 5 numbers of cages were harvested on 6<sup>th</sup> July, 2005 after 45 days of rearing in the cages (Plate-7 & 8). The percentage of recovery and the average growth performance of individual species were recorded as follows.

**Recovery:**

Cage site	Numbers of fish fry stocked.	Numbers of fish fry recovered.	% of recovery
A. From 3 cages at Era Kolong.	6000	4600	77
B. From 2 cages at Kanuamari Beel.	6500	5300	82
<b>Total</b>	<b>12500</b>	<b>9900</b>	<b>Average%= 80</b>

**AVERAGE INDIVIDUAL GROWTH PERFORMANCES OF FIVE DIFFERENT FISH SPECIES REARED (Plate 9,10,11 & 12):**

Sl.No.	Fish species	Growth in Length (cm)	Growth in weight (gms.)	Initial length (cm)	Initial weight (gms.)
I	Grass carp	19.0	150.0	2.5- 3.0	0.40
II	Silver carp	17.5	138.0	2.5- 3.0	0.40
III	Catla	15.0	132.0	2.5- 3.0	0.40
IV	Rohu	12.0	68.0	2.5- 3.0	0.40
V	Mirika	9.0	35.0	2.5- 3.0	0.40





**Plate:5: Photographs showing average individual growth of- grass carp, silver carp, catla & rohu harvested during 1<sup>st</sup> trial.**

**Economic Analysis of the First Trail:**

**1. Total cost of the first trial.**

- A. Capital cost for the construction of 5 numbers of bamboo cages including accessories like- the inner nylon cages, feeding trays, scoop nets, sinkers, etc. = **Rs. 17, 750.00**
- B. Cost of 12,500 numbers of fish fry purchased @ RS. 150.00/ 1000 numbers.  
= **Rs. 1,875.00**
- C. Cost of fish feed = **Rs. 225.00**

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**Grand Total** = **Rs. 19,850.00**

**(Rupees nineteen thousand eight hundred fifty) only.**

**2. Income from the first trial.**

- A. Total numbers of fish seed recovered = **Rs. 9,900.00**
- B. Worth of the fish seed produced = **Rs. 2.00/ piece.**
- C. Total Income = **Rs. 19,800.00**

**(Rupees nineteen thousand eight hundred only).**

Another 3 trials would be conducted with different stocking densities in the same cages and in the same sites. Stocking density and the feeding schedule would be standardized based on the growth achievement by providing various doses of food to the fishes. To obtain a normal value on cage in the rest of the trials would be kept as control i.e. without providing artificial diet. The trials are on and results are awaited.