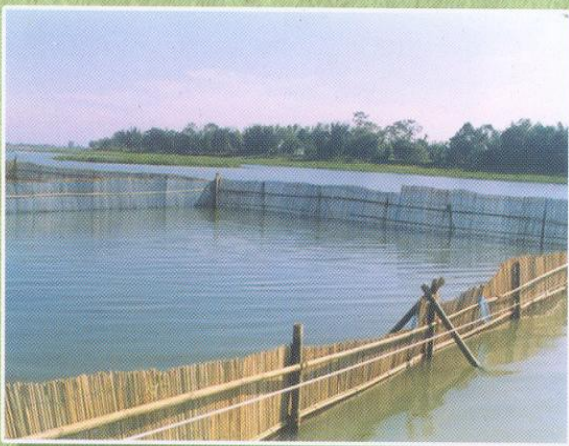


PEN CULTURE IN BEELS OF ASSAM



No. 1

2008

CENTRAL INLAND FISHERIES RESEARCH INSTITUTE

Regional Centre, Guwahati

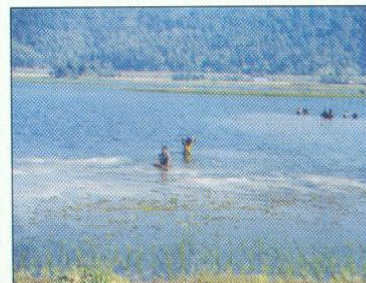
(Indian Council of Agricultural Research)

HOUSEFED Complex, Dispur, Guwahati - 781006

Introduction

The eastern and northeastern regions of India have numerous floodplain wetlands (beels) covering over 2 lakh hectares water-spread area. These wetlands are usually spread in the Brahmaputra and Ganga river basins. Beels are one of the most important fisheries resources of Assam because of large resource size (1 lakh ha) and high fish production potential (1000-1500 kg ha⁻¹ yr⁻¹). However, the present average fish production from the beels of the state (173 kg ha⁻¹yr⁻¹) is far below their production potential. A number of factors like river regulation, siltation and over-fishing are responsible for such low yields.

Fish production in most closed beels (those losing riverine connection) and seasonally open beels (connected to rivers during the rainy season) can be increased by stocking advanced fingerlings (10-15 cm long) of major carps in them. However, such fingerlings are not available in required quantities in most beels. This necessitates raising fingerlings in pen enclosures in beel margins. These pens can also be used to raise table fish. This technology is especially suitable for weed-choked beels, where recapture of stocked fingerlings is difficult. CIFRI has developed a low-cost and simple technology for fish culture in pens erected in beel margins. The salient points of this technology are outlined below.



Site selection

To succeed in pen culture, selection of a suitable site is important. We should select a site, which is gently slopping and have water depth of 1-2 m at least for 4 months. A mild water flow is desirable. However, the area should not experience strong wind and wave action. The proposed site should not have dense vegetation (to prevent soil and water quality deterioration through rotting of leaves). Easy availability of construction materials, cheap labour, good communication and social environment (including poaching problem) are other important considerations in site selection.

Culture period

The rainy season and very cold months are not very congenial for pen culture. Two periods are suitable for pen culture in the beels of Assam: September to December and February to May.

Pen size and shape

Small pens are easier to manage, and require less money. However, construction of bigger pens facilitates better fish growth and is more economical. Pens measuring 500 m² are found to be both economical and manageable.

Construction of pen

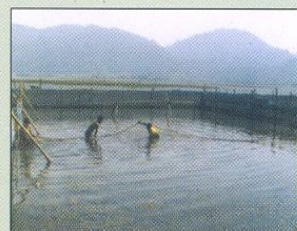
- A suitable area of 500 m² is demarcated and bamboo poles (5-8 cm diameter) are driven into the beel bottom after every 1.5–2.0 m. At least 50 cm of poles should remain above water surface.
- The main frame of the pen is made by tying half-split or full bamboo (5 cm diameter) on to the poles.
- The screen for encircling the pen is made by weaving split bamboo strips (8–10 mm thickness) with coir ropes.
- To prevent movement of fishes to and from the pens, cheap polyethylene mosquito netting is stitched into the inner wall of the split-bamboo screen (bana).
- Now, the bamboo screens are driven into the beel bottom along the inner side of the main frame. These are tied on to the poles with the help of half-split bamboo and coir ropes.
- Additional support may be needed in beels having strong winds/water currents or in places where the height of screens exceed 2 m. These can be in the form of support poles driven into



bottom from the outside at 45° angle and/or cross-tying of half-split bamboo resembling the letter 'X' between adjacent poles.

Pre-stocking management

- Before stocking with major carp fry, macrophytes present inside the pen are cleared (manually/mechanically).
- Predatory and weed fishes inside the pen are then removed by repeated netting with small mesh-sized nets.
- For correcting soil acidity and also to improve the overall environmental conditions, liming is done with quick lime @ 500 to 650 kg/ha based on the pH of water. For this, quick lime is soaked in water in the morning and applied to water surface of the pen in the afternoon.



Stocking

- In case of polyculture of Indian major carps, for each mrigal fry, 2 rohu and 3 catla fry is stocked in the pen.
- For fingerling raising, carp fry (4-6 cm long) are stocked @ 20,000 to 30,000 per ha.
- For growing table fish, carp fingerlings (8-10 cm) are released @ 8,000 to 10,000 per ha.
- Best time for stocking seed is evening hours when the temperature of water is low and dissolved oxygen levels are high.

Post-stocking management

- The stocked fishes are given supplementary feed @ 5% of their total body weight in addition to natural food for higher production.



- For reducing feed costs, rice polish and mustard oil cake are mixed in equal quantities. Mustard oil cake is soaked in water overnight, mixed with rice polish and made into balls. These balls are kept in submerged feeding trays made of bamboo to minimize wastage and to observe feeding intensity.
- Fishes are fed twice a day (morning and afternoon) at fixed times.
- The reared fishes are sampled at fortnightly intervals to record their growth and observe health conditions. Daily feed ration is recalculated after every sampling.
- Submerged and emergent macrophytes growing in the pens are cleared at regular intervals.
- The pens are limed every month @ 100-150 kg/ha depending on the pH of water.

Harvesting

- After rearing the fishes for 3–4 months, they are harvested by repeated netting with drag nets.
- Average fish production of over 2,000 kg/ha in 4



months has been obtained in the demonstrations conducted by CIFRI.

- In case of fingerling raising, 16,000 to 24,000 advanced fingerlings per ha were obtained.

Economics

- Approximate total expenditure for fish culture in a 500 m² pen is Rs. 3,260.00 yielding gross return of Rs. 6,282.00 and a profit of Rs. 3,022.00.

Maintenance and precautions

- Any holes in the pen walls should be promptly repaired.
- Algae, other organisms and organic debris may clog the nets. These should be periodically removed by brushing the pen walls with not-so-hard coir brush.
- Crabs, snakes and predatory birds should be controlled/scared away.
- Floating dead fishes, if any, should be immediately removed.
- To overcome severe heat during hot pre-monsoon months, a small patch of macrophytes may be left as shelter.

Prepared by : Dr. B. K. Bhattacharjya and Mr. B. K. Gorai

Published by : The Director, CIFRI, Barrackpore, Kolkata – 700120

Printed by : Graphique International – 3058 9245/48-52

For more details, please contact :

Regional Centre, Guwahati
CENTRAL INLAND FISHERIES RESEARCH INSTITUTE

(Indian Council of Agricultural Research)
 HOUSEFED Complex, Dispur, Guwahati - 781006
 Phone/Fax : 0361-2228486
 E-mail : cifriguwahati@gmail.com