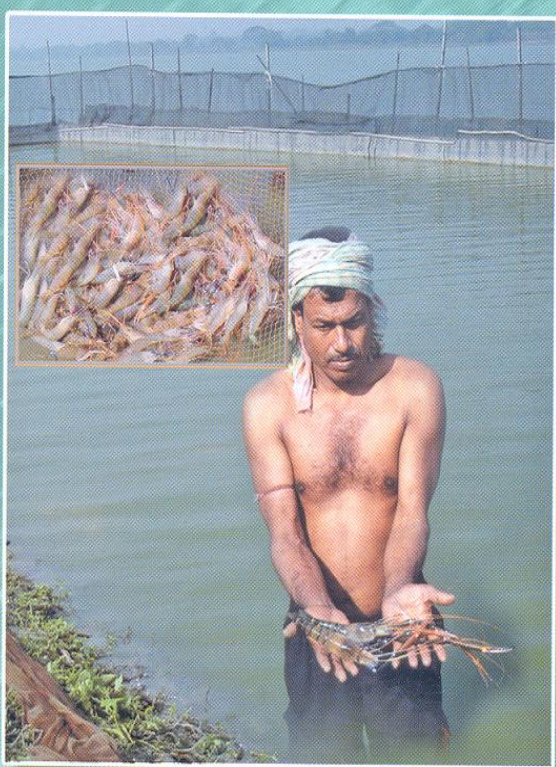


Pen Culture in Floodplain Lakes



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Pen culture in floodplain lakes

Floodplain lakes are a common feature of the landscapes of rural West Bengal, Assam, Uttar Pradesh and Bihar. These water bodies are essentially the cutoff river meanders, with or without a connection with the parent river. Apart from being an important source of fisheries, they form the lifeline of these states supporting agriculture, post-harvest operations, navigation, animal husbandry and a host of other economic activities. India has more than 3,00,000 ha riverine wetlands locally known as mauns, chours, beels, jheels, and pats. The present level of yield from floodplain wetlands is very low (100-200 kg/ha/yr), but their production potential range from 1,000 to 2,000 kg/ha/yr. They also provide ideal habitat for pen and cage culture operations.

Many floodplain lakes in the country are choked with submerged and floating weeds which create problems in the operation of many fishing gear. This can be overcome by culturing fish in cages and pen enclosures by clearing off the weeds from the marginal areas of these water bodies. CIFRI has identified pen and cage culture of prawns and fishes as a viable management measure for such water bodies. Pen culture trials have been conducted successfully by the Institute in the mauns of Bihar and the beels of West Bengal and Assam.

Pen size and construction material

The CIFRI technology is simple and inexpensive. The pen material is prepared from bamboo, which is locally available in plenty. Split bamboos are woven together with coir ropes. The split bamboo mats are erected in the beel and they are covered with close-meshed nylon cloth. The bamboo screens are further reinforced with galvanised iron wire mesh for protection against crabs, which are known to damage the bamboo screens. If the pen site is crab free bamboo screen can be replaced by HDPE net which is more cost effective. Any area for pen installation should be shallow with a minimum depth of 1.0-2.0 meters, gentle gradient and sandy-

clay bottom. The pens may be square, rectangular or circular in shape, but for better management the size should vary between 0.1 and 0.2 ha. Pen height above 6' needs special care for protection against wind action.

Most of the wetlands are thickly infested with macrovegetation and unwanted fauna which need to be cleared before stocking. The aquatic weed control is better done manually as it is cheap and easy for small water areas like pens. The weed fishes compete with the cultured species for food and space and the predators prey upon the stocked young ones. Repeated netting is the best method for eradication of fishes from the pens.

Liming hastens mineralisation of organic matter and helps in maintaining the environment hygienic. Use of quick lime @ 400-500 kg/ha pen area is recommended with initial dose @ 200-300 kg/ha followed by monthly instalments @ 50-75 kg/ha. The pen water also needs to be fertilized for the growth of plankton and other biotic communities if carps are to be cultured. Organic fertilizers like cow dung can be used for this purpose.

Species for culture

Species belonging to the groups planktivores, detritivores and bottom feeders are the most suitable for pen farming. Combined culture of indigenous and exotic carps with giant freshwater prawn has also been proved to be successful, but from economical point of view monoculture of giant freshwater prawn is more profitable. Species ratio is fixed on the basis of available food in the environment, depth of the water body, seed availability etc. In exclusive carp culture the suggested species mix is :

Feeding at	Species	Percentage
Surface	<i>Catla catla</i>	30-40%
Column	<i>Labeo rohita</i>	15-20%
Bottom	<i>Cirrhinus mrigala</i>	40-45%

The bottom slot of *C.mrigala* can be replaced by *Macrobrachium rosenbergii* or go for mixed culture of both mrigal and prawn at 1:1 ratio.

Stocking density

In monoculture of carp, the recommended density ranges between 4,000 and 5,000 nos/ha. In mixed culture, the densities of carp and prawn could be between 3,000-4,000 and 1,000-2,000 nos/ha pen area respectively. In monoculture of prawns, the stocking density could go as high as 20,000-30,000 nos/ha pen area. The pens are stocked with the prawn juveniles of 100-150 mm (4 g) size. In monoculture, the prawns grow faster and survival rate is also more compared to their mixed culture with carp.

Feeding

A locally manufactured feed is given to the prawn to supplement the natural food available in the pen. The artificial feed, made of prawn meal contains 42% protein. Feeding is normally done during night @ 4-5% of prawn body weight. Cockle flesh and fish meat are well known sources of animal protein for feeding the prawns. It is observed that feeding in trays saves loss of supplementary feed and reduces the cost of production.

Since the maintenance of hygienic environment is comparatively easier in a small pen area, the general health of the stocked animals is satisfactory. However, the diseases whatsoever rarely encountered are mainly caused by bacteria, fungi, protozoa, helminths and crustacea. The remedial measures for most of these diseases are available and can be applied if need arises.

The prawn stocked in the pen are sampled periodically to monitor their growth. Cast nets and drag nets employed for collecting the samples from the pen.

Harvesting

The final harvesting is done 4 months after the stocking. Harvesting of fish and prawns from pen is a difficult task. However, the fish can be netted out with drag nets and

cast nets through repeated operations. The nocturnal habits of prawns are to be utilized to harvest them fully. These bottom dwellers come up for feeding at night and are highly attracted towards light. Therefore, netting should be done in the darkness with the help of lights. Drag nets, cast nets and traps are the usual gear used for prawn harvesting. Harvesting size largely depends on the market demand and price of fish/prawns.

Yield

Seed

In case of seed production, at least three crops of advanced fingerlings of carps in a composite culture mode are possible from the same pen during the growing period between April- September. In each cycle 140-150 kg of advanced fingerlings with size range of 10-18cm could be produced totaling 4200-4500 kg/ha in 6-7 month growing period.

Table fish

It has been observed that from carp culture, 4,000-5,000 kg of fish can be produced from one hectare pen area in a year. In mixed culture annual yield to the tune of 2,000-2,500 kg of fish and 500-800 kg of prawn could be achieved from 1 ha pen area. Prawns in monoculture give an average yield of 1,300 kg/ha in about four months period. Two crops of prawns could be raised per pen per year.

This pen culture technique offers scope for wide adoption in rural India. This will enhance the revenue from the beels and mauns by augmenting per hectare productivity. A spectacular feature of the culture system is the impressive growth of prawn with minimum inputs. This type of culture system does not require any special expertise and can be adopted by the village folk throughout the country.



Site selection for pen



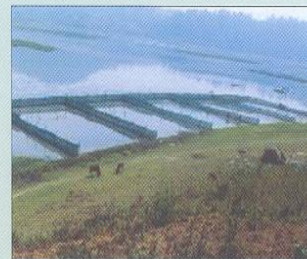
Fabrication using bamboo and nylon net



Material ready to install



Erecting of pen in beel



Pens stocked with prawns



Harvesting prawns from pen

