Prawn Culture in Salt Pan Areas - A Profitable Venture

The high production rates of 1200-1600 kg/ha/crop are a record for salt pan areas in India. Even in brackishwater tidal ponds the productio rates achieved in monoculture of prawns fluctuate between 300-600 kg/ha/crop. The very encouraging results obtained at Veppalodai, indicate that the white prawn P. indicus is a prime species for culture in salt pan areas where the salinity ranges from 38-48 ppt.

Penaeid prawns and marine fishes which can tolerate wide fluctuations in salinity are cultured in salt pan areas in many parts of the world without any hindrance to the normal production of common salt. The water let out from the culture ponds is discharged into adjacent ponds from where it is drained into different shallow ponds, for evaporation and finally led into the crystallisation ponds. Semi-intensive prawn culture practices in salt pan sites have been tried in India in a few areas around Kakinada in Andhra Pradesh and Tuticorin and Manakkudy near Cape Comorin in Tamil Nadu. Similar developments have also been made in the Philippines. In Japan, about 70% of the prawn farms are constructed in salt pan areas where prawns attain the harvestable weight of 20 g in 6 months and yields up to 2500 kg/ha have been achieved with *Penaeus japonicus*.

Construction of pond in salt pan area

The areas in and around the salt pans at Veppalodai, north of Tuticorin in Tirunelveli District of Tamil Nadu, provide suitable environment for the occurrence, survival and growth of some of the commercially important marine fishes and prawns. Possibilities of developing mariculture practices in the salt pan reservoirs have been explored earlier by the scientists of the Central Marine Fisheries Research Institute but these experiments were badly affected by the presence of predators. Hence, a new site adjacent to the existing salt pans was developed exclusively for prawn farming. On the southern side of the Kallar estuary, at Veppalodai a salt pan owner has converted 3.5 ha of marshy tidal flats into five productive prawn culture ponds with the technical help of the scientists of the Tuticorin Research Centre. Two of them are 1.0 ha and three are 0.5 ha in area. Soil is clayey mixed with sand and rich in organic matter. The estuarine area has a moderate tidal range of about 0.75 m and is rich in prawn seed resources. Prawn culture ponds are constructed in an elevated place of the flat. The ponds are rectangular in shape with inlets and outlets for water on opposite bunds. The bottom slopes gently towadrs the bund with the outlets. Water is pumped with a 5 H.P. diesel pump from the tidal creek to maintain a depth of 0.7 m in the ponds. One fifth of the volume of water in the ponds is drained through the outlet daily and replaced by pumping seawater from the creek. The pumped water passes through a velon screen before entering the pond to prevent the

Sea water being pumped into the culture pond

Harvesting by dipnet in catching pit

entry of unwanted organisms. Salinity ranges from 38-48 ppt, dissolved oxygen 3.80-4.42 ml/l and pH 7.90-8.25. The site is free from predators.

Before stocking, the ponds are treated with 500 kg/ha of chicken dung to stimulate growth of benthic algal communities on which the prawns feed. Chicken dung at the rate of 100 kg/ha is also added periodically to maintain good primary productivity throughout the culture period. Supplementary feeding is not necessary during the first month since the benthic algal growth is good. Pelletized feed manufactured by Tatas and obtained from MPEDA at subsidised rates of Rs. 2.80/kg is given twice a day at the rate of 7 - 10% of body weight of the stock from the fortieth day onwards. In addition to this, a mixed feed of rice bran, groundnut oil cake and wheat flour is given at 5% of body weight after 3-4 months. Clam meat and trash fish are also given occasionally. The growth of the prawns in the ponds is monitored every fortnight by sampling with cast nets.

Two 0.5 ha ponds (Pond A and B) and a 1.0 ha pond (Pond C) were stocked with the seed of *P. indicus* of 15-22 mm in February-March 1986 at the rate of 78,000; 128,000 and 121,000 per ha respectively. Pond A was harvested after 6 months and Ponds B and C after 7½ months after complete draining of the ponds. The production rate from these ponds was 1200 kg/ha, 1604 kg/ha and 1234 kg/ha, the average size of harvested prawns being 16 g, 13 g and 11 g respectively. The survival rate of prawns in the 3 ponds was 96%, 95% and 92 per cent respectively. A total of 2604 kg of prawns was harvested from these 3 ponds and the gross income to the pond owner was Rs. 1,11,619/-. The total expenditure on the purchase of feed, cost of seawater pumping, collection of seed, watch and ward and harvesting was about Rs. 35,000/-.

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achieved in monoculture of prawns fluctuate between 300-600 kg/ha/crop. The very encouraging results obtained at Veppalodai, indicate that the white prawn *P. indicus* is a prime species for culture in salt pan areas where the salinity ranges from 38-48 ppt. The high survival rates obtained were mainly due to the absence of predators and the frequent exchange of water in the ponds. The smaller harvest size of prawns in ponds B and C compared to pond A is due to the higher stocking densities adopted in the former ponds. It is suggested that the stocking density may be restricted to about 30,000/ha. Higher stocking densities lead to retardation of growth, prolongation of culture period and production of smaller prawns which fetch a lower price; the higher yield is offset by the lower unit price. With the suggested stocking density two crops can be raised in a year. The experiments have shown that management practices like maintenance of water quality and elimination of predators can give higher yields.

There is great scope for culturing *P. indicus* in the salt pan areas in Gujarat, Maharashtra, Karnataka, Tamil Nadu and Andhra Pradesh. Pump-fed ponds with provision for daily exchange of water can easily be constructed in such areas with minimum cost. The same pumps used for the salt works can be used for pumping seawater into the culture ponds.

The present experiments at Veppalodai were monitored by Shri R. Marichamy, Scientist S-2 and S. Rajapackiam, Technical Assistant of Tuticorin Research Centre.

Pond culture of *P. indicus* in the salt pan area at Veppalodai

Ponds	A	B	C
Area of pond	0.50 ha	0.52 ha	0.95 ha.
Date of stocking	8-2-86	1-3-86	20-2-86
Size at stocking	20 mm	22 mm	15 mm
Actual no. stocked	39,000	66,500	1,15,000
Stocking density (Nos./ha)	78,000	1,28,000	1,21,000
Date of Harvest	2-8-86	10-10-86	10-10-86
Survival rate	96 percent	95 percent	92 percent
Prawns harvested	600 kg	835 kg	1169 kg
Production rate (kg/ha)	1200	1604	1234
Av. size at harvest	125 mm	123.4 mm	116 mm
	16 g	13 g	11 g
Gross income	Rs 33,000	Rs 36,846	Rs 41,773
Price per kg.	Rs 55	Rs 46	Rs 37

PRAWN CULTURE IN SALT AREAS — FLOW CHART

PREPARATION OF POND

a. Manure with chicken dung @ 500 kg/ha
b. Let in 10 cm depth of water to develop lab-lab (7-10 days)

STOCKING

a. Stock *P. indicus* seed 15-25 cm total length @ 80,000 nos/ha.; Seed can be collected from the surrounding creeks.

MANAGEMENT

a. Monitor growth of prawns by sampling at fortnightly intervals.
b. Drain 1/5 of water daily and replenish with seawater pumped from creek.
c. Manure with chicken dung @ 100 kg/ha whenever the water tends to become clear
d. 40 days after stocking, daily feeding with pelletised feed @ 7-10% of weight of stocked prawns.
e. After 3-4 months a mixture of equal proportions of rice bran, groundnut oil cake, wheat flour and trash fish given @ 5% of weight of stocked prawns.

HARVESTING

a. Can be harvested after 6 months or earlier when the average weight of prawns is 15-16 g (about 125 mm).
b. Drain the pond by letting out water through outlet.
c. Collect prawns from the harvesting pit near outlet.
d. Two crops, each of 6 months duration can be grown in a year.