



# Sustainable farming methods for community development in fishing villages

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The availability of fish from the sea is declining in recent years mainly due to overexploitation of fish stocks. In order to address the issue of declining capture fisheries, the major management strategy being followed worldwide is the adoption of fishing holidays. Though trawl ban is diligently followed in our country for 45 days in east and west coast annually, it is felt that the same alone may not be sufficient to ensure the long-term sustainability of stocks. Another option is to ban trawling in a phased manner. The demand for fish is increasing year after year as it is an important source of protein and it is an essential nutrient to poor section of the society. Hence in future years the additional marine fish requirement has to be met by farming- Mariculture. Some of the sustainable farming methods which were already adopted by fishermen groups in the coastal areas of Tamil Nadu are mentioned below:

1. Cobia farming in sea cages
2. Silver pompano farming in coastal ponds
3. Marine ornamental fish culture
4. Seaweed farming
5. Pen farming of milkfish
6. Lobster fattening/farming in pen/cages
7. Integrated Multi Trophic Aquaculture (IMTA)
8. Mud crab fattening in cages
9. Blue swimmer crab farming in pen/cages

The important details like stocking density, culture period, harvest quantity, cost and benefits are mentioned under each farming methods.

## I. Cobia farming in sea cages

Cage dimension (GI pipe)	6m dia and 4 m depth
Stocking density	750 nos per cage
Culture period	6 months

Fixed cost	Rs. 1.25 lakhs
Operational cost	Rs. 3.25 lakhs
Harvestable size (six months)	2.5 kg (average)
Harvest quantity per cage	1.8 tonnes
Gross income (@ Rs.320 per kg)	Rs. 5.76 lakhs
Profit	Rs. 1.26 lakhs (1 <sup>st</sup> crop), Rs. 2.51 lakhs (2 <sup>nd</sup> crop)
Prospects	High export quality
Need	Establishment of hatcheries to cater the local seed requirements

## 2. Silver pompano farming in coastal ponds

Coastal pond	One hectare
Stocking density	10,000 nos per ha
Culture period	8 months
Total cost	Rs. 7,91,400/-
Harvestable size (8 months)	450 g (average)
Harvest quantity per pond	4,050 tonnes
Gross income(@ Rs.300 per kg)	Rs. 12,15,000/-
Profit	Rs. 4,23,600/-
Prospects	Good export quality, huge demand in local markets
Need	Establishment of hatcheries to cater the local seed requirements

## 3. Marine ornamental fish culture

Area (Shed with cement tanks)	144 sq.m.
No. of tanks	51 RCC tanks (3 ft dia and 2 ft depth) with 350 litres capacity
Total number of pairs (clownfishes)	10
Saleable size and duration	One inch & 45 to 60 days
Fixed cost	Rs. 6.5 lakhs
Operational cost	Rs. 2.5 lakhs
Sale of clownfish fingerlings @75 per fingerlings (240 juveniles × 10 pairs × 12 months = 28,800)	Rs. 21.60 lakhs
Profit	Rs. 12.60 lakhs (1 <sup>st</sup> year), Rs. 19.10 lakhs (2 <sup>nd</sup> year)
Prospects	Low volume and high trade, huge demand in international markets
<ul style="list-style-type: none"> <li>● Establishment of marine ornamental fish broodbank and producing plenty of half inch juveniles by an Institute.</li> <li>● Many Self Help Groups can be encouraged to start the ornamental unit for whom the half inch juveniles will be supplied.</li> <li>● They grow them up to one inch size and marketing will be arranged to sell them.</li> </ul>	



#### 4. Seaweed farming in bamboo rafts

Bamboo raft (12 × 12 ft.)	45 rafts
Seed material	60 kg per raft
Culture period (one cycle)	45 days
Total cost	Rs. 63,000/-
Harvest quantity for 45 rafts (after retaining 2700 kg as seed for next cycle)	9000 kg
Seaweed Dry Weight @ 10: 1 ratio	900 kg
Selling price (@ Rs. 37 per kg of dry wt.)	33,300
Gross income for 4 cycles in 7-8 months	1,33,200
Profit	70,200/-
Prospects	Carrageenan and Liquefied Seaweed Fertilizers (LSF) can be produced in huge quantities to meet our countries demand
Need	Farming of native seaweed species has to be promoted

#### 5. Pen farming of milk fish *Chanos chanos*

Pen (fish nets & casuarina poles)	120 × 120 m
Stocking density & size	25,000 milk fish seeds with average weight of 4.6 g
Culture period	10 months
Total cost	Rs. 2.5 lakhs
Harvestable size (10 months)	300 g (average)
Harvest quantity per pen	2562 kg
Gross income	Rs. 3,58,680/-
Profit	Rs. 1,08,680/-
Prospects	Good demand in local markets, price is more during the months of April and May (Trawl ban)
Need	To encourage many SHGs to take up pen farming wherever possible

#### 6. Lobster fattening/farming in pen/cages

Pen (fish nets & casuarina poles)	16 × 16 feet
Stocking density & size	2 nos per sq.ft. & 70 g per wild collected seed
Culture period	7 months
Total cost	Rs. 45,000/-
Harvestable size (7 months)	200 g (average)
Harvest quantity per pen	100 kg
Gross income (@ Rs.2,000/- per kg)	Rs. 2.0 lakhs
Profit	Rs. 1.55 lakhs
Prospects	Candidate species for live trade, huge demand during the months of December, January and February
Need	To develop the hatchery technology for producing lobster seeds
To reach 500 g size it takes 18 months and costs Rs.2,700/- per kg. One kg size of lobster costs Rs.3,500/-	

## 7. Integrated Multi Trophic Aquaculture (IMTA)

One of the anticipated issues while expanding the sea cage farming is environmental degradation and consequent disease problems. In this context the idea of bio-mitigation along with the increased biomass production can be achieved by integrating different groups of commercially important species which are having varied feeding habits. This concept is known as Integrated Multi-Trophic Aquaculture (IMTA) which is getting importance at global level. In this context a trial on IMTA was conducted by Mandapam Regional Centre of CMFRI with participation of seaweed farmers from Munaikadu village near Mandapam. The centre has given 3 numbers of low cost G.I. cages of size 4.5 m × 4.5 m × 3.5 m and stocked with cobia fingerlings at the rate of 100 numbers per cage. The seed material (720 kg) for the seaweed was also supplied for integrating with the cages. A total of 652 kg of cobia was harvested. The length ranged from 59 to 83 cm and weight ranged from 1.8 to 4.2 kg (average weight: 3.25 kg). The farm gate price of cobia realized was Rs. 210 per kg. The total seaweed harvested was 2,700 kg wet weight. The seaweed harvested was used as the seeding material for the next crop. It was observed that the seaweed rafts integrated with cobia cages had a better average yield of 225 kg per raft in contrast to 150 kg per raft of others which were not integrated. It is felt that this practice is effective both in terms of increasing the production and also for alleviating the organic load to the environment due to fish farming. It is an initial step towards the development of a full-fledged integrated marine fish farm at Munaikadu village which will be first of its kind in the country where seaweed, mussel/oyster, lobsters, high value marine food fishes and ornamental fishes can be farmed together.

## 8. Mud crab fattening in cages

Cage dimension	3 × 2 × 1 m
Stocking density & size	4-5 nos per m <sup>3</sup> (750 g per mud crab)
Period for fattening	15 - 20 days
Fixed cost	Rs. 5,000/- per cage
Operational cost	Rs. 10,000/- per cage
Harvestable size	800 g
Harvest per cage	20 kg
Gross income (@ Rs. 1,200/- per kg)	Rs. 24,000/-
Profit	Rs. 9,000/- per cage
Prospects	Candidate species for live trade, huge demand during the months of September to December
Need	To standardize the hatchery technology for producing seeds