Financial Aspects

The success of the adoption of any innovation or new technology lies in its economic performance. The rate of return per rupee invested is the economic indicator that guides the investor to choose a particular enterprise or practice. In this background, the economic performance of the cage culture demonstration was worked out and is detailed in the following table.

Cage cultured Asian Seabass

The production potential of one cage in a year is about 4.0 tonne quality fishes from a 6.0 meter diameter cage and net revenue of ₹ 2.8 lakhs from the west coast and 2.10 lakhs from the east coast from a crop is possible after meeting all expenses.

Approximate cost for east coast for one HDPE cage

Investment

Fixed capital	: ₹ 3,00,000
Working capital (two crops of seabass/annuum)	: ₹ 4,77,000
Total investment	: ₹ 7,77,000
Gross revenue	: ₹ 12,20,00 (6,100 kg/annum X ₹ 200/kg)
Net Profit	: ₹ 4,43,000 (₹ 12,20,000-7,77,000)
Rate of return (Net profit/total cost)x100	: 57.01%
Profitability (Net profit/working capital)x100	: 92.87%

Approximate cost for west coast for single G.I. cage

Investment

Fixed capital	: ₹ 1,25,000
Working capital (two crops of seabass/annuum)	: ₹ 4,64,000
Total investment	: ₹ 5,89,000
Gross revenue	: ₹ 10,00,000 (5,000 kg/annum X ₹ 200/kg)
Net Profit	: ₹ 4,11,000 (₹ 10,00,000-5,89,000)
Rate of return	: 69.78%
Profitability	: 88.58%

Potential for cage farming

Cage farming needs protected areas in coastal waters. Cage culture needs to be taken up as clusters. Each cage farm consists of 15/20 cages (one unit). This will make farming and maintenance easy and profitable. GI cages are recommended for west coast operation.

In east coast, cage made of HDPE are recommended, since this type of cages are found ideal for east coast sea conditions. Farming operations at west coast can start immediately after SW monsoon (September onwards) while at east coast the culture operations can begin by December. Each farm unit may consist of 15 cages. Therefore one farm unit cost 15x₹3.20 lakhs in west coast and 15x₹ 3.90 lakhs in east coast.

Epoxy coated galvanized iron cage

Cage cultured Spiny Lobster

Technical Assumptions

- Each cage is of 6 m diameter
- Each unit consists of 15 cages
- Each unit can be stocked with (15x5000) 75000 fishes
- Survival rate of fishes at harvest is 80%
- Size of fish at harvest is 1 kg
- Estimated harvest from each unit (75000x0.8x1.0kg) is 60000 kg (60 tons) of fish
- Each unit can be reused with minimum maintenance at least for a period of 5 years.

India has tremendous potential for fish production through cage culture. To increase our marine fish production by 1 lakh tonnes we require a minimum of 20,000 cages. The HDPE and GI cages developed by CMFRI, has remarkable potential to spread the cage culture technology in the coastal waters of India. The market potential of this technology is about ₹ 1500 crores / year.

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Dr. G. Syda Rao
Director
Central Marine Fisheries Research Institute
Indian Council of Agricultural Research
Kochi – 682 018, Kerala, India

Phone: 0484 2394357, 2391407, 2394867
Telegram: CADALMIN, Ernakulam, Fax: +91-0484-2394909
Web: www.cmfri.org.in; E-mail: director@cmfri.org.in

Prepared by
Dr. Kajal Chakraborty, Scientist-in-Charge
Institute Technology Management Unit, CMFRI, Kochi-18
E mail: itmucmfri@gmail.com

Publication Production and Co-ordination
V. Edwin Joseph
V. Mohan

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OPEN SEA CAGE FARMING

IN HIGH DENSITY POLYETHYLENE AND GALVANIZED IRON CAGE

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

Installation of high density polyethylene cage in progress

General Description

Central Marine Fisheries Research Institute (CMFRI) is the pioneer to initiate open sea cage culture for domestic and export oriented open sea marine fish farming in all the maritime states with the involvement of the fishermen community. CMFRI has developed two different versions of indigenously fabricated 6 m diameter cages (high density polyethylene (HDPE) cage (Indian Patent Application No. 31/CHE/2010) and epoxy coated galvanized iron (GI) cage) (Indian Patent Application No. 5196/CHE/2012) at different locations of India.

Cage cultured Cobia

Open sea cage farming is a promising venture, which offers the fishers a chance for optimally utilizing the existing water resources. The open sea cages are used for cultivating marine fishes, and may be used in domestic and export oriented marine sea farming in cages. The present invention describes cage culture devices for open sea fish farming in HDPE and GI cages.

By integrating the cage culture system into the aquatic ecosystem, the carrying capacity per unit area is optimized because the free flow of current brings in fresh supply of water and removes metabolic wastes and excess feed. Thus economically speaking, cage culture is a low impact farming practice with high economic returns.

Pompano fingerlings in cage

National Fisheries Development Board (NFDB) proposes to extend 40% subsidy to the entrepreneurs on the capital cost of ₹ 1.30 lakhs not exceeding ₹ 52000/- and 40% on the working capital of ₹ 2.55 lakh not exceeding ₹ 1, 02, 000/-. Therefore the proposed subsidy assistance to take up cage culture would be ₹ 1.54 lakh on the total project cost of ₹ 3.85 lakh for open sea cage culture in 6 meter diameter cage. It is desirable to take up cage culture in clusters for effective management of cage. If the cage culture is taken up by the Department of Fisheries, Fishermen Cooperative Federations/ Corporations then the subsidy could be 90 %.

Cage cultured Mullet

The mariculture in open sea cage devised under the present invention will expand a new mariculture space towards a sustained blue revolution in India, thereby the mariculture scale can be expanded greatly; simultaneously the self-pollution of mariculture can be solved.

Highly suited for many species like cobia, seabass, mullets, pearlspot, lobsters, redsnappers, seabreams etc in backwater areas and saline creeks apart from open sea.

Benefits

These interventions optimally maintain the size and quality of the marine fishes.

The system is eco-friendly without any human intervention, and a higher survival of above 75% was achieved and sustained.

Target Segment/End User profile

Target users of this technology are “fish farmers”. This path-breaking technology will benefit the marine fishermen communities, and will greatly contribute towards the blue revolution of India.

High density polyethylene cage

NFDB has funded CMFRI, Kochi for demonstration of the open sea cage culture in 14 different locations both in the east and west coast for culture of seabass, lobsters and shrimp. Fishermen, fishermen co-operatives and SHG's involved in the open sea cage culture have shown keen interest to take up this activity as an alternative livelihood.