

# ECONOMIC ANALYSIS OF SHRIMP CULTURE IN LINED PONDS

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**Abstract:** This paper views about the economic analysis and the process of shrimp farming (*Litopenaeus vannamei*) on experimental basis practiced in Maritech Research and Extension Centre, Tharuvaikulam, Thoothukudi, Tamil Nadu. The economic analysis confirms that the feed cost (37.47%); seed cost (18.47%) and labour cost (14.24%) dominates with irrespective of other costs (in terms of percentage respectively) of shrimp culture. The culture started with well-advanced pre-stocking and post stocking management practices. The calculated benefit cost ratio for the shrimp culture was found to be 1.231 (Positive). Based on the experience, this paper would discuss on the topic related to economic background of the shrimp culture; bio-security measures for the sustainable aquaculture and their role in production and importance pertaining to exports in India

**Key Words:** Economic analysis, Management practices, Biosecurity measures, exports.

## 1. INTRODUCTION:

Two Ponds (P3 & P4) lined with tarpaulin sheets were selected for the experimental culture having depth range of 1.30 & 1.25 m respectively. The pond measurements like Top & bottom width, surface area, pond name, and species stocked, stocking density and days of culture were prescribed on the display board at one corner of the pond. The pond was allowed to dry for 30 days. The pre-stocking management (Fig-01) practices were adopted as per the standard procedure follows as drying, desilting, bio-security measures like crab fencing (Fig- 02) & Bird fencing (Fig-03), water filling, application of chemicals (Fig-06), seed lifting, seed stocking, aerator installation, check tray installation (Fig-04), water quality management and feed management. The water quality parameters (Fig-07) like dissolved oxygen, temperature, pH and salinity were checked 4 times/day followed by parameters like alkalinity, Hardness, Ammonia, Hydrogen sulfide, calcium and magnesium were checked once in a week in both source water and pond water. Sampling was done thrice in a month to access the growth rate of the shrimps (Bureau *et al*, 2000; Tacon *et al*, 2002; Edward B. Barbier and Mark Cox, 2004; Wasielesky *et al*, 2006; Muangkeow *et al*, 2007; Karuppasamy, 2013; Danya Babu, 2014).

## 2. MATERIALS AND METHODS:

This study was conducted in Maritech Research Centre, Tharuvaikulam, Fisheries College and Research Institute, Thoothukudi, Tamil Nadu. The duration of this study was about 120 days.

Approximate cost expenditure, total profit, net profit and benefit cost ratio for the shrimp culture were calculated for the economic analysis based on the recent literature. Samplings were done by using cast net during the study to assess the growth rate of the shrimps (Fig 05).

### 3. RESULTS AND DISCUSSIONS:

At the end of the culture period of 120 days, the shrimps were harvested by drag net with the help of students of Fisheries College and Research Institute, Thoothukudi, Tamil Nadu. The harvested shrimps (Fig 08) were subjected to cold shock and washed in clean aerated sea water in a tub. Economic analysis of shrimp culture (Expenditure list) and Profit Calculation were tabulated in table 1 & 2 respectively. The Average yield of the both lined ponds was calculated to be 0.82 t that fetches Rs. 280 per Kg of shrimps. Therefore, the Approximate Total cum expenditure and the calculated yield to be sum of rupees one lakh eighty nine thousand and five hundred (Rs. 1,89,500/-) and sum of rupees two Lakh thirty three thousand and three hundred (Rs. 2,33,300/-). The average net profit was found to be sum of rupees forty three thousand and eight hundred (Rs. 43,800/-). The calculated benefit cost ratio for the culture of shrimps in lined ponds for the period of 3 months was found to be positive (i.e., 1.23)

### 4. PROBLEMS FACED:

1. Accumulation of black soil, excess or uneaten feed waste and excreta results formation of ammonia and hydrogen sulfide at the pond bottom
2. Current fluctuations results in malfunction of aerators
3. Heavy rainfall and adverse climatic conditions results in salinity fluctuations
4. Infestation of aquatic animals like crab, paste shrimp and other minor commercial shrimps from source water
5. Infestation of rodents, snakes and dogs
6. Temperature fluctuations & water quality problems

### 5. MEASURES UNDERTAKEN:

1. Feed management and removal of wastes accumulated in pond centre by 1 hp motor
2. Provision for generator
3. Biosecurity measures like crab fencing and bird fencing were adopted
4. Water filtering from both source and at inlet valve
5. Application of lime and other chemicals like dissolved oxygen enhancer and other probiotics.

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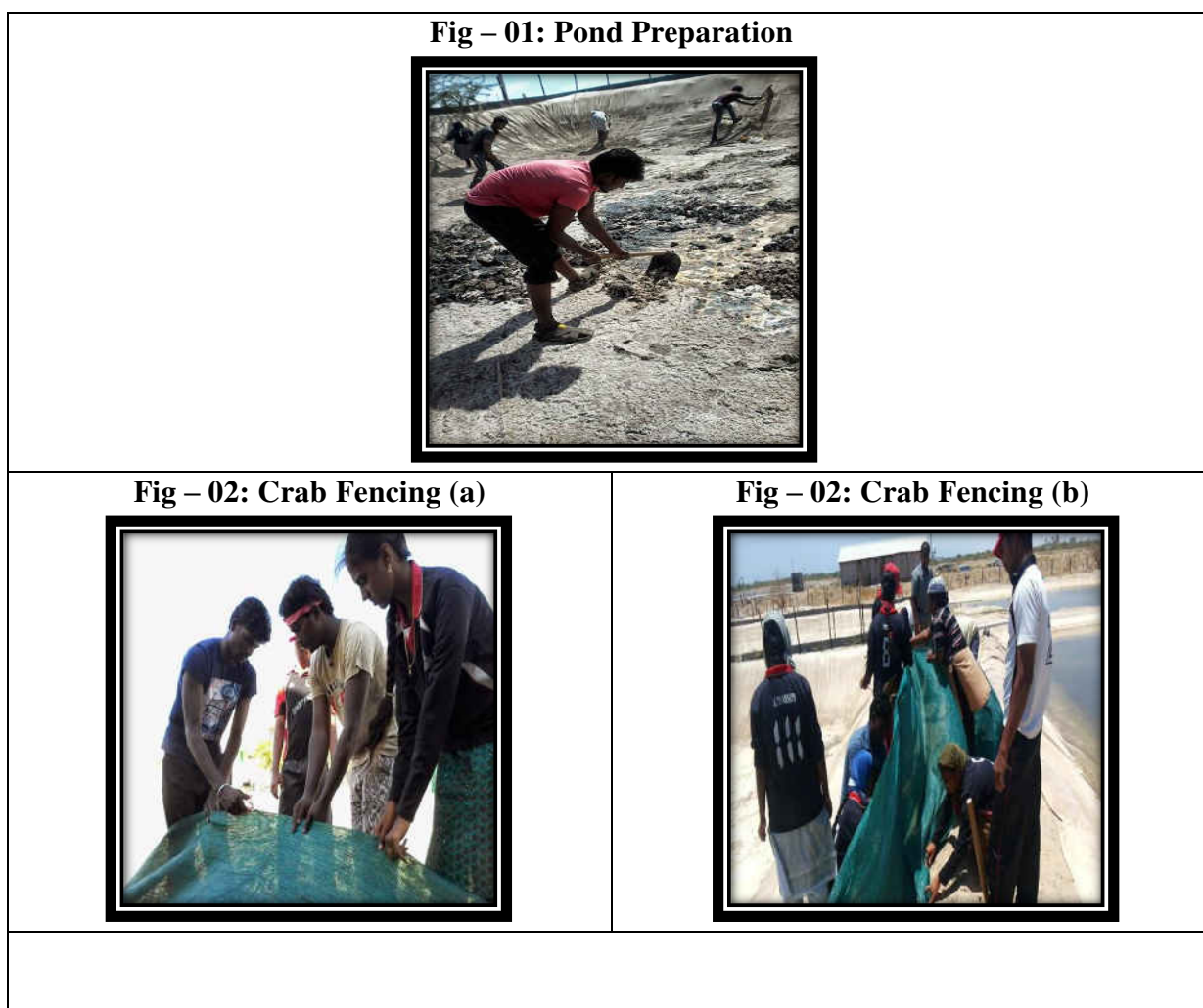
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FIGURES:



**Fig – 03: Bird Fencing**



**Fig – 04: Check tray installation (a)**



**Fig – 04: Check tray installation (b)**



**Fig – 04: Check tray installation (c)**



**Fig – 05: Sampling**



**Fig – 06: Chemical Application**





**Table – 1: Economic analysis of shrimp culture (Expenditure list):**

SL.NO	REQUIREMENTS	AMOUNT (RS)
1.	Check Tray erection	Rs.1,000/-
2.	Bleaching powder	Rs.1,000/-
3.	Feed	Rs.71,000/-
4.	Water fertilization	
	a. Agriculture Lime	Rs.1,000/-
	b. Dolomite	RS.1,500/-
	c. Minerals ( ▶ )	Rs.5,000/-
6.	a. Vitamin-C ( ▶ )	Rs. 500/-
	b. Binder for feed	Rs.500/-
	c. NH <sub>3</sub> Suppressor ( ▶ )	Rs.2,000/-
	d. D.O Enhancer ( ▶ )	Rs.3,000/-
7.	Seed Cost (From approved hatchery)	Rs.35,000/-
8.	Seed Transport using office vehicle	Rs.15,000/-
9.	Harvesting & Transportation	Rs.10,000/-
10.	Labour wages (3*300*3)	
	3 – No of workers	
	3000 – Monthly salary	
	3 – Period of culture	Rs. 27,000/-
11.	Electricity Bill	Rs. 8000/-
12.	Cost of Machineries & Instruments procured for Culture	Rs. 8000/-
<b>TOTAL</b>		<b>Rs.1,89,500/-</b>
Need Based application – ( ▶ )		

**Table – 2: Profit Calculation:**

S.NO	NAME OF THE POND	HARVESTED STOCK (in kg)	Rs./ KG	TOTAL
1.	P3	370	290	Rs. 107,300/-
2.	P4	450	280	Rs. 126,000/-
				<b>Rs. 233,300/-</b>