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WORKSHOP ON

# MUSSEL FARMING

25 - 27 SEPTEMBER, 1980

MADRAS



CENTRE OF ADVANCED STUDIES IN MARICULTURE

**CENTRAL MARINE FISHERIES RESEARCH INSTITUTE**

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TECHNICAL SESSION IV PRODUCTION AND ECONOMICS | CMFRI-CAS/MF/80/BP-13  
ECONOMICS

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BROWN MUSSEL PRODUCTION AND ECONOMICS AT  
VIZHINJAM

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#### INTRODUCTION

Brown mussel is distributed along the Southwest Coast of India and is much relished by the people along the coastal area. Considering the vast potentials of this resource, the Central Marine Fisheries Research Institute carried out a preliminary survey to assess the stock along the coast and also initiated experiments on culturing the mussel at Vizhinjam from 1973 onwards. The abundance of planktonic larvae, the dense settlement of spat in the intertidal rocky area around Vizhinjam and the availability of a protected bay suitable for culture work were the important factors in initiating mussel culture experiments at Vizhinjam. Initial experiments in the Bay have shown that Spanish method of raft or rope culture yielded higher than the natural production and is most ideal method of culture to this area.

## THE NATURAL MUSSEL PRODUCTION

At Vizhinjam the mussels are found attached to rocks and other hard objects along the intertidal area upto a depth of about 15 meters. Generally mussels do not move about once they settle over these substrata. So far no systematic attempts were made to estimate the potential and the exploited stocks of mussels from Indian Coast. Jones and Alagarwami (1973) made a preliminary survey of the mussel fishery resources of India and estimated the total mussel landing as roughly 1000 metric tonnes. For Vizhinjam area the total landing was 180 tonnes. A recent survey conducted for estimating the potential stock and exploited stock of brown mussels in the natural bed revealed that the Vizhinjam area, from Kovalam to Chowarah, 10 Km stretch of coastal line with continuous stretch of intertidal rocks with dense settlement of brown mussels is highly productive. For calculating the potential stock in the natural bed, number of random samples were taken from unit area at different centres around Vizhinjam. Exploited stock was estimated from the average catch per person per day, average number of persons engaged in mussel picking and number of active fishing days.

The fishing starts from October and lasts till May with a peak during December to February in this area. The fishermen reach the mussel bed by swimming or by catamarans and collect mussels ranging from 45 to 60 mm size. The mussels attached to hard substrata are scraped out using sharp chissel and collected in nylon bags or 'mal' tide around their waist. From deeper waters mussels are collected by diving.

The important mussel centres around Vizhinjam Viz. Kovalam, Avaduthura, Pulloorkonam, Vizhinjam, Kottappuram, Karimpally, Mulloor-Pulinkudy and Pulinkudy-Chowarah were selected for estimating the potential stock and exploited stock. The total estimated mussel bed for the whole area is 17.44 ha. The random sampling revealed that 5kg of mussels are found in a square metre area and thus the potential stock could be estimated as 872 tonnes. Regarding the exploited stock the average catch per person per day during an active fishing season is 14 kg. and the total fishermen engaged in mussel picking are roughly 325 per day. Average fishing days for a season is 50. Based on these details the total exploited stock could be computed as 227.5 tonnes of mussels every year. This shows that out of the potential stock estimated, only 26 per cent is being exploited every year. A precise estimate for Vizhinjam centre alone by regular sampling from 1976-79 has revealed that the yearly exploited stock varied from 4 to 15 tonnes per hectare depending on the variation in the settlement rate in the natural bed. From enquiry and information gathered from fishermen, it was understood that the trend was the same at other centres also. Mostly Harijan and Muslim fishermen go for mussel picking in this area. Method of disposal of exploited stock from all these centres are identical. The mussels brought by fishermen are cleaned, graded and sold in numbers to the merchants. The mussel is taken to interior markets by local merchants as head load or cycle load packed in gunny bags or baskets. The average size of shell varies from 45-60 mm. and the large sized mussels locally called 'muthuva' varies from

65-80 mm. The main market centres for brown mussel are located around 20 kilometers radius of Vizhinjam and nearby places.

100 numbers of mussels cost Rs. 3 to 7 and the average price calculated from the disposal rate for the last four years is Rs. 4. Large mussels ('muthuva chippi') are sold usually for Rs. 6 to 10. From observation it is noted that 100 numbers of marketable sized mussels weigh 3 kg. Keeping the total exploited stock as 227.5 tonnes the estimated cost of mussels exploited from Vizhinjam area is roughly Rs. 3,00,000 and the income of an active fisherman per day during fishing season is about Rs.18.50.

#### MUSSEL PRODUCTION IN CULTURE SYSTEM

Among the five different types of mussel culture methods viz. sea bottom culture, pole culture, rack culture, long line culture and raft culture practiced in different countries, raft culture was tried at Vizhinjam bay on experimental basis right from 1973. It was found that raft or rope culture is suitable for large scale production of brown mussel at Vizhinjam. Similar experiments conducted in the coastal waters of Calicut, Madras and Goa on green mussels also proved successful (Kuriakose (MS) Rangarajan (MS) and Quasim et al (1977)).

Experiments conducted at Vizhinjam Bay has shown that Spanish type of raft ranging from 6 x 6 meters to 10 x 10 meters, fabricated with teakwood poles and bamboos lashed by coir or nylon ropes with metal drums of 200 litre capacity as floats, can be used for raft culture

with minimum capital investment and substantial yield. For mooring the rafts, iron anchors or granite blocks with anchor chain are used inside the bay and open sea. At Vizhinjam bay the culture could be conducted throughout the year whereas in the open sea it was restricted for five month period as the monsoon was severe in this area affecting the position of rafts. Experiments conducted so far in the bay and open sea has shown that the ideal length of the seeded rope which can be suspended in the rafts is in between 5-6 meters and the growth rate of mussels in the upper 2 meters of the rope was found to be fast. While comparing the growth rate in the open sea and bay it was found that brown mussel grow faster in the open sea condition. Seeding of mussel done during November-December period could be harvested from May onwards adjusting the local demand. The average weight of mussel seed used for seeding one meter rope varies from 1.4 to 2 kg. and the average production is 10-12 kg. per meter inside the bay within 8 months. In the Vizhinjam bay by raft culture method the mussels attain the model size of 55-60 mm, within 8 months resulting an average growth rate of 2.94 mm. per month. This size is ideal for harvest as the ratio of meat weight to total weight was observed as 41.31% (May-June period). In a single raft of 6 x 6 meter size 50 numbers of 6 meter long seeded ropes could be accommodated. Based on this it is estimated that from a single raft 3 tonnes of mussels could be harvested in a season. It is quite possible to accommodate a minimum of 50 such rafts in a hectare area and thus the production computed per hectare area is 150 tonnes. Open sea mussel culture experiments

conducted during 1978 and 1979 in the coastal waters off Vizhinjam showed that the production rate is comparatively higher than that observed in the bay. The seeded ropes of 5 meter length reach harvestable size within 5 months in the open sea and per meter production is estimated as 15 kg. Thus the production per hectare area is calculated roughly as 180 tonnes.

To understand the economics of experimental brown mussel culture, the details of expenditure and anticipated income from the yield for an year are given below.

Capital investment for 6 x 6 metre raft inside  
the bay with 50 seeded ropes.

1. Teakwood poles	8 nos.	@ Rs. 20.00	Rs. 160.00
2. Bamboo poles	12 nos	@ Rs. 15.00	Rs. 180.00
3. Nylon rope (5 mm.)	7 kg.	@ Rs. 30.00	Rs. 210.00
4. Nylon rope (12 mm.)	60 kg.	@ Rs. 30.00	Rs. 1800.00
5. Anchor (granite blocks with anchor clamp and anchor rope)	4 nos.	@ Rs. 40.00	Rs. 160.00
6. Fabrication and launching charge			Rs. 150.00
7. Oil drums of 200 litre capacity.	6 nos.	@ Rs. 60.00	Rs. 360.00
8. Wages for seeding and other expenditure			Rs. 120.00
9. Mosquito netting			Rs. 180.00
		Total	Rs. 3320.00

Out of these items mentioned above, materials used for raft construction and the nylon rope used for

seeding can be used subsequently for 4-5 seasons, without incurring additional capital investment. It could be observed that recurring expenditure will be incurred from the second season onwards for replacing oil drums, mending and repair charges of raft, wages for seeding and cost of mosquito netting. Thus recurring expenditure is much low and the profit rate may increase after the first harvest. In the open sea mussel culture the initial investment will be higher than that of Bay rafts since, iron anchors and tested iron chains are to be used for positioning the rafts. Recurring expenditure for launching and positioning the raft and beaching the raft after harvest are the additional expenditure to be met with every year for open sea mussel culture.

Details of rope culture of brown mussel at Vizhinjam

Particulars	Bay	Open sea
1. Time taken for harvest	8 months	5 months
2. Average marketable size range	55-60 mm.	55-60 mm.
3. Length of seeded ropes used	6 meter	5 meter
4. No. of rope per raft (6 x 6 meter)	50 nos.	50 nos.
5. Production per metre of rope in a season.	10-12 kg.	15 kg.
6. Production per raft	3 tonnes	3.75 tonnes
7. Production per hectare	150 tonnes	187.5 tonnes
8. Return from a single raft	Rs. 4800.00-6000.00	Rs. 6000.00-7500.00
9. Value of marketable size mussel per kg.	Rs. 1.60 - 2.00	Rs. 1.60 - 2.00
10. Net profit for a season from a single raft.	Rs. 1480.00-2680.00	.....



### REMARKS

In project

In recent years mussels around Vizhinjam are being exploited indiscriminately due to greater demand in the market. It is also observed that compared with previous years mussel settlement is also poor in this area, but the number of fishermen engaged in mussel picking has considerably increased. Mussel culture experiments at Vizhinjam has revealed that production from raft culture is much higher than that of the natural bed and further if farming is taken up in the open sea the yield can be increased. Keeping the rafts in the open sea condition during monsoon period is felt much difficult and attempts are yet to be made to find out suitable technique to do mussel culture throughout the year in the open sea condition. Though attempts to raise good quantity of mussel seed by releasing artificial spat settlers in the farm area have proved successful, earnest effort to produce large quantities of mussel seeds by hatchery system is to be made for large scale mussel culture.

### REFERENCES

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