

A SOCIO-ECONOMIC STUDY OF MOLLUSC FARMING  
IN THE PHILIPPINES

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1. Introduction

This study would attempt to lend insights into the technology, resource utilization and profitability of oyster and mussel sea farming as actually practiced in farmers' fields. For mussel, the biggest producer is Bacoor Bay in Cavite, although other potential areas for cultivation have been also identified. The mussel study included 30 operators from Bacoor, Cavite, while the oyster study included 163 operators distributed as follows: 99 from Ilocos, 6 from Cagayan Valley, 48 from Southern Luzon and 10 in Western Visayas.

2. The operator and his farm

An average oyster/mussel farmer is male, 43 years of age and had received some formal education for about 6.3 years (Table 1). Some 10 percent of the oyster farmers and 7 percent of the mussel farmers were not able to attend school.

Table 1. Some characteristics of oyster and mussel farm operators.

Item	Oyster	Mussel	Total
Number of farms	163	30	193
Sex (percent)			
Male	96	100	96
Female	4	-	4
Average age (years)	44	42	43
Educational attainment (percent)			
None	10	7	9
Primary	19	20	19
Intermediate	41	43	42
High School	26	30	26
College	4	-	4
Average years of schooling	6.3	6.3	6.3
Operator with other occupation (percent)	80	100	83
Annual income from other occupation (₱)	2418	2248	2386
Labor use (months)			
Oyster/mussel operation	1.1	0.9	1.1
Other occupation	9.4	8.6	9.3
Not gainfully employed	1.5	2.5	1.6
Years in oyster/mussel operation	8	7	8
Years operating present farm	7	7	7

Eighty three percent of the oyster/mussel operators were also engaged in other occupations mostly fishing which on the average, generated an annual income of ₱2,386.

The mollusc farmer spent most of his time in these occupations, about 9.3 months, and only 1.1 months (full time equivalent) were devoted in the oyster/mussel farm. They were not gainfully employed for about 1 1/2 months. An average oyster/mussel farmer had been operating his present farm for seven years. Moreover he had at least one year experience before he started operating his present farm.

Majority of the farmers decided to enter into the oyster/mussel business due to either the discerned "profitability" or popularity of the business in their areas.

Oyster and mussel farms had an area of about 2,460 and 1,784 sq m, respectively, Western Visayas had the largest oyster farms averaging 10,800 sq m for the farms studied. Southern Luzon farms had an area of 4,843 sq m; in Cagayan Valley, 3,678 sq m.

Table 2. Distribution of oyster and mussel farms by region and farm size

	Ilocos	Cagayan Valley	Southern Tagalog	Western Visayas	All
<b>Oyster</b>					
500 sq m & below	84	17	56	-	68
501 sq m & above	16	83	44	100	32
Average area	434	3678	4843	10800	2460
<b>Mussel</b>					
600 sq m & below	-	-	50	-	50
601 sq m & above	-	-	50	-	50
Average area	-	-	1784	-	1784

In engaging in sea farming, permit is secured from the municipal or city government. The permit is usually for one year, payable in installment, and renewable. The cost of permit was ₱11.07 for oyster farms and ₱12.55 for mussel farms.

### 3. Cultural practices

Four methods are used in oyster cultivation: broadcasting, hanging, lattice and stake (Table 3). The stake method was the only culture method reported in mussel farms. The simplest and the cheapest of the methods is the broadcast. In this method oyster shells are scattered on the river or sea floor. The stake makes use of bamboo poles, either split or whole. Here the slender end of the full length bamboos are staked in rows, one meter apart and about 10 feet deep during low tide. The lattice is made of bamboo slats placed either in a vertical or slanting position. The hanging method makes use of cultches or strands of oyster shells tied on polyethylene cord hanged from a horizontal line, either of bamboo, wire or polyethylene cord.

Table 3. Culture method adopted by oyster farms<sup>a/</sup>

	Number reporting	per cent				
		Hanging	Stake	Lattice	Hanging/ Lattice	Broad- cast
Ilocos	49	3	40	43	14	-
Cagayan Valley	6	-	-	-	-	100
Southern Luzon	48	69	31	-	-	-
Western Visayas	10	20	80	-	-	-
All regions	163	21	39	26	10	4

<sup>a/</sup>All mussel farms employed the stake method.

Staking (or "tulus") was the culture method used by most oyster and all mussel farm operators studied. Among oyster operators, regional differences in adopted method was discerned. Operators in Cagayan Valley adopted the broadcast method while in Ilocos, both the stake and lattice methods were popular. Stake method was also more preferred in Western Visayas, Southern Luzon operators, however, use the hanging method where empty shells are suspended in nylon twines collectively called cultches.

Most (58 percent) of oyster and all mussel farms changed culture materials once a year (Table 4). The rest of the oyster farmers changed materials only once every two years or three years at most. Culture materials in the lattice or hanging lattice combination seemed to last longer with 41 percent each changing their materials only after 2 years of use and 12 and 24 percent, respectively, changing only after 3 years of use.

Table 4. Frequency of changing culture materials by oyster farmers<sup>a/</sup>

Culture Method	Frequency		
	Once or twice/year	Once every 2 years	Once every 3 years
		<u>percent</u>	
Hanging	91	9	12
Stake	59	29	12
Lattice	47	41	12
Hanging/Lattice	35	41	24
All Farms	60	29	11

<sup>a/</sup> Bamboos used in all mussel farms surveyed were reportedly changed every year.

Thirty one percent of the oyster farmers reported having predators in their farms, the most common of which was the boring snail. Other predators were crabs and barnacles. In Cagayan Valley, 50 percent of the farmers complained of predators; in Southern Luzon and Ilocos, 35 and 30 percent, respectively.

Most farms (92 percent) did not eliminate these predators; the 8 percent who did employed the catch and kill method.

The setting pattern for oysters appeared to be bi-modal, the low peak in May and the high peak in September to October. This characterized the setting pattern in Ilocos and Southern Luzon. In Cagayan Valley shell broadcasting was in July and September. It was earlier in Western Visayas, notably in February to March. Most of the mussel operators did their staking in April except for 2 who reported that setting was done in March.

The major consideration in determining the data of harvesting was the size of the oyster or mussel (85 percent) followed by market demand (32 percent) (Table 5).

Table 5. Factors determining the date of harvesting oysters and mussels

Factors	Oyster	Mussel	Total
Number of farms	163	30	193
Market demand	34	20	32
Size of product	85	80	85
Availability of natural feed	1	-	1
Weather condition	8	-	7
Need for cash	4	-	4

<sup>a/</sup> Total exceeds 100 because some respondents cited more than one factor.

Harvesting generally made use of boats to load products gathered. Collectors dived into the water and with the aid of a bolo, removed the oyster from their attachments. Or, the cultches could be picked up from the water. Some mussel operators pulled out the stakes instead.

Majority (55 percent) of the oyster/mussel farmers harvested several times while the rest harvested only once per season.

On the average, it took about 6.4 months for oysters and 8 months for mussel from setting to harvesting. For oysters, the rearing period was longest in Western Visayas, 7.4 months and shortest in Cagayan Valley, 5.3 months.

For the country as a whole, oyster appeared to be available the whole year round. Most of the farmers, however, harvested in April to May and in November to December. The time of mussel collection appeared to last from September to May similar to the oyster trend.

#### 4. Farm production and disposal

Oyster production from 2,460 square meter farm totalled 396 cans or about 806 cans per half-hectare (Table 6). On the other hand, an average mussel farm of 1784 square meters cropped a total of 272 cans or an equivalent of 762.4 cans per half-hectare. Although the production per unit area of oyster and mussel beds are comparable, the value of the crop was different. The value of mussels per half-hectare was ₱11,735 or almost twice as much as that of oysters (₱6,230). This is due primarily to the higher price of mussel per can (₱15.40 on average) compared to oysters (₱7.73 per can).

Table 6. Annual cropping rate in oyster/mussel farms in the Philippines

Items	Oyster	Mussel
Number of farms	163	30
Area per farm (sq m)	2460	1784
Quantity collected (cans) <sup>a/</sup>		
Per farm	396	272
Per half-hectare: Quantity	806	762
Value (₱)	6230	11735

<sup>a/</sup> One kerosene can is equivalent to approximately 19 liters.

Among the regions, oyster farms in Ilocos were the most productive, followed by Southern Luzon, Cagayan Valley, and the least, Western Visayas (Table 7). In terms of productivity per farm, Southern Tagalog had the highest. Moreover, the price in Western Visayas, ₱3.94 per can, was very much lower than that in Southern Tagalog which was ₱11.54. Presumably, there is a greater demand for oyster in Southern Tagalog than in any of the other regions. With the high price, coupled with high yield, a farm in this region earned a gross income of almost ₱10,000 per year compared with only ₱2,800 for Western Visayas or ₱585 per farm for Cagayan Valley.

Table 7. Quantity and value of oyster produced by region

Region	Per Farm			Production per 1/2 ha cans
	Area has.	Production cans	Value pesos	
Ilocos	434	165	713	1901
Cagayan Valley	3678	292	585	397
Southern Tagalog	4843	820	9641	847
Western Visayas	10800	715	2820	331
All regions	2488	396	3413	806

Table 8. Oyster production by method of culture

Culture Method	No. of farms	Area per farm sq m	Production	
			per farm	per half-ha cans
Stake	63	1603	212	661
Hanging	45	5698	872	765
Lattice	42	472	213	2255
Hanging/Lattice	7	245	198	4032
Broadcast	6	3678	292	397
All Farms	163	2460	396	806

Oyster farms using the combination of hanging and lattice methods attained the highest production, 4032 cans per half-hectare followed by farms employing only the lattice method, 2255 cans per half-hectare. The least yield was obtained using the broadcast.

## 5. Marketing practices and prices

Most (97%) of the farm produce were sold, the rest were eaten (2%) or given away (1%).

Majority (93%) of the farmers sold oyster in shelled (with shell) form while 21 percent sold their crop without shell. All the Cagayan Valley operators studied and one out of four of the Ilocos producers sold oyster without shell. Unshelled oysters were sold in "ginebra" bottles. After removing the meat, the empty shells are broadcasted back to the oyster bed for spot collection.

Majority (59%) of the oyster/mussel operators sold their harvest through direct wholesale, others by direct retail (23%) and by contract (20%). Surprisingly, market outlets for mussel were farther (15.6 kms) compared to oyster (3.4 kms).

Price of oysters appeared to have an upward trend during the period. Starting from ₱2.89 per can in January prices went up to ₱4.49 in June (Figure 1). During the latter months of 1974 oyster price averaged ₱7.17 per can more than double the price in the first six months of the year. The price in 1975 was even higher averaging ₱9.58 per can.

Among the different regions, operators in Southern Luzon received the highest price while the lowest price occurred in Cagayan Valley.



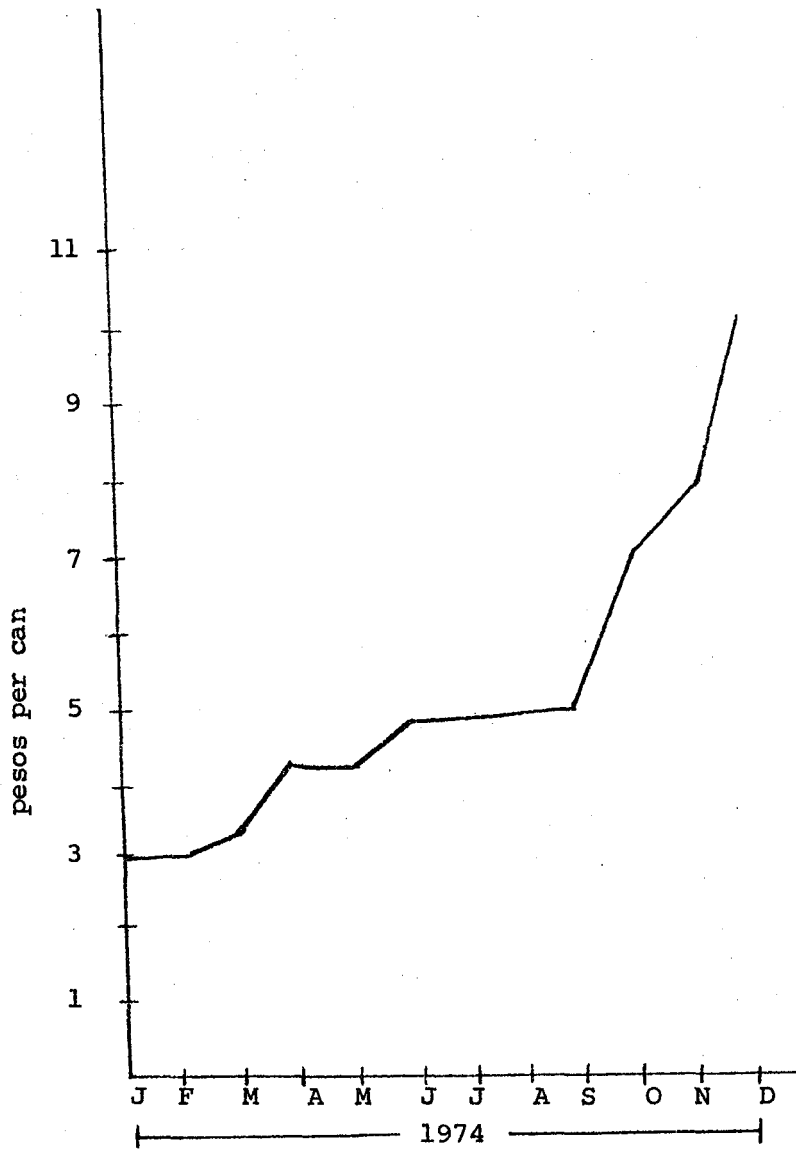


Figure 1. Monthly prices received for oyster, 163 sample farms, 1974