

Methodology for Economic Analysis of Grouper production

Farmer records of fish production

Two farmers in each of the case study villages were provided with notebooks during May 2000. Farmers were selected on the basis of our previous experience during interviews which showed them to be enthusiastic to participate in the research and possibly reliable record keepers. They were asked to keep records of their stocking, harvesting and feeding of grouper over an initial three-month period. The farmers included pond farmers in Thung Sa Pho, and cage farmers in Ba Kan Khoei and Koh Khiam.

The notebooks were divided into 2 sections to record feeding activities, and stocking and harvesting activities. Separate records were kept for each culture unit. Farmers were asked to provide the following information regarding their fish culture practice:

Feeding records	Stocking and harvesting records
Date	Date
Size of fish in culture unit	Type of fish stocked
No. of fish in culture unit	No. of fish stocked
Quantity of feed given	Average size of fish stocked
Cost of feed per kg	Cost of fish
Source of feed	No. of fish harvested
Species composition of feed	Average size of fish harvested
	Payment received for fish harvested
	Mortalities
	Additional notes (including water quality, weather, medicine administered, health of fish etc.)

Information about each of the record keepers was noted including the date the farmer began to raise fish, size and number of culture units, type of fish raised and no. of fish currently stocked, and the farmers usual source of feed and seed. The farmers were visited twice during the period of data collection to discuss any problem they were having and to encourage them to continue to keep records.

Due to time constraints, the notebooks were collected in October 2000, after a period of approximately 5 months. Three of the six farmers who had been asked to participate in record keeping had kept detailed records. They included a cage farmer in Ba Kan Khoei and two pond farmers in Thung Sa Pho.

The record books were photocopied and the originals left with the farmers. One farmer in Thung Sa Pho intended to continue record keeping for his own benefit. The information was entered into an Excel spreadsheet for analysis.

Data analysis

The information gathered from cage farmers during the situation appraisal was aggregated to produce average values of production costs, which varied between farmers. These values provided the assumptions upon which the cage culture analysis was based, as listed in Table x. The information was tabulated and a cost breakdown of cage culture under different culture systems was produced. Pond culture was analysed similarly using the records kept by pond farmers.

Estimating feed and seed inputs

In the absence of daily records detailing inputs of feed to cage culture systems, a standard was required to enable the calculation of approximate feed inputs to permit comparison of production costs between systems. The quantity of feed inputs required was calculated using data recorded by pond farmers and recommendations provided by SEAFDEC (2000) as a guideline. The feed inputs recorded for pond culture increased on average by a factor of 1.35 per month, which was found to be close to the SEAFDEC (2000) recommendation of 10% body weight per feed. The total quantity of feed required during the culture period was based on 12 feeds per month for 100 fish. The feed requirement for a system was calculated according to the size of fish stocked, the length of the grow-out period in months and the number of fish stocked. Fish mortality was not included in the calculation.

The costs of inputs of seed and feed were derived from data collected from middlemen and farmers during the community appraisal. As stocking and harvesting practices of farmers varied widely, a standard of 250 fish per cage was used for the analysis.

Fishery analysis

The gross income generated by fishing activities was based on highly variable estimates of average fish catches for important target species, and the average days fishers could fish for this species based on seasonal and lunar factors. Given the high level of variability in catches and incomes reported by fishers, in the absence of detailed daily catch records, the results generated from this analysis are therefore an illustration of possible outcomes from these fishing activities and provide a rough estimation of the cost of seed fish to fisher/farmers.

Sensitivity analysis

Sensitivity analyses were based on the assumptions outlined in Section x. Using an Excel spreadsheet, variables were manipulated to produce estimates of net profit under various scenarios.

Economic indicators

Indicators of economic performance were produced to compare systems, using the definitions given in Table 1.

Table 1 Definitions of economic indicators

Indicator	Calculation
Break even cost	Total operating cost / total production
Ratio of net income to operating costs	Net profit/ total operating cost
Return to capital	Gross revenue – total operating cost + depreciation
Rate of return on capital investment	Return to capital investment / total fixed costs
Profit Margin	Net profit / gross profit