VERIFICATION OF SEMI-INTENSIVE SHRIMP CULTURE TECHNIQUES: MYANMAR

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Project Site: Kyauktan, D.O.F. Shrimp Culture Compound, Yangon, Myanmar

BACKGROUND

In the year 2000, the Ministry of Livestock and Fisheries reinforced and encouraged many potential investors to be involved in the shrimp aquaculture development in the country. At the same time, the Union of Myanmar formed a State Level Committee to promote a drastic development of the shrimp aquaculture industry by formulating a three-year concept plan from May 2000 to May 2003 with a target to develop 120,000 acres (48,000 hectares) of shrimp pond areas at the end of the target period. Since then a lot of potential investors were involved in shrimp aquaculture practicing semi-intensive and intensive type of shrimp farming. As of May 2003, the data on shrimp culture ponds in terms of area and culture systems are shown in the following table:

Culture System	Area (acre)	Area (ha)
1. Extensive	169436.84	67774.7
2. Extensive-plus	25202.89	10081.1
3. Semi-intensive/intensive	5321.46	2128.6
Total	199961.19	79984.4

In 2002, some shrimp farms practicing semi-intensive/intensive system had successes but some encountered white spot disease occurrence resulting in great losses. The disease had devastated many farms in Yangon Division, paralyzing the shrimp industry development. In Yangon, the water is very turbid and the farms are near the urban waste dumping area.

Through the Project, three areas were surveyed in February 2001 to determine the level of shrimp technology that Myanmar has developed for shrimp farming. The three areas were: (1) Thi La Wa Shrimp Culture Zone (Kyauktan Township); (2) Chaungta (Kyauktan Township); and (3) Ngwe Saung area. Results of the survey were used to identify the areas that could be used for the Project:

(1) Without Mangroves: The farms in Thi La Wa Shrimp Culture Zone, but since the existing pond designs do not provide treatment pond for effluents, it was necessary to redesign the ponds, to make sure that all discharges would not be drained into the adjoining canals that also supply water back to the culture ponds.

(2) With Mangroves: The farms owned by the Comrades Group in Chaungtha, where the operator was willing to allocate some areas for the Project.

OBJECTIVES

The activity was envisioned to come up with the following:

(1) Refined and verified mangrove-friendly shrimp culture techniques for pilot demonstration throughout the country; and

(2) Trained manpower.

Through the Project, the disease problem in Myanmar was solved by demonstrating the environment-friendly shrimp culture technique, as has been well experimented and established by SEAFDEC/AQD through the Project.

PROJECT ACTIVITIES

The demonstration of the environment-friendly shrimp culture technique was done in two earthen ponds in Kyauktan Township, Yangon Division.

Culture pond	
Pond No. 1	1.4 acre (0.5 ha)
Pond No. 2	1.8 acre (0.72 ha)
Reservoir pond	
Reservoir No. 1	1.0 acre (0.4 ha)
Reservoir No.2	0.5 acre (0.2 ha)
Net Pen for Tilapia stocking	one inch mesh size polyethylene net 15m x 15m x 2m (h) stocked with 2500 tilapia of 8-10 cm body length

The existing grow-out ponds were renovated by removing the sludge and the pond bed was leveled. The ponds were then treated with lime and sun-dried. Organic fertilizers such as chicken manure and some compound organic fertilizers were introduced in the ponds at the rate of 0.5 mt/ha and filled up with seawater from reservoir No.1 into which thousand pieces of tilapia at 8.0 cm were stocked. Reservoir No.2 served as a sedimentation pond for turbid water. The seawater intake passes through a sand filter made up of marine plywood, and after one week, the pond water transparency was maintained at 35 cm. Six (6) paddle wheel sets, installed in each pond, were operated continuously and alternatively.

During the culture operation, no sign of disease occurrence, deficiency nor abnormalities were found. Data on growth of shrimp, feeding regime, amount of feed used were monitored every two weeks and summarized as follows:

A.	**Pond No. 1**	
	Area	0.5 ha (1.4 acre)
	Initial stocking	300000 (60 pc/m^2) (11 February 2002)
	Water parameters	
	1. salinity	18.5 ppt
	2. pH	8.3
	3. Transparency	35 cm
	4. Ammonia	0.07 ppm
	5. Average temperature	28°C
	Total amount feed and brand	5600 kg (CP feed)
	Total harvested shrimp	4000 kg
	Survival rate	58%
	Day of Culture	111 days
	Size at harvest	57 pc/kg
	FCR	1.8

B.	**Pond No. 2**	
	Area	0.72 ha (1.8 acre)
	Initial stocking	450000 (62 pc/m^2) (11 February 2002)
	Water parameters	
	1. salinity	21 ppt
	2. pH	8.4
	3. Transparency	40 cm
	4. Ammonia	0.15 ppm
	5. Average temperature	28°C
	Total amount feed and brand	9022 kg (CP feed)
	Total harvested shrimp	7100 kg
	Survival rate>100%	
	Day of Culture	104 days
	Size at harvest	44 pc/kg
	FCR	1.27

C.	**Summary on cost and return**	
	Operation cost	24718858-ks
	SEFADEC AQD contribution	15346023-ks
	DOF contribution 9372835-ks	
	Total return	36269960-ks
	Sale from harvest shrimp from 2 ponds	35166700-ks
	Sale of material	1103260-ks
	Net profit	11551102-ks

STUDY VISIT TO THE TECHNO DEMO FARM

The Project activity showcases and demonstrates environment-friendly shrimp culture to local shrimp farmers, especially at the time when majority of shrimp farms had the problem of white spot disease that resulted in major losses in terms of money. So the Ministry of Livestock and Fisheries-Department of Fisheries arranged for the local shrimp farmers and shrimp farm companies to visit and study the environment-friendly shrimp culture technique at the Project site. A number of farmers and potential farmers who came to visit the site were happy to see the successful culture operation, and became interested in the technology especially during the period of severe outbreak of white spot disease. Professors, lecturers and university students also visited the Project ponds.

RECOMMENDATIONS

1. The environment-friendly shrimp culture technology, which was successful especially during the peak period of white spot disease outbreak, should be promoted.
2. The use of tilapia, as a tool for buffering and elimination of sludge, showed that the pond bottom was clean and there was no more sludge after harvest indicating that such technique is more suitable than the closed system.
3. During culture period, only partial water fill-up and draining may be done to lessesn the cost and enhance energy minimization.
4. The Techno Demo operation was conducted with high stocking density, such as 60 pcs/m^2 and 62 pcs/m^2 thus, further demonstration should be operated with low stocking density such as 30-40 pcs/m^2.

5. Closed type or re-circulation system may be more effective, however, the technology may be more complicated because of the use of bio-filters like finfish, seaweeds and mollusk or oyster, but the environment-friendly shrimp culture practiced in Myanmar is more simple and easier for other shrimp farmers to adopt.

6. This type of Techno Demo farming should be widely conducted in all possible areas of the country as an on-going activity.

The Project's Pilot Demo in Myanmar

Cost and Return of Demonstration Activity

Operation Cost		
SEAFDECAQD Contribution		Ks 2,625,000
1. cost of post-larvae		
2. cost of feed		
a) Pond II 9022 kg		6,315,400
b) Pond I 5600 kg		3,920,000
3. Machineries		898,500
4. Utensils		1,587,123
Subtotal	**Ks 15,346,023**	
DOF Contribution		
1. fuel 1,200 gals		Ks 650,000
2. engine oil 20 gals		50,000
3. salaries and visa extensions		771,870
4. pond preparation, paddled, engines, etc.		7,021,405
5. Labor cost 7000x4x5 months and other		240,000
6. Harvest Cost		360,000
7. Miscellaneous		279,560
Subtotal	**Ks 9,372,835**	
TOTAL	**Ks 24,718,858**	
Total Return		
1. Culture pond I		Ks 9,196,000
2. Culture pond II		25,970,700
3. Sale of used materials		1,103,260
TOTAL	**Ks 36,296,960**	
Net profit		**Ks 11,551,102**