

SUMMARY

EXPERIMENTAL STUDIES ON THE MANGROVE BASED BRUSH PILE FISHERY

FINAL REPORT

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Background

The present findings supplement the results of the previous research conducted under Grant No: RG/MAN/87/01.

Rationale

Negombo Lagoon provides income and occupation for a substantial number of lagoon fishermen. It also provides multiple services, sink for urban and industrial wastes among others. The brush pile is a traditional fishing method which utilizes mangrove branches harvested from both natural and planted stands. Increasing value of land for housing and other high-value uses is now resulting in the progressive clearing of mangroves. If mangroves are to be protected, their existence must acquire as high an economic value as other uses. Brush piles also serve a conservation function by preventing the widespread use of trawls and similar fishing devices that destroy seagrass beds, essential nursery habitat in Negombo Lagoon.

Review of Phase 1

Growth rate and feed conversion were inadequate to make the Brush Pile-Mini Pens (BP-MP) profitable. However, the participating lagoon fishermen were very enthusiastic about pursuing the investigations.

Introduction

Objectives of Phase 2 research were improvement hapa and BP-MP management to achieve a harvest of 30 kg per unit with an individual shrimp body weight of 30 g reached in 90 days. Reduce feeding costs appropriately to ensure profitability.

Method

The Hapa rearing protocols and BP-MP rearing protocols were adjusted to reach a profit of Rs.1530/= per unit. Comparative feeding schedules were arranged to provide information for analysis of the results. Two replications were carried out, 17 August - 18 December 1989; and 24 May - 22 September 1990.

Results

Rearing period 17 August - 18 December 1989

Anticipated results could not be achieved since strong winds damaged the BP-MPs leading to salvage operations which disrupted the planned rearing protocols. At the same time, auto stocking of *Penaeus indicus* and *Metapenaeus dobsoni* occurred leading to competition for food

intended for *Penaeus monodon*. The yield of *P. monodon* varied from a low of 4.35 kg to 18.57 kg per BP-MP. Survival of the stocked shrimp, *P. monodon*, varied from 51.80% to 86.40%. An unforeseen factor adversely affected the research. The Janata Vimukthi Peramuna (JVP) activities interfered with the supply of feed to the shrimps. Consequently feed of uniform quality could not be obtained. Feed conversion ration varied from 1.97 to 2.54. Environmental factors also were unfavorable to achievement of anticipated results. Although dissolved oxygen level was stable, salinity was inimical. Salinity remained below 10 ppt during a period when the desirable salinity was expected to be above 20 ppt.

Rearing period 24 May - 22 September 1990

The rearing protocols had to be adjusted substantially in keeping with unforeseen environmental conditions. Only two BP-MPs could be operated during the period under review. The yields of *P. monodon* were 15.00 and 10.00 kg respectively. Survival was depressed to 66.10% and 58.80% respectively. Feed conversion was 2.24 and 2.19 respectively. During the second rearing period, again, the anticipated targets of yield, growth rate and individual body weight could not be achieved.

Discussion

The focus of the analysis was on the three objectives stated in the introduction:

- identification of the hapa rearing protocol that would facilitate the growth of *P. monodon* to a body weight of 2.0 - 3.0 g during a period of 45 days.
- Achieve a harvest of 30 kg per BP-MP with an individual body weight of 30.0 g at the end of the 90th day.
- Reduce feeding costs to 60% of that which was incurred during phase 1 research.

Hapa rearing technique

Despite various unforeseen obstacles and deviations from planned rearing protocol, the anticipated growth of the postlarvae at the end of 45 days was "almost" achieved. This was achieved even under "extreme risk" situation. The result therefore is instructive. salinity during this period was favorable to relatively rapid growth.

Growth and survival of *P. monodon*

The targeted growth to 30.0 g at the end of the 90th day from commencement of rearing could not be achieved in any of the trials. Factors contributing to the poor results included damage to BP-MP walls that allowed auto stocking of undesirable species and escape of stocked *P. monodon* resulting in unfavourable food competition. The feeding protocol that was mainly confined to the daytime hours was also not in harmony with the preferred night feeding behaviour of *P. monodon*.

Deterioration of water quality

The retardation of growth may be partially attributed to deterioration of water quality within the BP-MPs stemming from the accumulation of putrefying organic matter on the floor. The release of hydrogen sulphide at the lower elevations in the water column competes with dissolved oxygen available for respiration and thereby inhibits growth of stocked shrimp which spend much time buried in the sediment.

CONCLUSIONS

1. The anticipated targets could not be achieved.
2. The current speed within the lagoon is inadequate for flushing organic debris from the BP-MP.
3. BP-MP sites need to be shifted in a rotation to allow soil at previous sites to return to original condition.
4. High quality pelleted feed is essential to achieve growth targets.
5. *P.monodon* feeding must be done at night.
6. Netlon pen material needs to be renewed at intervals of about 12 months.

LESSONS

1. Repetition of research with measures taken to overcome all problems encountered during the project being reported may result in different results that may warrant pilot scale investigations.
2. Carefully planned participatory research where the target communities are involved in all aspects of research planning may be required to ensure adoption of an innovative technology such as BP-MP culture of **P.monodon**.