

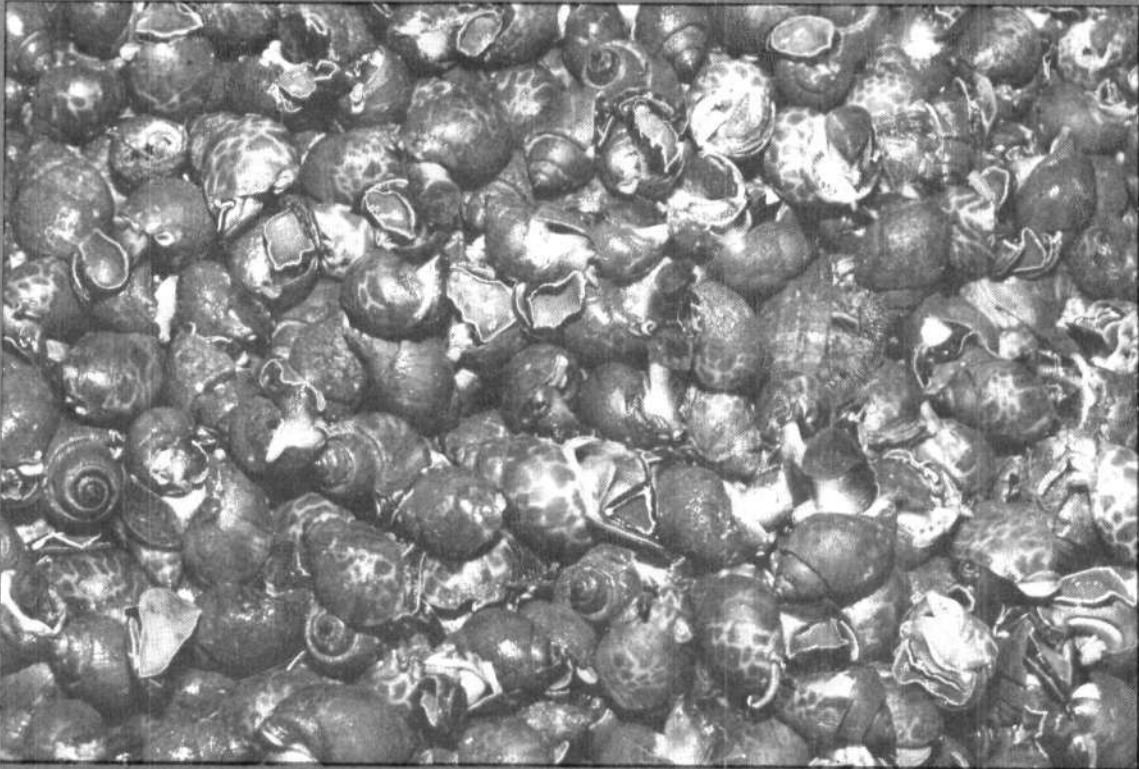


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TECHNICAL AND ECONOMIC CONSIDERATIONS FOR SHRIMP FEED PRODUCTION AT SOUTH CHELLANAM, ERNAKULAM DISTRICT PART - II : FIELD TRIALS AND ON-FARM TRAINING ON FEED PREPARATION

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With the background information elucidated in the earlier part of this paper, lack of an appropriate feed seemed to be a major constraint in the development of prawn culture at Chellanam. The prawn feeds developed so far by the feed industries are undoubtedly expensive and not acceptable to the prawn farmers. A research and development programme on prawn nutrition and feed formulation was therefore deemed highly pertinent. This paper highlights the dissemination methods adopted and the technological advances made in achieving the goals of low cost practical feed formulation from locally available low cost ingredients and also working out the economic viability of supplemental feeding.

Field trials with compounded feeds

The Central Marine Fisheries Research Institute has evolved a number of feed formulations over the years, but for the lack of supporting feeding trial data these have not been disseminated to the shrimp farming community. At Chellanam, feeding trials were initiated in ponds of various sizes to determine under the prevailing farm scale conditions the performance and relative cost effectiveness of a few of these feeds, so that they could be adopted by the shrimp farmers. A trial in a small pond of 405 M² was successfully completed which proved the relative cost effectiveness of growing *P. indicus* in monoculture using a pelleted water stable feed. The feed containing 35% protein yielded the equivalent of 30 kilograms of *P. indicus* in a culture period of 90 days with a feed conversion ratio of 0.90:1. The performance of shrimp fed on the experimental feed was exceptionally good when the yield from our pond trial was extrapolated and compared to the performance of those fed on clam meat or trash fish and rice bran based diet, prepared and fed according to the practices adopted by the local farmers. Pond pollution as evidenced by the degree of blackness of the pond bottom mud was not observed and from a

pollution prevention point of view, the pellets proved to be highly desirable in comparison to the moist hand made balls utilized by some farmers for feeding their shrimp. The adopted pond and a part of the harvest are shown in Fig.1 and 2.

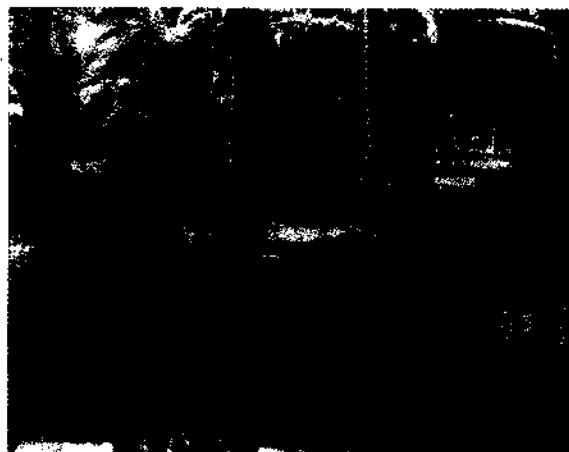


Fig. 1. The coconut grove pond adopted for the field trial with compounded feed.

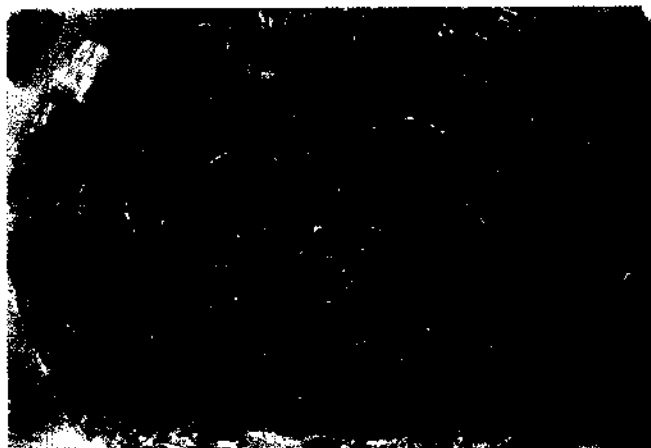


Fig. 2. A part of the harvest obtained from the trial by the help of cast nets.

A financial appraisal of the results of the trial indicated that the pelleted feed was quite cost effective at Rs.15/kilogram, though a still lower price would have definitely been more

profitable for the small scale prawn farmers. The trial also indicated that high nutrient density diets as used in intensive shrimp culture, would be inappropriate for extensive and semi-intensive culture in India as the use of lower nutrient specification diets would result in substantial reduction in the overall production costs. With these improvements in mind another trial in a large pond of 1 acre was initiated. The pond was stocked with 30,000 post larvae of *P. indicus* in December 1993 and the animals were reared on a feed formulation of a varying ingredient composition to the one used in the earlier trial. The data from this pond along with a few other trials to be undertaken is expected to throw enormous light on the most economical feed formulation for this area which can then be transferred to be adopted on a large scale.

Analysis of feed samples prepared by the local farmers

Samples of some of the feeds prepared and used by the local farmers on their farms were collected and analyzed for their water stability and nutrient content, and the results are depicted in Fig.3 and Table 1. The feed designated as No.5 is the feed used in the small pond trial and given as a comparative measure. Of the four feeds analyzed only one viz. Feed No.4 fell within the

standards prescribed for shrimp nutrition while all others were formulations at will, not even meeting the basic requirements of shrimp for any of the nutrients. The water stability of all the feeds was quite poor, especially feed No.2 which lost 50% of the dry matter within five hours of immersion in sea water (of 35 ppt). These farmers were advised accordingly so as to improve the nutritive value of their feed formulations.

TABLE 1. Proximate analysis of a few feed samples collected from the local farmers (% dry matter basis)

Component	Feed number				
	1	2	3	4	5
Dry matter	95.09	50.02	80.62	93.86	89.32
Crude protein	44.09	20.13	28.32	34.80	30.63
Crude fat	9.7	04.00	12.00	6.42	6.24
Crude fibre	0.26	18.61	6.00	3.00	3.63
Ash	7.49	35.00	23.22	13.12	12.00
Organic matter	87.60	15.02	57.40	80.74	77.32
NFE*	33.59	22.26	30.46	42.66	47.50

*Nitrogen free extract - calculated by difference.

Demonstration of farm feed preparation

A ready supply of feeds of known production performance would act as an impetus for the continuity of the culture operations. Farm made compounded feeds provide the farmer a potentially manufactured product and an opportunity to increase productivity. The savings on unit cost of feed achieved by small scale on farm feed preparation is also considerable without large capital expenditure. Additionally, the existing labour on a small farm may be able to absorb the extra work load of making feeds, keeping operational costs low. Moreover, as women constitute an important human resource of India's coastal area, on farm feed preparation by women would offer great scope for self-employment and also serve as an additional income for the family.

Dissemination of technology related to on-farm feed preparation was launched under the project "Empowering rural women through extension education — An action research in a fishing village" at South Chellanam, Kochi. It involved a seminar on the nutritional requirements of the commercially important species of the Indian white prawn *P. indicus* and the tiger prawn *P. monodon* followed by a demonstration on the use and operation of simple household equipment for shrimp feed preparation on the

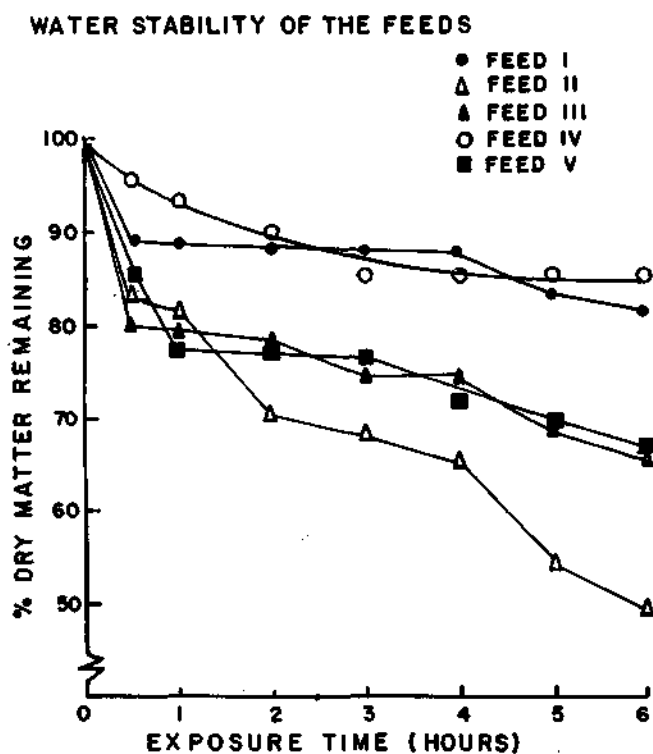


Fig. 3. Water stability of some of the analysed feeds.

farms/homesteads, for use for culture purposes in the unutilized water canals or coconut groves in and around their homesteads. Thirty women took part in this training cum demonstration which comprised two separate methods of feed preparation and pelletization (Fig. 4 & 5). The participants were also briefed on the methods of proper drying and storage of the prepared feeds.

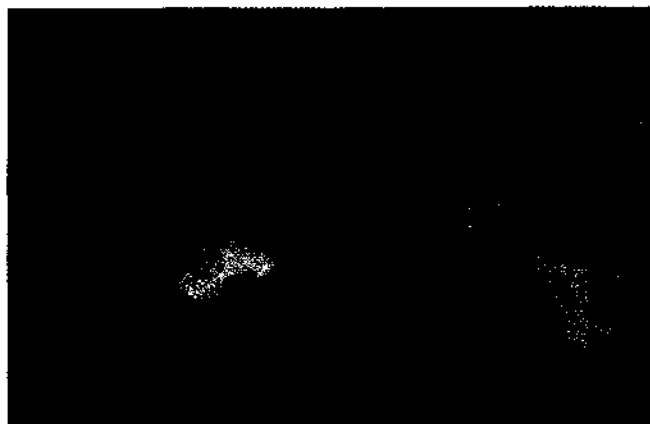


Fig. 4. Demonstration of shrimp feed preparation to the rural women.



Fig. 5. Showing the use of a household model mincer for pelletization of feed.

Training women in shrimp feed production

A project entitled "On farm production of low-cost nutritious prawn feeds on a small scale", was prepared with the following specific objectives -

1. to educate the shrimp farmers on the basics of feed preparation
2. to familiarize them with the use and handling of simple equipment which can be

employed for feed preparation on the farmsteads

3. to teach them few simple preparations keeping in mind feed management and water quality management for both semi-intensive and extensive prawn culture, and
4. to help women in small-scale prawn farming households to develop income generating enterprises based on the technology.

Under this project funded by NABARD five women were provided with loans for the purchase of simple household equipment and raw materials for the production of shrimp feed. This equipment comprised of a pulveriser and a meat mincer. The loan amount was stipulated to be recovered within a period of three years. These women were trained in operating the equipment and in formulating feeds, selecting feed ingredients, processing and storing them along with overall on-farm feed management. The feed production was carried out utilizing locally available ingredients and by minimizing the use of vitamin and mineral premixes, expensive binders and feed attractants (Fig. 6 & 7).

The feed prepared is to be given the brand name 'Mahima'. Table 2. gives feed characteristics.

TABLE 2. Assay characteristics of Mahima prawn feeds

Crude protein	>	35.0%
Crude fat	>	3.0%
Crude fibre	<	3.0%
Ash	<	16.0%
Moisture	<	12.0%
Acid insoluble ash	<	2.0%



Fig. 6. The trained women engaged in manufacture of shrimp feed.

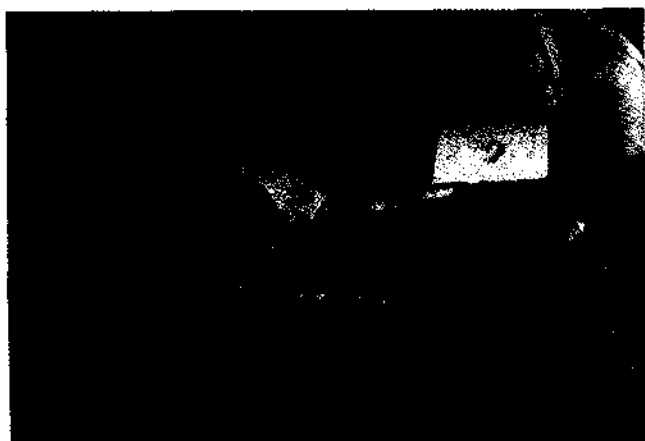


Fig. 7. The dried and packed feed ready for sale.

Though the nutrient composition is similar to Prawn Feed 'A' in the form of crumbles is formulated for post larvae and Prawn Feed 'B' in the form of pellets for juveniles and adults. Data will be collected and collated on the production, storage and utilization of these feeds and also their socio-economic impact on a regular basis. The progress made will be assessed to recommend follow-up actions.

General remarks

The success of the programme proved the feasibility of on farm shrimp feed production as an income generating activity which can be easily adopted by coastal women so that more of the unutilised lands can be converted into productive prawn culture sites. Both the demonstration and training programme attained great popularity as evidenced in the eagerness shown by many other women in adopting this technology and also the willingness of NABARD in disbursing more loans to women for procurement of equipment and feed ingredients for preparation of shrimp feeds.

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