On the path to self-reliance

Empowered with the right training and support, women in several coastal districts of Tamil Nadu, India, are turning to farm-feed production as a viable livelihood option

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Aquaculture is one of the fastest-growing food-production systems in the world. A highly viable livelihood option for women, especially those living in coastal areas, it offers high returns and opportunities for livelihood diversification.

In India, 30 per cent of women in rural and coastal areas are directly or indirectly engaged in small-scale fisheries. A third of this population is estimated to be involved in various field activities linked to aquaculture, such as manuring fish ponds, feeding fish, harvesting, transporting and marketing fish, peeling shrimp in fish-processing plants, working in shrimp hatcheries, rearing mud crabs, producing aqua-feed, and preparing, processing and marketing value-added fish and farm products.

A key component of the aquaculture industry is aqua-feed production. The quality of ornamental fish and crabs depends directly upon the quality of the aqua-feed used during production. Today, the increasing global demand for crab has stimulated crab production in several Asian countries. With this, the demand for good-quality aqua-feed is also on the rise. The production of aqua-feed is thus a potentially viable income-generating activity that can be gainfully incorporated into women's empowerment programmes.

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Marketing of farm-made aqua-feed produced by coastal women self-help groups is a potentially viable income-generating activity in Tamil Nadu, India

Inspired by this goal, the Central Institute of Brackishwater Aquaculture (CIBA), located in Chennai, India, has, since 2004, been training women's self-help groups (SHGs) in coastal areas to produce farm-made aqua-feed for domestic marketing. Fish-feed manufacturing units, with a productive capacity of 20 kg per hour, designed inhouse at CIBA, were fabricated and installed in the pilot villages of Thonirevu in Tiruvallur district and New Perungulathur in Kancheepuram district. Local SHGs were then trained in various aspects of production, including technology, manufacture, packaging and marketing of the feed. Once farm-feed production got under way, the women began marketing it to aquafarmers in nearby areas and also using it for their own aquafarming activities.

What does the farm-feed production process entail? The important first step is to start with a balanced formulation of aqua-feed. This would include a healthy mix of protein, fat and carbohydrate sources as well as vitamins and minerals. Protein sources might include any marine product, including dry fish, fish waste, acetes, squid waste, squilla, prawn-head waste, snail meal, clam meal and crab meal. Locally available plant protein sources like groundnut oil cake, *gingelly* oil cake, cottonseed cake, sunflower oil cake, soyabean meal and mustard oil cake may also be used. Energy sources might include broken rice, broken wheat, maize, tapioca, sorghum and other millets. Fat sources would include fish oil or cheaply available vegetable oils. Wheat bran and rice bran are also important ingredients for farm-made feeds.

The dry solid raw ingredients are measured, according to the formula, spread in a heap on a platform and thoroughly mixed. The ingredients are then ground in the grinder component of the feed-manufacturing unit. The materials are first coarsely, and then finely, powdered in the hammer mill. The powdered

materials are passed through a sieve into the mixer. At this stage, additives such as binders, minerals and vitamins are added. After five minutes of mixing, liquid ingredients like fish oil and lecithin are added, along with water. The mixing process usually takes ten to fifteen minutes to complete.

The mixed materials are subjected to steam cooking to improve the digestibility of the feed and also to destroy any pathogenic microbes that might be present. The cooked feed materials are then passed through a pelletizer. The pellets that emerge are collected in trays and kept in a dryer at a temperature of 105° C until the moisture level goes below 12 per cent. During the drying process, the pellets are periodically turned to enable uniform drying. Finally, the dried pellets are sieved to remove debris, and weighed, packed and sealed in lined polythene bags. Labels are then stuck on the packets and the product is ready for marketing. Different grades of pellet feeds (starter, grower and finisher) can be manufactured for use as feed for shrimp, fish and crab.

The economics of farm-feed production work out well for the producer. The cost of one farm-feed manufacturing unit of 20-kg-per-hour capacity is approximately Rs400,000 (US$7,273). The manufacturing cost works out to about Rs30 (US$0.55) per kg, and the feed can be stored for a period of up to two months. The relative ease of production, the reasonably good profit margins and the ready availability of marketing opportunities through community networks combine to ensure that the women farm-feed producers trained by CIBA are well on their way to self-sustenance, thus proving that farm-feed production is indeed a viable livelihood option for women in coastal areas.