SHRIMP FARMING TECHNOLOGY

Since ages shrimp culture as a traditional activity is being practiced. It was only in early nineties that modem scientific shrimp farming got a boost and since then a phenomenal expansion has been achieved. Presently, hardly 15% of the total potential brackish water area available in the country (about 1.7 lakh ha) is under shrimp farming. During 2001–2002, India exported cultured shrimps worth Rs 3,500 crores, which constituted 85% of the total shrimps exported from the country. The Central Institute of Brackishwater Aquaculture (CIBA), Chennai has developed scientific shrimp farming technology with good management practices for sustainable production of shrimps from the culture systems. However, shrimp culture technology and the system of culture depends on several factors like:

- Site characteristics,
- Design of shrimp farms,
- Pond preparation,
- Stocking,
- Water quality management, etc.

Site Characteristics

Undertake a thorough study of the site with reference to meteorological factors (wind, temperature, light, rain, humidity etc.,), location factors (tides, waves, currents, accessibility, prior uses, gradients etc.,), soil quality (soil texture, topography, nutrient and microbial content, leachable toxins), water quality (physical, chemical and biological) and social, legal, and economic aspects.

Improved traditional farm

Design of Shrimp Farms

The farm can either be open or a closed system. If sufficient good quality water is readily available, it is simpler to have low cost open systems. However, if the source water is of poor quality, pre-treatment/ sedimentation is required to be undertaken in reservoir ponds. In larger farms, Effluent Treatment Ponds are essential.

Pond Preparation

It is an essential component of shrimp farm management and is carried out to remove the accumulated metabolites of the earlier culture, elimination of pests and predators, enhancement of the nutrient status of water, and growing natural food organisms. This comprises of:

- Drying of pond bottom
- Sediment removal
- Tilling/ploughing/raking
- Liming
- Water intake
- Chlorination/dechlorination
- Fertilization/manuring

Stocking

The stocking of the pond with hatchery reared, disease free and high quality shrimp seed will ensure a successful culture. It is recommended to have a stocking density of 6–10/m^2 for sustainable production in improved traditional and semi-intensive systems of culture.

Water Quality Management

Another essential component of the shrimp pond management is water quality management. Nutrients and organic wastes produced in shrimp culture ponds consist of solid matter (mainly uneaten feed, faecal matter and phytoplankton) and dissolved metabolites (mainly ammonia, phosphate, carbon dioxide, nitrites and nitrates). In order to maintain these within the tolerable limits, the following methods should be adopted:

- Water exchange
- Aeration
- Application of chemicals/pro-biotics to improve water and soil quality

Scientific farming

FEED AND HEALTH MANAGEMENT

The growth of the shrimp essentially depends on the quality of feed used. It is recommended to go in for compounded feeds, fulfilling the nutritional requirements of the shrimps at different stages of growth, and with good acceptability, digestibility and FCR. Since more than 50% of

Different grades of shrimp feed

the recurring expenditure is on feed, its management in a shrimp farm is of great importance. While over feeding will lead to nutrient loading, under feeding will result in poor growth of the cultured shrimps. Hence feeding rate and feeding frequency should be regulated using feed check trays.

Health Management plays very important role to prevent the occurrence of diseases in the cultured shrimps. Since disease manifestation is a complex interaction of shrimp, pathogen and environment, holistic management approach involving the following processes need to be adopted.

- Undertake continuous monitoring of the health of the shrimps using rapid diagnostic techniques.
- Exclude pathogens from the culture ponds by proper water management and preventing the entry of carriers of pathogens.
- Use prophylactic treatments and use of probiotics to exclude harmful bacteria from the pond ecosystem
- Use non-specific immuno stimulants to enhance the immune response of the shrimps
- Avoid environmental stress by proper water and soil management following bio-augmentation and bioremediation methods.

Waste Management

This is extremely essential in large farms to reduce the nutrient loading in the source water. For the farms above 5 ha, effluent treatment ponds are essentially needed.

HARVESTING AND MARKETING

Harvesting and marketing of the produce from shrimp farms is relatively easy as the processors or their agents readily agree to collect it at the farm site.

CAPITAL INVESTMENT AND RETURN

In order to construct a 5 ha farm, Rs 15 to 20 lakhs will be needed depending on the soil characteristics, distance and elevation of the site with reference to the source water. Recurring Expenditure of a 5 ha farm will be around Rs 12 to 16 lakhs per annum. The cost of production is around Rs 120 to 160 per kg of shrimp.

By following proper management practices, it is possible to produce from a 5 ha farm, 10 tonnes of shrimp, at a farm gate price of Rs 30 lakhs. It is expected to earn on an average, a net profit of Rs 2 lakhs per ha, by complete adoption of the recommended practices.

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