Article Id
AL04166

BEST MANAGEMENT TECHNIQUES IN SHRIMP CULTURE

[1]T. Jagadeesh*, [2]M. Anusha, [2]G. Ganesh and [2]Malothu Mohan

Email

tejavathjagadeesh183@gmail.com

[1]Technical Consultant- (Aquaculture), Coastal Andhra Pradesh, India

[2]College of Fishery Science, P.V. Narasimha Rao Telangana Veterinary University, Pebbair- 509 104, Wanaparthy, Telangana, India

Fish or shellfish are produced by aquaculture, primarily for human use. It involves ongoing engagement with the environment because it is done in ponds, cages, or open water bodies. If aquaculture is practiced in a way that is both socially and environmentally appropriate, it can be a sustainable activity. Aquaculture production systems that are sustainable operate in harmony with the environment and other living organisms, make use of renewable resources whenever possible, give animals living conditions that are as similar to those found in their natural habitats as possible, and are sensitive to the human and social environment of the area. Using better management practises, sustainability can be attained (BMPs). BMPs (Best Management Practices) include legal observance, social responsibility, effective site selection and farm construction, as well as excellent management, practises for farms, from pond preparation to harvest and post-harvest management operations. Better output, productivity, and profitability would follow the adoption of BMPs, as well as increased environmental and social obligations.

Guidelines for Better Management Practices in Shrimp Farming

- Increasing demand for the shrimp products is leading to high stocking densities and usage of more chemicals in the aquaculture sector. If the process continued, aquaculture will be dropped into an unsustainable condition. BMPs are the only approach to overcoming the problems.

- BMP can be defined as a set of guidelines that are developed, based on risk factor studies, in consultation with the practitioners and relevant stakeholders on the evaluation of current issues. Production should be increased to meet the demand; at the same time, we should keep sustainability in mind. BMPs should besimple, science-

based, cost-effective and appropriate to their context if farmers are to adopt and implement them. Some important BMPs steps.

1. Preparation of Pond Bottom and Water Management before Stocking

- Sludge removal and disposal away from the pond site.
- Ploughing on wets oil if the sludge has not been removed completely and water filtration.
- Using twin bag filters of 300 µm mesh size and ensuring a water depth of at least 80 cm at the shallowest part of the pond.
- Waterconditioningfor10to15daysbefore stocking

Fig 1: Preparation of pond bottom

2. Post Larvae Selection and Stocking

- Selecting PL of uniform size and Colour, which are actively swimming against the water current, testing (with nested PCR) PL for WSSV (using batches of 59 PL pooled together Negative test results indicate, with 95% confidence, that the prevalence of WSSV infected PL is less than 5% in that population).

- Eliminating weak PL before stocking, using formalin (100 parts per million [ppm]) stress for 15 to 20 minutes in continuously aerated water, on-farm nursery rearing of PL for 15 to 20 days.
- Stocking from the first week of February to the second week of March (early spring) ensuring a transportation time for PL of less than six hours from hatchery to pond site.
- Stocking into green water with stable algal blooms and avoiding transparent water during stocking.
- Fillinggrow-out ponds with water from reservoirs that have been left to 'age' for at least 10 to 15 days.

Fig 2: Post Larva Stocking

3. Water Quality Management

- Periodical monitoring and management of salinity, pH, dissolved oxygen and microbial load.
- Chemicals used in maintaining the water quality are…

- Zeolite–soil conditioner.
- Benzal Konium Chloride(BKC)–disinfectant.
- Iodine compounds.
- Lime.

- The water depth at the shallowest part of the pond should be atleast 80cm.

Fig 3: Water quality management

4. Pond Bottom Management

- Check on weekly basis, especially at the feeding area for black soil, benthic algae and bad odors.
- Rapid consumption of feed in the check trays can be a cause of bottom sludge.
- If soil is black, exchange water and reduce feeding.
- Black soil are a should be agitated care fully during the water exchange.

5. Feed management

- Excessive feeding is dangerous than under feeding.
- Check trays should be introduced after one week of stocking.
- If any sized inference occurs, use two different size pellets atleast for 7 days.
- First in, the dicatorofaseriousdis ease problem: is an abrupt decline in feed consumption and low dissolved oxygen.

Fig 4: Feed Management

6. Feed and Health Monitoring

Gutcontent color	Probable food item	Probable cause(s)
Light golden brown	Manufactured feed	Normal
Black, dark brown	Benthic detritus, sediment	Under-feeding; inadequate feeding frequency
Green	Benthic algae	Under-feeding
Red, pinkish	Cannibalized body parts from dead shrimp	Diseaseeventinpond
Pale, whitish	None(disease condition)	Gregarines, or some other disease condition

7. Health Monitoring

- Daily visual inspection of the animals.
- Sampling once a week for general health condition.
- Monitor soil and water quality.
- Regular removal of benthicalgae, exchanging water only during crucial periods (e.g. periods of low oxygen, algal bloom crash).
- Weekly checking of pond bottom mud for blackish organic waste accumulation and bad smells.
- Regular shrimp health checks, and weekly health and growth monitoring, were using a cast net.
- Removal and safe disposal of sick or dead shrimp.

Fig 5: Health Management

8. Handling the Disease Outbreak

- Check the water and soil quality.
- Remove dead animals and bury them.
- If mortality is increasing, emergency harvest can be carried out.
- Inform the neighbor farmers and FDO immediately. Drain the water only after treatment with bleaching powder and aged up to 5-7 days.

9. Harvesting

- If newly Molted shrimps are >10% avoid harvesting.
- Don't feed the shrimp 6hrs before harvesting.
- Pre-harvest testing is done for antibiotic residues.
- Harvesting is done only after the receipt of the test report, and the report is submitted to the buyer along with the shrimps harvested.
- Chill killing and thereafter shipped to the processing plant in insulated carriers packed in ice.
- The water should be discharged after ensuring the standards prescribed.
- Four harvest outcomes were considered

    - Days of culture.
    - Productivity.

- Shrimp size.
- Shrimp survival.

Fig 6: Harvesting

10. Record Keeping

- To identify problems in the pond environment
- Useful to learn from the past experiences
- To estimate the production cost and to find out the net profit or loss

❖ Advantages of BMPs in shrimp farming

- ✓ Reduces the risk of disease occurrence.
- ✓ Improves growth performance.
- ✓ Decreases operational cost.
- ✓ Improves environmental conditions.
- ✓ Attains food quality standards.
- ✓ Fetches higher market prices.
- ✓ Facilitates stainability, among the others

Conclusion

An in-depth understanding of the many aspects of BMP adoption in small-scale shrimp farming systems was provided by this study. Farmers tend to selectively adopt BMPs that they believe are essential for the success of the crop and for higher economic returns, whereas the capital-intensive BMPs that require additional investment were poorly adopted.

A variety of factors, including the farmer and farm site-specific characteristics, influence farmers' adoption decision choices.

References

Bhatta, R., (1999). Coastal aquaculture and coastal ecosystem: institution perspective from Karnataka. In: Krishnan M. and Birthal P. S. (eds.), Proceedings of workshop on aquaculture development in India: Problems and prospects, National Centre for Agriculture Economics and Policy Research, New Delhi, India, 6-7 Sept. 1999, pp. 78 – 86

Boyd, C.E., Clay, J.W., (1998). Shrimp aquaculture and the environment. Scientific American, June 1998, 59-65.

Charles Jeeva, J., Balasubramaniam, S., Krishna Srinath., (2009). Adoption of good management practices by Aquafarmers. Fishery Technology. 46(1):

HFS, (2014). Hand book of fisheries statistics, Ministry of Agriculture (Govt.ofIndia), Department of Animal Husbandry, Dairying and Fisheries. Delhi.

Poulomi Bhattacharya., (2009). Economics of Shrimp Farming: A Comparative Study of Traditional Vs. Scientific Shrimp Farming in West Bengal. The Institute for Social and Economic Change. Working paper 218. ISEC, Bangalore. 1-22.

Ramachandra Sahu, Swadesh Prakash, N., Kumar, R., Krishnan, M., (2014). Adoption of Better Management Practices (BMPs) and constraints in shrimp farming in selected districts of Odisha. Indian Journal of Fisheries, 61(2): 151-155.