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Study on management practices adopted in shrimp hatchery, located at Dandi village, Valsad

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Abstract
Shrimp is a valuable aquatic food resource with high in protein and main target commodity with good aquaculture export market. Traditionally, shrimp fry are trapped and held in ponds and then grow-out ponds. The increasing demands in international market so that supply of wild shrimp fry has become insufficient and inconsistent for shrimp farm. The breakthrough in the completion of the life cycle of commercially important shrimps in captivity, such as the tiger shrimp *penaeus monodon* and white leg shrimp *litopenaeus vannamie* has greatly enhanced mass production of shrimp fry under hatchery bio-secured condition.

Keywords: Shrimp farming, hatchery, management practices

Introduction
Aquaculture is a controlled cultivation or farming of aquatic organisms such as fish, crustaceans, molluscs, algae and aquatic plants. It is an environmental source of food and commercial products that help to improve healthier habitats and are used to reconstruct the population of endangered aquatic species. The shrimp farming is a form of aquaculture that takes place in the marine water or brackish water environments and producing yields are highly nutritious for the human consumption. The shrimp industry has elevated responsibility about environment and ecosystems. The increasing environmental problems, continuous disease outbreaks, are led to changes stronger regulation for industry. The hatchery is a place that bio-securely artificial breeding take place under control environmental conditions. It is usually located near calm sea coast and near from brackish water inflows. The capacity of hatchery would be based on its functional requirement and economic efficiency. The quality and quantity of the hatchery produced seeds is depends upon the quality of brood stock, water management and feed administration etc. (Juan *et al*., 2000).

Materials and methods
Data collection was conducted through in-depth personal interview with questionnaire and observations including personal visit of shrimp hatchery located at Dandi village of Valsad district in Gujarat state, India.

Importance of this study
- To construct an ideal shrimp hatchery.
- To maximize production with minimize investment through best management practices.
- To know the environmental responsibility.
- Essential component and infrastructure of a shrimp hatchery.

Results
The shrimp hatchery management was appropriate methods of operation and construction to protect the natural resources.

a. Water quality source
The hatchery was demonstrated that there is no increase in concentrations of total suspended solids, soluble phosphorus, total ammonia-nitrogen, BOD and non-decreases in dissolved oxygen concentration and also, they are doing regular filtration with monitoring.

b. Availability of power source
The electricity is essential to provide the necessary power to run the equipment and life support system. Alternatively, they are installed of an onsite standby generator for using during frequent lengthy power failure and fluctuations.

c. hatchery design and infrastructure
The facility has demonstrated the separate area for brood stock, larval rearing, water treatment, feed production, hygiene work flow with control of contamination.

d. Larval rearing techniques
The larval rearing covers the various larval stages (Nauplius to post-larvae) with stocking density, feeding schedule including tank maintenance to ensure healthy shrimp seed production.

e. Diseases control and biosecurity
The facility has implementing stick biosecurity protocols with disinfections, quarantines, pathogen free practices including early diseases detection methods to help and prevent viral, bacterial, fungal and protozoan infections.

f. Effluent monitoring and management
The hatchery was regularly monitored the concentrations and impacts of the metabolic wastes. Uneaten feed is discharged from their facilities to effluent treatment plant.

g. Soil and water conservation
The hatchery construction and operations has not cause any soil and water salinization or deplete groundwater in surrounding areas.
Other best practices include:
- Not discharging saline water into freshwater areas or ground water
- Avoidance of pumping of groundwater for rearing of seed.

h. Sediment and sludge management
The sediment accumulation in tanks was reduced by implemented proper infrastructure design and construction.

Accumulated sediments in the basin are removed regularly by pumped or siphoned periodically to offline sludge basins.

i. Storage and management of supplies

The range of chemicals and supplies used and solid wastes generated in hatcheries. They are developed a systematic approach to the management of first aid supplies, fire extinguishers, chemicals, feed, fertilizers, oils, compressed gas cylinder, medicines, including labels, risk indicator, warning sign, rodents, birds and pest control along with solid wastes in their particular production context.

j. Solid waste disposal

A solid waste is not accumulated on hatchery property. Such waste has collected properly as it is generated and placed in temporary solid waste storage areas (dumpsters, bins) prior to final disposal.

Discussion

The water supply system normally includes settling tanks to remove larger particles and filters for water treatment and disinfection. (AAI 2002). As per Ravichandran and Pillai (2004) [23], a flow diagram for water treatment in shrimp hatcheries is the commonly used 5-10 ppm chlorine as disinfectant and excess chlorine would be neutralized by adding sodium thiosulphate. The EDTA is used as a chelating agent helps in reducing the equipment of safety and quality management System. There are separate pumps, tanks etc. for freshwater intake (AAI 2002) and as per Islam *et al*. (2004) [15] effluent management is depending on the size of the hatchery. As per (AAI 2002) infected larvae and fry should be isolated and disinfected before releasing into open waters in order to prevent spreading of disease and environmental degradation. The effluents from the hatcheries would be treated before discharging into the open waters. The environmental impacts of the wild shrimp seed facility as well as the possibility of environmental degradation from mass production of shrimp seed (Islam *et al*. 2004, Primavera l998) [15]. The shrimp hatchery also is facing increasing pressure to lower its environmental impact. The huge mortality and loss of other species have been reported for every single *P. monodon* PL collected from the wild. Hatchery production of shrimp seeds started in 1980s and has been a potential alternative of wild shrimp seed. The shrimp fry posed serious impacts on the regional biodiversity and aquatic community structure by reducing the food availability of other organisms such as aquatic birds, reptiles etc.

Conclusion

The shrimp hatchery was studied to know the management practices adopted in seed production facility. It is important for improving seed quality, preventing diseases, supporting sustainability, increasing productivity and promoting economic development in the aquaculture industry.

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References

1. Allan w stoner, Michele L Ottmar, Louise A copeman. Temperature effects on the moulting, growth lipid composition of newly-settled red king crab., Journal of Experimental Biology and Ecology,2010:393:138-147.
2. BOBP Nursery rearing of tiger shrimp post larvae in West Bengal, India, 1993. BOBP/WP/92.
3. BOBP, Nursery rearing of shrimp prawn fry in Bangladesh, 1994. BOBP/WP/92.
4. Chanratchakool P. Health management in shrimp ponds. Aquatic Animal Health Research Institute, Bangkok, Thailand, 1993, 111.
5. CPA Devi, D Sudarsanam, CD Rosalin, The influence of live supplementary feed in the growth of post larval stages of *Penaeus monodon* Fab. proceedings of the national seminar on new frontiers International Journal of Research in Marine Sciences,2015:4(2):15-19. 18 in Marine Bioscience Research, January 22-23 (2004) 139- 150.
6. CP Gopinath, R Gireesh, Microalgae culture as live feed, Central Salt Marine Chemical Research Institute, A. Tewari Ed, 2006, 1.
7. C Rosas, G Cuzon, G Taboada, C Pascual, G Gaxiola, A Van Wormhoudt. *et al*. Effect of dietary protein energy levels on growth, oxygen consumption, haemolymph digestive gland carbohydrates, nitrogen excretion and osmotic pressure of *Litopenaeus vannamei* Boone *L. setiferus* Linne juveniles Crustacea, Decapoda, Penaeidae. Aquaculture Research,2002:32:531-547.
8. FAO. Improving *Penaeus monodon* hatchery practices. Manual based on experience in India. FAO Fisheries Technical Papers T446. Rome, FAO. Online version, 2007.
9. FAO State of World Fisheries Aquaculture, 2010.
10. FD Paroda-Estepa. Prawn hatchery operations. Aquaculture Extension Manual, 2010, 19-1976
11. Frankenberger. A livelihood analysis of shrimp fry collectors in Bangladesh: future prospects in relation to wild fry collection. Report from the Shrimp Action Plan, 2002. Department of Fisheries / DFID.
12. G Supriya, TV Ramachandra, Chronicle of Marine Diatom Culturing Techniques, Indian Journal of Fundamental Applied Life Sciences,2011:1(3):282-294.
13. Huntington. Scope study for the certification of shrimp aquaculture in Bangladesh. Report from the Shrimp Action Plan. Department of Fisheries / DFID
14. Improving *Litopenaeus vannamei*, hatchery practices. FAO Fisheries Technical, 2002, 446.
15. Islam S, Wahab A, Tanaka M. Seed supply for coastal brackishwater shrimp farmingzenvironmental impacts and sustainability. Marine Pollution Bulletin,2004:48:7-11.
16. JDH Strickland, TR Parson. A manual of sea water analysis. Fish Research Board, Canada bulletin,1960:125:1-187.
17. Kungvankij P. Shrimp hatchery design, operation and management. NACA Training Manual Series No.1. NACA, Bangkok, Thailand, 1986, 88.
18. Kongkeo H. Comparison of intensive shrimp farming systems in Indonesia, Philippines, Taiwan and Thailand. Aquaculture Research,1997:28:789-796.
19. Limsuwan C, Chanratchakool P. Shrimp farming industry in Thailand. National Research Council of Thailand, Bangkok, Thailand, 2004, 206.
20. Natesan Sivakumar, Mutheraman Sundaraman Gopal Selvakumar. Efficacy of microalgae cyanobacteria as

alive feed for juveniles of shrimp *Litopenaeus vannamei.* African Journal of Biotechnolog,2011:55:11594-11599.
21. P Juan Lazo, T Maria Denis, G Joan Holt, Cindy Faulk, R Connie Arnold. et Co-feeding micro particulate diets with algae toward eliminating the need of zooplankton at feeding in larval red drum *Sciaenops ocillatus* Aquaculture,2000:188:339-351.
22. P Soundarapandian, R Babu. Effect of probiotic on the hatchery seed production of black tiger shrimp, *Litopenaeus vannamei* Fabricius. International Journal of Animal Veterinary Advances,2010:2(1):9-15.
23. Ravichandran P, Pillai SM. Hand Book of Shrimp seed production Farming, Bulletin, CIBA, Chennai, 2004, 16.
24. SS Mishra, MS Shekhar, IS Azad. Concurrent infection with WSSV and MBV in tiger prawn *Litopenaeus vannamei* Fabricious in West Bengal their detection using PCR and DNA Dot-blot hybridization technique. Indian Journal of Biotechnology,2005:4:06-51.
25. Vishwanath Patil, Torsten Kallqvist, Elisabeth Olsen, Gjermund Vogt, Hans R. Gislerod. Fatty acid composition of 12 microalgae for possible use in aquaculture. Aquaculture International,2007:15:1-9.
26. V Rekha, R Gurusamy, P Santhanam, A Shenbaga Devi, S Ananth. Culture biofuel production efficiency of marine microalgae *Chlorella marina* and *Skeletonema costatum.* Indian Journal of Geo-Marine Sciences,2012:41(2):152-158.