BMPs for
Sustainable Scampi Farming

Prepared by NaCSA based on Brainstorming session deliberations in

Kakinada on 6th and 7th Dec, 2007

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1. Background:

The multi-stakeholder consultation with the objective of developing Better Management Practices for the fresh water prawn *Macrobrachium rosenbergii* (Scampi) was held in the Head Office of National Centre for Sustainable Aquaculture (NaCSA), Kakinada on 6th and 7th of December'07. The meeting was attended by 19 delegates representing farmers, farmer societies, hatcheries, processors, feed companies, academicians, state fisheries department, CIFE and NaCSA. MPEDA was represented by the Director from HO and Deputy Director from the regional centre in Andhra Pradesh.

The meeting discussed and deliberated in detail on the main issues related to Scampi aquaculture given below.

Issue	Principle
Legal compliance	Locate and operate farms within established national and local legal framework
Land and water use	Farms should be located, designed and constructed to minimize negative impacts on other users and the environment
Hatchery/Nursey/Growout management	Adopt the best management options available in a sustainable manner maximizing the profits while minimizing the risks of disease and other related issues
Environmental management	Minimize impacts on local environment and natural habitat
Social Responsibility	Develop and operate farms in a socially responsible manner that contributes effectively to rural development and poverty alleviation

Based on the deliberations of the meeting draft BMPs were developed for Scampi. The draft report was sent to Dr. N. Sarangi, Director, CIFA for further wetting. His valuable suggestions have been incorporated in the report.

1. Principles of Scampi sustainability

i. Legal compliance:

a. Laws of the country:

No national law to regulate scampi farming, AP Govt. has taken a lead to register all the Fresh water farms. Similar policies can be adopted by other states/Union territories. Registration of group societies/Aquaclubs should be encouraged. During farm registration process incorporation of nursery component may be encouraged.

b. Hatchery Registration:

Scampi Hatchery registration must be made mandatory similar to that of Shrimp hatchery that is being taken up by MPEDA/CAA.

c. Inputs-

Commercial feed mills, chemical dealers and other input agencies and suppliers should be registered. Quality standards must be checked by appropriate regulatory agencies.

d. Consumer concerns

- Food safety- HACCP, -
- Traceability of culture system-brood stock to consumer
- No Use of banned chemicals and antibiotics
- Certification

e. Cumulative effect of farming operations:

- Social issues
- Farms should be located where sufficient surface water is available
- Irrigation facility may be extended to scampi faming also. Water tariff should be on par with Agriculture.

ii. Land and water use:

a. Impact on Habitat:

- Scampi farming should not result in habitat loss

b. Plan areas for aquaculture based on Agro ecological conditions-

For promoting sustainable scampi production under Monoculture/Poly culture/integrated farming/Cage-pen culture lands with good water facility, low lying lands, water logged areas, saline and alkaline soils could be used. Polyculture of scampi also could be promoted in seasonal tanks and reservoirs. Pen/cage culture could be promoted in rivers and canals.

iii. Hatchery/Nursey/Growout management:

a. Hatchery Management:

- **Brood stock Management: Setting up of brood stock bank**
- High quality captive broodstock can be developed from hatchery-raised post-larvae following the recommended husbandry and management practices.
- Use of wild stock as brood stock should be discouraged due to two main reasons

  1) Wild stock use will interfere with our long term goal of domestication of the stock through genetic improvement programmes,

  2) Wild stock are thought to be potential carriers of unknown pathogens and their use may cause more harm than good.

    - Hatchery BMPs- will be formulated based on the recommendations of a brain storming session planned during Feb- 3rd week at College of Fishery Sciences, SVVU, Muthukur ,Nellore (considering the large number of hatcheries in and Nellore)

b. Nursery Management ;

1. Nursery pond design: Harvesting juveniles from poorly designed and constructed earthen ponds is highly stressful and leads to post stock mortality of the stock. Thus more emphasis should be given on designing and construction of nursery ponds.
2. Pond preparation- sludge removal; drying; fertilization; screening of the water; Substrate provision with locally available materials like used nets/pal/coconut leaves which provides more surface area- 5 to 10% of the nursery area; Fencing of the nursery area
3. Seed selection: Age of the PL - PL10 (10 to 12 mm), seed should be free of necrosis, fouling, WTD, should be active (body shining, no opaqueness of eye, no appendages cutting, size uniformity.), Formalin Stress test
4. Stocking: Stocking density not more than 25 per sq m.
5. Water quality management: screening of water, Depth- 2 to 3 ft, water transparency, color light green to brown, water, Temperature <18 and >37 should be avoided, pH, alkalinity, ammonia n2, nitrite N2, avoid using culture water from other ponds
6. Feed and feeding strategy- Good quality pelleted feed- with min. 35% protein should be used 2 to 4 times @20% body weight in the first month and 15% in the second month.
7. Nursery duration- 45 to 60 days
8. Harvesting juveniles- Cast netting in early hours before 10 AM, Care should be taken to reduce stress during shifting with out giving scope for air drying
9. High density and low temperature aggravate the white tail disease
10. Small farmers can go for growing in production ponds by using nylon hapa method.
11. Cooperative nurseries (society/aquaclubs) in societies of small farmers should be encouraged.

c. Grow out management:

For sustainable production target one ton per ha. per crop under batch culture is recommended

- Pond preparation: drying, ploughing, liming, pond conditioning and fertilization using organic manure (avoid poultry manure), Gypsum in saline soils to reduce pH,
- Rectangular ponds with flat bottom sloping towards outlet is desirable
- Area- of 0.5 to 0.7 ha desirable. Avoid trenches in the pond
- Shelters: 10% of pond area
- Stocking density: <4 pcs per sq. mt
- Stocking of nursery juveniles of 1 to 2 gm recommended
- Water quality management- Do phased fertilization whenever necessary, avoid excessive algal blooming (avoid poultry manure). Wherever required inorganic fertilizers can be used.
- Feed: min. 20% protein quality feed (free from banned feed supplements)
  - Feeding minimum 2 times
  - 4 to 1% body weight
  - Sampling once in 15 days for growth and health monitoring
  - Centre feeding is desirable

Record keeping with respect to growth, health, feed management and water quality management should be followed.

Water Quality:

- Water depth 3 to 4 ft.
- Water exchange need based.
- Water transparency of 30 to 40 cm secchi disc, Stable water color (light green/brown) desirable, excess bloom is not desirable and could cause mass mortality during summer days.
- DO of 3 to 8 ppm
- Agri. Lime 50 kg per month

Pond bottom management.

- Stocking of major carps (Catla- Rohu / Silver carp) at the density of 150 to 200 ha. to maintain good pond environment.
- Excessive vegetation on bunds should be trimmed periodically

Health management:

- Animal should be active
- Shining of the body Cleanliness of the body, appendages, gills - free from fouling

- Dispersed Pigmentation
- Free from Black or brown spots on body/gills, necrosis
- Free from Opaqueness of the eyes
- Appearance of dead animals during sampling indicates poor pond environment and poor prawn health.
- Dead animals should be properly disposed
- Appearance of sluggish prawns on the pond margin, fish coming to surface for gulping air during day is indicative of DO problem in the pond.

These have to be examined during fortnightly sampling.

Harvesting:

- During sampling 1 or 2% Blue claw with prominent spines is indication of first cull harvest
- First partial harvest 90 to 100 days, after stocking (excluding nursery)
- During every harvest pre harvest molting should be monitored
- During cull harvest reduce water level by 20 to 30% harvest using cast net and remove blue claw males and berried females. Removal of second pair of walking legs should be avoided.
- Further repeat harvest must be done every 20 to 30 days.
- 4 to 6 harvest should complete the batch (180 to 200 days)
- Continuous culture yields poor results
- Chemicals use should be minimized/avoided

Post harvest Handling:

- Wash with good quality water
- Remove chelated legs
- Chill killing,
- Beheading (if required- skilled labor)
- Pack with ice for marketing
- Advised to use processing waste for preparation of chitin/chitosan/silage/meal/compost depending on the quality.

Polyculture:

Target production of 2.0 tons fish, 500 kg scampi can be expected from polyculture.

- Catla, rohu (2500 to 3000 per ha).
- Manuring has to be done regularly,(phased manuring – once a moth) and care should be taken not to over bloom (no poultry manure)
- Water depth should range between 1.2 to 2 mts.
- Stocking of 1 - 2 nos. per sq. mt of scampi of >2gm juvenile give better results
- Cull harvesting is not desirable
- Crop should be maximum of 7-8 month (excluding nursery)

- Advanced/Stunted fish fingerlings stocked simultaneously with scampi juveniles
- Fish feeding @3 to 1% should be done in the morning hours while scampi can be fed @ 2 to 1% of the scampi biomass in the evening.

Polyculture- Reduced risk with low cost of production

v. Environmental management:

- Scampi farming has no negative impact on environment
- While practicing cluster farming, concept of ETS/settlement tank could be used where carps/bivalves can be grown profitably to reduce organic loading

vi. Social Responsibility:

- Cooperative farming- Cluster farming/group farming, HR development, Awareness building
- There should be buffer zone between aquaculture ponds and other food production sectors wherever possible.
- Integration of scampi farming with agriculture and allied activities improves social responsibility
- Enhances the Nutritional security
- Gainful employment for local people
- Rural development
- More woman employment in scampi farming-grading/feeding/beheading (gender equity)
- Farmer family is involved in pond maintenance, feeding and day today management