

Shrimp and Prawn hatcheries designing construction and working

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Shrimp hatchery

- Construction of a well designed shrimp hatchery is required for production of seed on a large scale to meet farmers demand for commercial scale farming of major species of marine shrimps in the Indo-Pacific region (*Peneaus monodon*, *P.indicus*, *P.japonicus*, etc).
- Based on the shrimp larval rearing system, there are two basic hatchery systems.
- 1. Large Tank Hatchery System (Japanese system)
- 2. Small Tank System (American system/Galveston system)

- 1. LARGE TANK HATCHERY SYSTEM
- This system was developed in Japan and use large tanks of 40-2000 tone or more. In this system, a large tank is used for both larval and post-larval rearing as well as have food culture of diatoms and rotifers. These tanks can be kept open or under partially transparent roofing.
- Disadvantages: 1) Difficult to control algal bloom 2) Improper disease management and large scale mass mortality 3) Requires large number of spawners

- HATCHERY FACILITIES
- The size of the hatchery depends upon the production target and number of brooders available for hatchery operation.
- The dimensions of various tanks and water intake systems are designed taking into consideration the production targets.
- Following are the basic facilities to be provided in a shrimp hatchery.
- 1. Holding tanks i) Maturation tanks

- ii) Spawning tanks
- iii) Larval rearing tanks
- iv) Nursery tanks (Post Larval rearing tanks)
- v) Algal culture tanks
- 2. Seawater storage and filtration tanks
- 3. Seawater and freshwater supply system

- 4. Aeration system
- 5. Power supply system
- 6. Laboratory equipment
- 7. Hatchery building

Prawn hatchery

- *Macrobrachium rosenbergii* is gaining immense popularity in the recent years. In order to have commercial aquaculture ventures of giant freshwater prawn in different parts of India, seed is one of the major constraints.
- Therefore, it is essential to establish commercial and back-yard hatcheries in different parts of India.

- **INFRASTRUCTURAL FACILITIES**
- The infrastructure facilities include earthen brood-stock ponds to maintain adequate supply of brooders, water supply system, aeration system, main hatchery shed for housing brood-stock holding tanks, hatching tanks, larval rearing tanks, post-larvae holding tanks, power house, pump house, etc.

- i) BROOD STOCK UNIT
- This unit has provision to hold Berried females and hatching the eggs of Berried females. The unit is provided with freshwater, brackishwater and air supply grids of PVC all along the walls inside the shed.

- ii) BERRIED FEMALES HOLDING TANKS
- The brood stock unit consists of various size (2.0 to 10.0 ton capacity) cement tanks/plastic pools / FRP tanks to hold the Berried females collected from the brood stock ponds. These tanks are housed under an asbestos roofed shed.

- iii) HATCHING TANKS The size of hatching tanks varies from 0.5 to 1.0 ton capacity in commercial hatcheries. Normally FRP tanks are used for hatching.
- iv) LARVAL REARING UNIT The larval rearing shed should be situated with a North-South orientation having large windows on eastern and western sides for proper ventilation.

- v) LARVAL REARING TANKS
- Prawn larvae are reared in different types and sizes of tanks made up of cement, FRP, Ferrocement, etc. Smaller hatcheries use 0.25 to 1.0 ton and commercial hatcheries use 1.0 to 5.0 ton capacity parabolic shaped or circular tanks with disc shaped bottom. The tanks are provided with aeration.

- vi) ARTEMIA HATCHING UNIT Artemia hatching unit consists of 50 l to 500 l capacity FRP cylindroconical jars. The conical part of the jar is translucent and the inner surface of the jar is white in colour. The jar has a lid. Aeration is provided at the center of the cone. An outlet valve is provided at the center of the cone to harvest the Artemia nauplii after hatching. Above the each jar two fluorescent tube lights are fired to get 1000 Lux light.

- vii) POSTLARVAL REARING UNIT In the hatcheries the post-larvae are generally reared in 10 to 20 ton capacity cement tanks/ plastic pools/ FRP tanks. These tanks are roofed under asbestos side Open sheds. Aeration is provided in the tanks. In the field, postlarvae are reared in hapas fixed in the earthen ponds.

- viii) EQUIPMENTS The essential equipment are pumps, oil free air-blowers generator; salin1, refractometer, chloroscope, pH meter, thermometer, oxygen meter, analytical balance mixer, cooker, refrigerator, oven, hot plate, sieves, etc.

- ix) OTHER FACILITIES In addition to the above facilities the hatchery complex consists of pump houses, power house, filter units, overhead tanks, small laboratory, stores, office, staff quarters, etc.