Marine Aquaculture 2

PhD. student

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Advantages of small-scale marine finfish hatcheries

1- Low capital inputs

For example, in Indonesia the capital cost for constructing a small-scale hatchery is around US$2,851

2- Simple construction

There is no complicated mechanical set up, the only machines needed are air blowers, water pumps and a backup generator.

3-Ease of operation and management

Easy to manage and there is less requirement for sophisticated technical expertise for the workers or owner to operate the system.

The turbid water at this location will require filtration before it is suitable for use in a marine finfish hatchery. The turbidity may be due to runoff and consequently this site may experience rapid changes in salinity

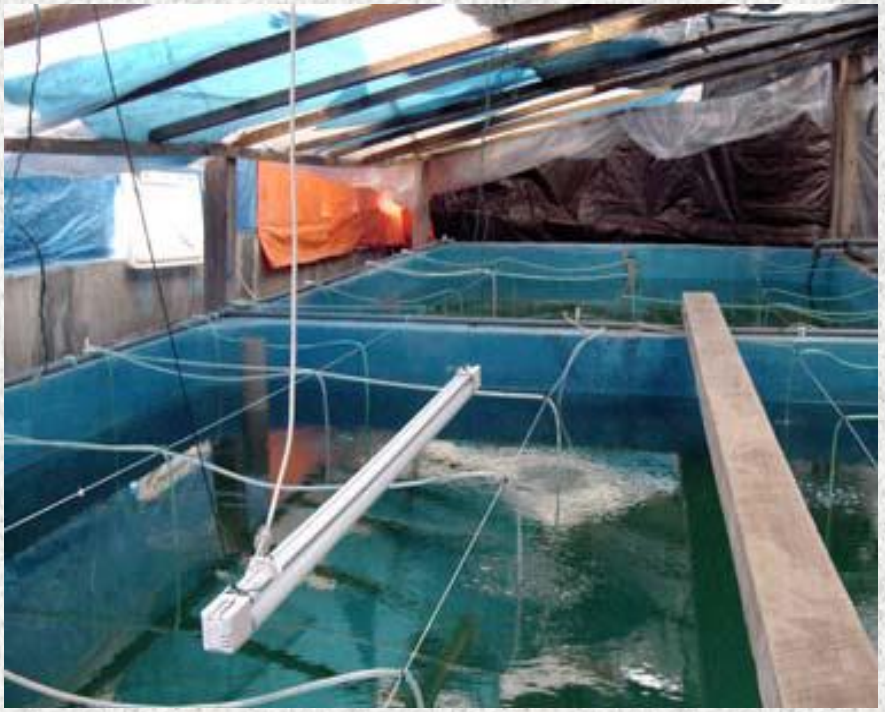
Advantages of small-scale marine finfish hatcheries

4- Flexibility

Can be used for a range of marine finfish. Many small-scale hatcheries in Indonesia switch between milkfish and grouper production as prices of these two commodities fluctuate.

5- Quick economic returns

Capital and operating costs are low, the return on investment is rapid. An economic assessment of small-scale hatcheries in Indonesia indicated that 7 out of the 11 hatcheries surveyed had capital payback periods of less than one year.



Interior view of a small-scale hatchery showing larval rearing tanks.

Small-scale hatchery equipment, design and setup

Site selection

A site suitable for a small-scale marine finfish hatchery should have the following characteristics:

- Good water source – both seawater and access to freshwater.
- Good infrastructure, such as roads, electricity and freshwater supply.
- Free from domestic, industrial, fisheries and agricultural pollution.
- Located in an area where technical support can be obtained from the government or academic research centers.
- Access to:
  - Good quality fertilized eggs.
  - Hatchery and live feed suppliers.
  - Fingerlings traders/exporters.

It is important to avoid the following when selecting a site for a small-scale hatchery:

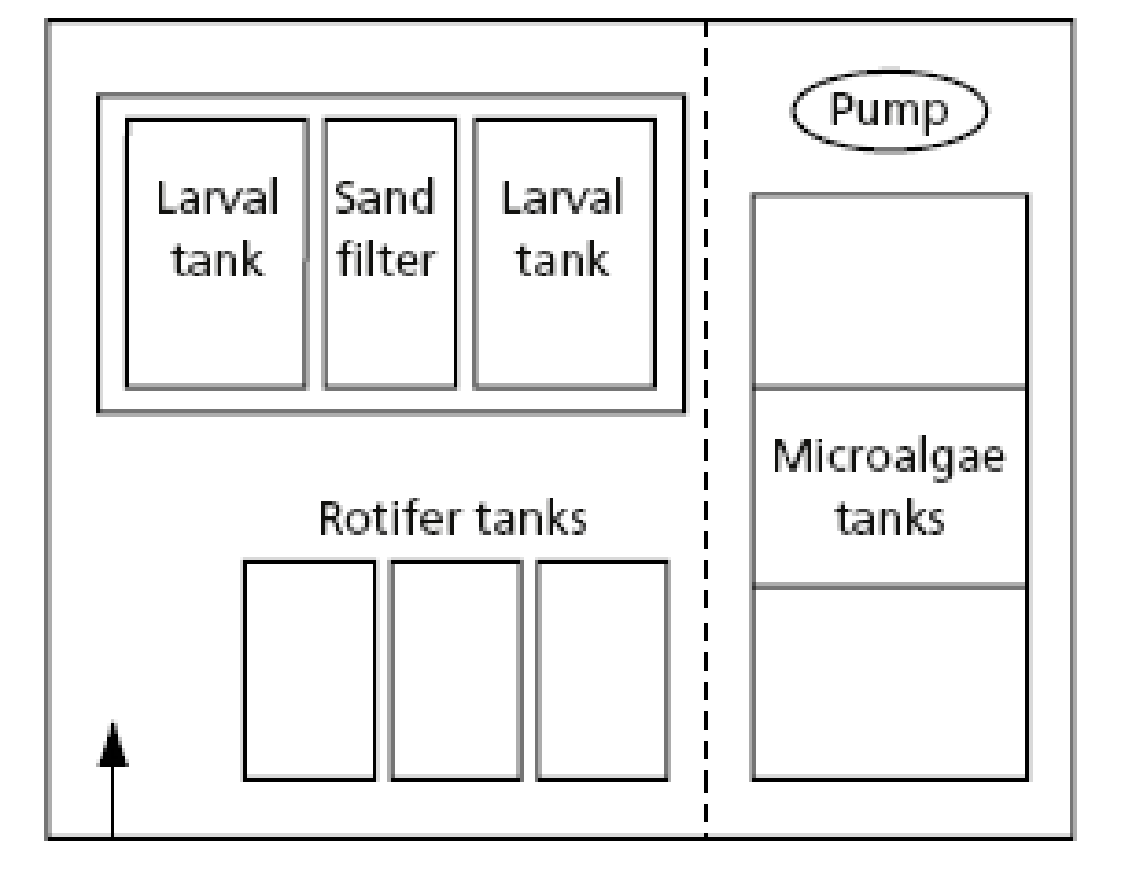
- Poor quality or polluted seawater supply (high turbidity, high nutrient loads, variations in salinity due to freshwater runoff).

Small-scale hatchery equipment, design and setup

• Locating the hatchery close to other hatcheries, which may result in:
- Local pollution – hatcheries may discharge nutrient-rich wastes.
- Disease transmission from other hatcheries, either by direct contact or through hatchery discharges.
• Areas where conflict of interests may arise between communities or resources users.

Concrete sand filter tank for a small hatchery – approximately 10 m³ capacity.

Small-scale hatchery equipment, design and setup

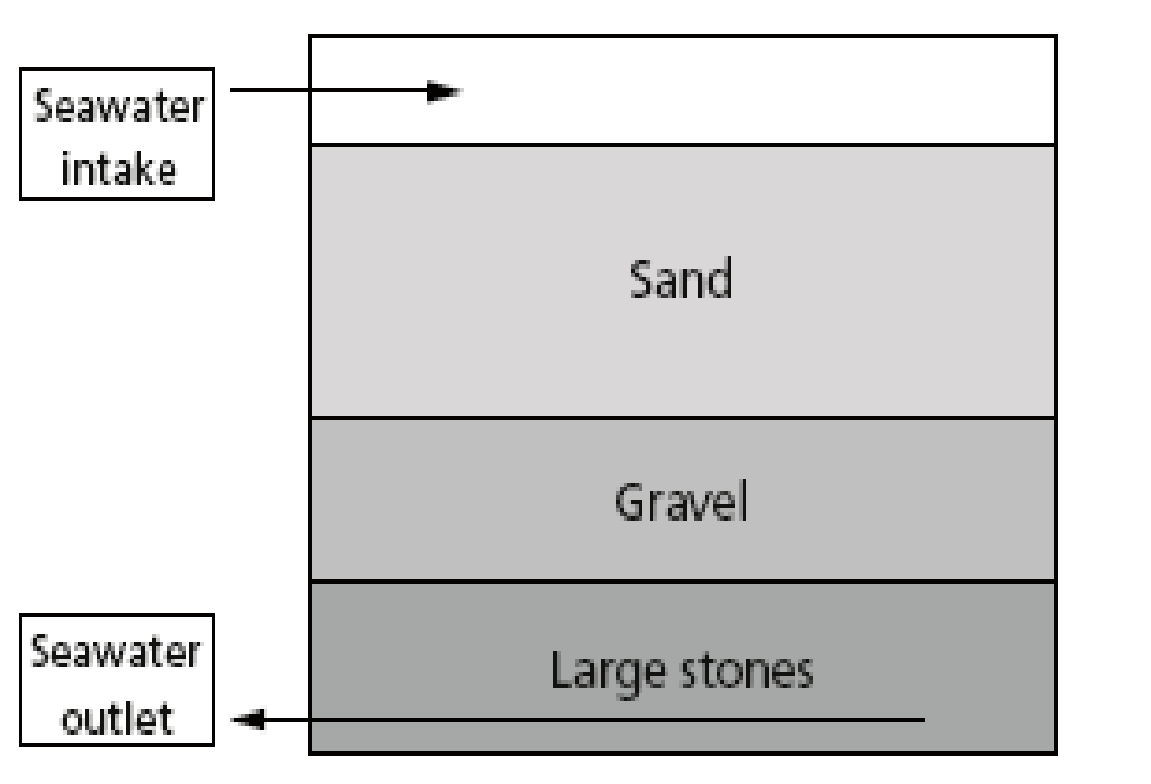


Basic layout for a small-scale hatchery with 2 larval tanks, 1 sand filter, 3 rotifer tanks in indoor section, a pump house and 3 microalgae tanks at the outdoor section.

Tank design and description

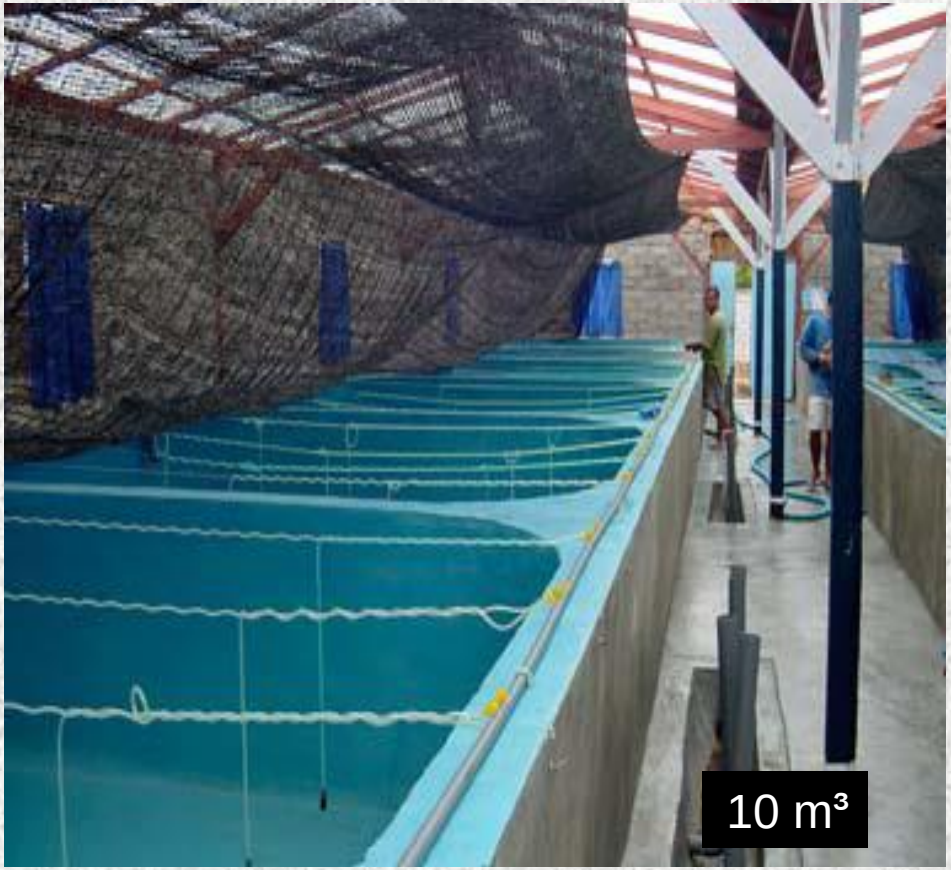
Sand filter tank

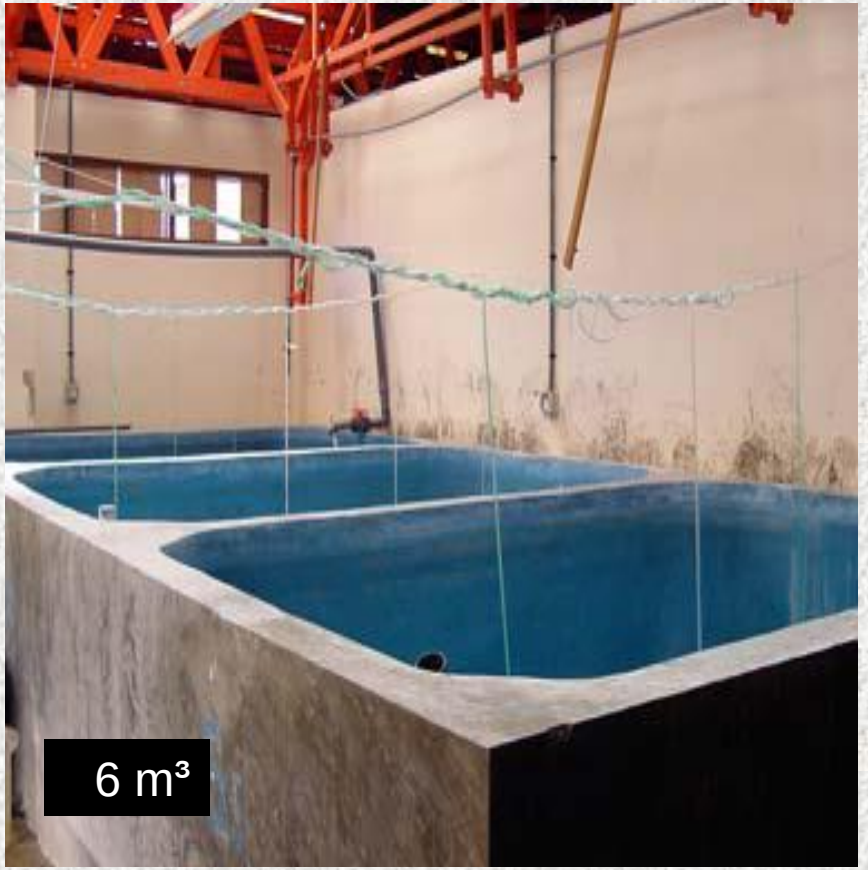
Small-scale hatcheries may use a gravity sand filter to initially remove coarse particles and organisms from the source water. Such filter tanks are usually made of concrete and the filter medium comprises a layer of coarse material such as stones at the bottom and gravel and sand layers.



Tank design and description

Larval rearing tanks are generally concrete tanks, rectangular or square in shape. They range in size from 6 to 10 m³ capacity. Usually larval rearing tanks are 1 meter in depth, but nursery tanks can range between 0.5–1 meter in depth. All concrete tanks used in hatcheries need to be finished internally with an epoxy paint to prevent the water coming in direct contact with the concrete. In marine finfish hatcheries, the tanks are often painted blue or yellow (for milkfish).





Tank design and description

Live food production tanks

Microalgae production tanks normally make up about 30% of the total production volume of a small-scale hatchery. These tanks are usually located outside the hatchery building and are not roofed. Capacity varies from 10 m^3 to 20 m^3.

Tank design and description

Rotifer tanks are usually located close to the microalgal culture area, although in some hatcheries, rotifers may be cultured within the hatchery building itself. Generally, the rotifer culture area will take up about 10% of the total hatchery area. Rotifer tanks are usually 5–6 m^3.

Indoor rotifer production tanks, about 5 m^3 capacity.

Tank design and description

Small fiberglass tanks (1–2 m^3 capacity) for rotifer enrichment

Fiberglass brine shrimp hatching tank, about 50 liters capacity.

Circular concrete tanks for hatching brine shrimp, about 500 liters capacity.