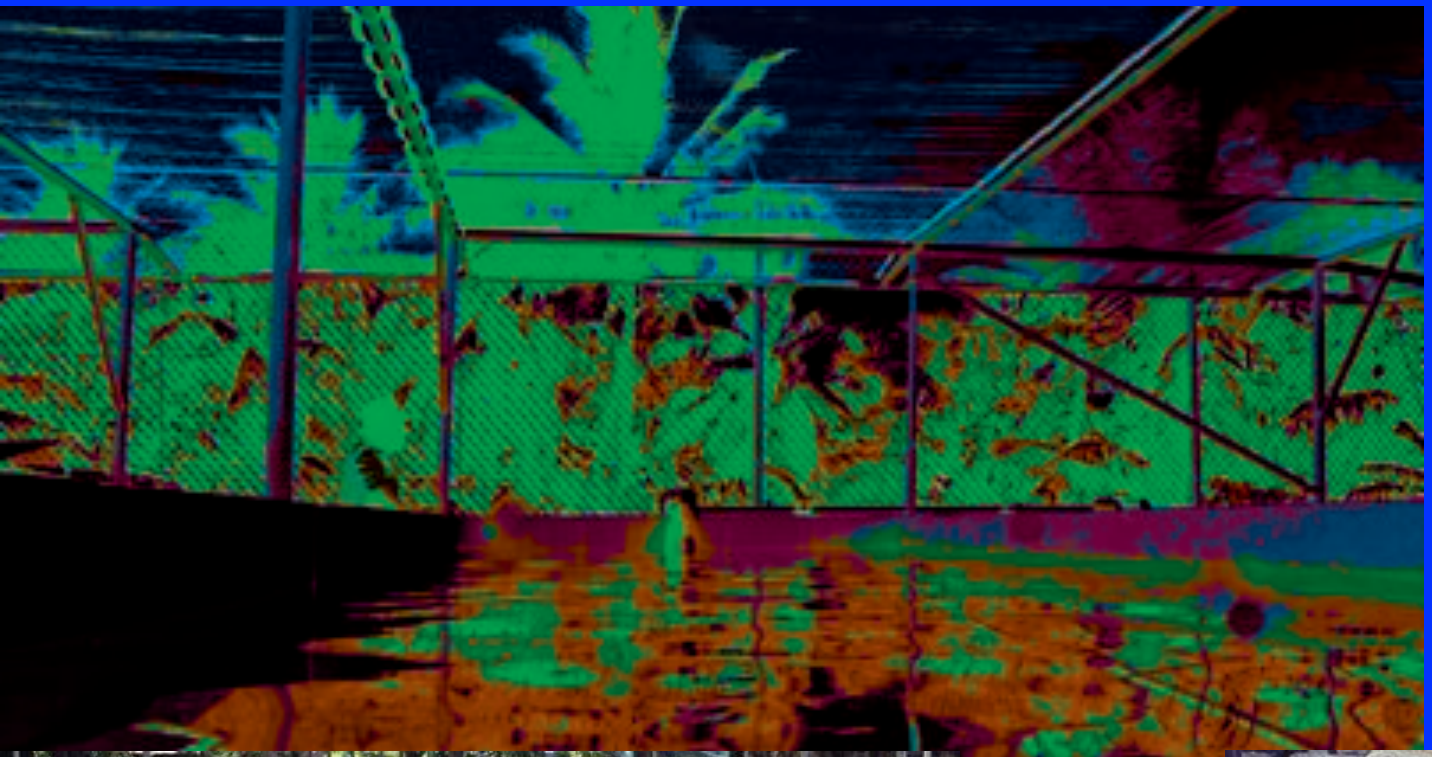

Giant Clam Nursery
and Grow-out

Phases of Giant Clam Farming

- Hatchery – Up to 2 weeks
- Nursery – 2 weeks 4-10 mm
- Grow-out – Land-based
  Ocean-based

Nursery Culture

- Land-based tanks up to 10 mm
- Need limited quantity of filtered seawater
- At about 2 weeks of age, seawater is flowed into the tank
- 50% shade cloth on the tank is recommended

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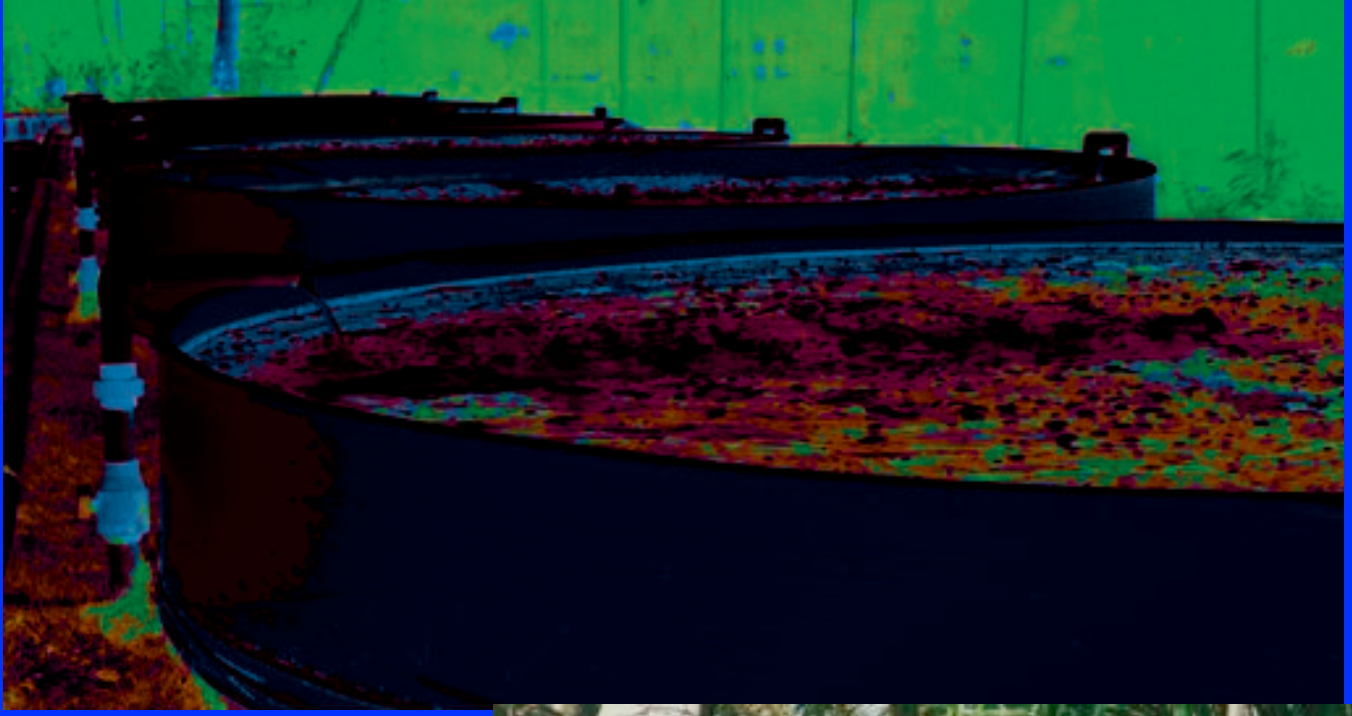


Early Nursery Phase 2-3 months

- Balance water flow to minimize algal growth but maintain clams in a healthy condition
- Clams will become visible in 2-3 months
- Fan up algae and siphon out occasionally
- Add small trochus, money cowries or mangrove snails at one month
- At the end of this phase, siphon clams from tank

Land versus Ocean Grow-out

- Land-based has better survival but slower growth. Growth rate 3x faster in ocean.
- Land-based is more costly and equipment intensive but has better security.
- Land-based requires electricity
- Ocean-based is more suitable for the outer islands.

Land-based Grow-out

- 2-3 water exchanges per day
- Nitrogen spiking to enhance growth
- 25 um filtration to prevent *Cymatium* larvae
- Regular rinsing of detritus from the tanks
- Take care not to cut the byssus too regularly as the clams stop growing until reattachment

Aspects of Ocean Culture

- Site selection
- Protection from predators and pests
- General husbandry

Site Selection

- 10-20 feet in depth
- Area with other corals or clams
- No large changes in salinity or temperature
- Close to farmers house is better
- Sheltered sites with good flow are better

Protection of your farm

- Until clams are 20 cm (5 inches) in length they will need some kind of protection from predators and pests.
- This consists usually of cages of some sort.
- The simplest and most convenient type of cage is the MMDC modular cage.

Floating vs. Benthic Cages

Floating cages promote faster growth and less predation. Also easier to work on.

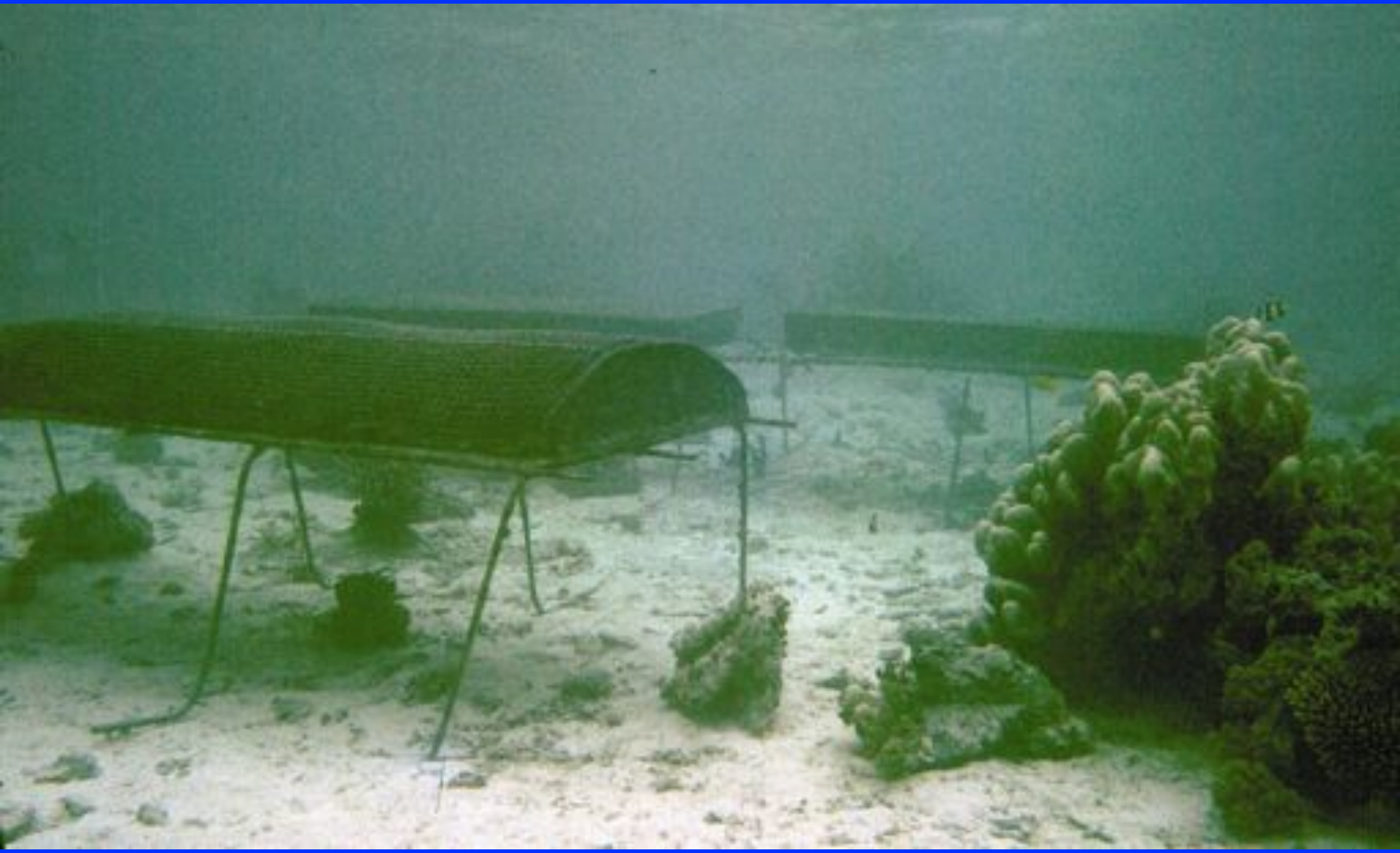
Floating cages are more expensive to make and tend to break up under wave action because they are right on the surface.

Benthic Cages

- Cheap to construct out of materials that are usually available
- Use a modular design. Each cage is 60 cm (2 feet) square and holds 2 standard nursery trays.
- Cage must be able to protect the clams from fish and octopus while allowing enough light to enter.

Use of Trestles or Tables

- Benefits of using tables/trestles
- Less predation
- Increases areas where you can farm and improves use of marginal sites
- Reduces silt and sediment falling on the clams
- Allows for modular farming



Husbandry

- Minimum size for putting clams in the ocean for grow-out is 4 mm. Preferably 10-25 mm for better survival.
- Stocking density: < 1 cm – 250 /tray

1-2 cm – 125/tray

2-3 cm – approx. 60/tray

>3cm half the tray surface should show.

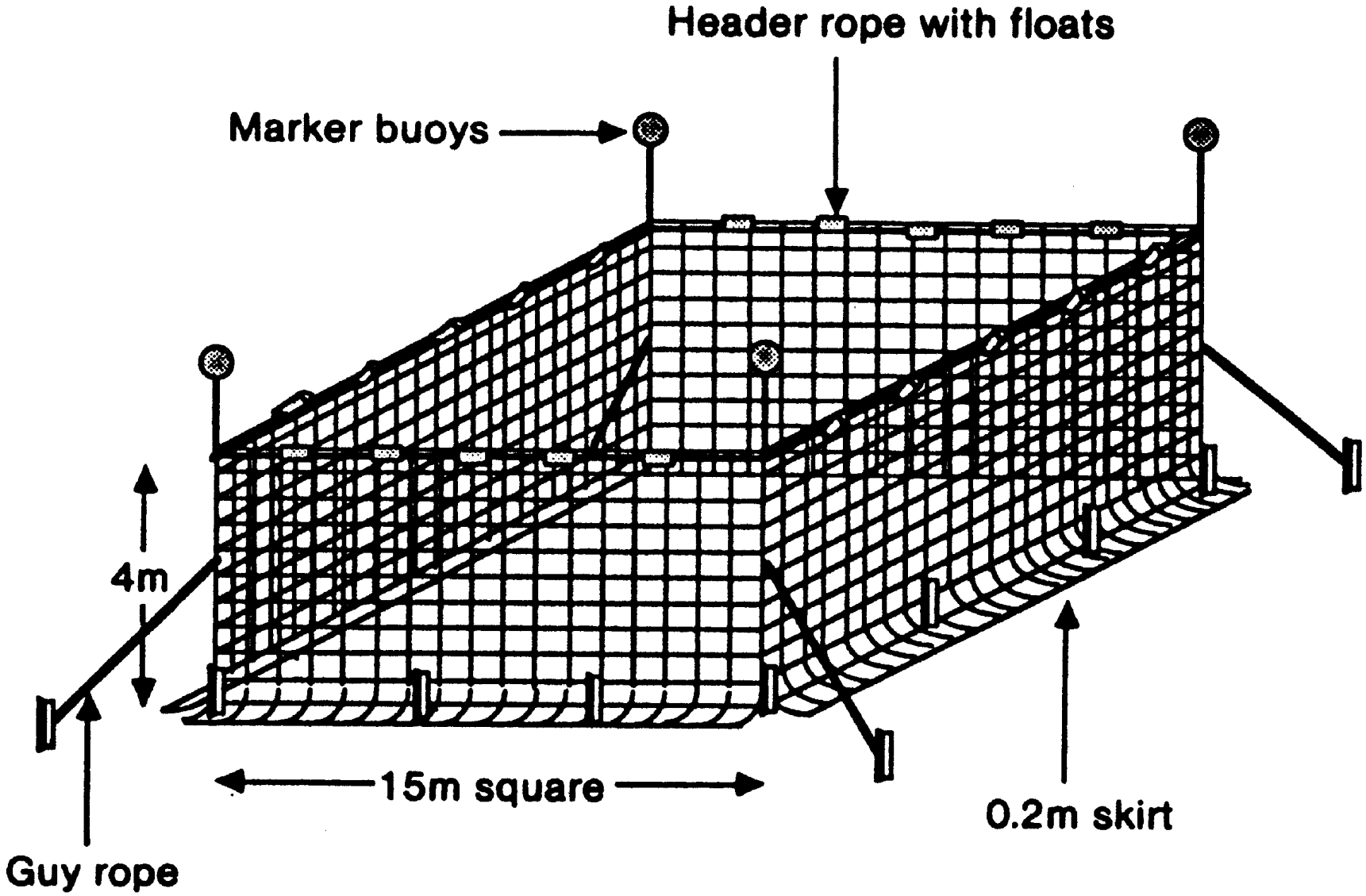
Overstocked trays will not grow as fast and may not survive well. It is also harder to find predators.

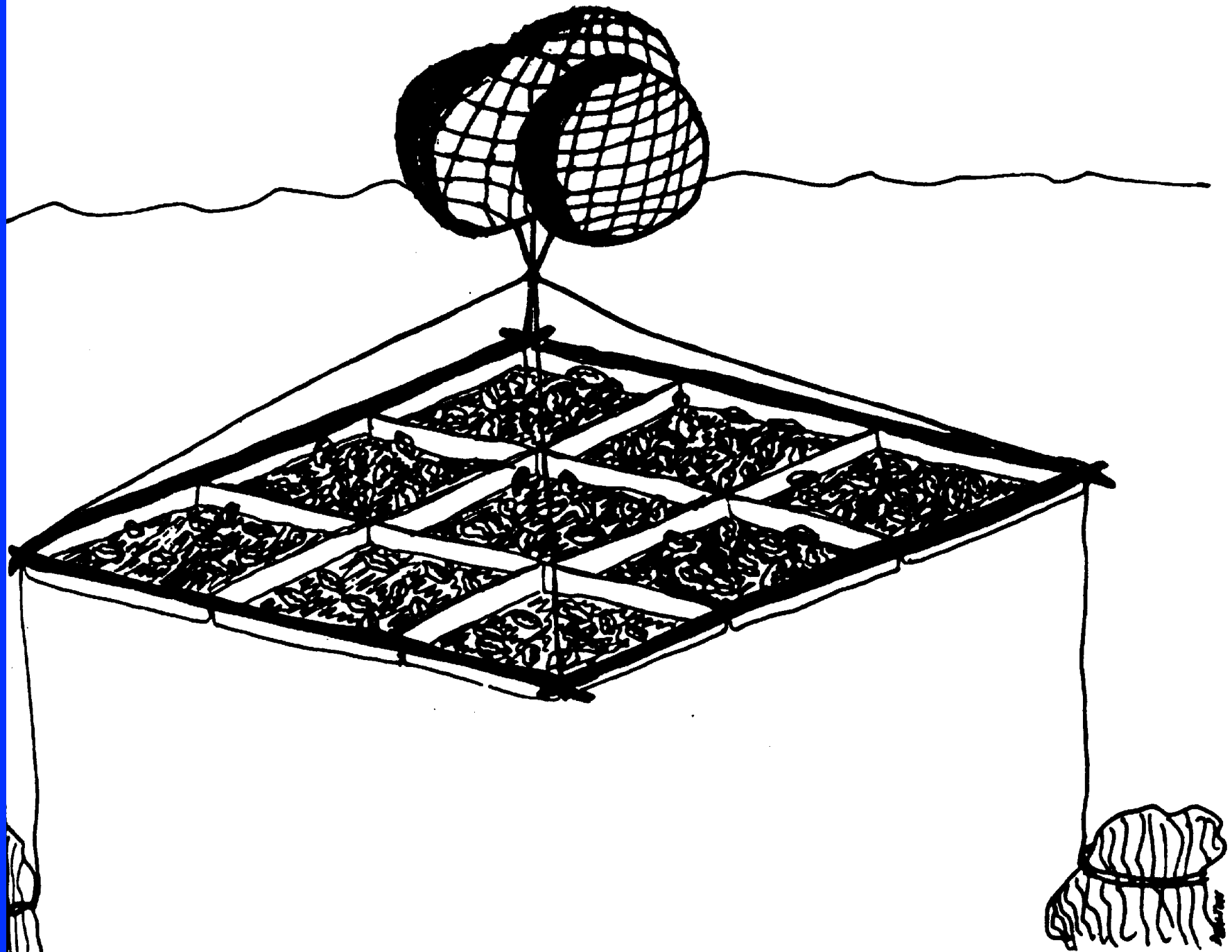
Husbandry

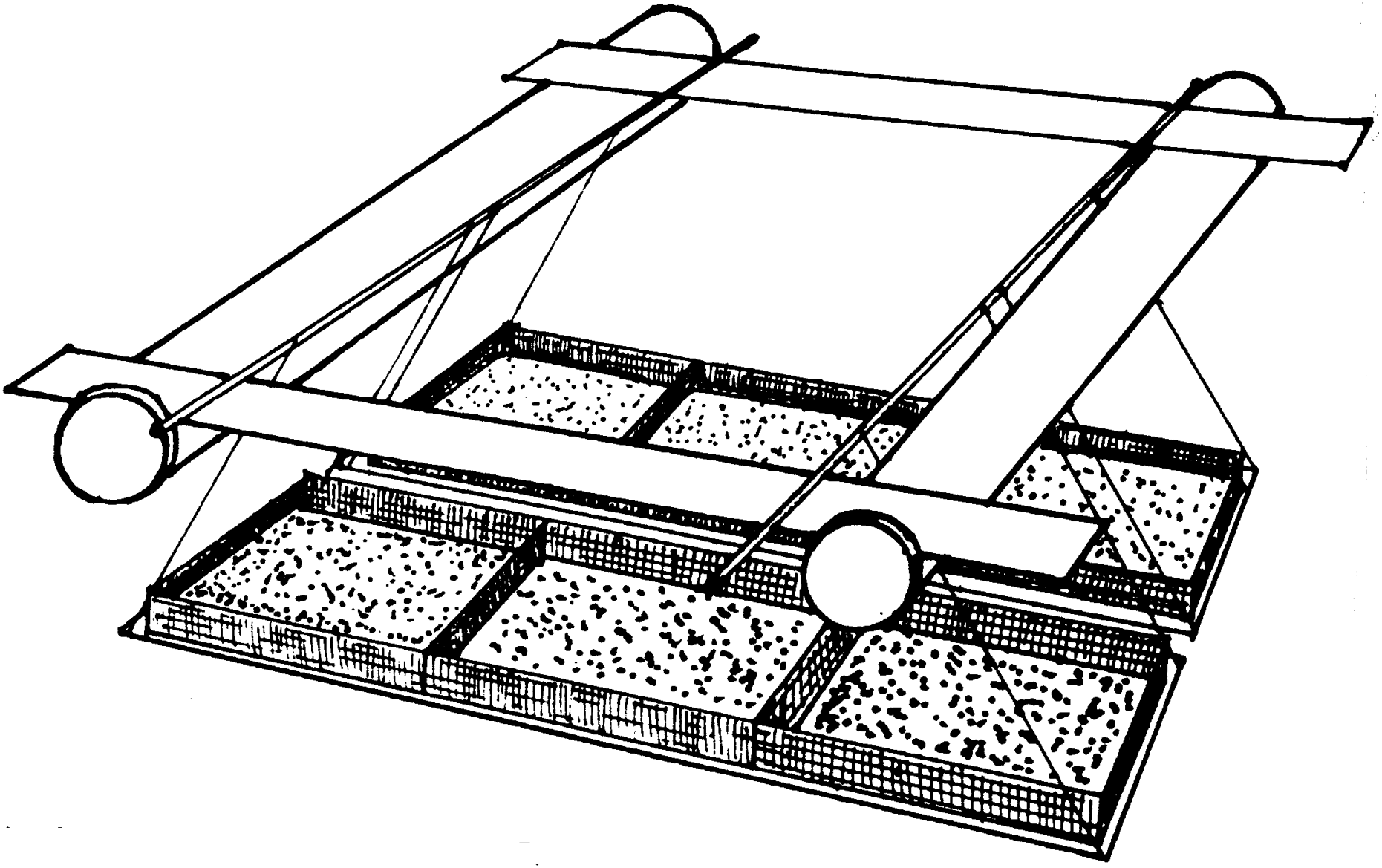
- Stocking: ensure the animals are attached to the substrate prior to stocking in the ocean or use trays to prevent them being washed away.
- Biofouling: Biofouling cuts down light and water flow. Cages need to be scrubbed regularly to remove algae or better still change out the cage lid periodically.

Husbandry

- Clumping: clams, especially those less than 2 cm will move around and will clump together. This slow growth so they must be redistributed every 2-3 months.
- Inspection for tears or holes that may let predators in.
- Collect data to monitor growth and survival


Header rope with floats
Marker buoys
4m
15m square
0.2m skirt
Guy rope





Predators and Pests

- Humans: Can be a real problem in some areas especially if the clams are large. Have the farm close to someones house if possible.
- Ranellid snails (aka *Cymatium*). The VERY WORST predator of all cultured invertebrates in the Pacific.

Cymatium

- Attacks clams in two ways. Large animals crawl into the cage and start to eat the clams.
- Larvae settle from the plankton and enter the clam then grow-up inside it and kill it.
- The only prevention of *Cymatium* predation is to inspect the clams regularly and remove predators until the clam is 15-20 cm. Every week.
- Resistance to *Cymatium* varies with species. *T. maxima* are very susceptible because of their large byssal opening. *T. derasa* and *H. hippopus* more resistant.

Cymatium precautions

- Small cage mesh size can prevent large animals entering the cage.
- Putting clams on trestles reduces predation by 50%
- Trestle leg excluders can be effective.
- Whatever you do you will still have *Cymatium* predation

Other Pests

- Pyramidellid snails: generally not a problem in ocean culture
- Fish, crabs and octopus. Properly secured cages will prevent fish and crabs that might harm the clams entering the cages. Octopus is a real problem though as they can get into the smallest cage. If they are a problem they must be found and removed.
- Rays, puffer fish, trigger fish

Mantle Bleaching

- This may occur when clams are moved from one level of light intensity to another or the temperature is too high. Cause in both cases is expulsion of zooxanthelle from the mantle.
- This may happen directly after stocking clams.

Boring algae and sponge

- This weakens the shell and makes less marketable. It is a real problem in larger animals and can become bad enough to actually go through the entire shell and kill the clam.