



# Aquaculture System Selection

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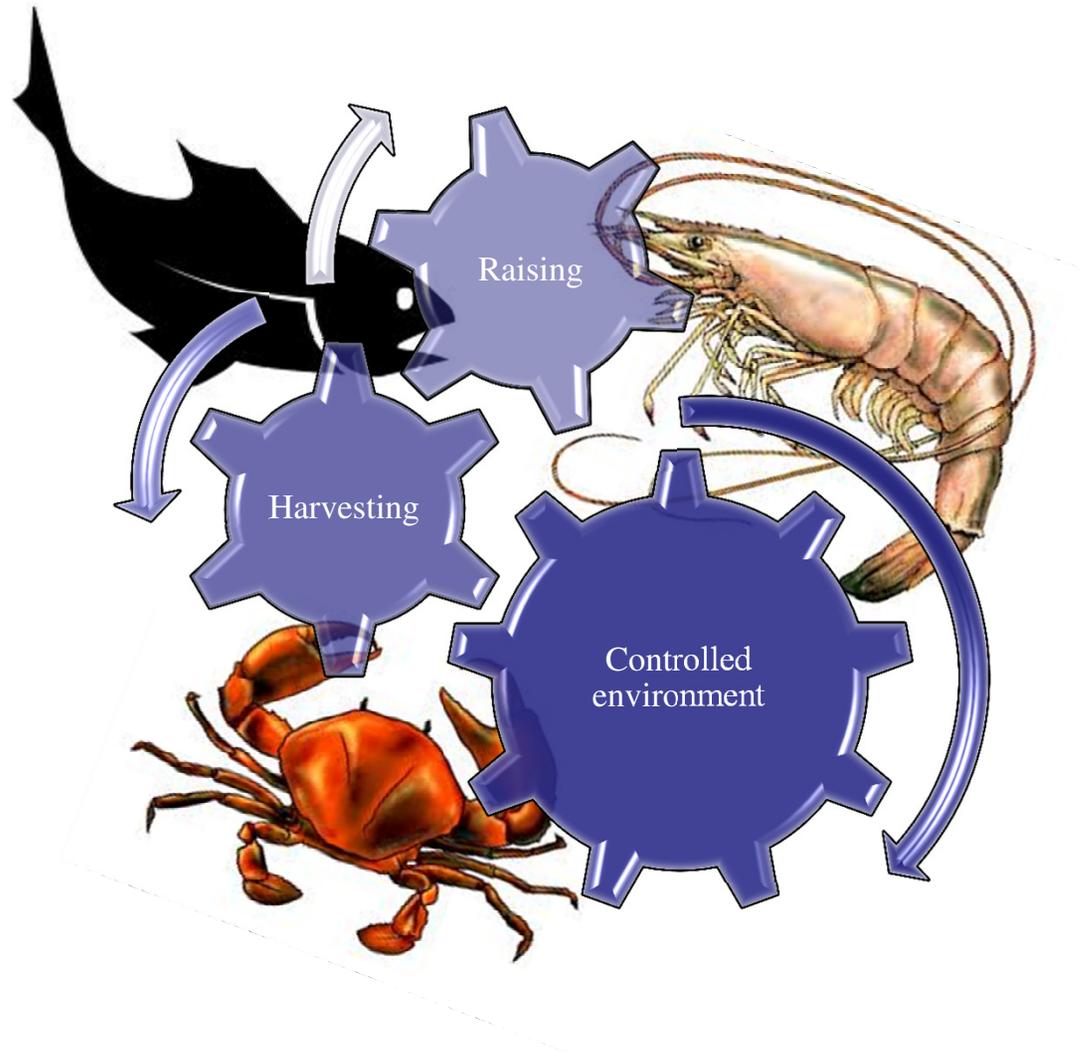
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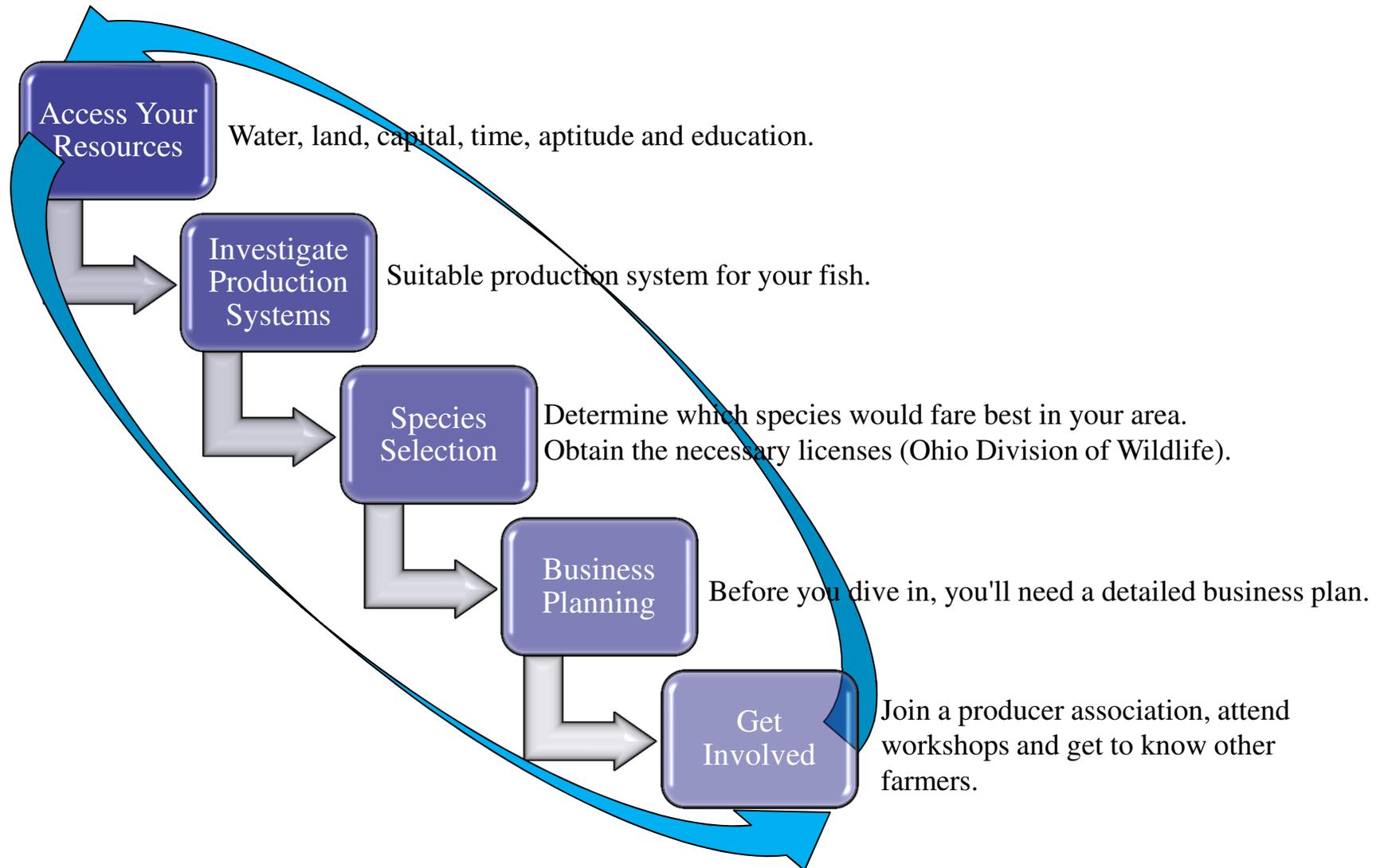
Bringing Knowledge to Life



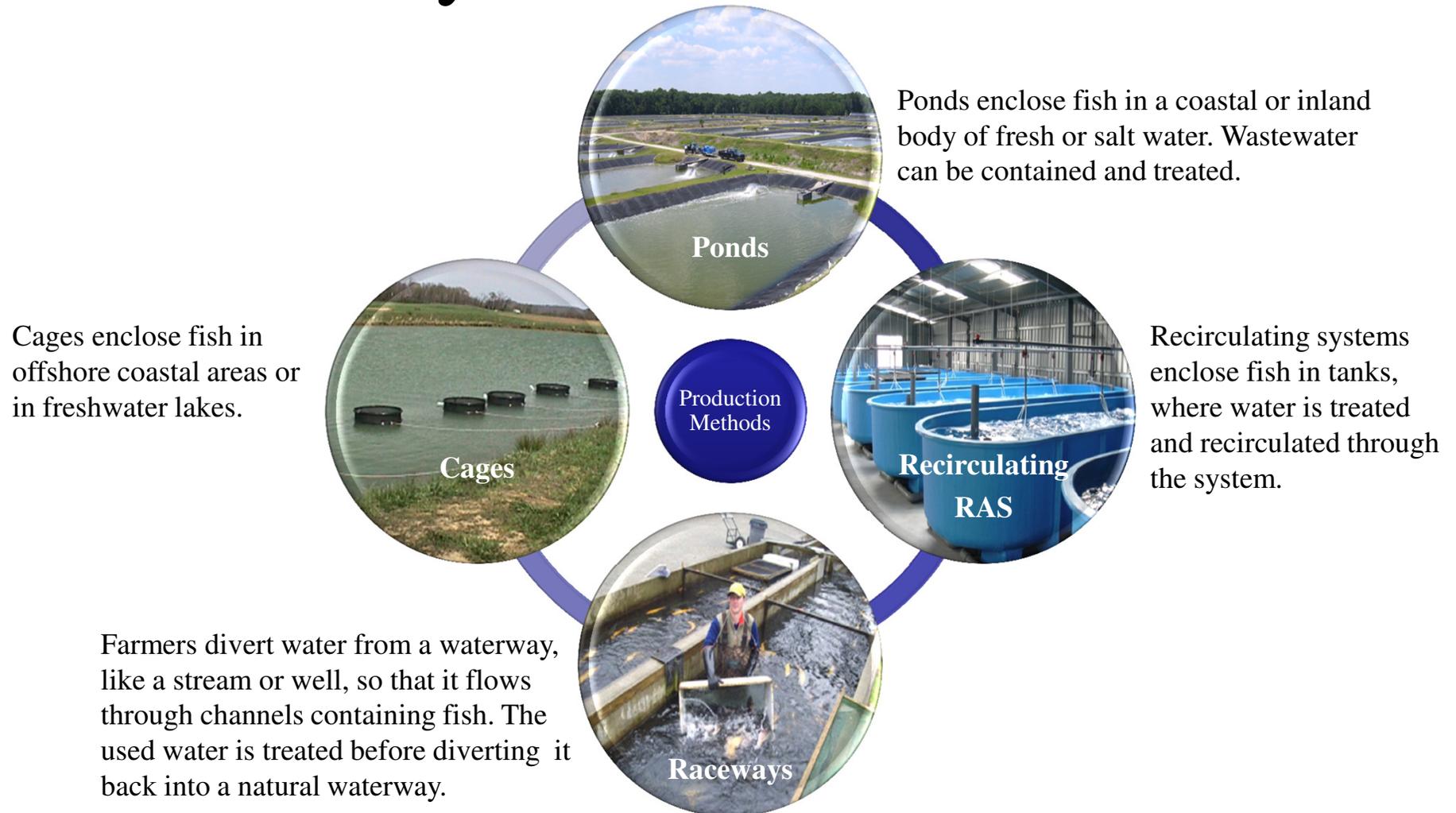
# Aquaculture



# Considerations



# System Selection



# Fish Farming Methods: What do they farm?



# Ponds

Freshwater fish ponds differ according to:

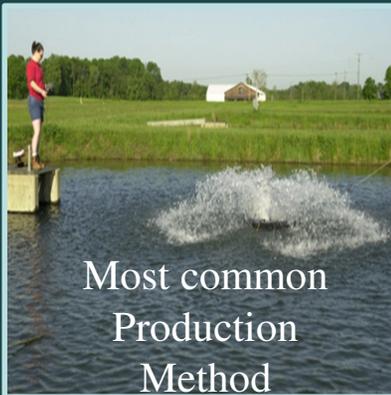
Source of  
Water

Drainage

Fish farming  
method

Material and  
Construction  
method

- ✓ Spawning
- ✓ Fingerling
- ✓ Finishing





# Ponds in numbers...

- ✓ Construction Cost: Approx. \$15,000.00/acre
- ✓ Most popular size: ½ to 1 acre
- ✓ Sizes: .25 – 10 acres
- ✓ Pond production: 3000-5000 pounds fish/acre

# Levee Ponds

Levee ponds are the most common fish production method

## *Common food species*

- ✓ Catfish
- ✓ Trout
- ✓ Largemouth bass
- ✓ Yellow perch
- ✓ Fresh water prawn

## *Source of water:*

- ✓ Spring : check adequate flow, nitrogen gas
- ✓ Well: check dissolved oxygen, pollution

## *Soil:*

- ✓ Slow infiltration rate
- ✓ High runoff rate
- ✓ At least 20% of clay



# Basic Site Requirements for Levee Ponds



- ✓ Adequate supply of clean water
- ✓ Soil that holds water
- ✓ Suitable terrain for pond construction

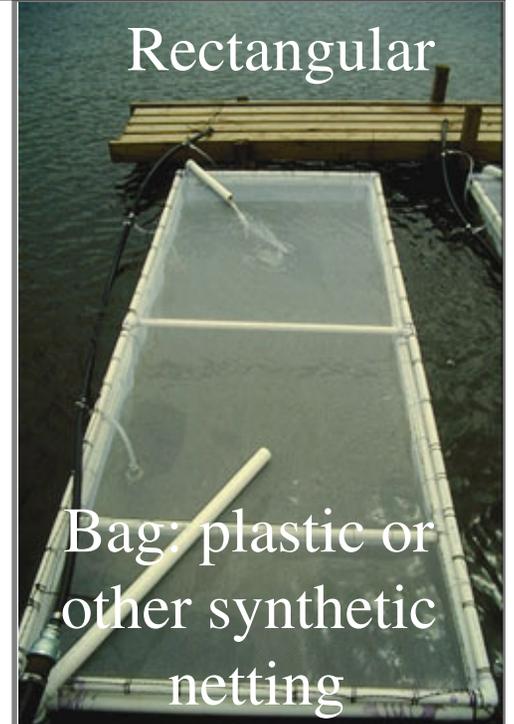
# Cages

## *Considerations:*

- ✓ Insure water quality
- ✓ Natural movement of new water through the cage since fish cannot move
- ✓ Having water deep enough for the waste matter to move well below the cage
  - ✓ Water depth: 6 feet
  - ✓ Cage depth: 4 feet
  - ✓ Placed 10 feet from other cages



Rectangular



Bag: plastic or other synthetic netting



Round

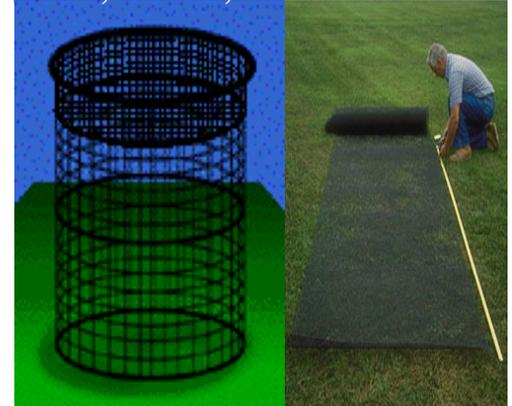
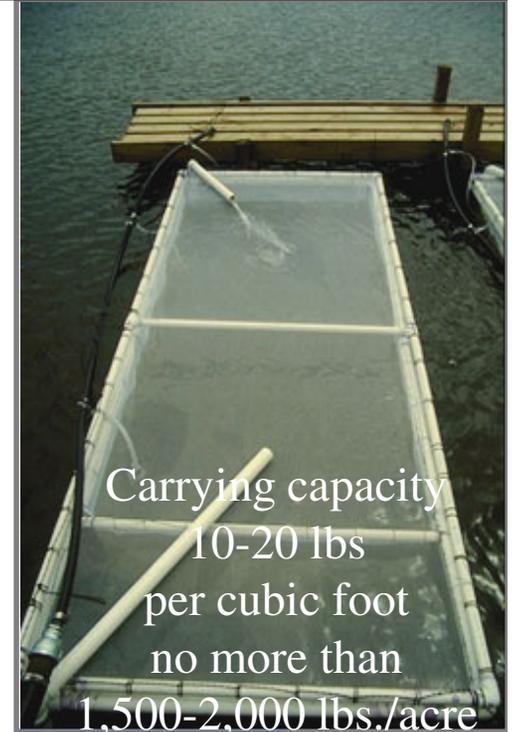
# Cages

## *Advantages*

- ✓ Adaptable on existing water sources
- ✓ Good for pilot projects
- ✓ Inexpensive to build

## *Disadvantages*

- ✓ Hard to get to commercial size
- ✓ Tend to have more disease problems
- ✓ Slower growth than in ponds
- ✓ Biosecurity is an issue



# Raceways

## *Water supply*

Required large quantities of water

Gravity springs are most economical

## *Location*

Near water supply

## *Topography*

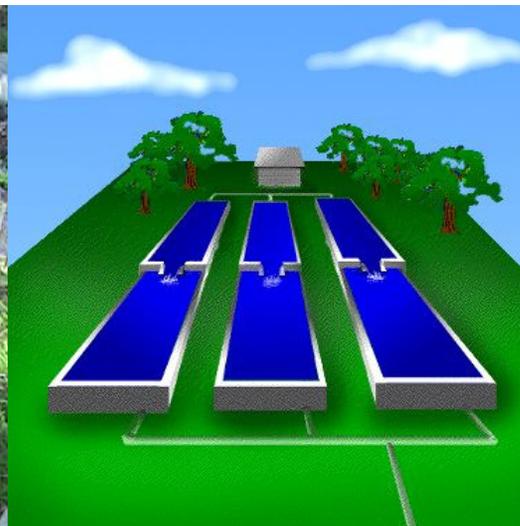
8-10 percent slope

18-24 inch water drop

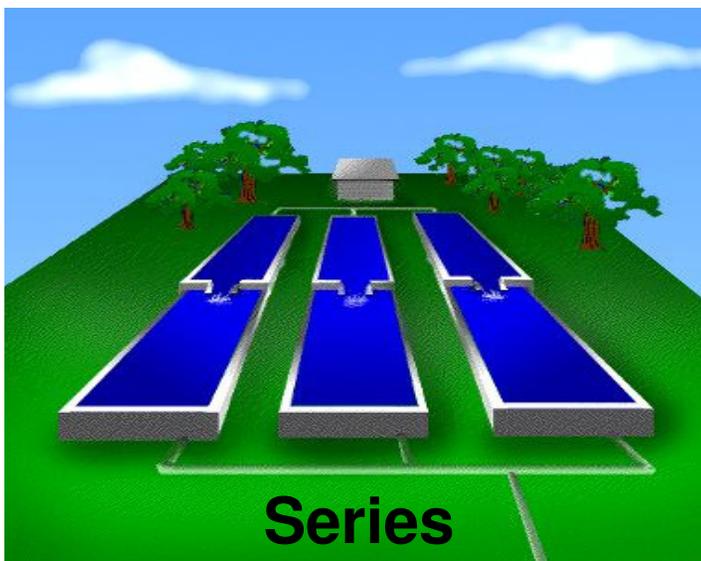
## *Construction*

earthen

concrete



# Types of Raceways



flow through  
multiple races



flow through  
one race

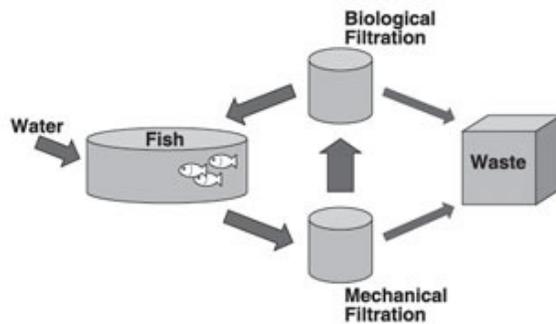
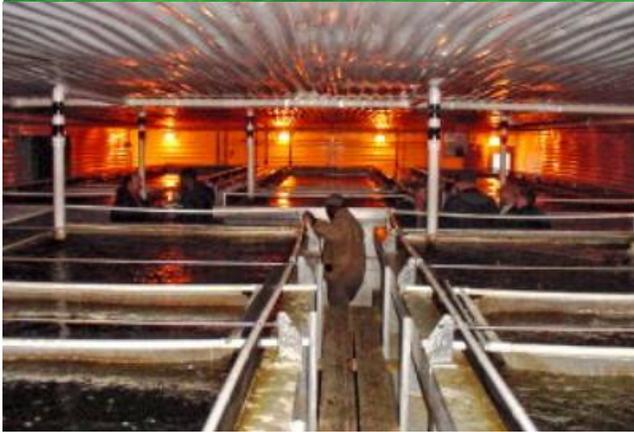
*Production:* Assumption based on 20,000 to 45,000 pounds per year per cubic foot /sec. (449 gals/min) water flow rate.

# Recirculating Aquaculture Systems (RAS)

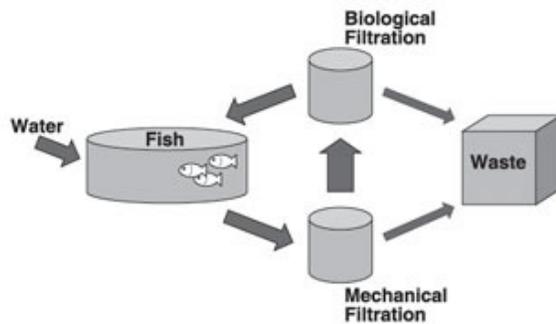
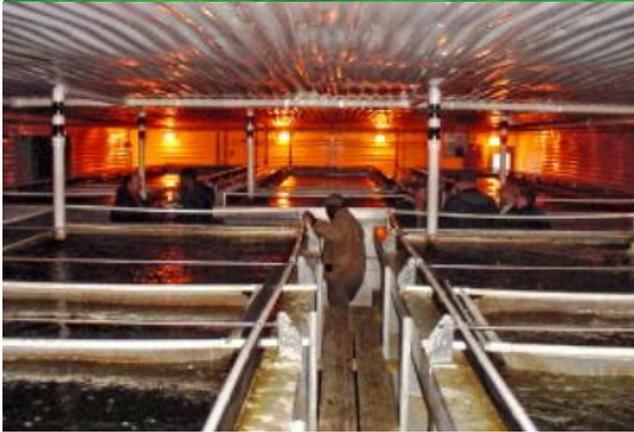
## *Main Features*

- ✓ High-Technology required
- ✓ Expensive Capital Costs
- ✓ Controlled temperature environment
- ✓ Adaptable on refurbished barns
- ✓ Conserves water
- ✓ Year-round production
- ✓ Future of production

*Production* rates range between 0.25 to 1.0 pounds per gallon depending on filter efficiency and water exchange rate.



# Recirculating Aquaculture Systems (RAS)



## *Site components*

- ✓ pump house
- ✓ emergency generator
- ✓ 3 phase electricity
- ✓ bulk feed storage
- ✓ oxygen supply
- ✓ building



# Recirculating Aquaculture Systems (RAS)

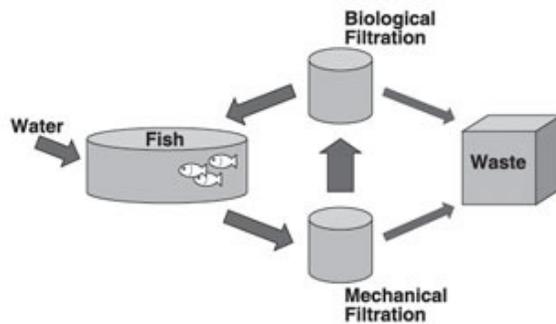
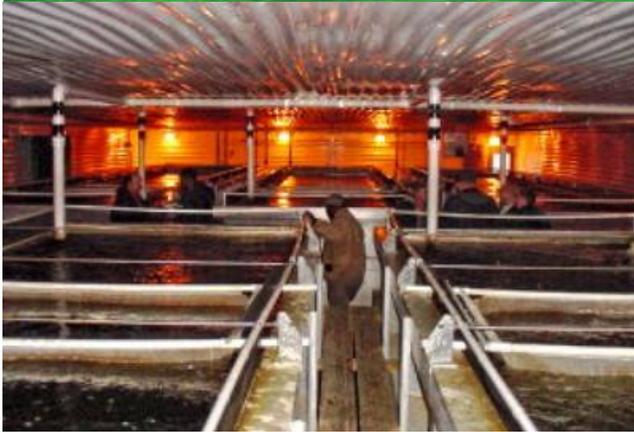
## *System Components*

### *Primary*

- ✓ biofilter
- ✓ solids filter
- ✓ tanks
- ✓ pump
- ✓ buffering system

### *Secondary*

- ✓ oxygen
- ✓ pumps
- ✓ heaters/chillers
- ✓ lighting



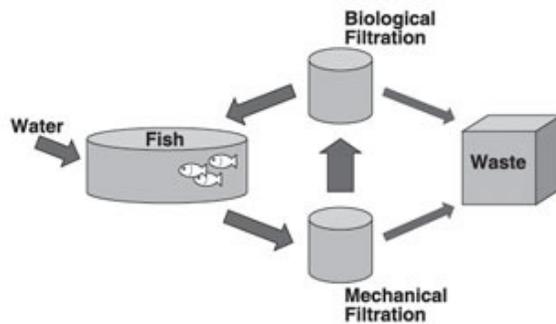
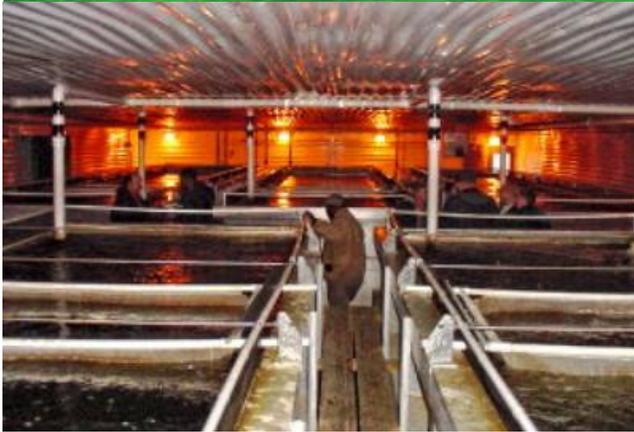
# Recirculating Aquaculture Systems (RAS)

*Why do we need biological filters?*

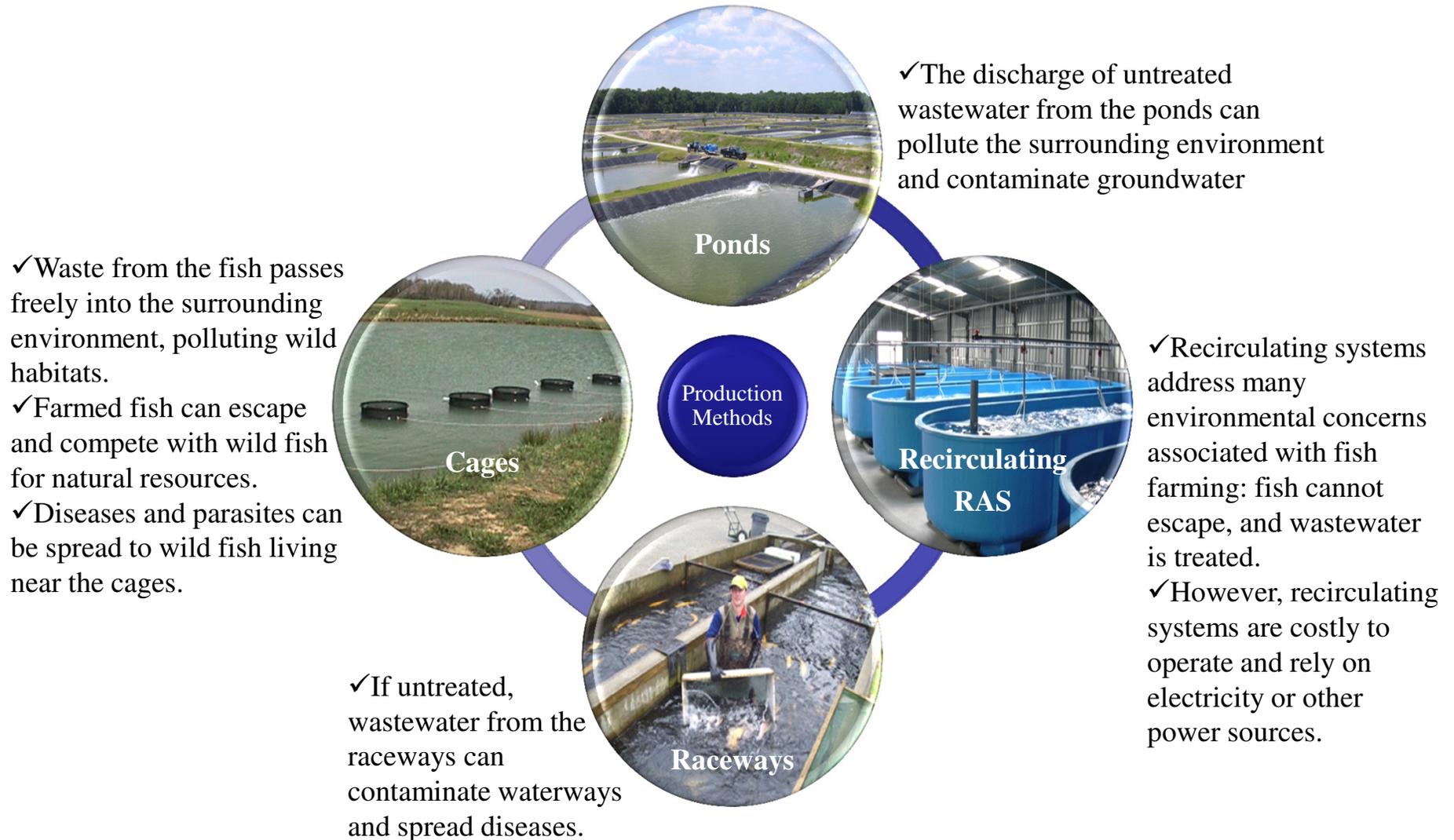
✓ It helps maintain water quality in recirculating or closed loop systems.

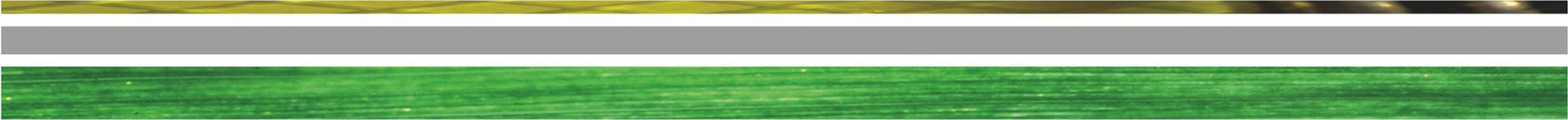
✓ It improves water quality before water is discharged from a facility.

**Biological filtration** is the removal of harmful waste chemicals that is produced by fish waste and uneaten food in the tank. These waste products causes the rise of ammonia in the water. Ammonia is very toxic in high levels and it is a common cause of fish deaths.



# Fish Farming Methods: What are the issues?





# Contact Information

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