Raceway Fish Culture System

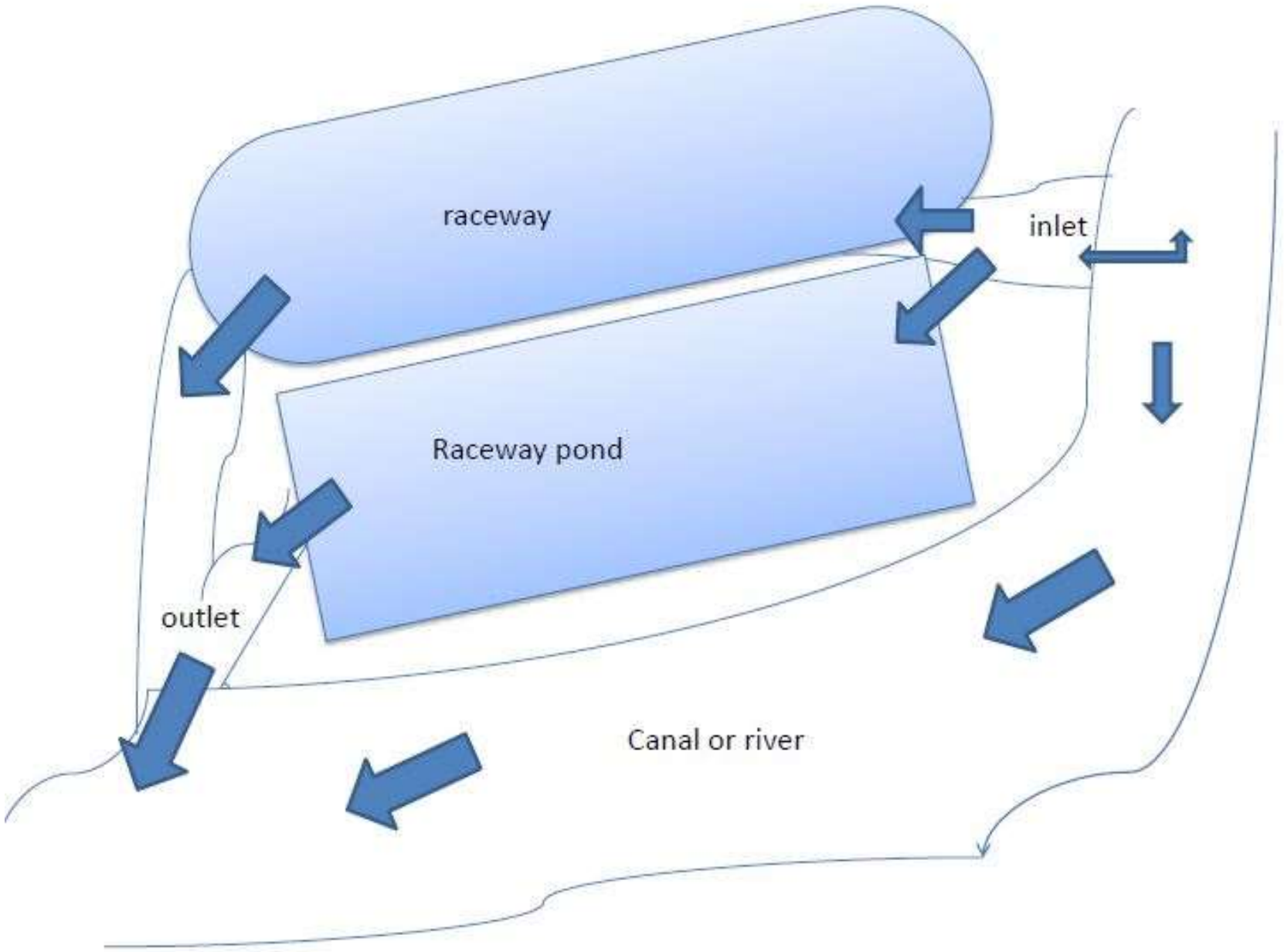
Subject Name: Industrial Fish & Fisheries
1ST YEAR/IInd Sem
Paper: CC-4
RAHUL MONDAL (Asst. Prof.)
Dept. of IFF
ASUTOSH COLLEGE

- **Raceway** are designed to provide a flow-through system to enable rearing of much denser population of fishes.

- Categorized under the **Intensive/ Semi-intensive farming system.**

- An abundant flow of good quality, well oxygenated water is essential to provide and flush out the metabolic waste mainly Ammonia from water.

- Raceway are smaller in size than ponds and occupy much less space.


raceway
inlet
Raceway pond
outlet
Canal or river

Raceways at a West Virginia fish hatchery

(Img. source: www.google.com)

Flow-through raceway system in Armenia

(Img. source: www.google.com)

❑Site selection & design considerations:

✓Water Source:

- ✓Raceway require large amounts of water/unit vol.
- ✓Structure should be like that where Water should be move easily.

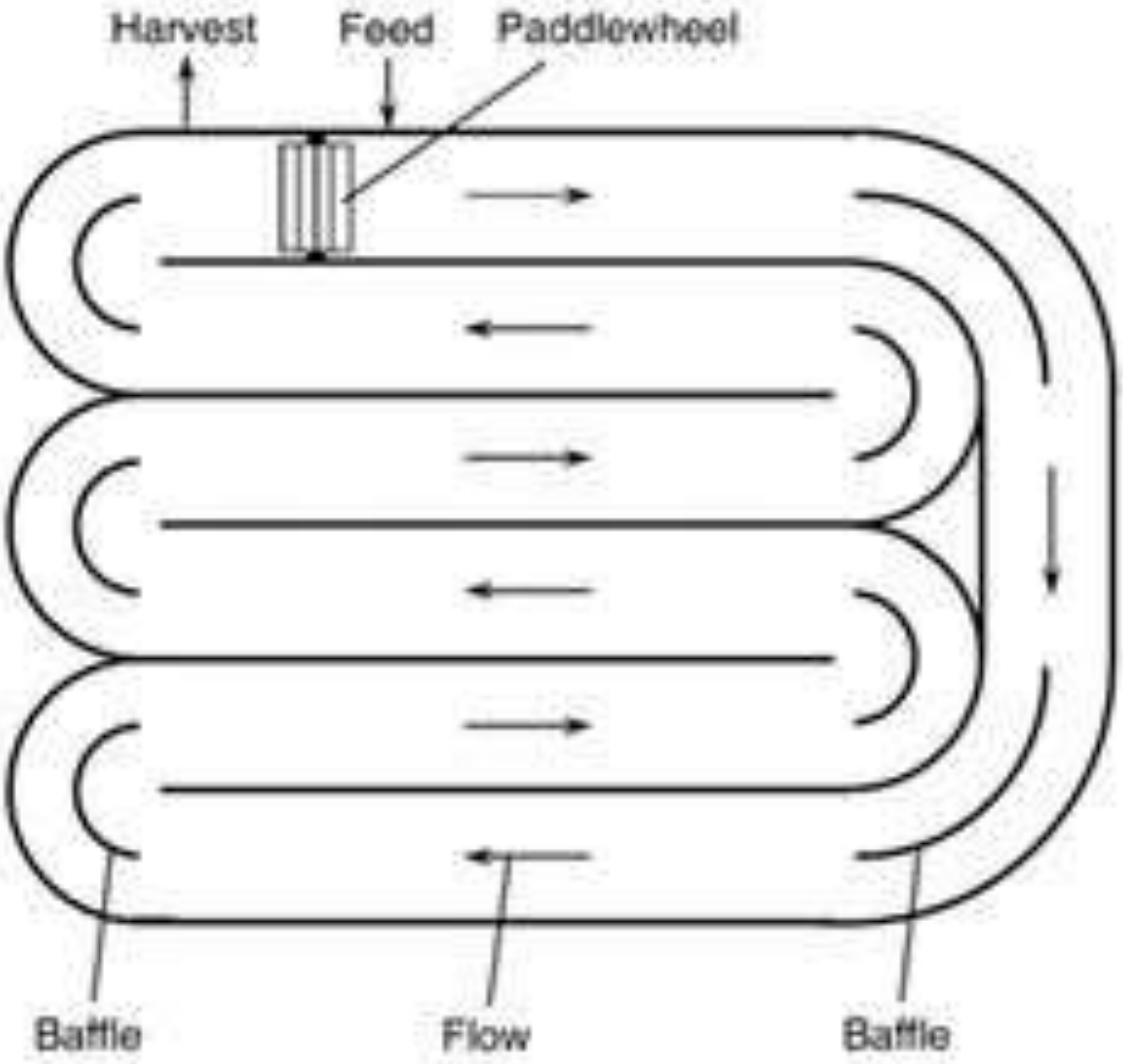
  Naturally the most important consideration is the steady water flow. The main sources of water are springs, streams, deep well or reservoirs.

- ✓In designing a raceway it is preferable to make use of contour of the land. A slope of 1-2% is preferred so that water flowing in at one end can be removed at the other.

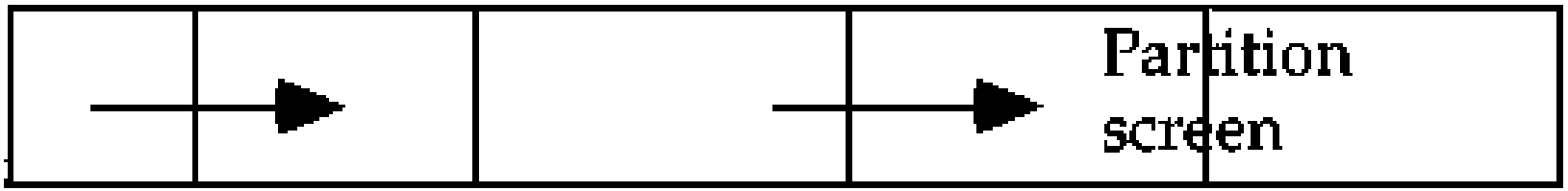
- ✓Raceways should be build Straight way and avoid curve to ensure the uniform flow. As many raceways as necessary can be built alongside each other in several rows.
- ✓Each segments of raceway can be about **30m long, 2.5-3mt wide at bottom & 1-1.2mt deep.** (for a ideal/basic system)

A raceway farm under construction. (Courtesy of J. Kovari.)

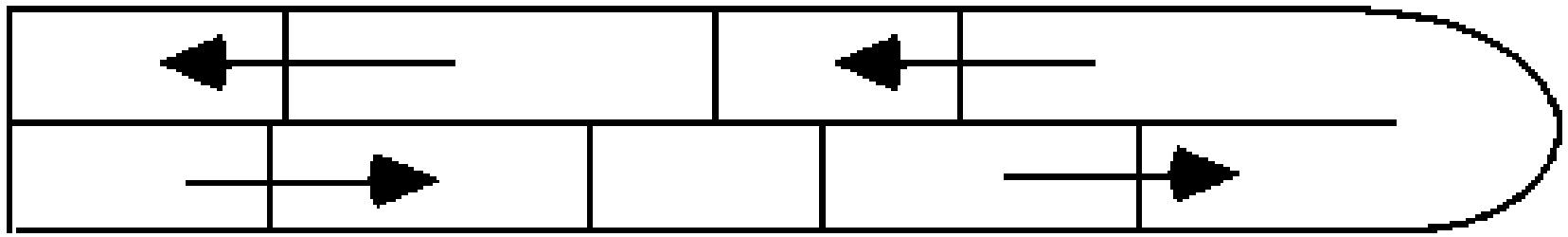
A raceway farm under construction. (Courtesy of J. Kovari.)


Harvest
Feed
Paddlewheel
Baffle
Flow
Baffle

Simple raceway



Double raceway (D-end)



Water flow

Materials: Majority of raceways are made by reinforced concrete, Fiberglass, Polyester resin and cement blocks. Earthen raceways could be lined plastic materials to avoid the loss of soil from bottom.

In Manali, INDIA

(Img. source: www.google.com)

Inlets & outlets

As discussed for ponds, the major function of the inlet for tanks and raceways is to regulate water exchange.

Generally, water flows into tanks is regulated using a valve, whereas flow to raceways may be regulated by either valves or sluices.

The delivery of water into the tank or raceway must be such that it facilitates an even movement of water throughout the structure, maintaining uniform water quality.

In raceways this is often achieved by delivering water at multiple points along the input end of the raceway either through perforated pipes or over spillways.

Maintaining uniform water quality may also be assisted by having multiple inlets along the length of the raceway.

The functions of outlets from raceways include:

- Maintaining Water Level;
- Retaining Cultured Animals;
- Allowing Drainage Of The Structure;
- Removal Of Wastes.

Water Screening: It is very important to have water control structure to regulate the water flow and depth of water. Commonly used materials for those structures are reinforced plastic, concrete, wood, metal etc.

They should permit the water discharge from the bottom of the raceway and include screens to prevent loss of stocks.

- It is essential to adjust the rate at which water is pumped or flows into a raceways to remove the metabolic wastes from bottom and in order to prevent overflow or emptying.

- For cleaning raceway bottoms in emergencies a suitable suction device is used.

Species Cultured:

Freshwater species such as trout, catfish are commonly cultured in raceways. Raceways are also used for some marine species which need a constant water flow, such as juvenile salmon, brackish water sea bass and sea bream

Advantages of raceways

- Higher stocking densities
- Improved water quality
- Reduced manpower
- Ease of harvest
- Precise disease treatments
- Collection of fish wastes