

# AQUACULTURE I

11. WEEK


CULTURE IN RE-CIRCULATORY SYSTEMS (RAS)




## WEEKLY TOPICS

WEEK	TOPICS
1. WEEK	WHAT IS AQUACULTURE?
2. WEEK	IMPORTANCE OF AQUACULTURE
3. WEEK	AQUACULTURE: ANIMAL PROTEIN
4. WEEK	HISTORY OF AQUACULTURE
5. WEEK	ORGANISATION OF AQUACULTURE
6. WEEK	CHARACTERISTICS OF AQUACULTURE
7. WEEK	POND CULTURE
8. WEEK	IN STATIC FRESHWATER PONDS
9. WEEK	IN BRACKISH-WATER PONDS
10. WEEK	RUNNING WATER CULTURE
11. WEEK	CULTURE IN RE-CIRCULATORY SYSTEMS (RAS)
12. WEEK	AQUACULTURE IN RACEWAYS, CAGES, AND ENCLOSURES
13. WEEK	MONOCULTURE AND POLYCULTURE
14. WEEK	RECENT ADVANCES IN AQUACULTURE




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- Culture in recirculating systems
  - Objectives: the reconditioning and recirculation of water in aquaculture in experimental and production work.
  - Advantages: economy in the use of space and water, possibility of greater control of water quality, feasibility of high rate of stocking, high rate of production.
  - Disadvantages: requirements of elaborate filtration and aeration systems, requirements of specialized technical skill, high cost of equipment and water treatment; requirement of costly high quality feed.


<http://www.fao.org/docrep/l9805e/l9805e09.htm#viii.culture.in.recirculating.systems>

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- Uses of recirculating systems: for incubation, seed rearing, fattening, study of fish feeds, conditioning of fish for markets through removal of bad flavours, etc.
  - Different kinds and designs of reconditioning systems.
  - Reconditioning processes: sedimentation, filtration, aeration, pH control, temperature control, sterilization (ultraviolet sterilization or ozone treatment), degassing, ion exchange.



[http://www.fao.org/docrep/l9805e/l9805e09.htm#viii.culture in recirculating systems](http://www.fao.org/docrep/l9805e/l9805e09.htm#viii.culture%20in%20recirculating%20systems)

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- (a) Sedimentation: purpose; facilities – open clarifiers, channels and lagoons.
  - (b) Filtration: function and process of filtration; different types of filters (horizontal, upflow, submerged and trickling); hydraulic loading rate and ammonia loading rate of filters; retention time of settling basin for removing settleable solids; backwashing of filters. Different kinds of filtration systems – mechanical, biological and chemical; media used for mechanical filtration (sand, gravel, broken oyster shells, diatomaceous earth, etc.), biological filtration (sand, gravel, crushed limestone, wood slats, plastic rings, styrofoam beads, etc.) and chemical filtration (charcoal, ion exchange resins, etc.); use of floating nitrifying micro-colonies for biological filtration.
  - (c) Use of centrifugal concentrations for removal of suspended solids.
  - (d) Aeration: purpose (oxygen input, release of gasses such as CO<sub>2</sub>, N<sub>2</sub>, and N<sub>2</sub>, and temperature control); different devices for aeration (aspirators, surface aerators, bubblers, etc.).
  - (e) Buffering systems used for pH control; crushed oyster shell filters, limestone filters and addition of buffering chemicals such as soda, ash or lime.

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- Removal and utilization of sludge.
  - Comparative economics of various types of water reconditioning systems.
  - Culture operation: species of fin fish and shellfish cultured in recirculating systems; stages and sizes of organisms reared or held in recirculating systems; density of stocking in relation to flow of water; feeds and feeding rates; rate of production in relation to water flow.
  - Practicals
  - Design of different types of recirculation systems and evaluation of their relative efficiencies; operation of experimental recirculating systems.

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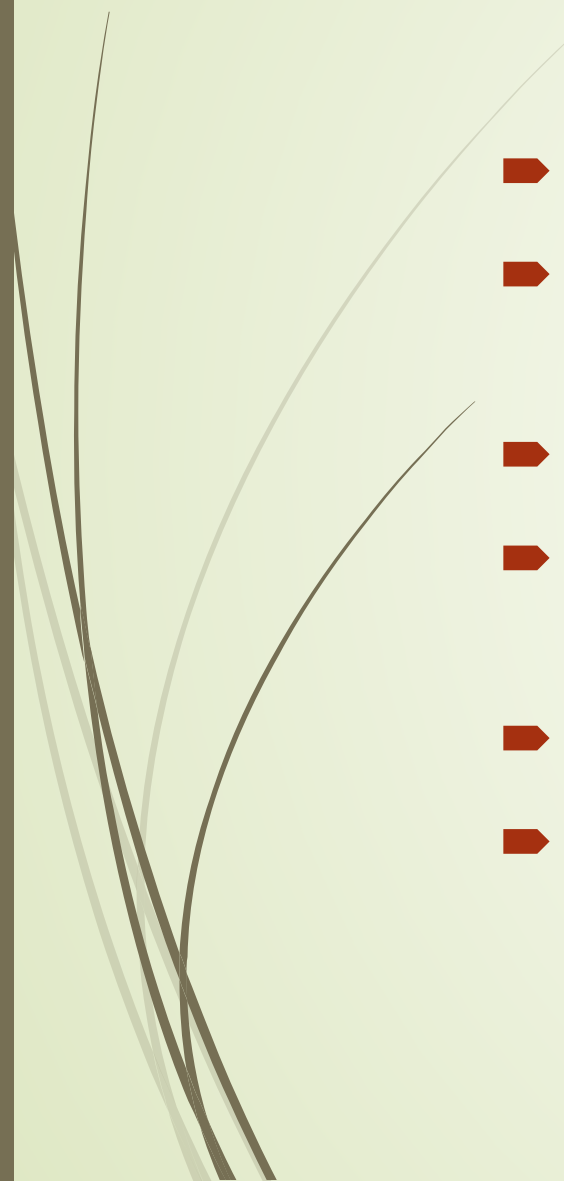




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