

# AQUACULTURE I

**13. WEEK**


**MONOCULTURE AND POLYCULTURE**




## 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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- Monoculture
  - Monoculture, as the name implies, is the culture of a single species of an organism in a culture system of any intensity, be it in any type of water, fresh, brackish or salt.
  - Fresh water
  - Common carp in East Germany
  - Common carp in Japan
  - Tilapia nilotica in several countries of Africa
  - Rainbow trout (*Salmo gairdneri*) culture in several countries.
  - Channel catfish (*Ictalurus punctatus*) in USA
  - Catfish, *Clarias gariepinus* in Africa.



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- Monoculture
  - Brackish water
  - Milkfish, *Chanos chanos* in the Philippines.
  - Mullet culture in several countries.




<http://www.fao.org/docrep/field/003/ac169e/ac169e00.htm#ch5.7>

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- Monoculture
  - Seawater
  - Yellowtail, *Seriola quinqueradiata* in Japan.
  - Kuruma shrimp, *Peneaus japonicus*
  - Nuri: *Porphyra* sp. in Japan
  - Scallop (*Patinopecten yessoensis*) in Japan
  - Red seabream (*Pagrus major*) in Japan
  - Pacific salmon (*Oncorhynchus* spp) in North America
  - Eel (*Anguilla* spp) in Japan.
  - Feeding with species specific feed is the main basis for monoculture in the case of finfish.

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- Polyculture
  - Polyculture, as the name implies, is the culture of several species in the same waterbody. The culture system generally depends on natural food of a waterbody sometime augmented artificially by fertilization and/or by supplementary feeding. If artificial food is given it is a common food acceptable to all or most species that are cultured.
  - Fresh water
  - Polyculture of *Clarias gariepinus* and tilapias in Africa.
  - Polyculture of several species of Chinese carps in China, Taiwan etc.
  - Polyculture of several Indian major carp species in India.
  - Polyculture in Indian major carps, Chinese carps and other fish in India (called composite fish culture in India).



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- Polyculture
  - Brackish water
  - Milkfish and shrimp culture in Philippines and Indonesia.
  - Mullet and shrimp culture in Israel. In systems where production depends on natural fish pond zonation i.e. ecological niches assume great importance.

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- **Monoculture**
  - This is the culture of single species of fish in a pond or tank.
  - The culture of trout, tilapia, catfish, carps are typical examples of monoculture.
  - Monoculture of high value, market oriented fish species in intensive system is common practice.

- **Polyculture**
- Polyculture is the practice of culturing more than one species of aquatic organism in the same pond.
- Success of polyculture depends on **synergism** and available food


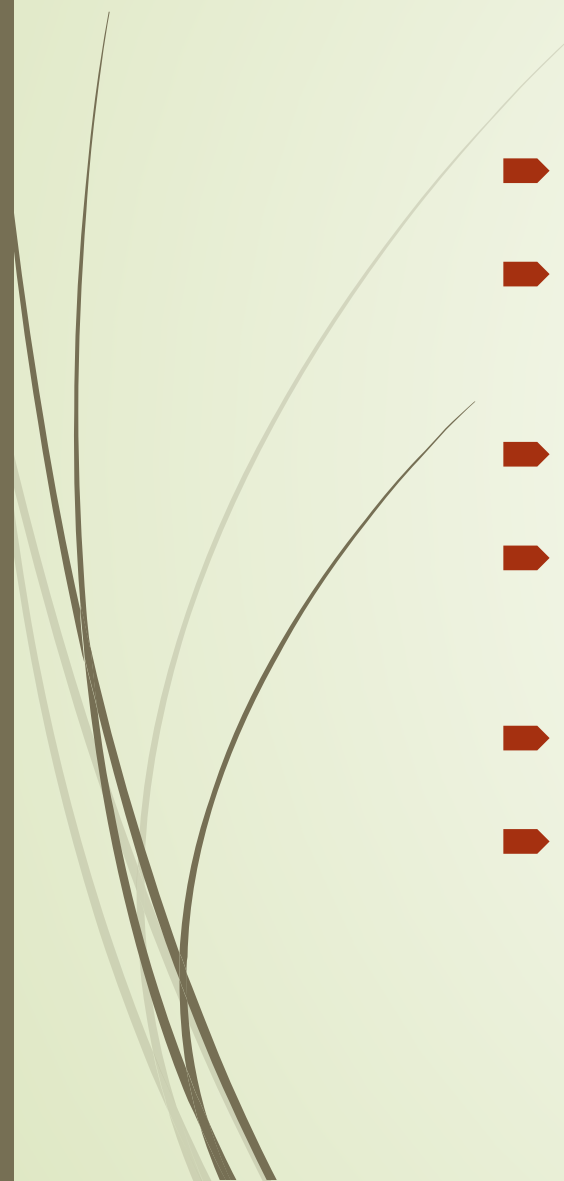
<https://afuians.wordpress.com/2018/02/26/types-of-fish-culture-based-on-species-number-monoculture-and-polyculture/>



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- Monoculture:
  - Advantages
  - Easy to feeding
  - Permits great control over size, age and sex
  - Easy to operate
  - Selective harvest of marketable fish can be employed
  - Suitable for farmers having limited land resources
  - Disadvantages:
  - Natural productivity of pond is not fully utilized
  - Available space in water column is not utilized
  - More chances of epizootic disease and parasites
  - More risk of water quality problem like dissolved oxygen depletion

<https://afuians.wordpress.com/2018/02/26/types-of-fish-culture-based-on-species-number-monoculture-and-polyculture/>

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- Polyculture
  - Advantages:
    - Full utilization of feeding niche
    - Full utilization of space available in the water column
    - Full utilization of compatibility of species
    - Full utilization of artificial feeds
    - Less chances to fail of the enterprises
    - A variety of products available in the market
    - Make more economic return than monoculture under same condition
    - Plays an ecological role in maintaining water quality
    - Less chances of epizootic diseases and parasites
  - Disadvantages:
    - Difficult to harvest
    - Difficult to maintain the food for all the species
    - Need of high technical know-how

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