

LECTURE NOTE

ON

**FISH FARMING TECHNIQUES
AND HATCHERY
MANAGEMENT (3 UNITS)**

FIS 313

PREPARED BY

**DR. IDOWU ADEKUNLE ADEDOYIN
DEPARTMENT OF AQUACULTURE
AND FISHERIES MANAGEMENT**

**UNIVERSITY OF AGRICULTURE,
ABEOKUTA**

FIS 313: Fish Farming techniques and hatchery management (3units)

Contents

Different types of fish culture techniques, monoculture, polyculture, selected breeding, intensive and extensive culture, inland and brackish water in rice field, in floating cages and rafts.

Different types of fish culture techniques

Fish culture techniques can be described from different perspectives. They can be described on the bases of biological, economical and social factors. The type of rearing facilities, technology of production, number of species cultured, type of fish, cultivation stage, geographical origin of cultured species and target market.

A Fish culture technique based on rearing facilities

1. Fish culture in earthen ponds.
2. Fish culture in concrete tanks.
3. Fish culture in reinforced plastic tanks
4. Fish culture in plastic tanks
5. Fish culture in wooden troughs or vats
6. Fish culture in rearing cages

B. Fish culture techniques based on technology of production

1. Extensive culture system – characterised by low stocking density, no input and output of less than 1000 kg/ha/year.
2. Semi-intensive culture system – characterised by moderately high density, addition of input (fertiliser and feed) Yield around 10,000 kg/ha/year
3. Intensive culture system – characterised by high stocking density, addition of high input (fertiliser and nutritionally balanced diet), cost of production is generally high with yield above 10,000 kg/ha/year

C. Fish culture technique based on number of species cultured

1. **Monoculture** – This is the culture of single species of fish in a pond or tank. The culture of *Clarias* only or *Oreochromis niloticus* or *Heterotis* or *Gymnarchus* are typical examples of monoculture. The advantage of this method of culture is that it enables the farmer to make feed that will meet the

requirement of his fish especially in intensive culture system. Fish of different ages can be stocked thereby enhancing selective harvesting.

Polyculture

This is the culture of two or more species of fish in a pond or tank. It is also a system that grows more than one species of fish from the same trophic level.

Integrated Multi-trophic Aquaculture (IMTA)

Integrated multi-trophic aquaculture systems mimic natural ecosystems. Here organisms (fish) are present from more than one trophic level and waste products are recycled. An example is cultivating sea weed near mariculture fish pens. Nutrients in the fish waste fertilize algae, which in turn improve water quality for fish.

Mariculture

In mariculture, fish are grown in pens or mesh cages in harbours or sea.

Aquaponics

It is a combination of aquaculture and hydroponics, two systems that are not new, but share a common problem and concern, TOXIC WATER BUILDUP!! In aquaculture, it is the fish emulsion, with hydroponics, it is the fertilizer water. This toxic water is not good for the fish or the plants. This water must be cleaned from time to time and it cannot be dumped any place in our environment without causing damage.

Aquaculture and hydroponics are systems that compliment each other as a single unit, not as separate units. The fish water is pumped to a greenhouse, which is evenly distributed. The fish water feeds the plants, such as lettuce and tomato's, then filters through a porous material (volcanic cinders in Hawaii) and returns to the fish tank by gravity. Both systems are in a controlled environment, meaning light and temperature are controlled. The primary crop is the vegetable and the fish are secondary, meaning commercially, there is more money and turn around with the vegetables.

The aquaculture is suitable for ornamental fish, prawns, tilapia, catfish bass and escargot snails. We also grow the Hawaiian taro plant in cement pots that are placed

in with the fish. Watercress can also be used. What is amazing is the stable and balanced pH and crystal clear water.

The water is basically recycled, with a small amount of water added weekly for evaporation. This is a balanced, self-contained eco system that works!! Solar powers the water pump and no chemical are added what so ever, it is totally organic. Chameleons control any insects that might get into the house. Earthworms are raised to feed the fish and the earthworm compost is used in the garden or planter box gardens. (<http://www.bromes.com/aquaponics.htm>).

Fish rearing in cages

A fish cage is an enclosure made with net where fish are raised in free flowing water especially in lagoon waters, rivers, lakes and large reservoirs. Cages are made of four parts: 1. Solid frame 2. Nets 3. Floats 4. Anchor.

A cage can be floating type or fixed type.

Floating type if the cage is submerged

Fixed type if it is attached to a stake fixed to the bottom. Cages have high potential to improve the status of the local fish supply. Major disadvantages are:

1. Water pollution
2. Poaching
3. Conflicts in the use of water with other users.

Management include routine check, provision of adequate security and good supply of quality feed to ensure faster growth.

Fish culture in pens

Pens are constructed from bamboo or wooden poles that are forced down into the lake or shore bottom. Nets are strung from pole to pole to form an enclosure. The nets are anchored into the lake bottom with weights or sinkers. They are stocked with fish. Pens with size of ponds are often placed in the fertile lakes to yield high biomass. No feeding, no extra feed input but if lakes are not fertile feeding may be required.

Disadvantages

1. Expensive to build
2. Last for 3 – 5 years
3. Poaching
- 4, Pollution