Pond Environment

Water Quality Parameters, soil quality & biosecurity.

Water quality management in aquaculture is vital, as fish are highly sensitive to changes.

Equally important is soil quality, for productivity as it controls pond bottom stability and nutrients required for the growth of plankton.

Bio security is important to reduce the potential for the introduction, and spread of disease-causing organisms onto and between sites.

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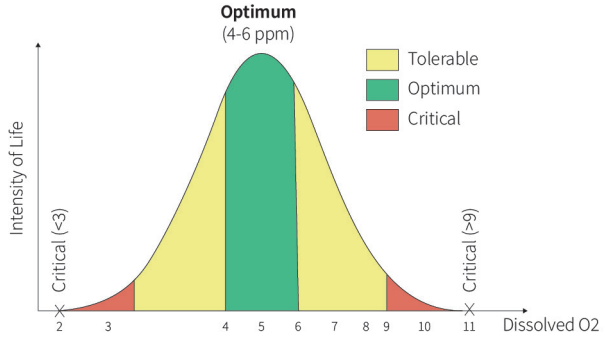
Physical Parameters

Important physical water quality parameters and their optimum ranges:

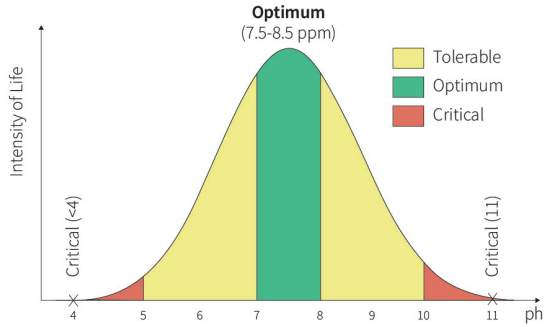
Parameter	Optimum level
Water Depth	1.5 - 2.0 m
Temperature	26 - 32 °C
Colour	Light yellowish-green
Transparency	30 cm from surface
Odour	No fouling smell from pond

Chemical Parameters

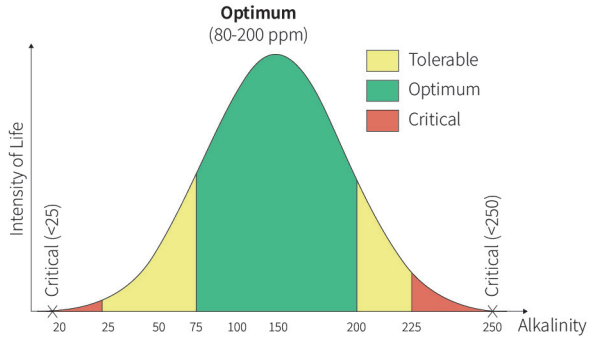
• The most important chemical parameters determining the water quality are Dissolved Oxygen(DO), pH, Alkalinity and Ammonia.



Optimum & Critical levels of dissolved oxygen (ppm) in fish pond



Optimum & Critical levels of pH in fish pond



Optimum & Critical levels of alkalinity in fish pond

Fish need optimum conditions for optimum growth and any deviations from not having optimum conditions may lead to stress which leads to diseases, less growth, and at risk of having diseases leads to death resulting in financial loss. Better conditions will result in good growth and financial gain.

Water Quality Parameters

Biological Parameters

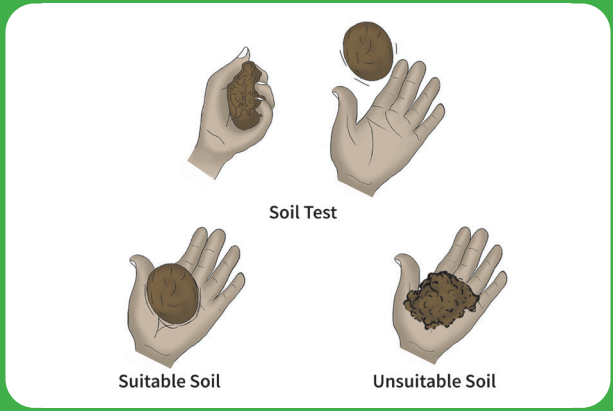
- Maintaining good plankton density of plankton is essential for good growth of Fish. The optimum plankton density for good growth should be 4-5 ml of plankton/100ltr of water filtered with 5-6 zooplankton/ml.
- **Traditionally, 30 cm transparency is considered as indicator of required plankton in the pond.**
- If the plankton density is not in the range additional manuring is required.

Manuring

- During pond preparation only 25-30% of the recommended dose is used.
- **The balance is to be used in equal monthly installments for the rest of the culture period to maintain continuous plankton production as a post stocking management practice.**
- High transparency (> 30 cm) indicates low productivity (low alkalinity <20 ppm)) and requires one additional dose of manuring.

Soil Quality

- The soil quality influences the pond productivity and water quality and determines the dyke construction.
- **For better water retention, the soil should be clay or loam-based soil containing more than 90% clay and pH between 6.5-7.5 is preferable. A good quality gravel should not exceed 10 %.**
- The water retention can be assessed in the field by taking a handful of soil,



moist it and squeeze in to a ball and throw in the air and catch it. If it holds together it is a suitable soil that has water holding capacity. The more accurate method is to get the soil texture analysis done in a laboratory.

Biosecurity

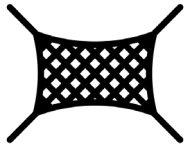
- **Bio security is a set of management practices, which reduces the potential for the introduction, and spread of disease-causing organisms onto and between sites.**
- **Many times farmers feel that the biosecurity measures are unnecessary financial burden without realizing its potential and positive impacts. Most small and marginal farmers do not follow any biosecurity measures in their farm.**

Benefits of Biosecurity

- Proper biosecurity measures can significantly influence the financial gain from the aquaculture industry besides limiting the threats of disease outbreak and zoonosis.
- Lack of scientific knowledge and support is the major constrain, while unavailability of standard protocol, legal framework and their implementation are the key challenges to be addressed.

General Biosecurity Measures to be Taken

- Fencing of pond to a height of 1 m using pegs and nylon netting around the pond.
- **Avoid birds entering the farm and spread of disease through droppings.**
- Personal hygiene and keep things clean
- **Keep harvesting nets and other equipment off the soil and floor to control contamination and keep them sterile.**
- Remove dead animals as soon as possible and dispose off appropriately.
- **Bio-fencng is also a method of biosecurity measure.**



Cover pond with a net to avoid bird predation & bird faecal droppings

Provide a net fence around the pond to prevent entry of predators

Provide a foot-bath facility at entrance of the farm