



Environmental Effects

It is important for fish-farmers to understand various **environmental factors & their effects** to maintain a **good pond** & have a good harvest





Baideo, can you tell me what are these environmental factors & their effects?

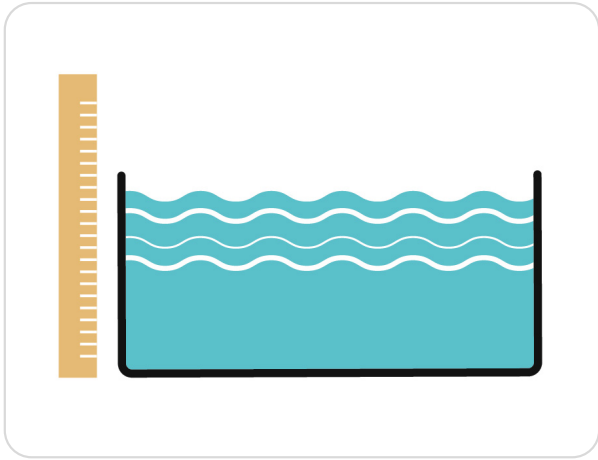


The health of an aquaculture pond depends on several parameters like:

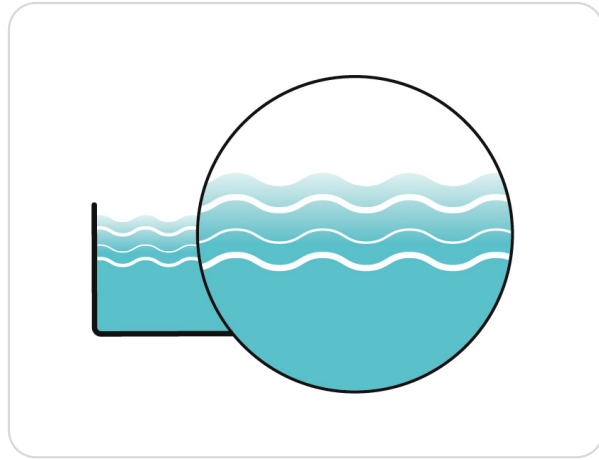
- Water quality
- Physical parameters like water depth, temperature, colour, transparency, odour, etc.
- Chemical parameters like pH, dissolved oxygen, alkalinity, ammonia, etc.
- Pond hygiene
- Use of commercial inputs
- Aging of ponds
- Avoid use of imprudence uses of chemical and fertilisers



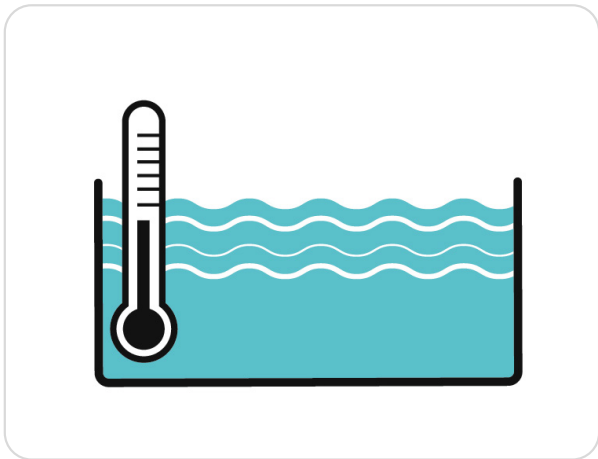
For a healthy pond, we need to maintain these parameters in specified ranges



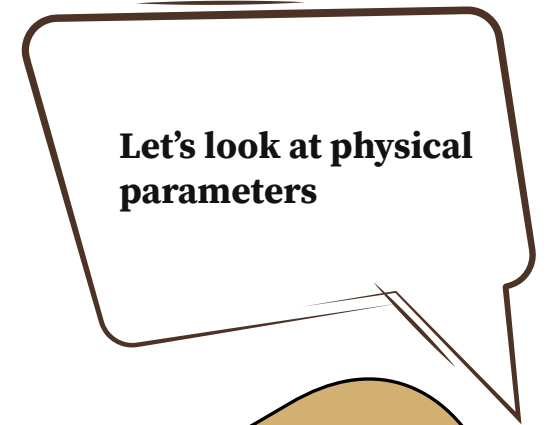
Water depth: Maintain 1.5 - 2 m water depth to ensure plankton growth & suitable temperature

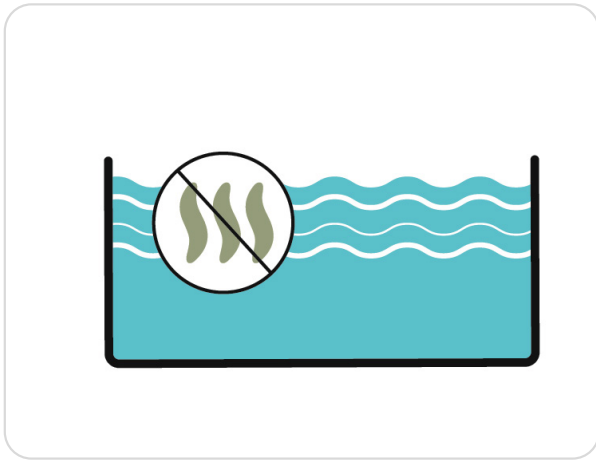
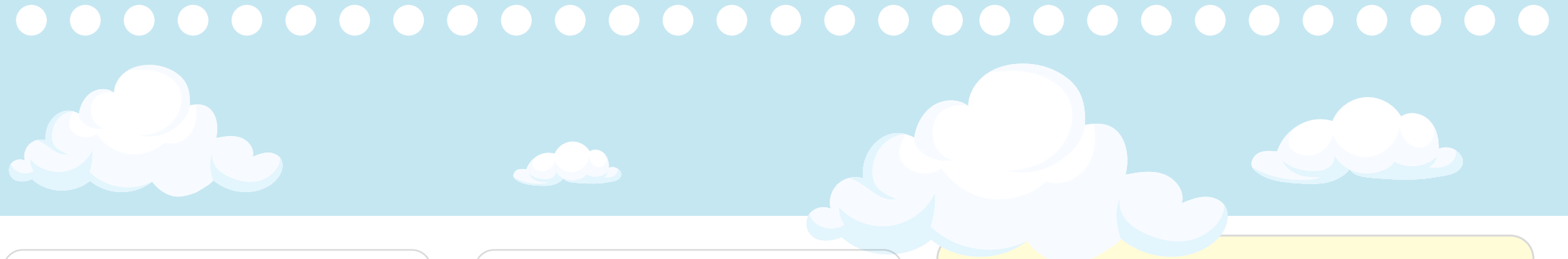


Water colour & transparency: Light yellowish green in colour with transparency till 30cm from surface

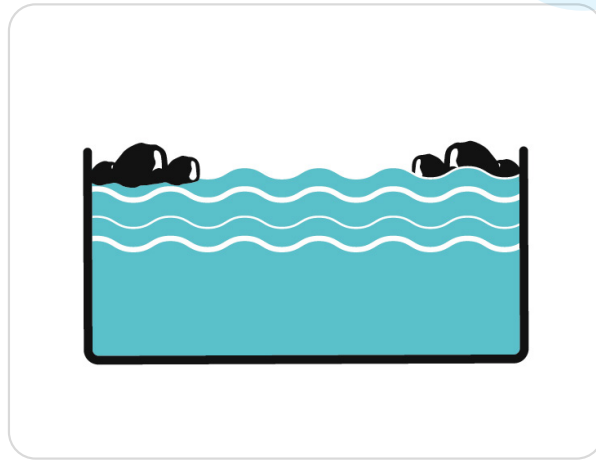


Water temperature: Should be maintained between 26 to 32°C for better fish growth



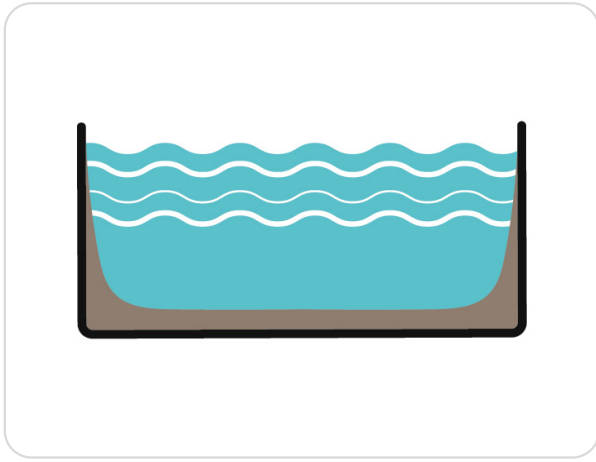


Odour: There should not be foul smell from the pond



Suspended solids: Should be less than 50 mg/L to ensure cleanliness in pond

Solution
Cleaning the pond regularly and replacing the water helps keep it healthy. Providing shade to maintain temperature, and using fertilizers & lime to neutralize acidity are the methods to keep these parameters in check.



Pond bottom: Bottom should be made up of clay for better water retention





6.5 - 8.5 pH - Nursery
7.5 - 8.5 pH - Grow out

Now lets see some important chemical parameters

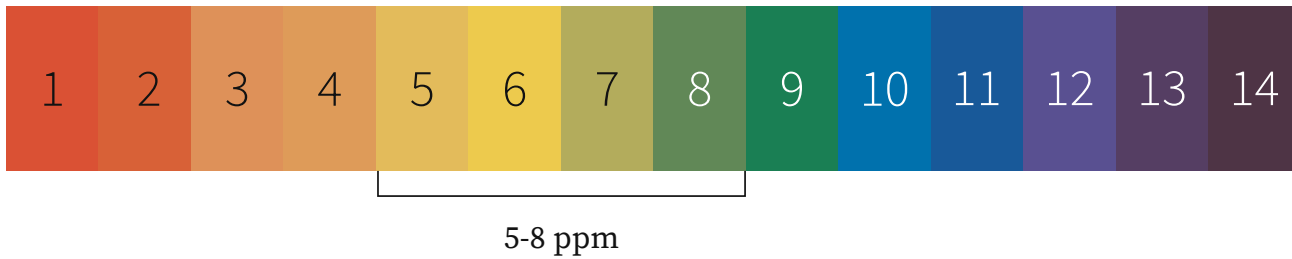
pH: Maintain a pH of 7.5-8.5 for healthy fish. Check the pH periodically with a test kit and use lime to neutralize high acidity & gypsum to neutralize high alkalinity.



40-80 ppm - Nursery
80-200 ppm - Grow out

Alkalinity: Should be maintain within 80-200 ppm with 25 ppm being the critical value. Maintenance is necessary as high alkalinity forms ammonia which is harmful to fish.





Solution

Close monitoring of chemical parameters is necessary to maintain healthy pond. Aeration, replenishing water and cleaning helps with DO, ammonia & alkalinity.

Dissolved oxygen(DO): Should be within 5-8 ppm. & shouldn't drop below 4 ppm. Close monitoring of weather & oxygen level is important & aeration by distributing the water is advised to increase DO.



Ammonia: It should be below 0.2 ppm as high level of ammonia causes intoxication of fish & may cause mortality.





Pond Preparation: Raking of the pond bottom

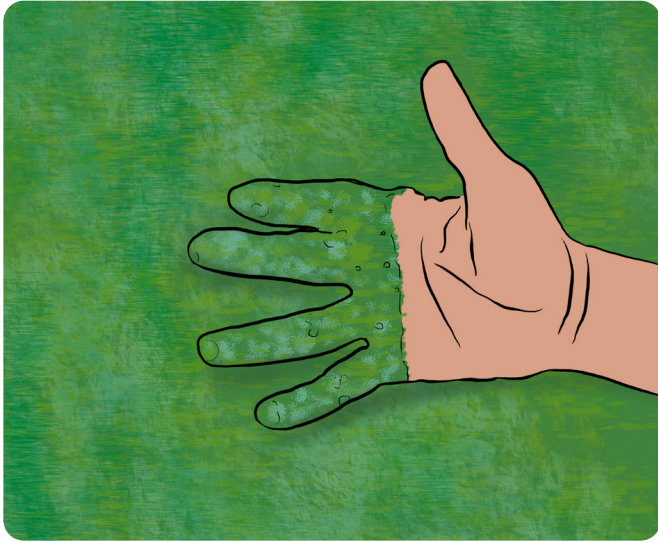
That's not all. Excessive use of commercial inputs & aging has its effect on pond environment.

Excessive use of commercial feed, fertilisers, antibiotics, and manure, growth promoters etc. results in water quality deterioration leading to disease outbreak along with affecting soil health. Hence it is necessary to use it in recommended doses & intervals.

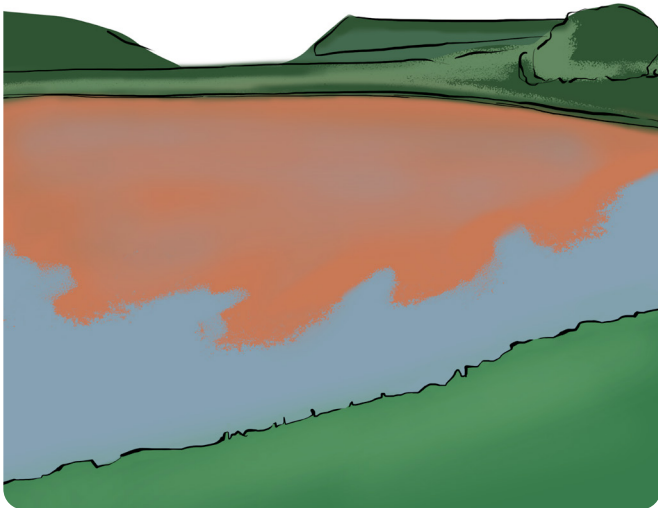
Aging of ponds: After 2-3 years of continuous use without emptying, drying & cleaning affects the water quality due to deposition of fish waste & residual fish feed at the bottom. It also promotes excessive growth of algae in water harming the fish health.

Solution

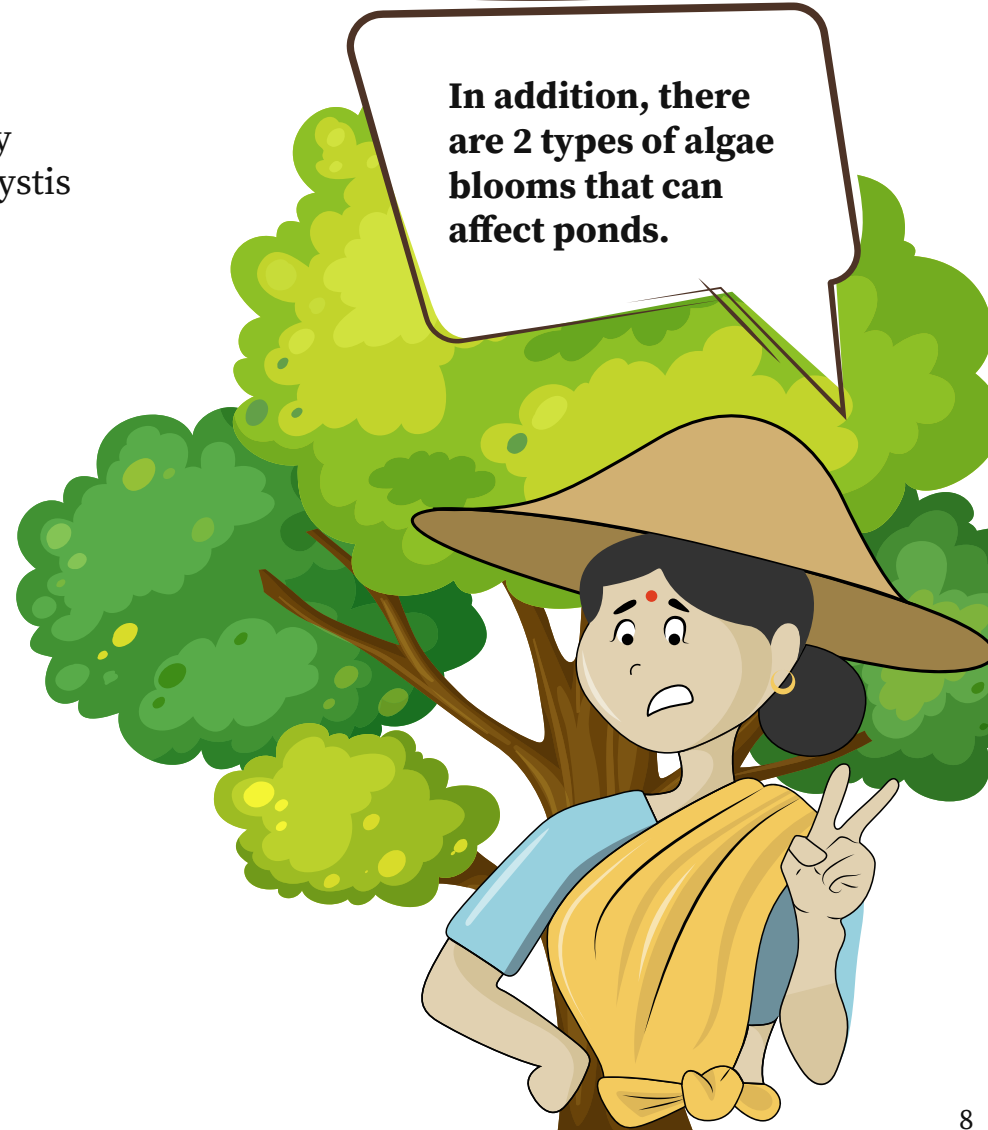
To tackle pond aging issue, we should drain the pond after harvest to remove bottom sediments & organic matter



Dark green bloom caused by blue-green algae i.e. microcystis (filamentous algae)



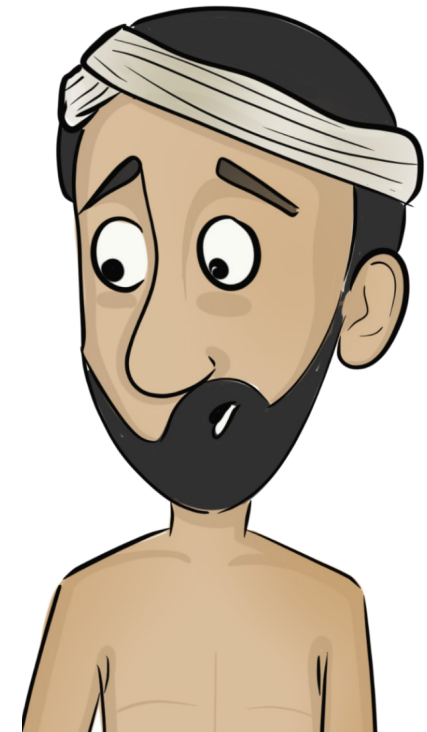
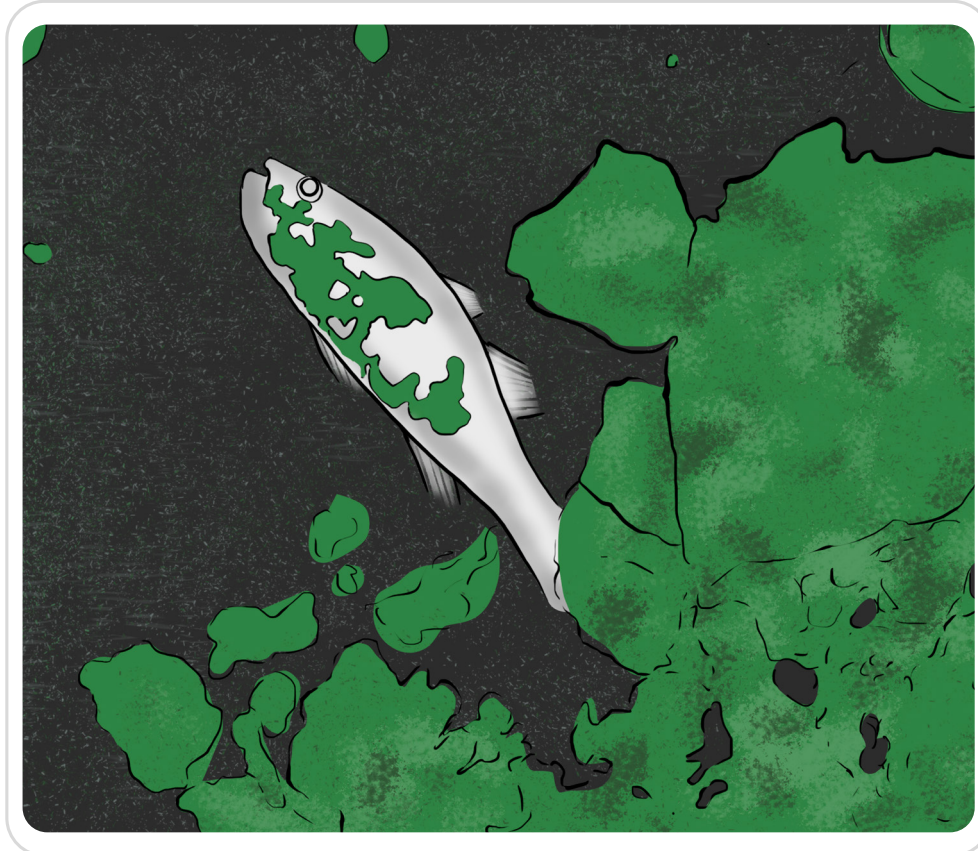
Red/ brown bloom is caused by euglena algae



In addition, there are 2 types of algae blooms that can affect ponds.

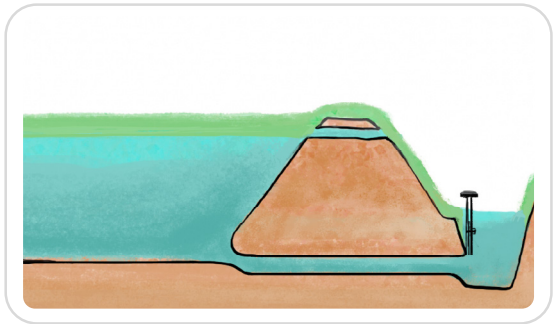
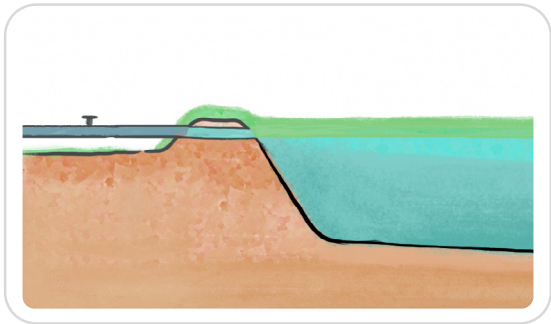
Both these algae blooms prevents sunlight from penetrating into pond. The green algae is more harmful as it releases harmful material in water affecting fish health

Then how do we save our fish from it Baideo? What is the solution?





Cleaning the algae manually



Partial water exchange using inlet & outlet


We can clean the algae by manually removing it periodically.

We can do partial exchange of water to reduce the growth of algae.





Baideo, how can I maintain pond hygiene?

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- Maintain 1.5-2 m water depth
 - Clean excessive aquatic weeds & marginal plant
 - Stop feeding during excessive rainfall & winter
 - Clear algae blooms by manually removing or partial exchange of water
 - Disinfect nets & other equipment regularly
 - Check pH, dissolved oxygen, alkalinity periodically to maintain optimum levels
 - Feed & fertiliser should be given with recommended doses