

What is 'Clean'?



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Presence of healthy fish population is considered as an ecological indicator of clean water body. Fish life indicates presence of dissolved oxygen, this indicates close to zero Biochemical Oxygen Demand (BOD). Fish also indicates absence of toxic organics (industrial discharge, pesticides, etc.).

But the fish population should be selected by the eco-system, without human help. Oxygen needed by the fish should be generated by the eco-system itself (through phytoplankton activity that reduces nitrates, the root cause of all other forms of pollution). If external aeration (borrowed oxygen) is keeping the fish alive, this water body cannot be considered 'clean'.

If our water well has no fish because there is no nitrate pollution in it, we should not introduce fish in the well as fish is an ecological indicator of 'clean' water body. In the past, our water wells had a tortoise that would graze on algae growing on the stone. So, the food chain was: nitrates-algae-tortoise. A tortoise excreta was so clean that we never bothered to think about it.

Shall I put fish in my water body?

If fish population is imposed on a clean ecosystem, it will not sustain. Clean water body cannot provide pollution (food) and oxygen to imposed fish population. Fish population that is built through the food chain (phytoplankton-zooplankton-small fish-large fish) is a realistic indicator of clean water body.

In fact, if the fishing rights of a water body are given to one party, the water body soon gets polluted because extra proteinous fish food is used to increase the fish harvest. Fish excreta then pollutes the water body. Commercial fisheries need to supply food and oxygen to sustain large fish population and also remove the polluted water from the bottom. If we consider the land needed to clean this polluted water and also generate fish food and electricity for aeration, such commercial fish farming is no more productive. Natural fish farming with zero external inputs is more productive and also ecologically sustainable.

Let us take a case to understand the above analysis. Suppose a village has two water bodies, both of similar size. One has 100 fish per acre and another one 1,000 fish per acre. Which water body should be used to get drinking water?

Most of us may think that high fish population should give cleaner water. But this is not true.

Fish should be considered as a water-cleaning machine invited by the water body, depending upon the pollution. High fish population, thus indicates high water pollution. Drinking water should be fetched from a well near the cleaner pond. This well will have close to zero nitrates that are desirable for drinking water. There will be no fish population in it.

Indicators of Higher Water Pollution

Any water body will breed fish, frogs or diverse forms of mosquitoes, depending upon the water pollution. At smallest band of nitrates, we get clean water and food (fish) as a reward. Small pollution is visible to eyes. Fish thus, is a visible indicator that comes at the lowest band.

Next band of pollution gives us both video and audio indications. Frogs come on the scene because rain washes the polluted air of NO_x and gets polluted with nitrates. Singing mosquitoes (that do not bite) also come in the second band of nitrates.

Night-biting mosquitoes (that do not cause malaria or dengue) come in the third band of nitrate pollution.

Day-biting mosquitoes cause malaria or dengue and indicate water body with highest band of nitrates. Dengue mosquitoes need higher levels of pollution than the malaria mosquitoes.

Raw sewage often may breed ordinary night-biting mosquitoes. But the 'treated' sewage that has been deprived of its food component and not the nitrates (and other real pollutants) can breed malaria mosquitoes. This means that the treatment is not ecologically sound. Treated sewage may look clean to eyes and nose because there are no food molecules left to sound the alarm of pollution (nitrates).

'Clean' municipal tap-water may still breed dengue mosquitoes because the treatment does not remove the nitrates. If water is sourced from a well in an organic farm, it will have close to zero nitrates and will not breed mosquitoes.

This suggests that true water (or wastewater) treatment should be achieved using ecological filter (organic soil with diverse plants), not using chemicals or external aeration.

Water Quality Parameters set by Ecology

WHO recommends that drinking water should have nitrates less than 45 ppm. This value supports large fish population in the cold region, but is too high for the warm region, where dengue mosquitoes may breed. Our water quality standards should not be imported, but set ecologically. Ecological filter can produce close to

zero nitrates needed in order to get water with high 'cleaning ability'.

Water bodies have limited mechanisms of converting 'pollution into useful biomass'. Nature shifted her evolution 'from water to the land' about 600 million years ago. Organic soil can use pollution to produce our needs. Chemical farming cannot achieve this. It creates extra pollution. Yamuna enters Delhi carrying tons of nitrates leached by chemical farming activity of Haryana. Nitrates reduce human creativity and also breed bad habits, corruption and crime. Nitrates in drinking water also create garbage and sewage pollution. Kolkata city has no pollution and in fact, gets utilized by organic farms and fish farms because the city uses water of Ganga river, which contains low nitrates. Hence, ecological water treatment should be the first step of total environmental planning. This is effected using BIOSANITIZER Ecochips that are placed in the water storage tanks. Then the tanks also remain clean all the time.

We can use such low nitrates water to clean everything, our food, body, clothing, house, car, etc. 'Unclean' is high nitrates and 'clean' is low nitrates. Pathogens and pests come at high nitrates. Odour and oxygen demand is due to nitrates.

Use of chemicals to clean our water, food, body and our belongings, is ecologically unsound. Green plants are able to utilize nitrates and fulfills our needs. Incorporation of diverse plants in human life, thus, is ecological sanitation. Use of BIOSANITIZER Ecochip makes it convenient for the urban life. **IP1**

The views expressed and information contained in this article are provided by the author. He can be contacted at: bvpl@vsnl.com