
Raw Water Treatment | Industrial | Domestic



Accelerated In-situ Phyco-Remediation of Water Ecosystem

‘Towards Low Carbon City’

By: Abdul Latif Osman
NUAIM CORPORATION (M) SDN BHD



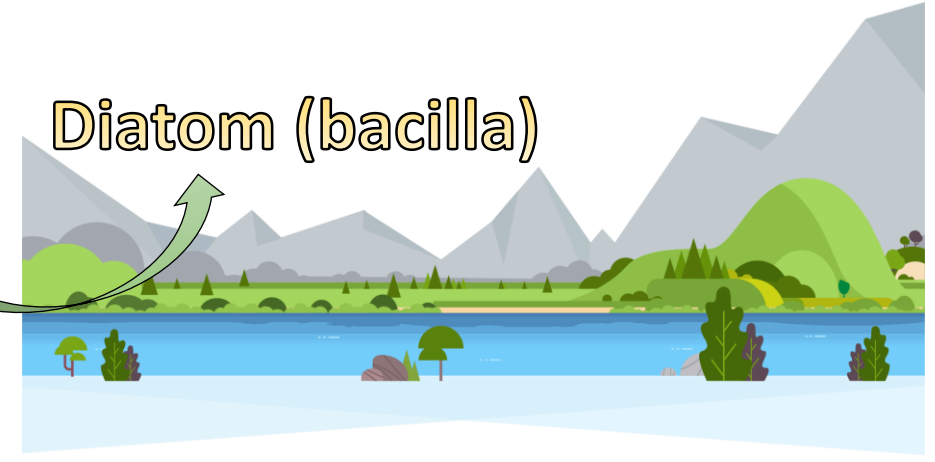
Fully utilize **Ponds & Lakes:**

Bio-filters to the waste
(organic and inorganic)

Phyco-remediation
(micro-algae / phytoplankton)

Diatom (bacilla)

Photosynthesis (light)

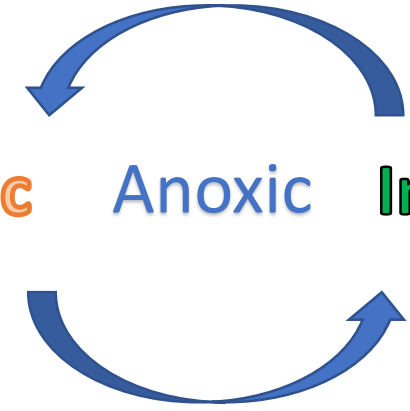


O₂ + **Organic**
Fossil

Anoxic

Inorganic
CO₂

(Water System)



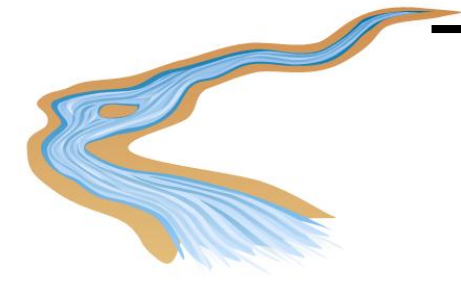
City



Ponds & Lakes



Drains / Rivers



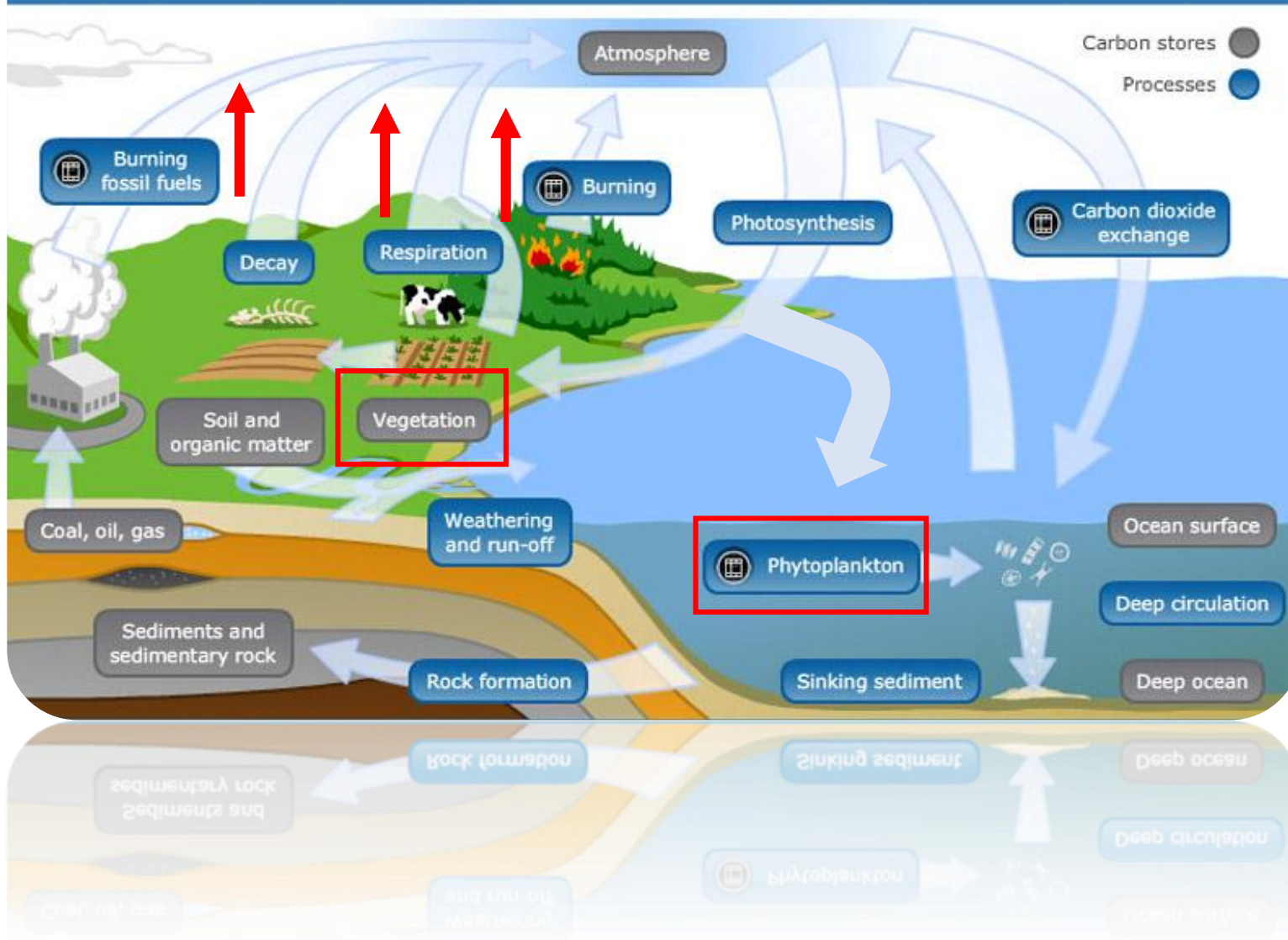
Ponds & Lakes



Ocean



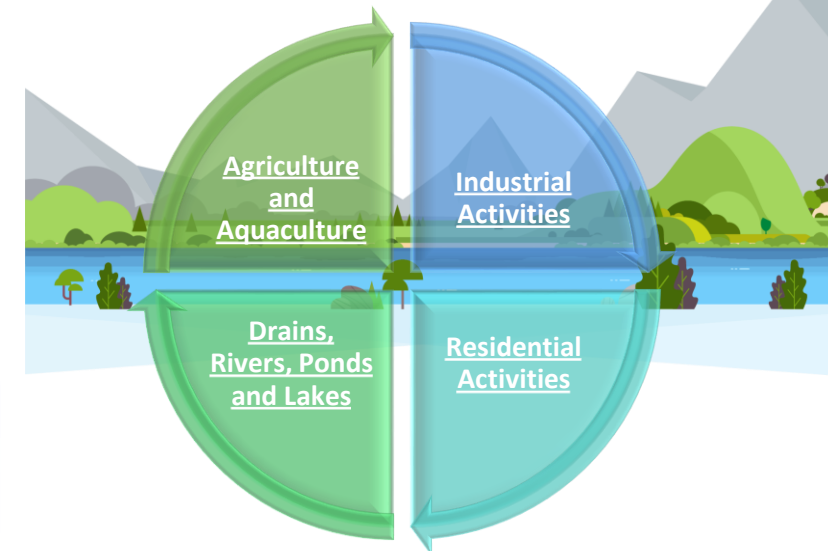
CARBON CYCLE



Maintaining & Re-Planting
the tree (terrestrial)



Water Management

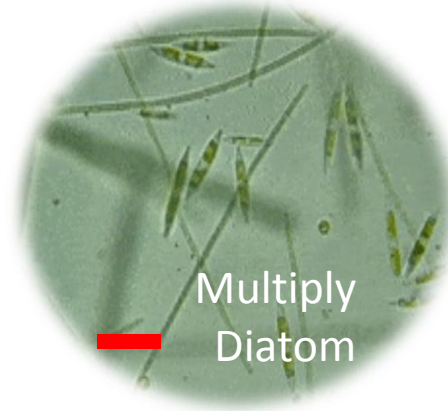
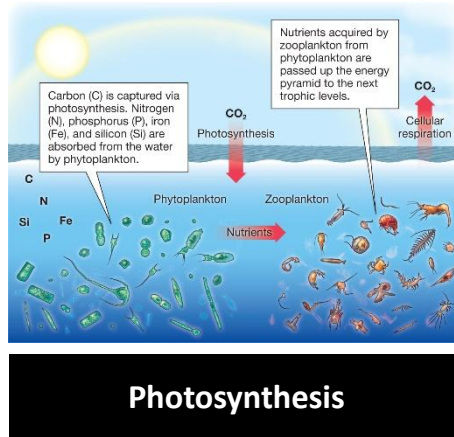




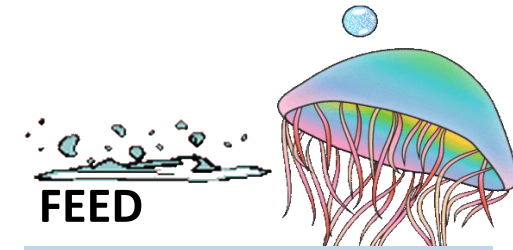
How Nano-Technology works?

Formulation of 1-500 nanometers of nutrients (Silica-based)

- **Avoid Nutrient Pollution**
Absorb Nutrients & Minerals

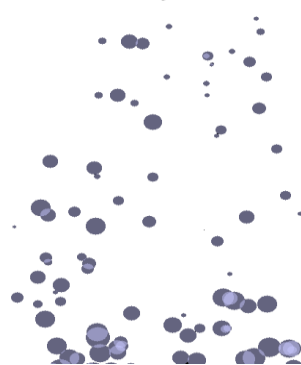


Multiply Diatom



Zooplankton, Fish and
other Marine Life.

✓ **'CARBON FIXATION'**



- **Increase DO**
Fixing CO₂, Release O₂, Highly Oxygenated Water



enhanced
Aerobic

REDUCE

BOD, COD, TKN
& Turbidity

Better Sludge Digestion.
Reduce TSS, TDS, Odour/ Toxicity (<H₂S & NH₃) & Coliform.

✓
Improve

Water Quality,
Increase Aquatic Diversity
& **RESTORE NATURAL ECOSYSTEM**



Expected Outcomes

Enhancement of DO

Diatom as Powerful Oxygenator
(Decomposition Process **'Well-balanced'**)

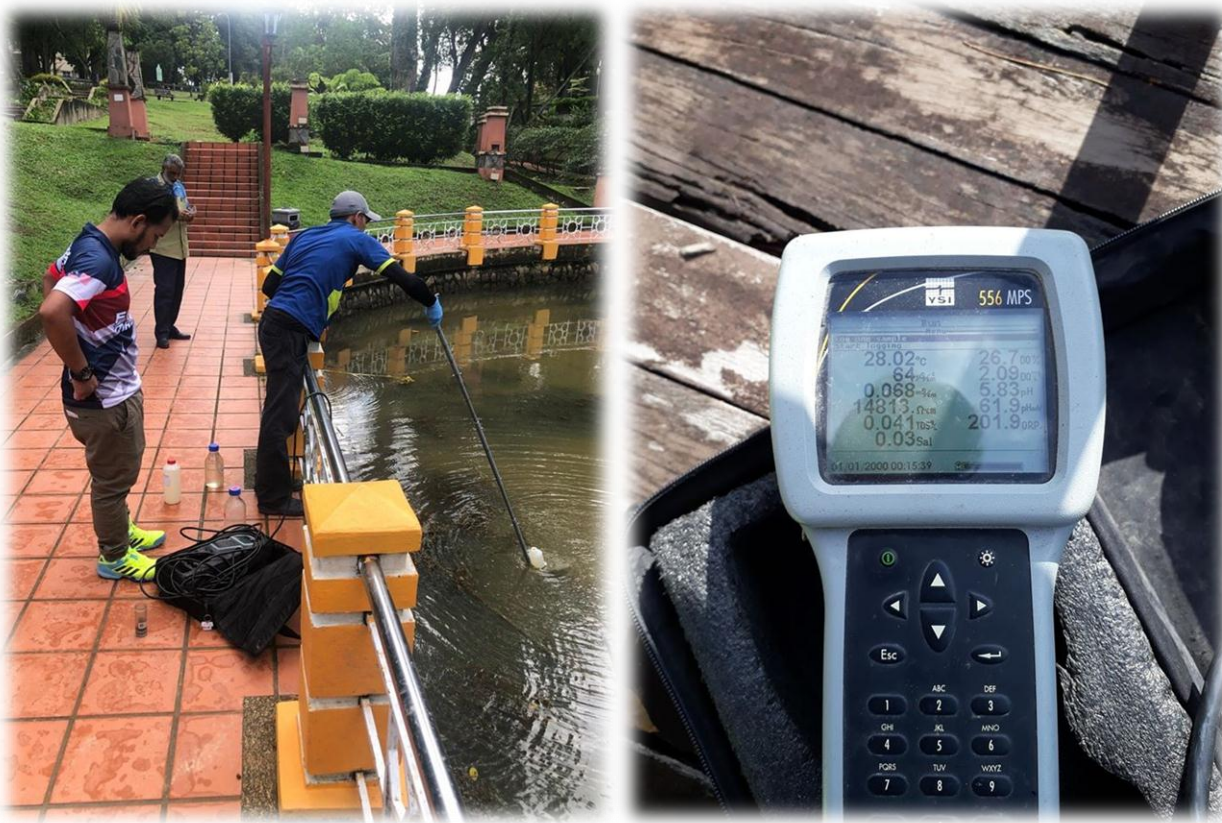


Seremban Lake Garden (Nov 2019)

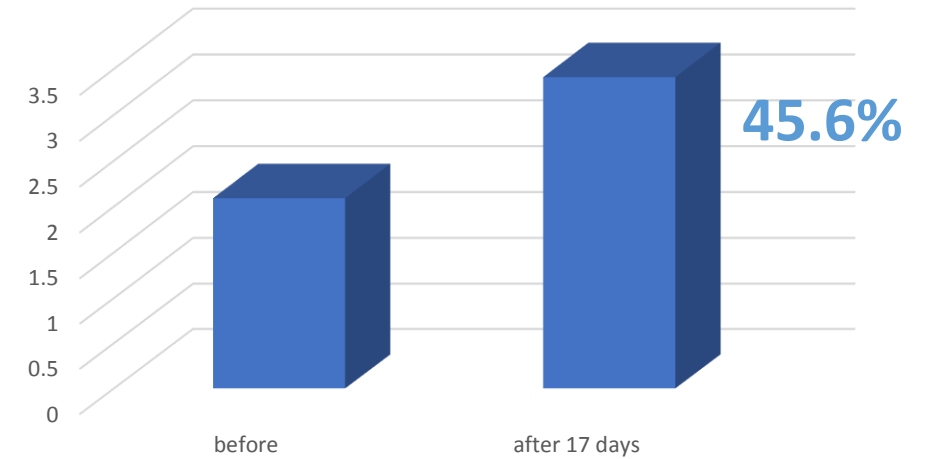
Expected Outcomes

Enhancement of DO

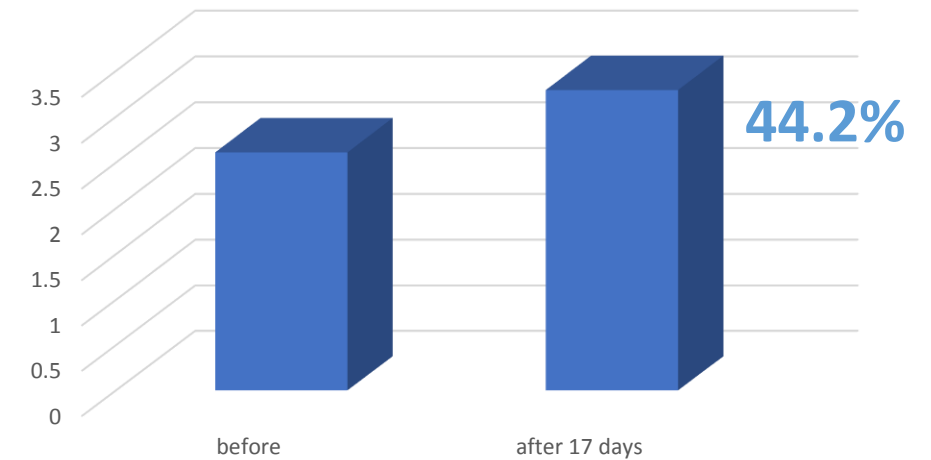
Diatom as Powerful Oxygenator



Dissolved Oxygen in 17 Days at Lake 1



Dissolved Oxygen in 17 Days at Lake 2



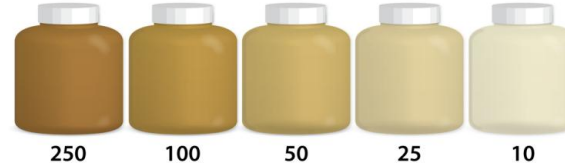
Expected Outcomes

Enhancement of DO

Diatom as Powerful Oxygenator

Turbidity (NTU)

Water Samples:



Expected Outcomes

Removal of Foul Odor

Replacing the anaerobic process to aerobic



Brownish color of crude waste (Aeration)


















Clear color of crude waste (Aeration)

Indah Water Konsortium (IWK) in 2020

Expected Outcomes

Removal of Foul Odor

Replacing the anaerobic process to aerobic

Foul Odor			
	Near / Inside Pump House	Aeration Pond	Clarifier Pond
Pre Treatment (11/2/2020)			
After 8 Days (17/2/2020)			
After 15 Days (27/2/2020)			
After 23 Days (5/3/2020)			
After 30 Days (11/3/2020)			

Expected Outcomes

Removal of Foul Odor

Replacing the anaerobic process to aerobic

Effluent Compliance

	Effluent (Water Discharged) Parameter					
	BOD (mg/L)	COD (mg/L)	NH3N (mg/L)	NO3 (mg/L)	SS (mg/L)	pH
Standard A (DOE)	< 20	< 120	< 10	< 20	< 50	6 ~ 9
IWK Data 28-Nov 2019	9	48	16	N/A	16	7
Pre Treatment (11/2/2020)	31.6	23.0	15.0	NA	N/A	7.6
After 8 Days (17/2/2020)	23.6	26.0	19.5	NA	N/A	7.71
After 15 Days (27/2/2020)	4.3	14.9	0.9	4.62	12.0	7.78
After 23 Days (5/3/2020)	9.9	34.9	11.10	2.62	25.0	6.88
After 30 Days (11/3/2020)	13.7	39.5	5.27	2.59	28.0	7.08

Achieved and maintained according to DOE standard (A) in **15 Days** of application.

Electricity Saving

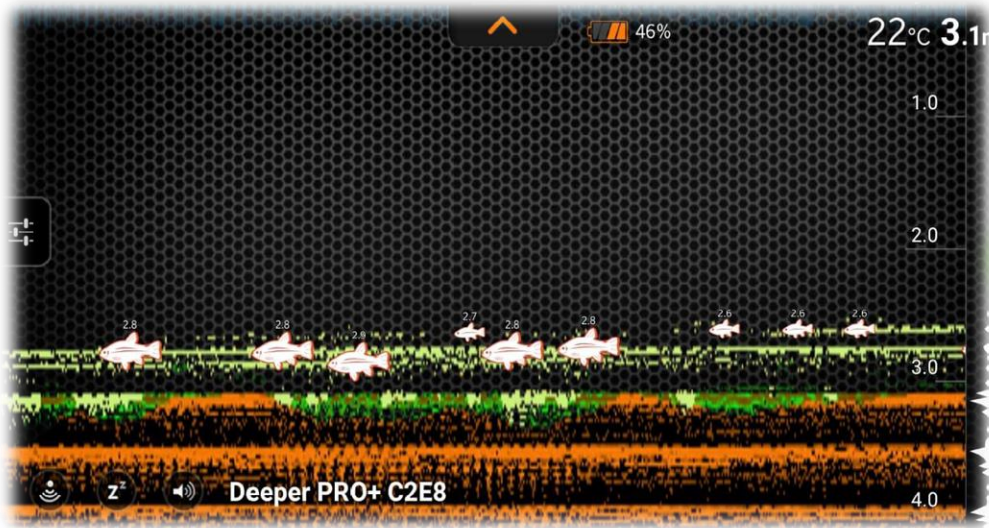
	Aerator 1		Aerator 2		Total kWhr/Day	Reduction kWhr/Day	Electrical Cost/Year	Saving %
	Run Hrs/Day	kWhr/Day	Run Hrs/Day	kWhr/Day				
Initial	19	142.5	19	76	218.5		RM27,913	
1 week	14	105	19	76	181	37.5	RM23,123	17%
2 week	4	30	10	40	70	148.5	RM8,943	68%
3 week	4	30	10	40	70	148.5	RM8,943	68%
4 week	19	142.5	19	76	218.5			

Recently, reduce to 90% of Total Operation Time of Aeration System:
2 to 3 hours per day for both aerators

Expected Outcomes

Rejuvenation of Aquatic Life

Diatoms represent a major component at the base of the marine food web, responsible for up to 50% of total oceanic primary production (Mann, 1999).



Increase in fish population in 3 months

Thank You

‘Towards Low Carbon City’

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