

Eco-Logical Water Treatment

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BIO CHIP PROCESS

Design of Nature

- Groundwater: low TDS, low microbial load
- Rainwater: Low TDS, but has nitrates due to air pollution
- Rainwater can percolate into the ground only after nitrates are utilized by the plants.
- Nitrates breed slimy bacteria that seal the soil.
- Leads to water accumulation, mosquito breeding.
- Both mosquitoes and plants need nitrates, we have a choice.
- Pests need small levels of wasted nitrates, pathogens come at high levels of wasted nitrates.

Modern Scenario

- 25% increase in air pollution, acidic rain
- Acidification of water bodies, sea and soils
- Use of acid-forming chemical fertilizers, pesticides
- Speedy dissolution of rock particles, increase in salinity of soils, groundwater and surface water
- Increase in Ca, Mg, nitrates, Fe, F, Na, Cl, heavy metals, pesticides - particularly in the groundwater

Nitrates: Root Cause of Pollution

- Nitrates can be utilized only by green plants, to produce resources, using CO₂.
- Nature produces nitrates only as per the demand from the plants.
- Increase in nitrates in rain, surface water, soil and also in the groundwater
- Wasted nitrates sound unpleasant alarms.

From previous page Alarms of Pollution

- Scaling, corrosion, biofouling, algal growth
- Odor, pathogens and pests (mosquitoes)
- Water logging, floods and droughts
- Water borne diseases
- Due to wasted nitrates
- Need root cause correction

Low-Nitrate Systems

- Can heal themselves, of toxic chemicals, heavy metals and pathogens.
- Harmful salts get converted into useful minerals.
- Low-nitrate healthy soils are productive and produce healthy food with minerals.
- Allow only eco-logically filtered water to the groundwater.

Learning from Nature

- Low nitrate blue lagoon: coconut plants with roots in the seawater
- Converts seawater into tasty coconut water.
- Bio Chip is based on many such lessons from Nature.



BIO CHIP 1

- Developed
- In collaboration with Nature, that has 4.6 billion years of evolutionary experience
- Also based on 10,000 years of Indian traditions, that supported prosperity and rich culture in the past.

BIO CHIP 2

- Spoiled during the past 500 years
- Due to burning of fossil fuels
- Increase in nitrates in water, food, man and his pets(plants and animals)
- Super Catalyst is the remedy.
- Can bring prosperity to all, through increase in plant production.

BIO CHIP-3

- Field-tested over the past 12 years
- **Just put in a well, borewell, pond, lake or water storage tank, no recurring expenses.**
- Sustains its operation without getting depleted or without any loss of activity.
- Converts polluted water into healing water that resists scaling, corrosion, biofouling, algal growth and recontamination with pathogens and toxic chemicals.

BIO CHIP Mechanism

- All pollution problems get tackled in low nitrate ecosystems.
- Each plant has enzymes that operates in specific band of nitrates.
- Super Catalyst is a broadband bio-catalyst.
- 100 mg of Super Catalyst= 1 acre of natural forest, in action.
- Offers compact speedy, broadband phytoremediation.

Treatment of Borewell Water in Maharashtra

Parameters	Before	After	REMARKS Water became useful for drinking and irrigation The water tastes sweeter Irrigated soil that was showing white salty patches, has turned black again.
pH	7.44	7.57	
TDS	1966	1050	
Hardness	922	444	
Alkalinity	119	331	
Chlorides	315	165	
Sulphates	484	97	
Nitrates	8.62	11.0	
Fluorides	0.03	0.02	
Iron	0.19	0.3	
Coliforms	13	1600	

Treatment of Arsenic Affected Groundwater in W. Bengal

SWID *	SWID *	SAFE * Lid closed	SAFE * Lid open for 5 days
Raw water	Treated water	Treated Water	Treated Water
pH- 6.57	6.66	6.9	7.9
Fe-0.8	0.1	0.19	0.31
As-0.7	0.3	0.18 (Trivalent)	below 0.01 (Trivalent)

***SAFE and SWID are labs. All values in ppm (except pH)**

Treatment of Arsenic Affected Groundwater in W. Bengal-2

	SAFE * Raw water	SAFE * Treated water
pH	7.7	7.7
NO ₃ -N	13.4	0.08
Fe	0.48	0.31
As	0.05	0.02

Groundwater Treatment in Gujarat

- TDS reduced from 7,800 to 3,178 ppm
- Hardness reduced from 2,020 to 900 ppm
- Chlorides reduced from 3,180 to 1,320 ppm
- Sulphates reduced from 2,270 to 360 ppm
- Nitrates reduced from 550 ppm to nil.
- Fluorides reduced from 0.98 to 0.8 ppm
- Alkalinity reduced from 600 to 280 ppm

Sewage Treatment in Godavari River in Maharashtra

- BOD reduced from 174 to
- COD reduced from 392 to
- DO increased from nil to 1.1 ppm.
- Oil and grease reduced from 14 ppm to nil.
- Detergents reduced from 13.2 ppm to nil.
- Cu reduced from 0.52 ppm to nil.
- Fe reduced from 3.36 ppm to nil.

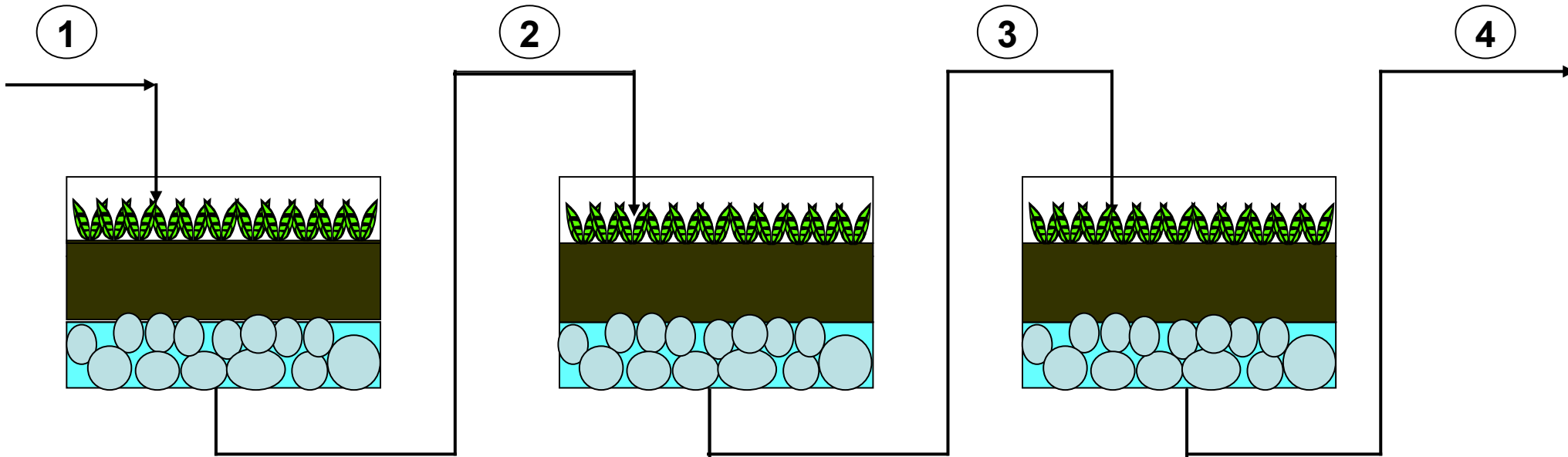
Sewage Treatment in Godavari River in Maharashtra, contd.

- Zn reduced from 0.21 to 0.024 ppm.
- Pb reduced from 0.1 ppm to nil.
- Hg reduced from 0.01 ppm to nil.
- Sodium reduced to 21 ppm.
- B reduced to nil.
- F reduced to 0.09.
- Nitrates reduced to 0.55 ppm.

Eco-logical Water Treatment-1

- Water pollutants: only the food for plants
- Should be utilized to produce resources.
- Not separated and disposed of, to pollute some other place.
- Should not use external recurring inputs.
- Should operate itself, like natural ecosystems.

Eco-filter to Harvest the Nutrients



STREAM	1	2	3	4
pH	4.0	6	7	7.5
BOD(mg/L)	26,000	4800	94	30
COD(mg/L)	51,020	7500	280	120
Cl (mg/L)	900	184	35	9.5
Na (mg/L)	220	62	28	27
K (mg/L)	570	40	5	3

Eco-Logical Water Treatment-2

- **Pre-treatment** using BIO CHIP Produces eco-friendly water that becomes a resource for man and for growing plants.
- **Eco-Logical Filter:** To grow plants and produce eco-filtered low TDS, tasty water, conforming to IS-10500(2003-09)
- Operates itself and improves itself with time, being an ecotechnological method.

Can Remediate

- Turbidity, color, odor, particulate matter, oil, pH, BOD, COD, unpleasant taste, etc.
- Human pathogens(protozoa, bacteria, viruses), parasites, etc.
- Toxic organics: POPs, pharmaceuticals, etc.
- Excess of inorganics:
Ca,Mg,Si,Na,Cl,F,Fe,Nitrates,sulphate,carbonate, bicarbonate, P, heavy metals, etc.

But retains essential minerals in the right formula. Produces tasty, 'healing water'.

Deluge in Mumbai: 26th July, 2005



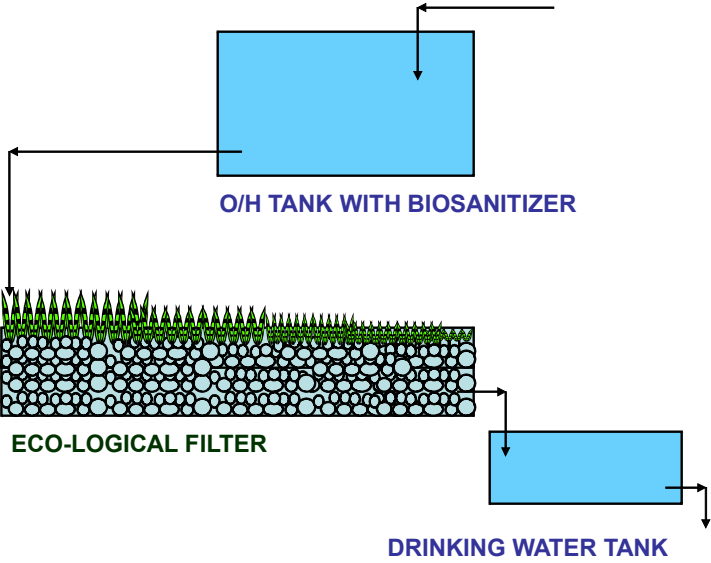
EXPRESS INVESTIGATION
Indian Express dtd 13/8/05
Express, Green
Cross launch
campaign to cut
epidemic risk
How you can use biosanitizer with
US patent to keep your area safe

Rotting garbage is sprayed with the biosanitizer at Juhu Military Road in Mumbai on Friday—Vasant Prabhu

To Treat 1500 liters/day of Water

- Pre-treatment tank of 500-1500 liters, with 100 mg of Super Catalyst7.0
- Eco-Logical Filter of 2 m² area, 1 m depth, filled with pebbles, gravel and sand, with biodiversity garden growing on it.
- Needs only harvesting of useful plant produce growing on the eco-filter, once a while. This happens automatically.
- Constructed in brickwork, can also be in plastic tanks, the eco-filter exposed to sunlight.

ECO WATER FILTER



Special Features of Eco-Filter

- Cost-effective, robust, user-friendly, stand alone
- Needs no electricity, chemicals, repairs, etc.
- Maintained by ecology itself.
- Converts pollution into resources.
- Creates no waste stream, traps the greenhouse gases.
- Produces clean, tasty ‘healing water’, using water from any source of varying quality.
- Good teaching aid for environmental education