Cost breakup of new emerging decentralised wastewater treatment technologies

Name	Treatment Method	Treatment capacity	Reuse of treated water	Capital cost (₹/KLD)	O&M cost (₹/KLD/ year)	Features
Green bridge	Filtration, sedimentation, biodigestion and biosorption by microbes and plants	50 – 200 KLD/ sq m	In situ treatment of water bodies	200-500	20-50	• Suitable for in-situ treatment in rivers, flowing streams • No skilled labour is required for its operation and maintenance • It improves the overall aesthetics, aquatic life of the water body • Pollution load reduction is upti 80 per cent in general • Increase in dissolved oxygen (DO) from 150-200 per cent
Biosanitiser/ Eco chip	Bio catalyst- breaking the toxic/ organic contents	100 mg/ KLD	In situ treatment of water bodies, Horticulture	Chip costs 10,000 excluding civil / construction cost	NA	—
Nualgi	Phycoremediation (use of micro/ macro algae)- fix CO_2, remove nutrients and increase DO in water	1Kg treats upto 4ML	In situ treatment of lakes/ ponds, Increase in fish yield.	₹350 / MLD	9000 -10,000/ML	• The growth of diatoms is very fast-starting within 5 minutes and continues as long as the nutrients lasts ie.,about 1 week to 10 days • 1 kg of Nualgi results in the release approximately 100kgs of oxygen • 100kg of Nualgi can treat 4 million litres of water
Bioremediation	Decomposition of organic matter using biological products	1 billion CFU/ml	In situ treatment of lakes/ ponds	Rs. 20,000-30,000/MLD for flowing water and Rs. 4000-5000/ML for still water	1.9 lakhs/ MLD for flowing water 2.8 L/ Acre in case of still water (for eg. Lakes)	• Reduce odour emission considerably • It is cost effective. No construction or additional infrastructure is required • Effective in removing highly toxic and health hazardous gas H_2S from the environment completely • These strains exhibit growth even at low temperature as low as 4 degree celcius and in the optimum pH range of 6-9 • The strain of bacteria maintains a satisfactory level of DO and therefore aerators, which consume high power, can be avoided or its use can be reduced • Controls the nutrient level in water thus helps in controlling "Eutrophication" process
Soil Bio technology	Sedimentation, filtration, biochemical process	5KLD – tens of MLD	Horticulture Cooling systems	10,000-15,000	1000-1500	• The process can be run on batch or continuous mode • No sludge production • Mechanical aeration is not required • The hydraulic retention time range from 30 mins to 1 hour without any pre-treatment • The overall time of operation is 6-7 hours. The bed is dried prior to next cycle of use.
Soil scape filter	Filtration through biologically activated medium	1-250 KLD	Horticulture	20000-30000	1800 - 2000	COD reduction in the range of 70-98% Area requirement is 1 sq m
DEWATS	Sedimentation, anaerobic treatment, plant rootzone treatment, oxidation process	Should be more than 1 KLD, but plants bigger than 1 MLD are also not feasible as would need extensive land.	Horticulture, mopping floors, cooling towers and flushing	35,000-70,000	1,000-2,000	• Consist of several modules like settler, anaerobic baffle reactor, planted filter bed and a pond. • There's no need to have all the modules at each site, selection of modules depend on the quality of the water required after treatment • Settler helps in trapping the settlable solids whereas ABR helps in reducing BOD by 80-90%, while PFB helps in trapping the nutrients. Pond takes care of the odour • Minimal running cost, as no electro-mechanical equipment used
Ecosanitation Zero discharge toilets	Separation of faecal matter and urine		Flushing Horticulture Composting	30000 – 35000 (includes civil work)	35000 – 40000 (includes salary of the caretaker)	• Easy to install with no sewerage system requirement. • No electrical power supply or motor driven devices required • Hygienic conditions are maintained at the same level as in conventional water borne systems. • Can easily be operated and maintained by the community.

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Fixed Film Biofilter Technology (FFBT)	Settling and flow equalisation followed by enhanced natural degradation (biochemical process)	0.5 KLD to tens of MLD	Horticulture Car Washing	25,000-35,000	1000-2000	• Biofilter used may be stones, gravels, sand or PVC filter material whichever provides maximum surface area and is easily available. • Enhanced degradation of contaminants takes place in minimum area, since suitable micro-culture is added to the Biofilter cell.
Phytorid	Settling followed by plant root zone treatment in specially engineered baffled treatment cells whch provides both aerobic and anaerobic treatment	5 KLD – tens of MLD	Horticulture	14,000-35,000	1,000-2,000	• Use of chosen wetland plants that are locally available • Retention time is between 5-7days • BOD and TSS removal average between 70-90% while faecal coliform is about 85-97% in treatment cells • Average nitrogen and phosphorus removal are in the range of 69-90%