Grey Water Reuse Potential and Technical Challenges

Guiding factors /principles

Low operation skill requirements
Low interventions and monitoring
Convertible to citizen science
Documentable by semi-skilled people
Simple to build & Viability for 15-20yrs
No threat /nuisance to residents nearby
No chemical additions
Low or no moving parts /grid dependency

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What will influence the Techniques used?

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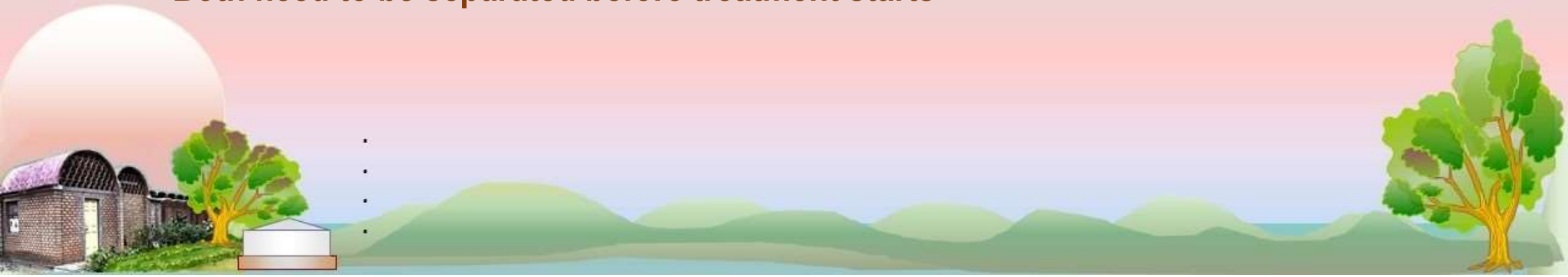
- Level of per capita water use (25 – 85?) (village size 5000)
- Level of per capita GW generation (15 – 60?) size needed 7.5 – 30KLD
  - Low use Greywater is more concentrated easy and lesser volume to treat, flow is poor, gets anaerobic before reaching treatment system
  - High discharge, dilute, larger volume, difficult to treat, more treated water available for reuse
- Affluence and use of Scouring agents (detergent content)
  - Use of Ash will increase the potash content in water (more particulates)
  - Affluence and use of commercial washing powder increase FOG and detergents
  - **Both need to be separated before treatment starts**



Size based options

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Simple open Chamber Mid-outlet

Baffle Reactor/

Vertical /Hoirontal. CW

Plants Canna etc.

Tree Nursery

←<7.5kLd

Fog /Grit separation

Anaerobic Digester 1d HRT

Clarification System 1dHRT

Nutrient Capture System 1dHRT

Treated Water Storage

Screens with FOG/Grit Chamber.

.Anerobic Upwelling Sludge-Bed Reactor

Euglenoid reactor with shade and solar circulation

Algal Pond with solar circulation.

Water recharge /horticultural or flower crops /Fodder

Use of treated water will depend upon the value of water in the off-season. Tree nursery is one of the important option to recycle these nutrients

← 10-1000kLd

Maintenance Needs

• Ensuring Clean Drains and steady flow	1/F
• Storm Flow /Run-off diverted	1/W – 1/M
• Floating FOG removed when accumulated	1/M – 1/Q
• Monitor and remove Settled grit /powders	1/M – 1/Q
• AD system is functional by viewing outlet water	1/F
• Clarifier system is not clogged	1/W
• Nutrient Capture system plants /algae are growing	1/W
• Treated water is used every day	

What will Trouble us in future?

Detergents in washing formulations
Increased use of pharma and personal care products
Increased use of household chemicals
Handwashes and anti-microbials
Sodium based compounds
Dust and particulates in open drains
Increase daily use of small and particulate plastics

Shifting to urban life-styles [major technology change needed]

1MLD Passive Sewage treatment Plant at Yelahanka-Putenahalli Lake, Bangalore has been working since July 2019.

No moving parts