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The STORY:

From a Student to an Entrepreneur

Presented by: Vikash K Agarwal, Independent Consultant, Tinsukia, Assam (India)
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Date: 12 August 2021

Online & Residential Trainings across verticals

OUR SCHOOLS

Circular Economy | Industrial pollution & governance | Water and waste | Sustainable urbanization & air pollution | Climate change | Enviro

- Advanced Training Programme on DWWTs, Faecal Sludge and Septage Management (2021) - Residential
- Planning and Designing of Rainwater Harvesting Systems (2021) - Residential
- Basic & Advanced Training on Preparation of Shit Flow Diagram (SFD) (2020) - Online
- Faecal Sludge Management in Rural Areas (2020) - Online
- SaniPath Tools: Assessing Fecal Contamination in Urban Settings (2020) – Online
- Water Woes: Reality of Urban Water Management (2020) - Online
- Decentralised Wastewater Treatment (2020) - Online
- Water audit and conservation in industries (2021) – Online
- New Vaastu: Designing Sustainable Habitats In A Post-Pandemic World (2021) - Online
- Source segregation and home composting (2021) - Online
- Tools & Approaches for Water & Sanitation Management (2021) - Online
- Making Data Speak - Demystifying Water and Waste Data for Communication and Action (Ongoing) - Online

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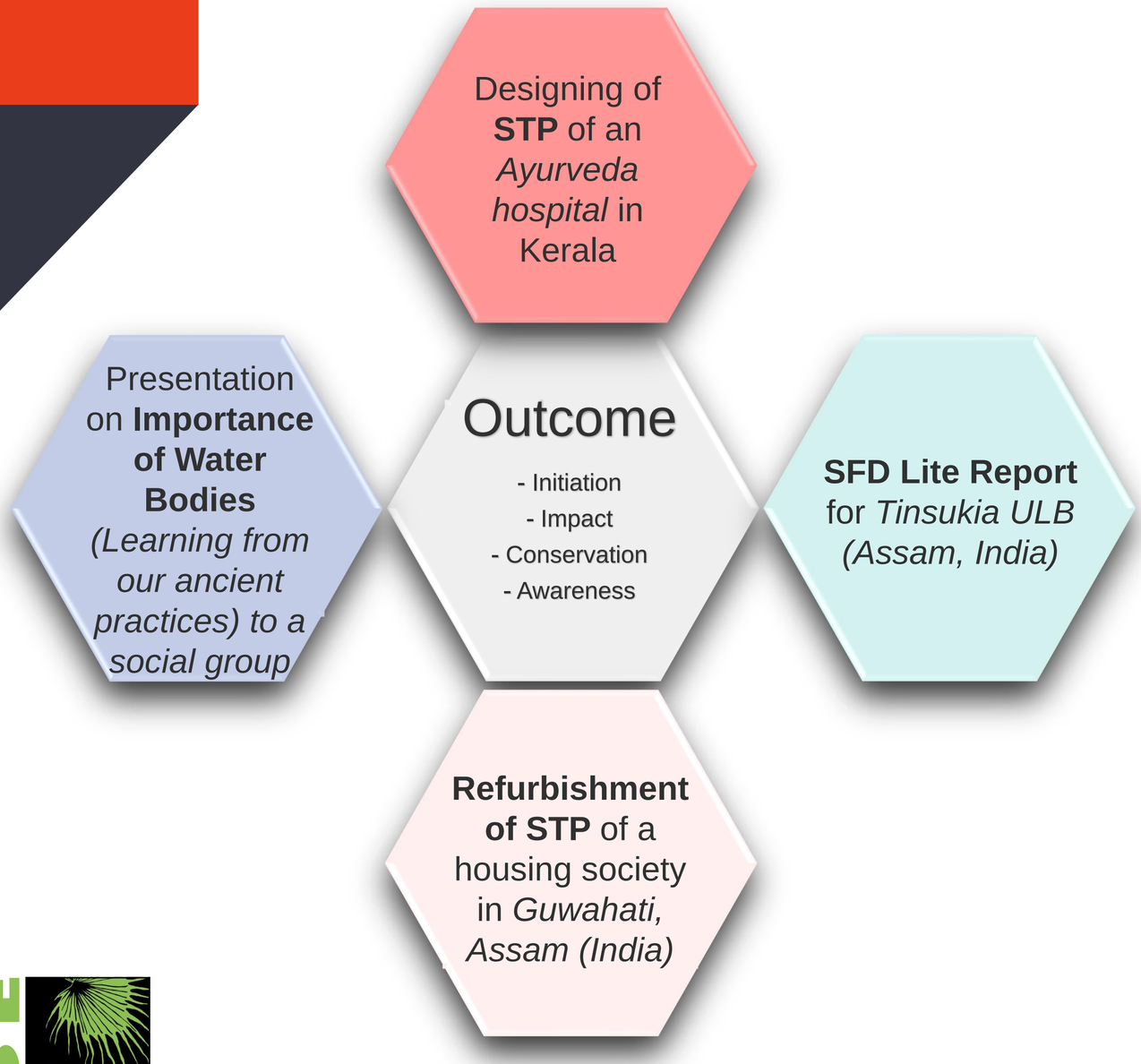
CSE training contribution in knowledge building & skill development



Benefits from Training

- Provided the important tools and know-how to help address clients problems
- Trainings helped in understanding the various aspects and role of water and how stakeholders can manage water economics
- Resource materials helped in developing understanding
- References to connect with community and other stakeholders

The Initiation:

Designing of
Sewage Treatment Plant (STP)
of an Ayurveda Hospital
(P.A.H.R.C., Kerala: June, 2020)

Based on Reed Bed Technology
(Nature-based Solutions)

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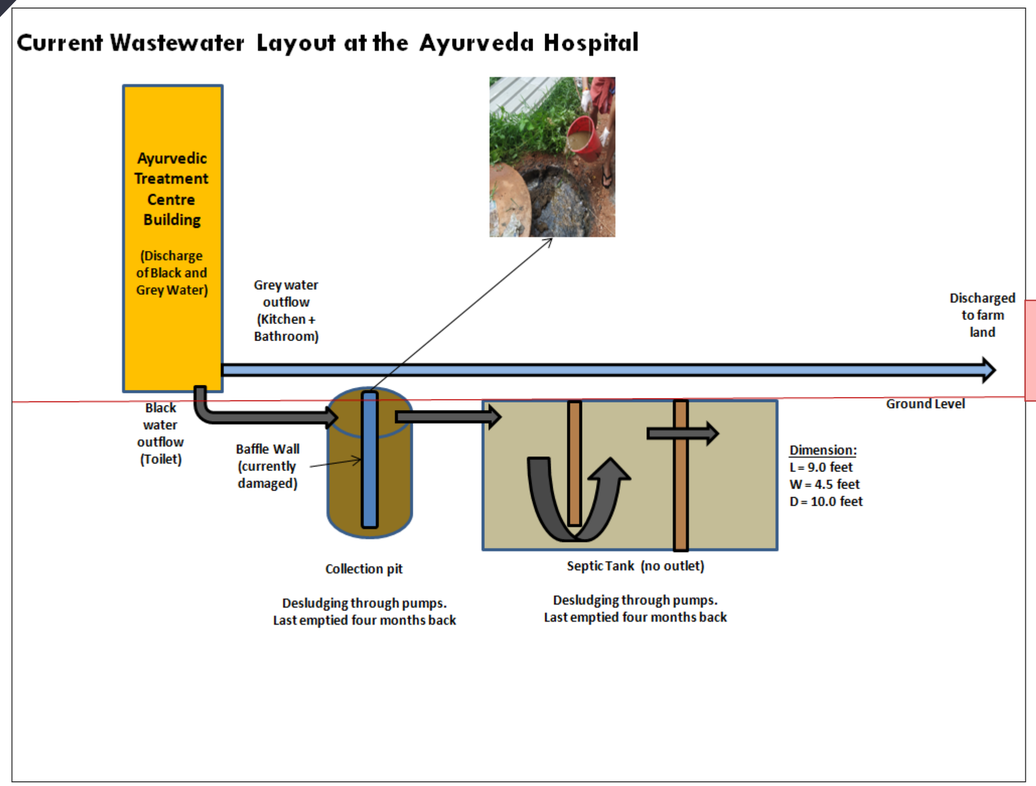
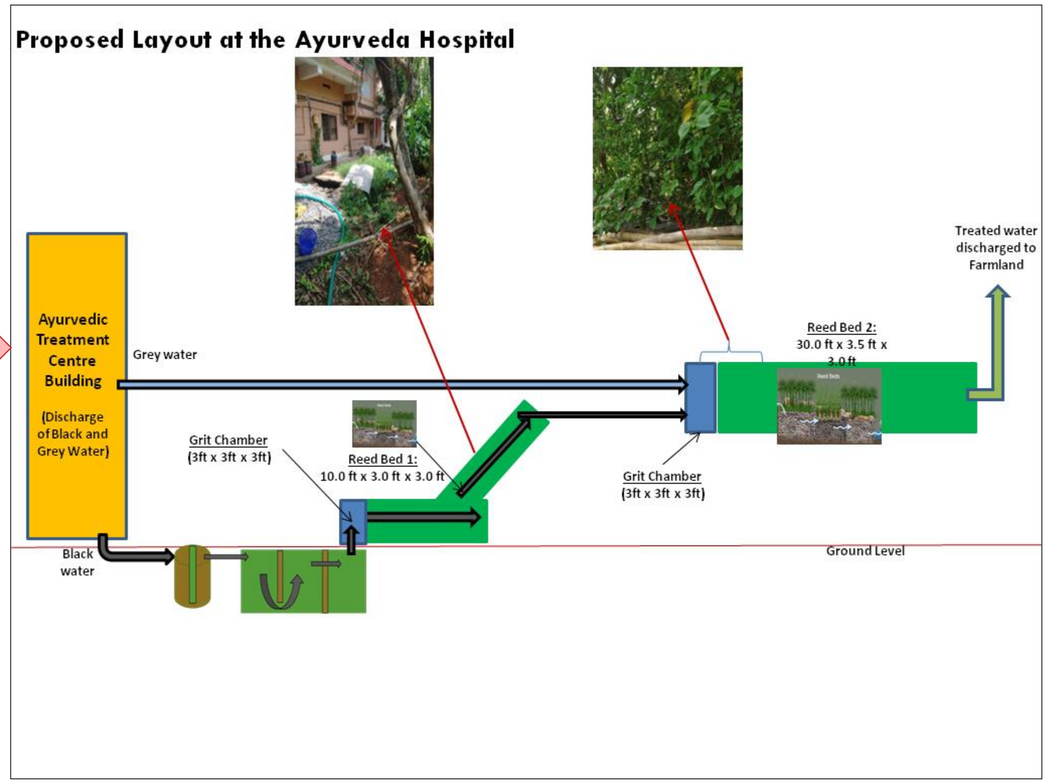
Current & Proposed Wastewater Layout at the Ayurveda Hospital

Existing Problem:

- Collection Pit baffle wall damaged
- No anaerobic reaction seen in the septic tank and collection pit
- Water getting filled in the third chamber of the septic tank every second day
- No treatment system for black and grey water

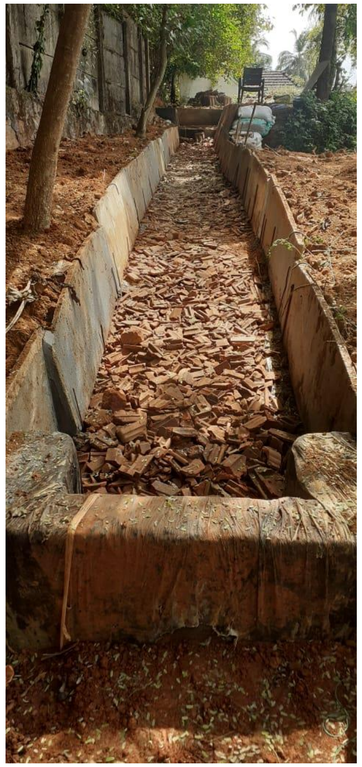




Solution achieved:

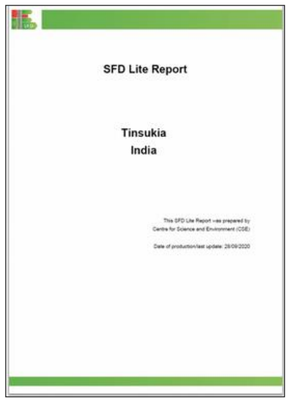
- Enzymes through cow dung and curd introduced in collection pit to aid anaerobic digestion
- From no treatment of wastewater to discharge of processed water to farmland

Layout in Pictures at the Ayurveda Hospital



The Impact:

SFD Lite Report for Tinsukia ULB, Assam, India (October, 2020)


SFD Lite Report

Tinsukia
India

This SFD Lite Report was prepared by
Centre for Science and Environment (CSE)

Date of production/last update: 28/09/2020

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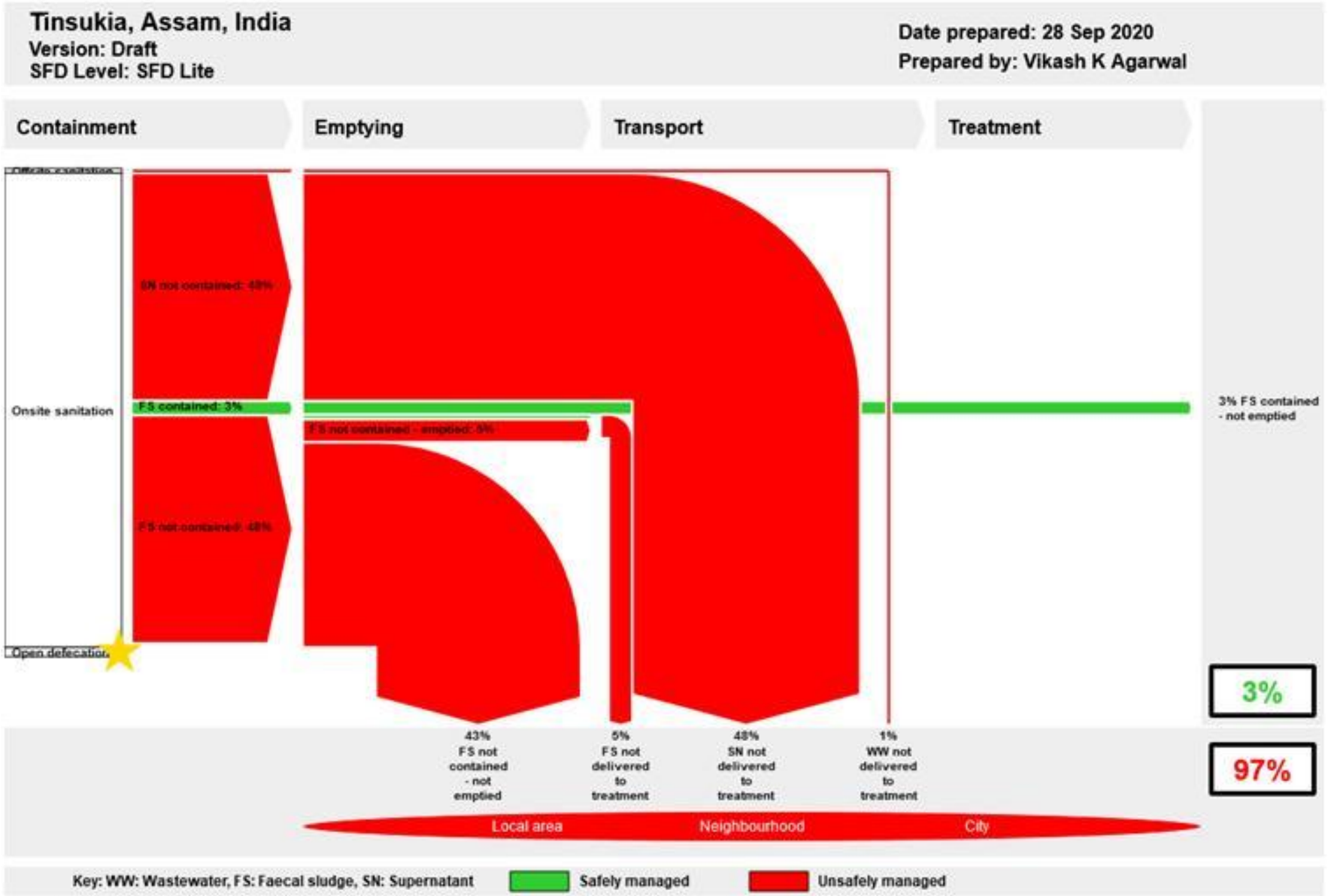
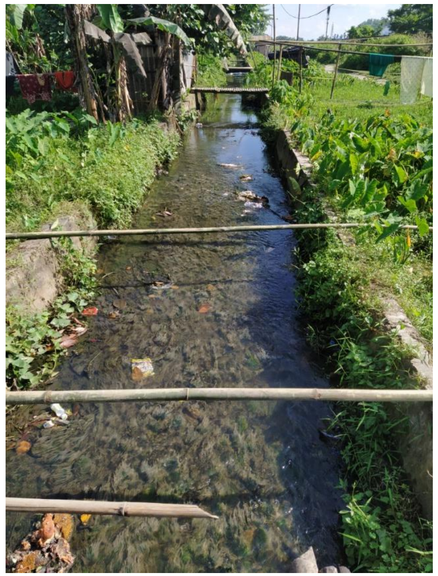
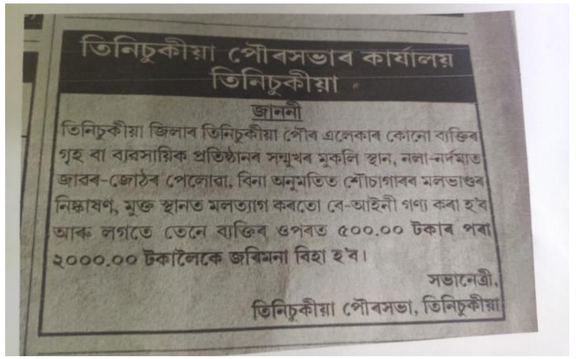
The SFD Graphic



The SFD Promotion Initiative recommends preparation of a report on the city context, the analysis carried out and data sources used to produce this graphic.
Full details on how to create an SFD Report are available at: sfd.susana.org





Septic Tank size			
L (in feet)	B (in feet)	D (in feet)	Chambers
10/12/14/18	6/8	6/8	3
6	4	8	3
12	4	6	3
8	5	6	3

The IMPACT of the SFD Lite Report

Introduction of Vacuum truck/Cesspool for emptying services on chargeable basis

Municipality and Private Vendors initiate discussion on Sewage Treatment Plant and Faecal Sludge Management Plant. ULB *floats tender* for the same. However, owing to COVID-19 situation and funds unavailability, the execution is postponed.

The Conservation:

Refurbishment of Sewage Treatment Plant (STP) of a housing society in Guwahati, Assam (India) August 2021

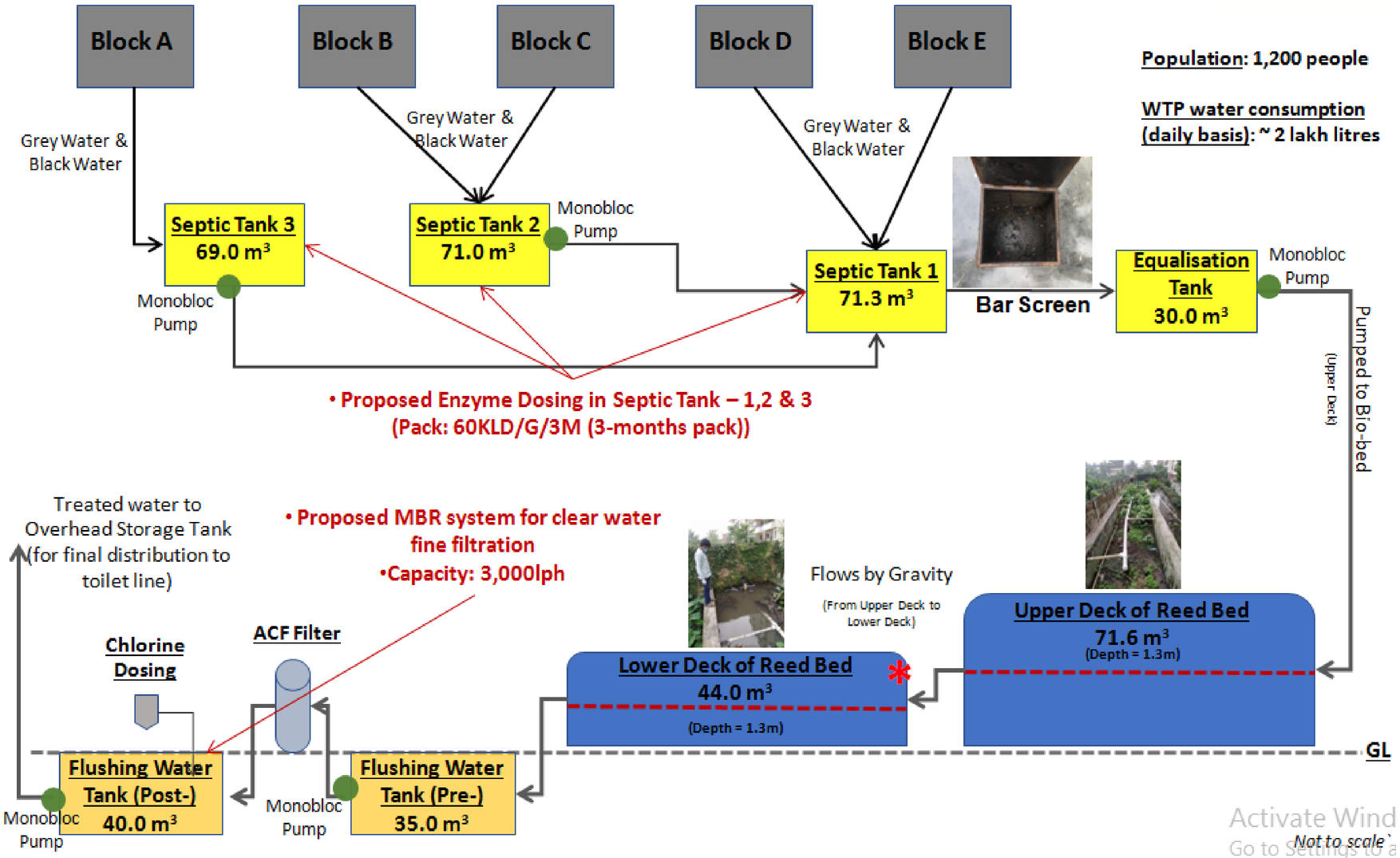
Based on Reed Bed Technology
(Nature-based Solutions)

Subham Elite, Guwahati (Assam) – STP Layout Drawing

DHARA BIOTECH

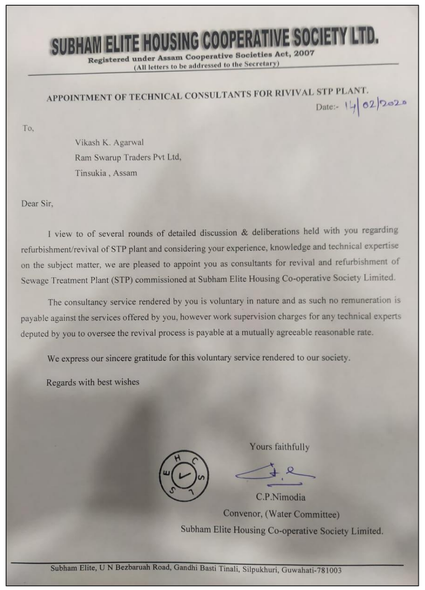
Subham Elite, Guwahati (Assam) – STP Layout Drawing

RSTPL



Population: 1,200 people

WTP water consumption (daily basis): ~ 2 lakh litres



SUBHAM ELITE HOUSING COOPERATIVE SOCIETY LTD.
Registered under Assam Cooperative Societies Act, 2007
(All letters to be addressed to the Secretary)

APPOINTMENT OF TECHNICAL CONSULTANTS FOR RIVIVAL STP PLANT.

Date: 14/02/2020

To,
Vikash K. Agarwal
Ram Swarup Traders Pvt Ltd,
Tinsukia , Assam

Dear Sir,

I view to of several rounds of detailed discussion & deliberations held with you regarding refurbishment/revival of STP plant and considering your experience, knowledge and technical expertise on the subject matter, we are pleased to appoint you as consultants for revival and refurbishment of Sewage Treatment Plant (STP) commissioned at Subham Elite Housing Co-operative Society Limited.

The consultancy service rendered by you is voluntary in nature and as such no remuneration is payable against the services offered by you, however work supervision charges for any technical experts deputed by you to oversee the revival process is payable at a mutually agreeable reasonable rate.

We express our sincere gratitude for this voluntary service rendered to our society.

Regards with best wishes

Yours faithfully

C.P.Nimodia
Convenor, (Water Committee)
Subham Elite Housing Co-operative Society Limited.

Subham Elite, U N Bezbaruah Road, Gandhi Basti Tinali, Silpukhuri, Guwahati-781003

For:
Subham Elite, Guwahati (Assam)

Date:
20 Jun 2021

Provided by:
RSTPL, Tinsukia (Assam)

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Status before Refurbishment (in pictures)

A. Top View: Upper Deck and Lower Deck

B. Lower Deck

C. Upper Deck

D. Pipeline distribution

E. Bed depth and Plant density

F. Broken pipes

G. Septic Tank

H. Septic Tank

I. Septic Tank

Given options

Sl. No.	DESCRIPTION	AMOUNT INR
01 SET	**Modification of Existing STP to 250 KLD**	
	Air Blowers – 02 Nos, Course Diffuser, Fine Linear Diffuser, MBBR Media, Clarifier Plates, Dosing Pumps with 200 L Plastic Tank – 04 Nos, Chemical Mixing Agitators- - 02 Nos, Sludge Transfer Pump – 01 No, First charge of Culture Media, Pipework & Valves within the STP Limits, MGF Filter Media, Operating Electrical Panel, Designing & Engineer Supervision for the modification Job of the STP [Details as above]	16,65,000.00
	Rupees Sixteen Lakhs Sixty Five Thousand only	

SR No	Item	Specification	Qty	Cost (Rs.)
1	MS MODULE CONSISTING OF a)AERATION TANK, b) TUBE SETTLER	5 mm MS with Epoxy coating inside, painted outside, with side and bottom Stiffners. Weight approx 9000kg	1	12,50000.00
2	Air Diffusers	Dome type Diffusers, PVC	80 nos	80,000.00
3	FMR Media	Floating PVC media	LOT	70,000.00
4	Tube Deck Media	Fixed PVC Media	LOT	2,58,000.00
5	Air Blower+ Motors	250 CFM, 5 psi Make:NGI/Beta/HGN/AIRVAC	1 Working+1 Standby	5,50000.00
6	Pipe and Fittings for Aeration tank and blower	PVC/MS	LOT	80,000.00
7	Erection Commissioning		LOT	150,000.00
	TOTAL			**24,38,000.00**

S.No.	Particulars	Amount
1.	Price for Daily Operation Contract on monthly basis a.) *Manpower Services (Annexure I)(3 manpower+ I reliever + monthly visit of Site Engineer 1 times)*	90000.00
	b). *Bio Culture per month* As per above table	79600.00
	Total	**169600 /-p.m.+ GST as applicable**

Sr. No.	Description	Qty.	Amount (INR)
1	Design, Supply, Erection & Commissioning of 220 m3/day capacity sewage treatment plant as per details enclosed with offer (Based on SBR Technology)	01	24,50,000/-
2.	Errectioning and Commissioning	01	80,000/-

Observation before Refurbishment undertaken

- Both Black and Grey water are treated in the STP
- Waste water test reports:

#	Parameters	Septic Tank 1 (Final collection pre-treatment)	Post Upper Deck of Reed Bed	Treated Water
1	pH	6.93	6.2	6.8
2	Total Solids	446	128	53
3	BoD	67.2	46.7	18.5
4	CoD	360	282	94
5	Oil & Grease	0 (?)	7.6	1.6

Note: Laboratory test reports

Observations:

- The required plantation and quality of plants (density-wise) on the Upper Deck and Lower Deck of Reed Bed is not adequate for secondary wastewater treatment to be processed
- Existing depth (of 0.5m) of the filter bed in Upper Deck and Lower Deck of Reed Bed is not sufficient for wastewater to be processed
- Pipeline and connections are broken at various places
- Hole in the distribution pipeline of size 10mm is big enough. It may result in water not reaching the end pipeline and pipeline distribution branches. Thereby not achieving the maximum efficiency required for secondary treatment
- Usage of chemicals like bleaching powder etc. have also taken a toll on the natural reed bed treatment efficiency
- Chlorine is dosed regularly
- Chlorinated water smells with chlorine although the final treated water appears to be clean but not colourless
- Residents do complain of receiving dirty water in the flush tanks
- The ACF is filled with sand, gravels and AC media
- The design requires **periodic de-sludging** as the Faecal matter and Oil & Grease collected needs to be emptied before it may become septic. There is no periodic de-sludging involved at the moment

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Post Refurbishment of STP: In pictures

Upper Deck

Lower Deck

Upper Deck & Lower Deck: Pipe Branches

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The Awareness:

Importance of Water Bodies.

India needs to conserve and value them

(Presentation to a social group, The Initiators)

(Tinsukia, Assam, India)

May, 2021

An effort to create awareness

What ultimately flows down the river is the result of a lot that happens outside the river

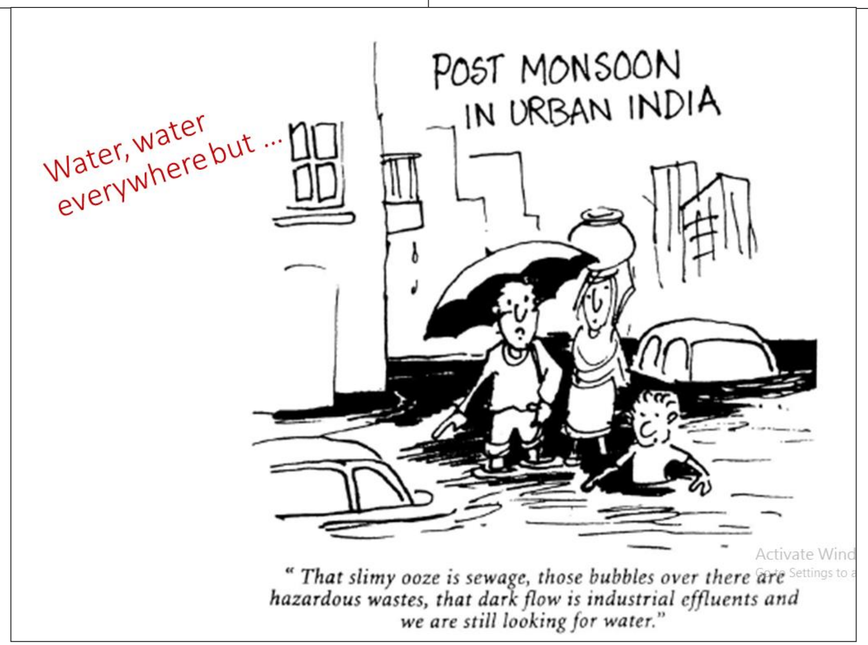
A Tale of Two Cities: Rome and Edo

What the ancient world can teach us?

State of Water Bodies

A lot of Delhi's sewage generated daily flows untreated into the Yamuna through rainwater drains, affecting the river's water quality that is two notches below normal bathing standards. HT PHOTO

Water bodies in Assam



Source(s):

- Centre for Science & Environment, New Delhi
- Publication of Cochin University of Science & Technology
- Encyclopedia of the History of Science, Technology, and Medicine in Non-Western Cultures, 2008
- The Sentinel, Assam

Learning & Outcomes

- Tinsukia ULB initiated talks to set-up STP & FSM plants; cesspool services introduced
- More housing societies see the benefit and economic of working with a nature-based WWTP
- Nature-based solutions designed with a focus on capex and opex
- Social groups willing to join hands for water management
- Talks initiated with couple of PSUs for Rain Water Harvesting
- Inspiration and motivation within to go for more training and refer people as well

Thank You!