ASSESSMENT OF LATEST TECHNOLOGICAL SOLUTIONS IN WASTEWATER TREATMENT

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INTRODUCTION

- *WATER CHALLENGES IN INDIA*
- *INCREASE IN URBAN POPULACE PROVED BENEFICIAL, SIMULTANEOUSLY REQUIRING APPLICATION OF MORE ROBUST STPs*
- *TILL DATE DIFFERENT TECHNOLOGIES BASED WASTEWATER TREATMENTS ASSESSED AT FULL SCALE LEVEL IN INDIA/ WORLD*
- *INTEGRAL ELEMENTS FOR THE DETERMINATION OF MOST SUITABLE TREATMENT FRAMEWORK ARE STILL OBSCURE*
- *COMPETENCE AND STATURE OF EACH PLANT VARIES WITH COST UTILISATION AND TECHNOLOGY ADOPTED*
- *FOCUS WAS PAID TO QUALITATIVE ASPECTS OF THE PLANTS*
- *OUTCOME OF THE STUDY PRESENTED UNDER PROJECT SARASWATI*

INTRODUCTION

- *EFFORT IS TO PROPOSE TREATMENT SYSTEM BASED ON AVALABLE RESOURCE OT THE USER*
- *THREE PLANTS TAKEN FOR CONSIDERATION*
  - *MBR AKSHARDHAM (DELHI)*
  - *SBR RISHIKESH (UK)*
  - *MBBR AT HYDERABAD (TELENGANA)*
- *ONE ANAEROBIC PACKAGE PLANT TAKEN AT ROORKEE (UTTRAKHAND)*

OBJECTIVE

- *PRESENT STUDY IS TO INVESTIGATE FOUR SEWAGE TREATMENT PLANTS IN THREE STATES IN INDIA USING A QUALITATIVE EVALUATION BASED APPROACH METHODOLOGY*
- *TECHNICAL PERFORMANCE WITH RESPECT TO WATER QUALITY CHARACTERISTICS*
- *PROPOSE PLANT SUITABLE FOR SPECIFIC REQUIREMENT NECESSITATING MINIMUM COST*
- *ANALYSE/ ASSESS O & M COSTS OF THESE PLANTS*

COMPARE MBR, SBR, MBBR & ASTF

	MBR	SBR	MBBR	ASTF
TECHNOLOGY	HAS BIOREACTOR WITH BIOMASS & SOLIDS SEPARATION BY MICROFILTRATION	FILL & DRAW REACTOR WITH MIXING IN BATCH REACTION & AERATION IN SAME TANK	MBBR ARE DYNAMIC, WATER PHASE FIXED FILM TREATMENT SYSTEMS	SEPTIC TANK + ANAEROBIC FILTER
MLSS (G/L)	8-10	3-5	5-6	20
PRODUCT WATER QUALITY	EXCELLENT	GOOD	VERY GOOD	NOT SATISFYING NORMS
TREATED EFFLUENT REUSE	INDUSTRIAL & COMMERCIAL	INDUSTRIAL	INDUSTRIAL & COMMERCIAL	NIL
MAINTENANCE	AERATION, MEMBRANE CLEANING AND REPLACEMENT	AERATION SYSTEM	EQUIPMENT MAINTENANCE	DESLUDGING
TYPE	INTERNAL & EXTERNAL	INTERMITTENT CYCLIC	INTERNAL	-
TERTIARY TREATMENT	NOT ESSENTIALLY REQUIRED	SOMETIMES REQUIRED	SOMETIMES REQUIRED	SECONDARY & TERTIARY

MBR AKSHARDHAM (DELHI)

SBR RISHIKESH

Raw Sewage

Receiving Chamber

Coarse Screen

Coarse Screen

Wet Well & Pumping House

Disposal

Centrifuge

Sludge Sump

NaOCl Dosing

C-Tech Basin

C-Tech Basin

Grit Chamber

Fine Screen

Fine Screen

Grit for Disposal

Screenings for Disposal

Chlorination Tank

Effluent

MBBR HYDERABAD

Influent

Screens

Equalisation Tank

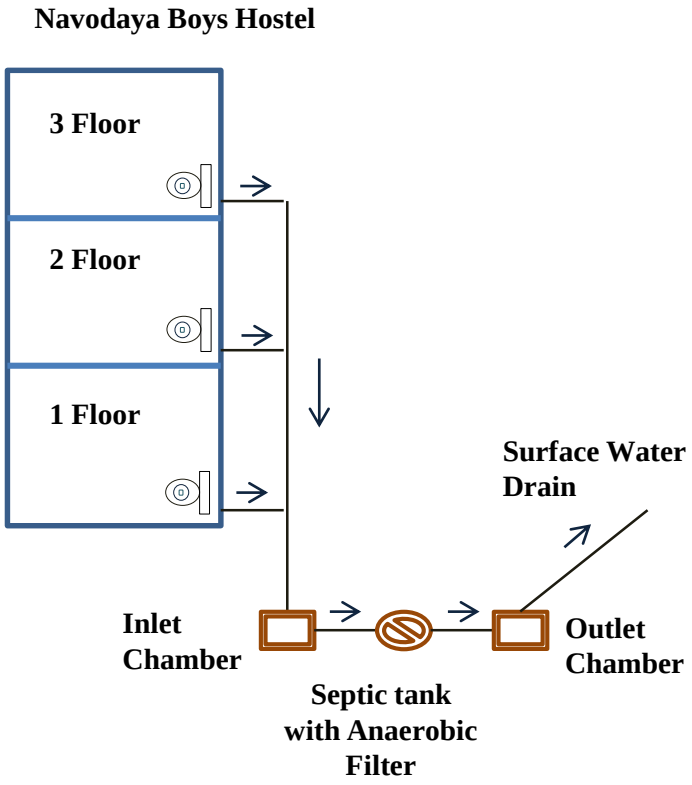
MBBR Tank

Disinfection

Effluent/ Treated Water

ASTF UTTRAKHAND

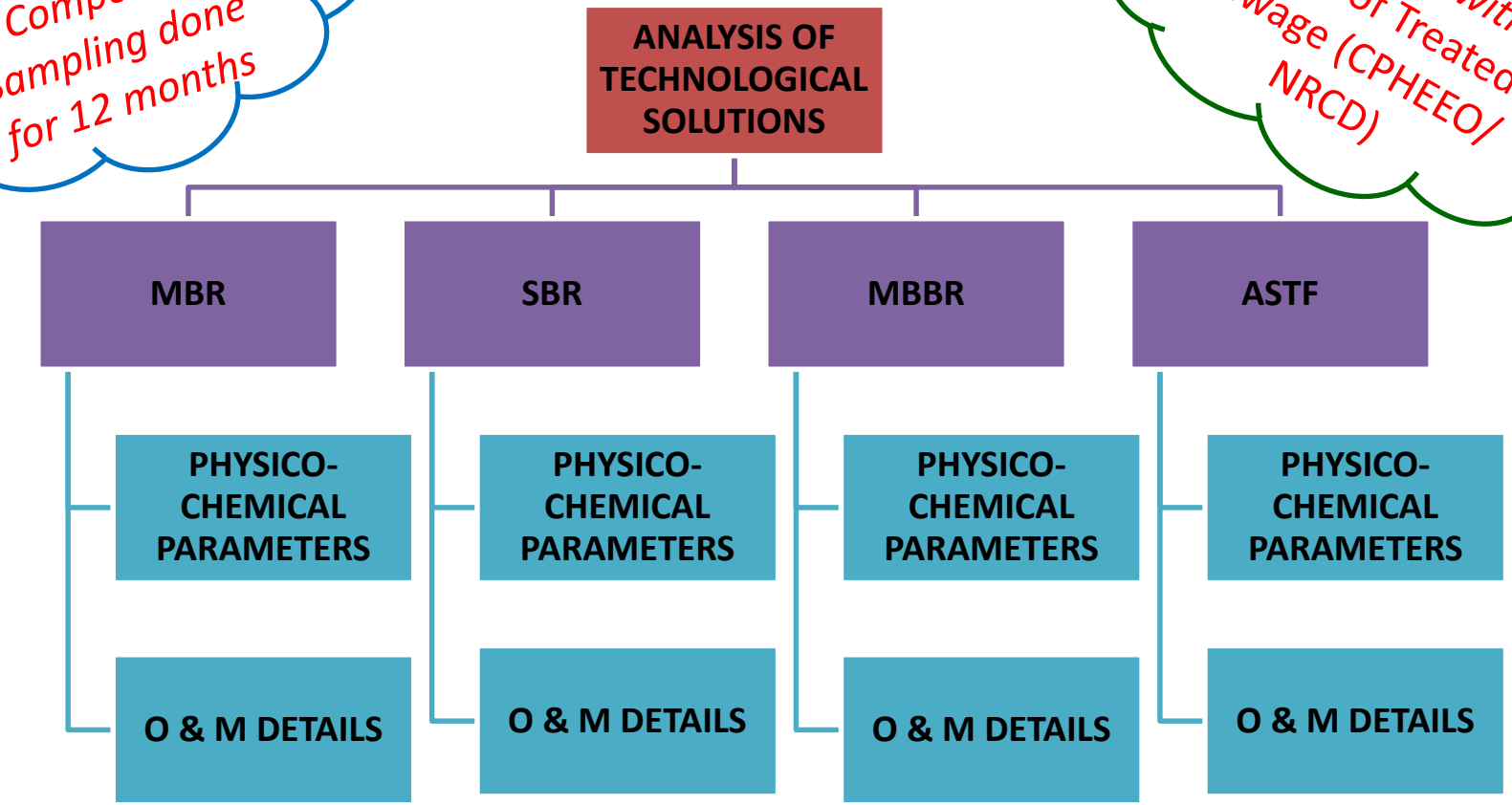
Raw Sewage → Septic Tank → Anaerobic Filter → Final Effluent



METHODOLOGY

Grab & Composite Sampling done for 12 months

Compared with norms of Treated sewage (CPHEEO/ NRCD)



O& M details ascertained & vetted

Min Power consumption per m^3found out

OBSERVATIONS

	LOC	PLANT CAPACITY (MLD)	AREA OF THE PLANT (SQM)	REMOVAL EFFICIENCY				
				BOD	COD	TSS	TN	FAECAL COLIFORM (LOG UNIT)
MBR	DELHI	4.5	2000	98%	96%	98%	84%	UPTO 5<6
SBR	UTTRAKHAND	3	700	93%	88%	92%	71%	UPTO 3<4
MBBR	TELANGANA	1	400	73%	66%	64%	59%	UPTO 2<3
PACKAGE	UTTRAKHAND	0.0005	~10	66%	62%	62%	36%	UPTO 1<2

INFERENCES

- *RESULTS OF GRAB SAMPLING & COMPOSITE SAMPLING FOR COD & TSS ARE ANALOGOUS, INDICATING FLUCTUATIONS IN LOADING OF PLANT DOES NOT ALTER OR AFFECT INDIVIDUAL CHEMICAL PARAMETERS*
- *CAPEX/ OPEX BASED ON REMOVAL EFFICIENCY*
- *USP OF PLANT "HIGH EFFECTIVENESS & SMALL FOOTPRINTS".*
- *LITTLE/ MINIMAL SLUDGE GENERATION.*
- *VERY LITTLE MAINTENANCE EXCEPT FOR MBR WHEREIN MEMBRANE REPLACEMENT COST IS HEAVY.*
- *COST OF TREATMENT OF THE MBR IS 5.5 Rs/M^3, SBR IS 4.6 Rs/M^3, MBBR IS 9.8 Rs/M^3.*
- *MBR BASED STP SHOWED THE BEST EFFLUENT QUALITY SYSTEM*
- *SBR BEST SUITED FOR PURPOSES WHEREIN INAUGURAL COST OF IMPLEMENTATION IS NOT SUBSTANTIAL (CAPACITY > 1 MLD)*
- *MBBR SUITABLE FOR SMALL SCALE TREATMENT (CAPACITY < 1 MLD)*

FURTHER RESEARCH

- *SUGGEST POST TREATMENT FOR TP/ TSS/ TURB REDUCTION TO MAXIMISE THE REUSE PRACTICES*
- *EXHAUSTIVE STUDY ON LAND REQUIREMENT VIS-A-VIS CAPITAL INVESTMENT*
- *MORE FIELD DATA ARE REQUIRED TO STANDARDISE THE SOCIO ECONOMIC ASPECTS IN SELECTION OF APPROPRIATE TECHNOLOGY FOR A PARTICULAR LOCATION*

THANKS