FAECAL SLUDGE AND SEPTAGE MANAGEMENT (FSSM) IN UTTAR PRADESH

Current Status and Future Pathways: Journey towards City-wide Inclusive Sanitation

REPORT FINDINGS & WAY FORWARD

July 29, 2022

PURPOSE OF THE REPORT

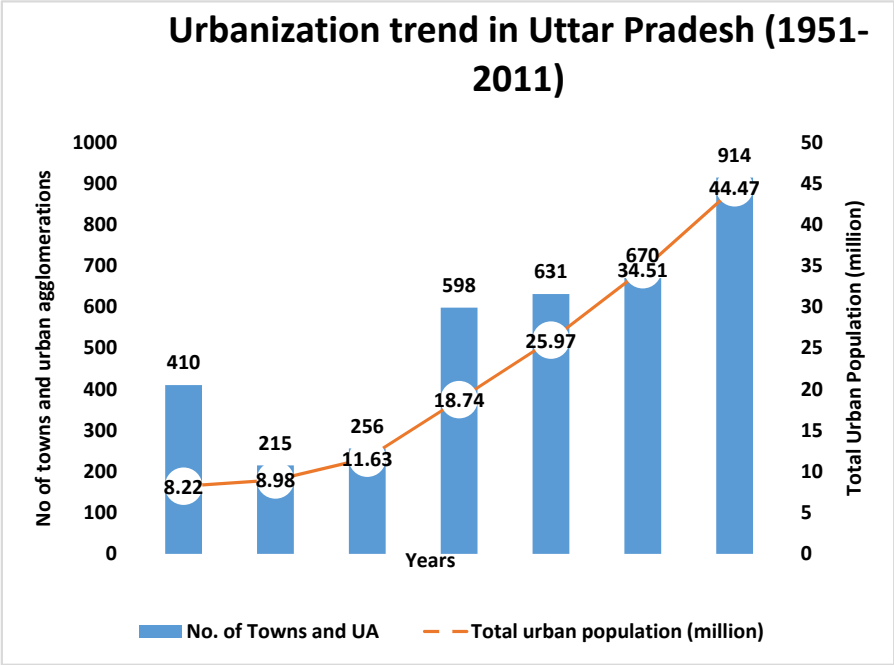
Septage Management is a pro poor inclusive urban sanitation outcome.

Uttar Pradesh has 62 FSTPs and Co-treatment plants, in various stages of construction and out of which 11 are now operational.

Purpose of the Report :

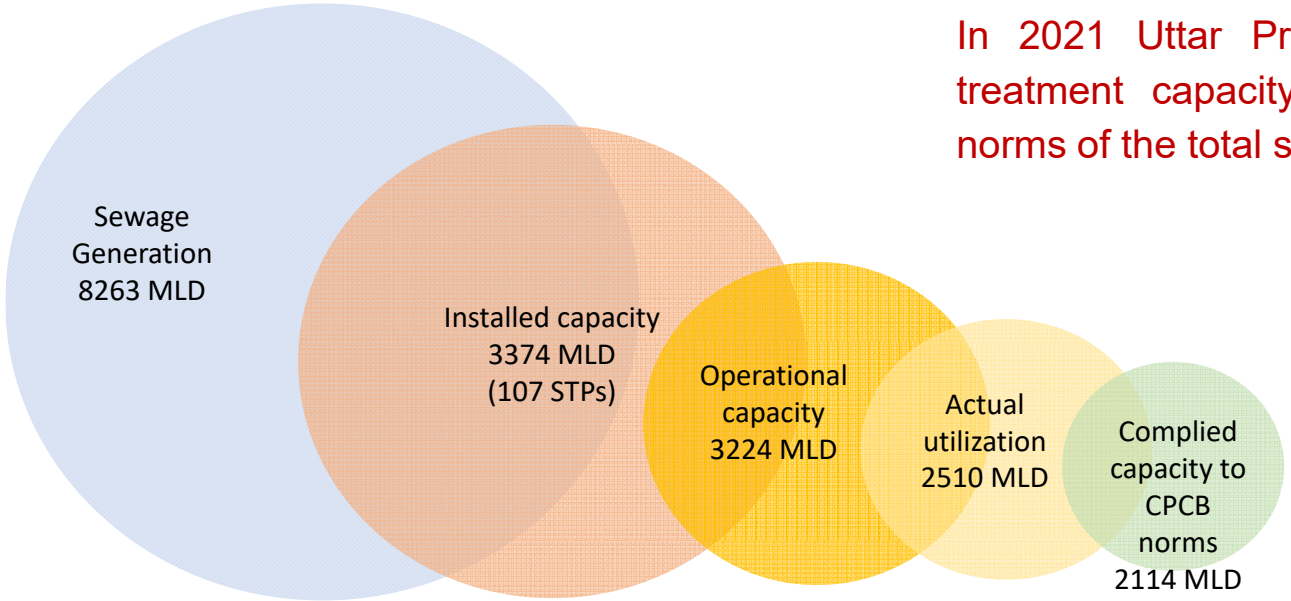
- Assess the status of UP's septage treatment infrastructure
- Identify emerging priorities for operationalisation of the plants
- Long-term upscaling and sustainability challenges

INTRODUCTION - Urbanisation



- Most populous state in India
- Population- 19.96 crore- Rural- 15.51 crore, Urban - 4.45 crore
- Estimation for 2021- 6.9% increase in the total population since 2011
- Urban centres (No of census towns and urban agglomerations) increased 123% from 1951 to 2011. In 2011, UP has 914 urban centres accounting for 22.27 per cent of the population.

INTRODUCTION – Sewerage and STPs

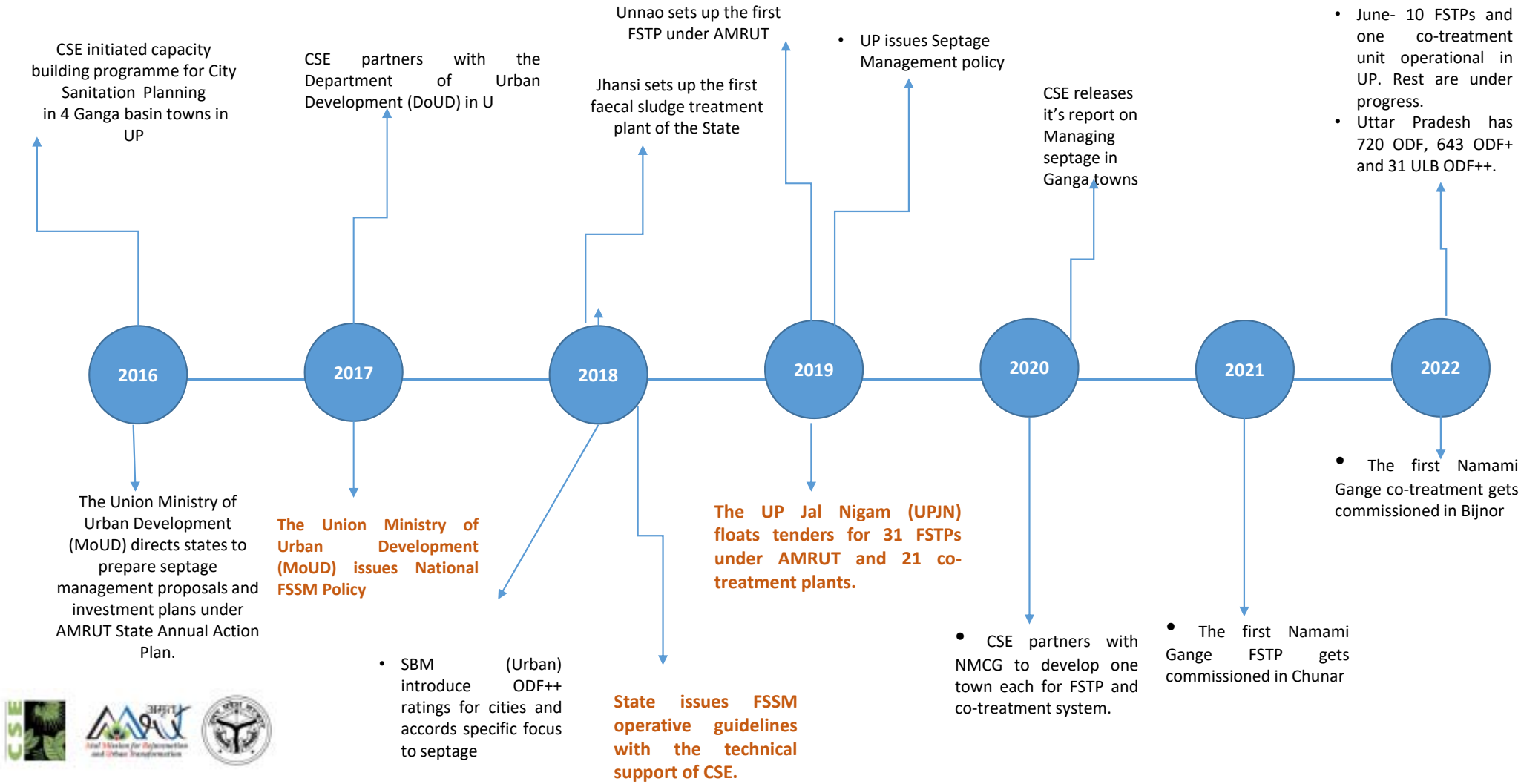


In 2021 Uttar Pradesh has only 25.5% sewage treatment capacity complying to CPCB discharge norms of the total sewage generated.

- Sewerage system- Only 20% of the urban areas
- Only 31 towns (out of 734 in the state) have partial coverage by sewerage systems (2021).

SC1

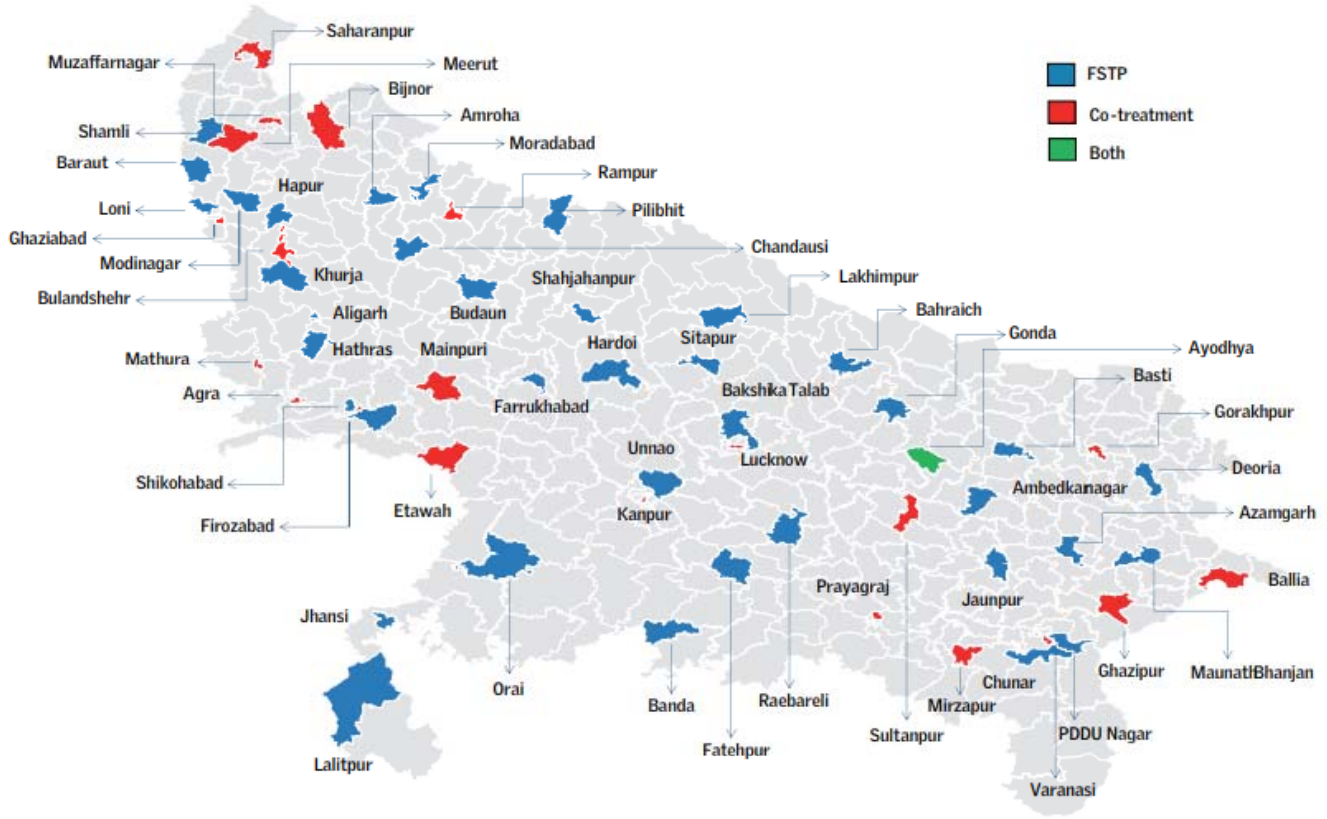
Journey of Septage Management in UP



Slide 5

SC1 This slide is clumsy. Need to reduce texts.
Subrata Chakraborty, 7/26/2022

FSSM PROJECTS IN UTTAR PRADESH



Source: Uttar Pradesh Jal Nigam

FSTPs- 40, CO-treatment Plants- 22, spread across 59 ULBs/towns, in 53 districts

SC2
SC3
SC4

Construction Status of FSTPs

0-20
AMRUT
PDDU Nagar, Maunath Bhanjan, Azamgarh

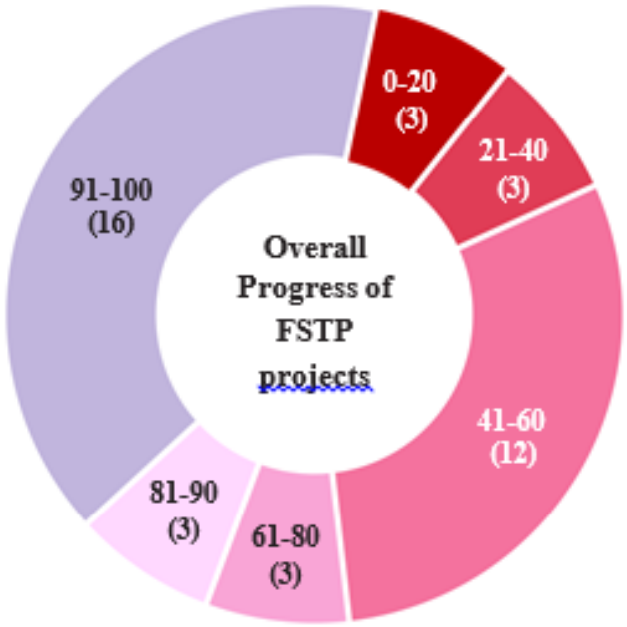
21-40
AMRUT
Banda, Shikohabad, Akbarpur

41-60
AMRUT
Jaunpur, Bahraich, Hardoi, Fatehpur, Khurja, Shamli, Jhansi, Lalitpur, Orai, Badaun, Chandausi, Deoria

61-80
AMRUT
Gonda, Farrukhabad, Basti

81-90
AMRUT
Pilbhit, Shahjahanpur, Baraut

91-100
ULB/15th FC
Jhansi (2), Bakshi ka talab
NMCG
Chunar
AMRUT
Unnao, Aligarh, Ayodhya, Moradabad, Hathras, Hapur, Amroha, Sitapur, Loni, Modinagar, Lakhimpur, Raebareli



Source: CSE assessment

Out of 40 FSTPs, 16 indicate a progress between 91-100 percentage points, while 21 FSTPS have shown an over 60 per cent progress.

Slide 7

SC2 In the headline, State will be state.
Subrata Chakraborty, 7/26/2022

SC3 It is not clear that the % es are related to physical progress
Subrata Chakraborty, 7/26/2022

SC4 Small % es on the left of the pie need to cut from the image and % es need to be put separately for better visibility
Subrata Chakraborty, 7/26/2022

SC5

Construction status of Co-treatment Plants

0-20
AMRUT
Ghazipur, Balia, Bulandshahr

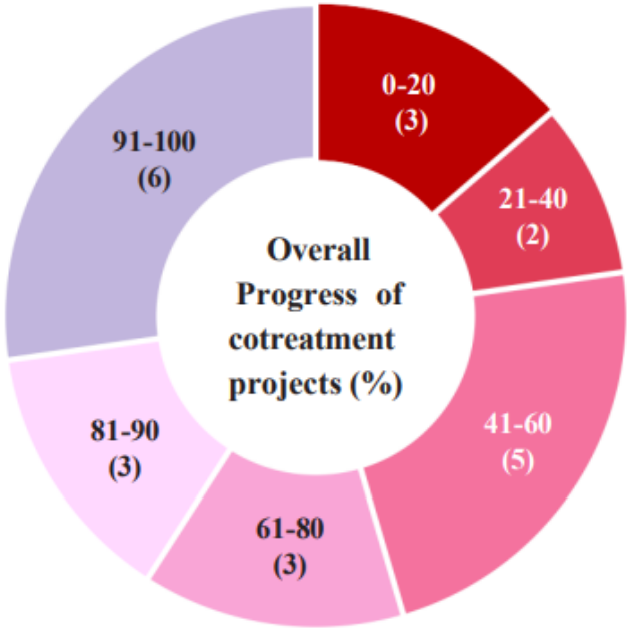
21-40
AMRUT
Etawah, Gorakhpur

41-60
AMRUT
Varanasi, Meerut, Lucknow, Agra, Prayagraj

61-80
AMRUT
Firozabad, Muzzafarnagar, Sultanpur

81-90
AMRUT
Saharanpur, Mainpuri, Ghaziabad

91-100
NMCG
Bijnor
AMRUT
Ayodhya, Rampur, Mathura, Mirzapur, Kanpur



Source: CSE assessment

Out of the 22 co-treatment plants, six have progressed to a 91-100 per cent completion stage, while 12 indicate a more than 60 per cent progress.

Concerted effort can operationalize at least 16 FSTPs and six Co-treatment plants very soon.

Slide 8

SC5 Same comments as previous slides
Subrata Chakraborty, 7/26/2022

SC6

Tendering

AMRUT

- Phase 1- 6 FSTPs (Mechanised treatment systems)
- Phase 2- 25 FSTPs (Open Technology)
- Individual ULB tenders- 5 FSTPs
- Co-treatment Plants- 21

ULB

- 3 FSTPs

NMCG

- 1 FSTP
- 1 Co-treatment plant

Slide 9

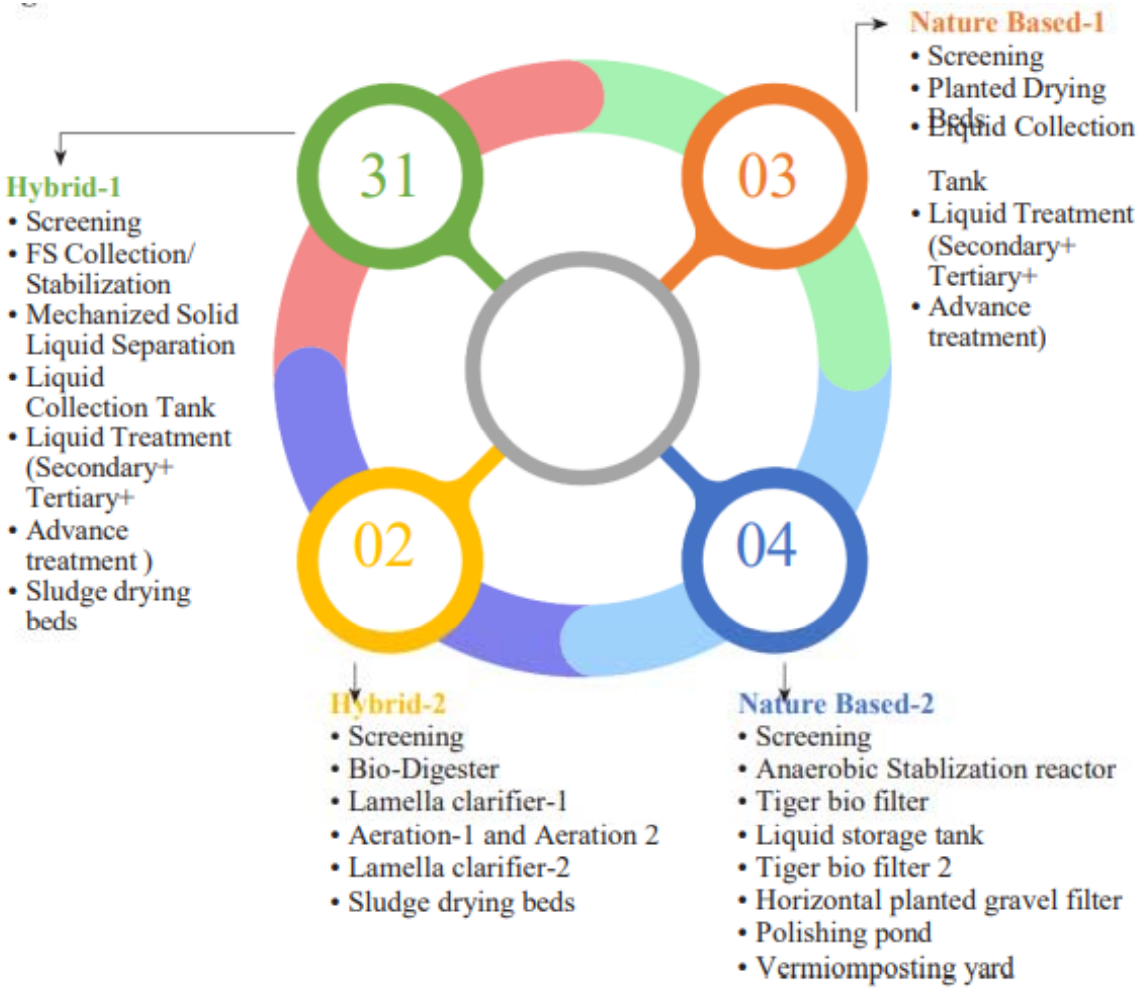
SC6 The content is more of funding source rather than the tendering process. So the heading may change.
Subrata Chakraborty, 7/26/2022

Treatment System Chains : FSTPs

SC7

Hybrid mechanical

Nature Based



Slide 10

SC7 Nature based 1 - 3rd bullet..some issue to read it properly.
Subrata Chakraborty, 7/26/2022

SC9

Investment in septage treatment infrastructure

Total investment : Rs 220 crore

Std capacity of FSTP : 32 KLD

Std capacity of Co-Tmt : 100KLD

Table 1: Investment in FSTPs

Funding source	Total FSTPs (numbers)	Total capacity (KLD)	Total cost (Rs crore)
AMRUT	36	1152	181.55
ULB	3	43	6.09
NMCG	1	10	2.70

Table 2: Investment in co-treatment plants

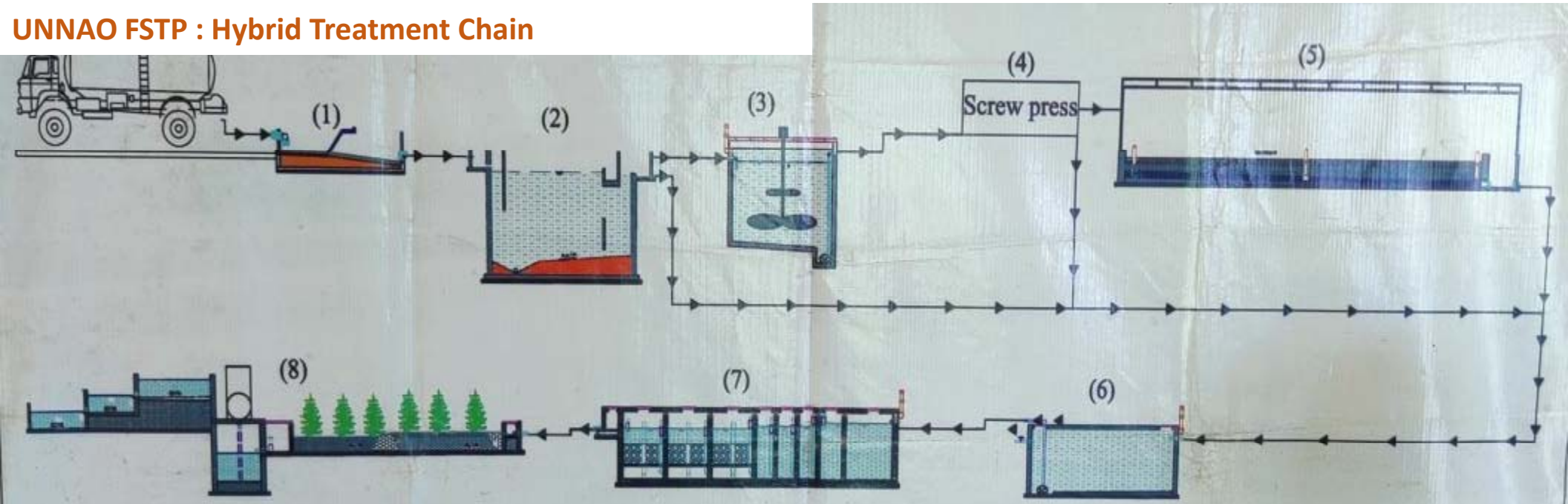
Funding source	Total plants (numbers)	Total capacity (KLD)	Total cost (Rs crore)
AMRUT	21	850	30
NMCG	1	20	0.4

Source: CSE analysis based on UPJN data

Slide 11

SC9 A nice graph would have been great..
Subrata Chakraborty, 7/26/2022

UNNAO FSTP : Hybrid Treatment Chain



SN	Components	Description
1	Integrated Screen & Grit Chamber	This is provided in order to remove the foreign particles present in sludge such as plastic and metal pieces etc. Grit chamber shall remove the silt and other heavy inert particles which may affect downstream treatment processes.
2	Thickening Tank	This is the primary treatment unit in the process, this shall primarily assist in solid liquid separation and sludge thickening by gravity. In addition, there shall also be some anaerobic digestion in the sludge retention zone leading to stabilization of sludge
3	Stabilization Reactor	The thickened sludge is digester anaerobically in a low rate mixer reactor. This shall not only stabilize the sludge, thereby reducing its organic pollution, but shall also increase its dewatering ability.
4	Screw Press	This is used to dewater the stabilized sludge by using mechanical means.
5	Un-Planted/Sludge Drying Bed	The dewatered sludge from screw press shall be dried in the beds to reduce the moisture content to desired levels of 50%
6	Equalization tank	This tank is used to homogenize the various liquid streams that is arising from dewatering and drying

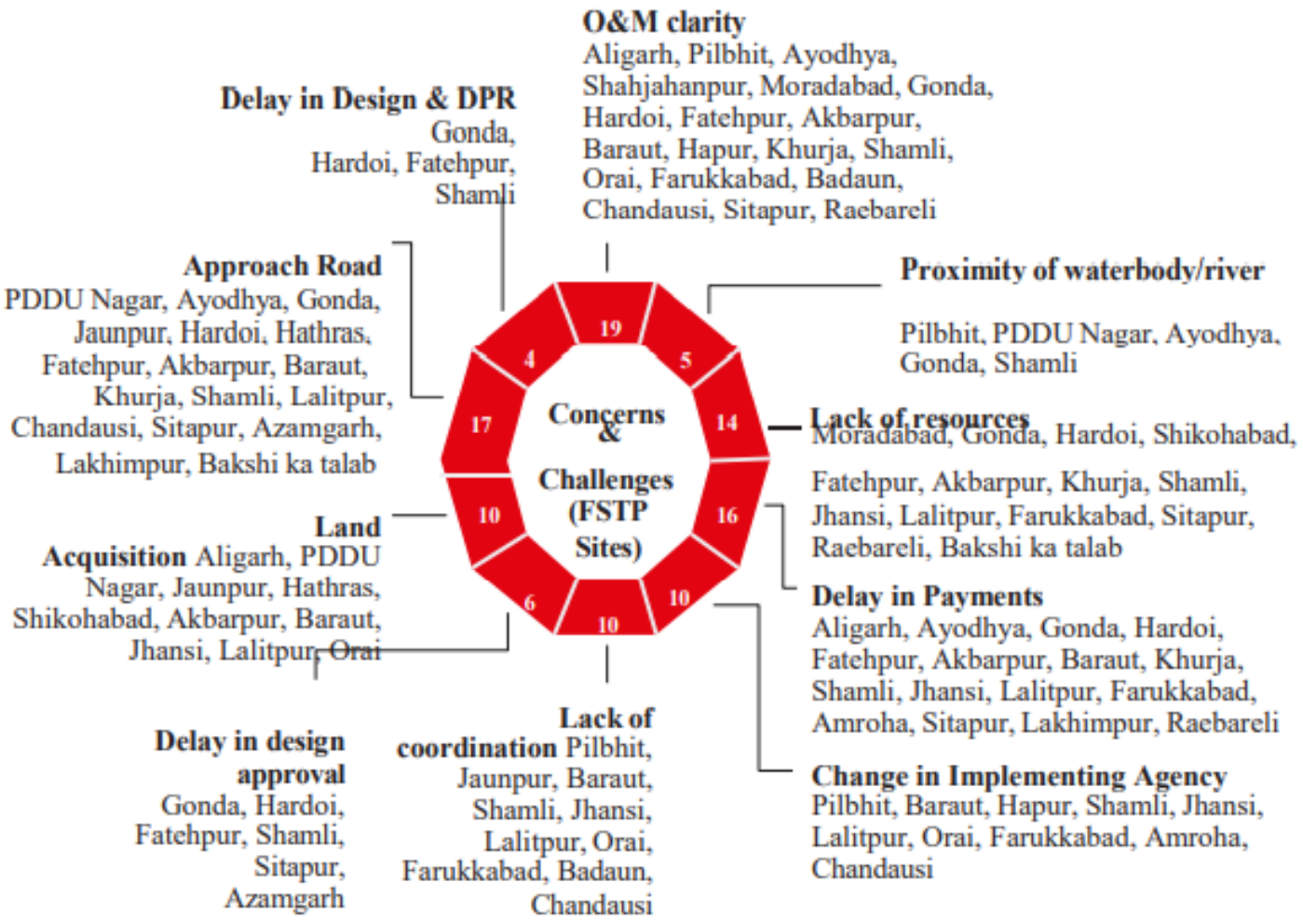
Mathura Co Treatment Plant : Mechanical Dewatering

Planted Drying Bed technology : Chunar

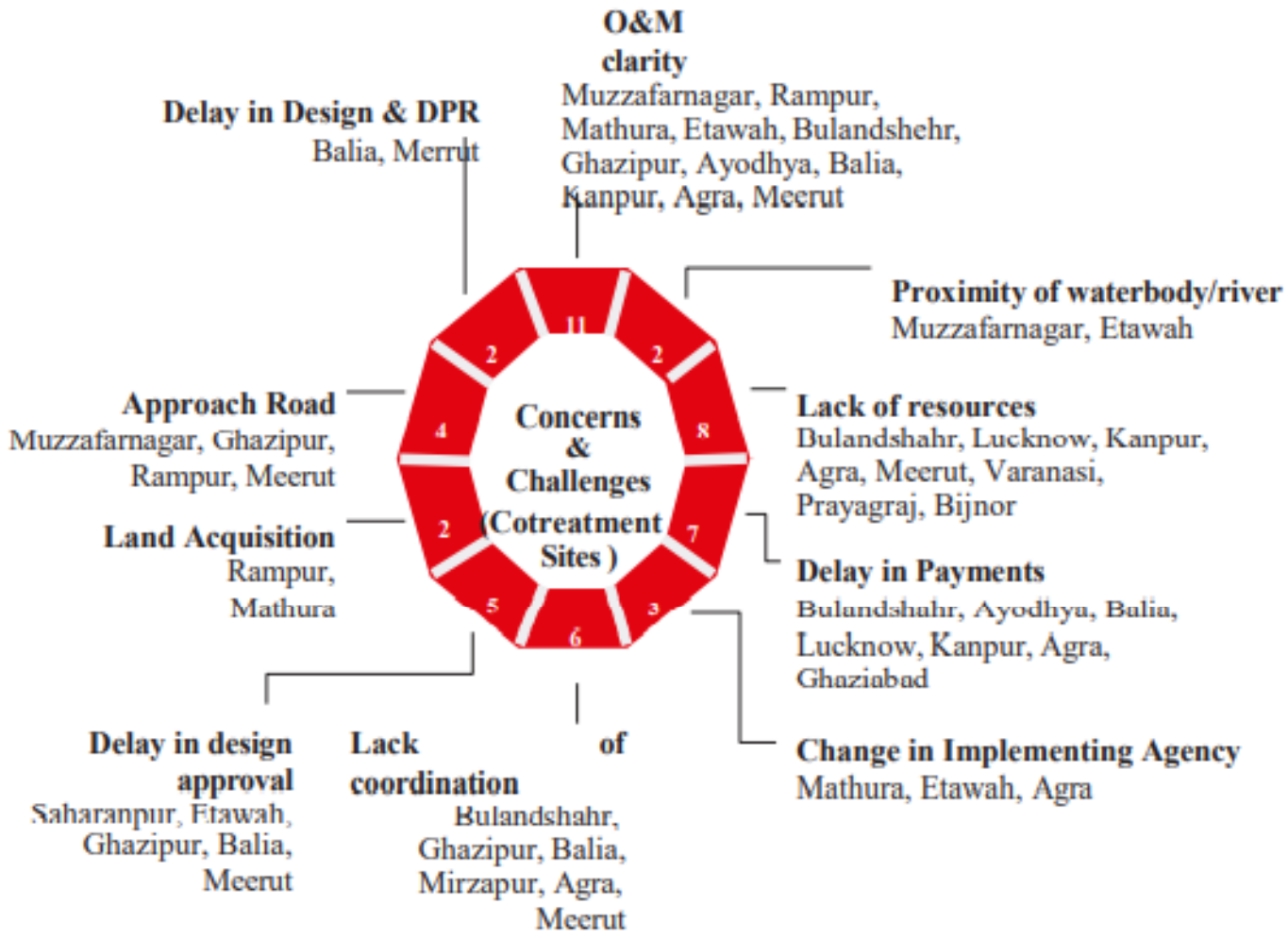
Pilibhit FSTP : Reed Bed technology

Automated plant : Ayodhya Reed Bed FSTP

FSTP : Infrastructure & O&M issues



Co-treatment : infrastructure & O&M issues



Way Forward : Making Treatment Plants OPERATIONAL

- **Treatment plants must receive faecal sludge and septage daily, in adequate quantity and quality.** These are primarily biological treatment systems — if the quantity, quality and frequency is not consistent, the treatment process will not work.

- **Mandate all institutions, government offices, private agencies, bus stands, offices and schools** to empty their septic tanks on a periodic basis, and send the sludge to the FSTP or co-treatment plant.

- **Incentivise households to empty their septic tanks** at a three year interval, by providing desludging services at a reduced fee.

- **Remove physical roadblocks for sludge to reach the FSTPs**, by ensuring access roads to the plants are clear and well-paved. New FSTPs should not be at a distance that makes septage desludging operations financially unviable for private operators.

Way Forward : Ensure Operations and Maintenance

O&M cost recovery is critical

- High Tanker Desludging fee of Rs 2,500 per household (that the plant operator is expected to recover from households) from 5000 households in a year.
- No other mechanism proposed : Property Tax, 15th Finance Commission sources, etc.

Enabling Advisories, Bye-Laws and Legislation at State and ULB level :

- Licensing of Private operators : annual registration fee should be kept low at low to enable desludging
- Penalty for indiscriminate desludging of septic tanks by tanker operators or public, at places other than FSTPS or STP co treatment facility
- Slowly introduce scheduled de sludging – 3 year compulsory zone wise cycle of emptying septic tanks across a town

Way Forward : Institutional Strengthening

A Septage Management Cell (SMC) at the state level, preferably as a part of the DoUD, for administrative coordination and support to ULBs for city wide inclusive sanitation :

- Inter Departmental/Program Coordination with AMRUT, NMCG, UPJN, SBM, CPCB and others.
- Coordinate the involvement of third party technically sound partners/ advisors for support and handholding during tendering — this can act as a bridge between the implementing agency and potential contractors.
- Facilitate roundtable meetings between stakeholders, raise and support valid concerns of contractors, and provide support to the implementing agency in resolving the concerns.
- Regular monitoring for quality control and quality assurance by the implementing agency/contractor under the supervision of a third party inspection agency. The third party inspection agency can flag potential technical issues and hazards during the construction phase.
- A regular monitoring framework and testing protocol for treated sludge and effluents can be developed after commissioning of the plant.
- Capacity building of officials on social issues of city wide inclusive sanitation, technology, awareness generations and campaigns coordination

Recommendations

Last mile challenge : physical connectivity of roads, final payments to contractors
O&M Cost Recovery by Private Operators is simplified, timely and assured payments based on work done
FSTPs get adequate faecal sludge and septage on a daily basis to become operational
A dedicated cell at DoUD level to support upscaling of and sustainable operations of septage treatment plants and co treatment infrastructure.
Enabling Policy(Advisories, Bye Laws and Legislation), Capacity Development and Behaviour Change awareness generation
Avoid indiscriminate combination of hybrid treatment chains for FSTPs.