Faecal Sludge Treatment Systems: Planning, technology, performance, economics and operations

26\textsuperscript{th} April 2023
Context for small scale FSTPs

- Small Towns
- Limited Financial Resources
- Poor capacities to plan, design, implement systems
- Limited understanding of Used Water Management in general and Faecal Sludge Treatment, more specifically
- Lack of skilled labour to take up maintenance of treatment systems
- Truck emptiers – who empty into drains/waterbodies/barren lands/ farm lands.
  - FSTP as an enabler for the emptiers.
Key Observations – Design Lens

**Inadequately designed screening chambers**

- Not taking into account the emptying rate from the trucks
- FS spills over
- Solid waste enters the drying beds

**Undersized drying beds**

- Compromised drying times
- Nightmare for operators in terms of sludge handling.
Key Observations – Design Lens

Planted Drying Beds are performing well
- Leh, Jhansi, Kumhari (Raipur), Amethi
- Able to hold sludge for longer, more ROI given the low O&M requirements

Drying times can be significantly improved
- *Using Polycarbonate roofs can reduce drying time by upto 50% in areas with average temperature of 25 Degree Celsius & above*
- *GI Roofs create conditions for moisture retention, slow down drying*
- *For new FSTPs, this approach can reduce area required while keeping the costs same*

Homogenization helps in better drying - *Observed in all FSTPs with stabilization reactor*

No Odour & Good Aesthetics are important for Operator satisfaction, Community buy-in
Key Observations – Operations Lens

**Simple Operation and Maintenance tasks** Go a long way in ensuring sustainability

- Well run FSTPs across the country have kept it simple
- Operators know what they are doing

**Irregular cleaning of screening chambers**

- Leading to Solid waste accumulation in the drying beds
- Have to be cleaned manually
- FS Spilling over

**Sludge loading onto drying beds**

- For Unplanted drying beds it is about 20-25 cm, however it is observed that operators tend to overload beds. Results in reduced drying times, uneven utilization of beds.
- For Planted Drying Beds – the recommended sequence is not adequately followed
- With low utilization, loading upto 20cm will suffice and also enable better drying
Key Observations – Macro – can do better

**FSTPs oversized?**
- SAR estimates from CPHEEO are 2.5 times more than our field observations leading to higher design capacities
- *FS continues to be dumped into open environment – need for more incentives to truck operators*

**Reuse has not been thought through**
- *Sludge stacked up*
- If farmers are the end consumers – there has been very limited/no engagement with them.
- *Successful case studies – Like Devanahalli, have invested hundreds of hours into farmer engagement and trials.*
- To what extent can standards enable these? How far are we?

**Delayed payments to the operators**

**Poor quality of construction**
- Limited capacities of contractors
- Extensive handholding required
Key Observations – Macro – can do better

Non Treatment Modules and Political Economy Considerations (big ticket items) are driving up costs

Non adherence to standard HRT, retention times saves cost but compromises performance and sustainability