

Septage Co-treatment in UP: Potential, Practice and Prospects

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What is co-treatment

- Co-treatment is the scientific treatment of septage at an existing STP
- Two ways of co-treating
 - Co-treatment in existing STP's liquid stream – after a screening and grit removal process, septage is added to the sewage for treating
 - Co-treatment in existing STP's sludge stream – the liquid and solid components of septage are separated. Liquid component is added to sewage stream and dewatered septage sludge to the sludge arising from treatment of sewage.
- Factors determining quantity of septage feasible for co-treatment:
 - spare capacity in existing STP
 - BOD / COD characteristics of sewage & sludge
 - Technology employed by the STP

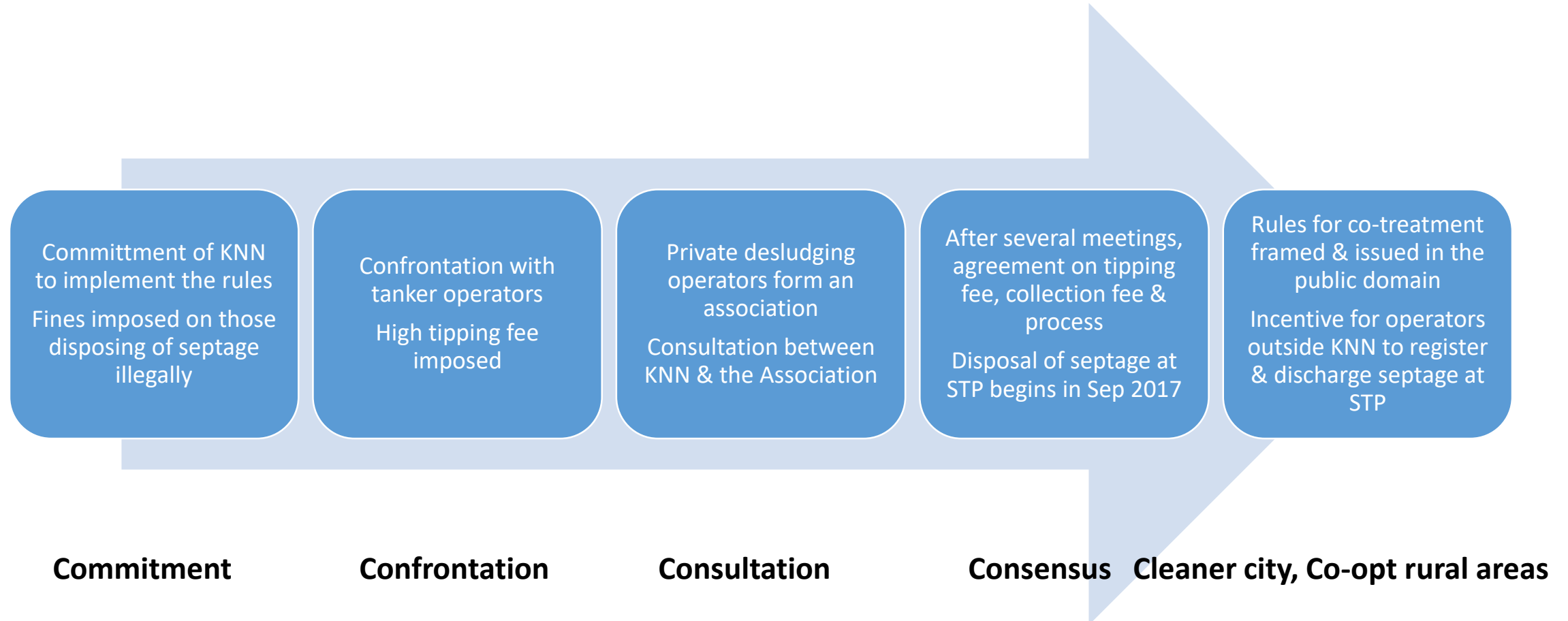
Why co-treatment

- STP capacity of ~25,000 MLD is either installed or under construction
- Only two-thirds of the installed STP capacity is utilized in India; about 75% in Uttar Pradesh
- Total co-treatment potential may be septage generated from 1.5 - 3 million households
- Low-cost option for treatment of septage
- Established practice at several STPs in India
- MoUD Guidelines suggest that co-treatment of septage along with domestic sewage at an STP, if available, is the most desirable option

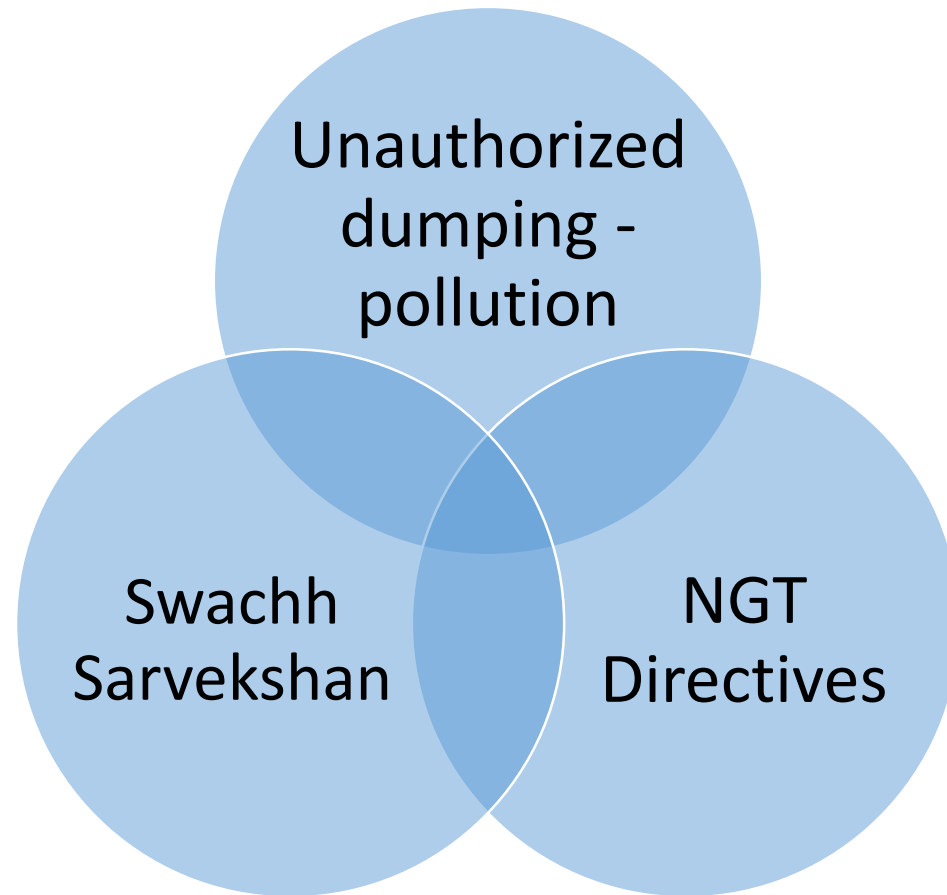
Key findings: Co-treatment potential in India

- **~400** cities and towns with STPs; average utilization of STPs ~66% (CPCB, 2013))
- **~2,200** cities and towns within a 30 km radius of these 400 cities with STPs
 - ~ 47 million Households (in 2017) reside in these 2,200 cities and towns
 - Account for ~50% of total urban households in India
 - ~37% of the HHs (~17.5 million) in these urban areas are connected to septic tanks
- Existing unutilized capacity at STPs can be used for co-treatment
 - Can serve upto 3.3 million HHs (~20% of HHs on septic tanks) from the urban areas around STPs
- 44 cities have co-treatment potential to meet 100% of septage generated

Kanpur case study on co-treatment governance process



Drivers for co-treatment in Kanpur & Ghaziabad



Kanpur – Bingawan STP

- 210 MLD, UASB Reactor
- Receiving station created – INR 8 lakh
- Registration charge INR 1000; monthly tipping fee INR 3500 – 21 trucks
- Up to 1 lakh HHs served by co-treatment
- Receives 60-80 truckloads of septage daily
- About 0.18 to 0.24 MLD of septage is blended with 80-90 MLD of sewage
- No operational challenges
- Slight improvement in BOD values of treated water



Ghaziabad – Indirapuram STP

- 56 MLD, Sequential Batch Reactor
- Decanting at existing Sewage Pumping Station and at STP directly; no special facility created
- Registration charge INR 2000; no tipping fee – 23 trucks
- Over 1 lakh HHs served by co-treatment
- Receives about 60 truckloads of septage daily
- About 0.32 MLD of septage is blended with 50 MLD of sewage
- No operational challenges
- No records maintained
- No significant impact on effluent quality
- Backflow from nearby STPs in the outlet area?

Decanting Station at Mohan Nagar SPS



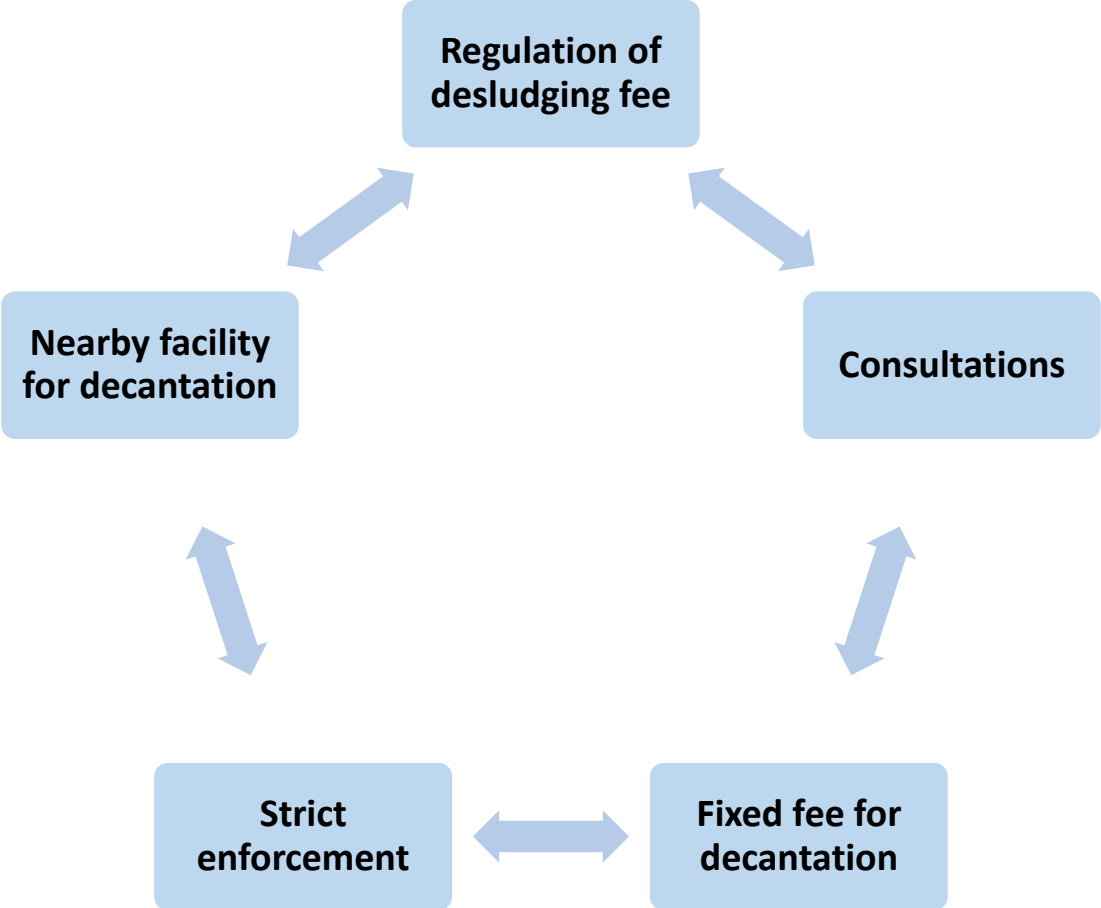
Co-treatment: *Theory and practice*

- Reported quality of septage varies significantly
 - Pollution strength of septage is considerably lesser in many samples analyzed by researchers (Chennai, Bangladesh)
- Plants co-treating septage in India able to accept and accommodate higher quantities of septage (than theoretical estimates), without significant impacts on plant performance and effluent quality

Plant	Theoretical estimate for septage addition (% of sewage flow)	Actual addition (% of sewage flow)	Number of truckloads discharged at plant
Kanpur (Bingawan)	1.4%	0.3%	80
Ghaziabad (Indirapuram)	0.14%	0.8%	58
Chennai (Nesapakkam)	0.32%	2%	200
Goa (Tonca)	0.27%	4.8%	120

- This may be due to weaker strength of septage from
 - More frequent emptying
 - Different design of septic tanks (holding tanks / one chamber)
 - Septage from institutions such as hotels

Why co-treatment worked in Kanpur & Ghaziabad



Future directions

- Better recording keeping at decanting stations
- Checking for industrial waste (random or regular analysis)
- Personal protective equipment for desludging workers
- Consultations and process to include septage from nearby rural areas for co-treatment
- If high septage flows, then installation of primary settling tank for primary treatment of septage to reduce pollution load