

October 2019

Concept Note:

Improvement in Sanitation and
Public Health in Western
Prayagraj Nagar Nigam and Peri
Urban Areas



Centre for Science and Environment

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Background: Excreta and Wastewater Management

India has been declared Open Defecation Free in 2nd October 2019 with construction of over 100 million toilets. However, efforts towards city-wide sanitation should not stop here. The excreta and wastewater generated from the toilets should be safely managed. Only 28% of urban population in the country was connected to a sewerage system as per 2011 census. Majority of the toilets are connected to onsite sanitation systems like septic tanks. Even though sewerage network has been constructed expeditiously in Prayagraj Nagar Nigam, pockets of non-sewered areas remain in Prayagraj Nagar Nigam and peri urban areas. The waste from these toilets would continue to pollute water bodies and would add to existing public health crisis.

Faecal Sludge and Septage Management:

In the absence of a sewerage system, Faecal Sludge and Septage (i.e. the waste from onsite sanitation system like septic tank) need to be safely managed. Safe Faecal Sludge and Septage Management (FSSM) includes safe containment of excreta in an onsite sanitation system, regularly emptying and transportation of Faecal Sludge and Septage to a Faecal Sludge Treatment Plant (FSTP). A National Faecal Sludge and Septage Management Policy was notified in 2017.





Septic Tanks need to be regularly emptied with proper safety gear.



Faecal Sludge needs to be disposed in a Faecal Sludge Treatment Plant to avoid contamination of water bodies

Greywater Water Management:

Greywater Management i.e. the water from bathroom and kitchen, is an important issue that needs to be addressed in non-sewered areas. Greywater is a pollutant for waterbodies and is a public health concern since it is a breeding ground for mosquitoes. Solutions like simplified sewers connected to decentralized wastewater treatment are available which needs mainstreaming.

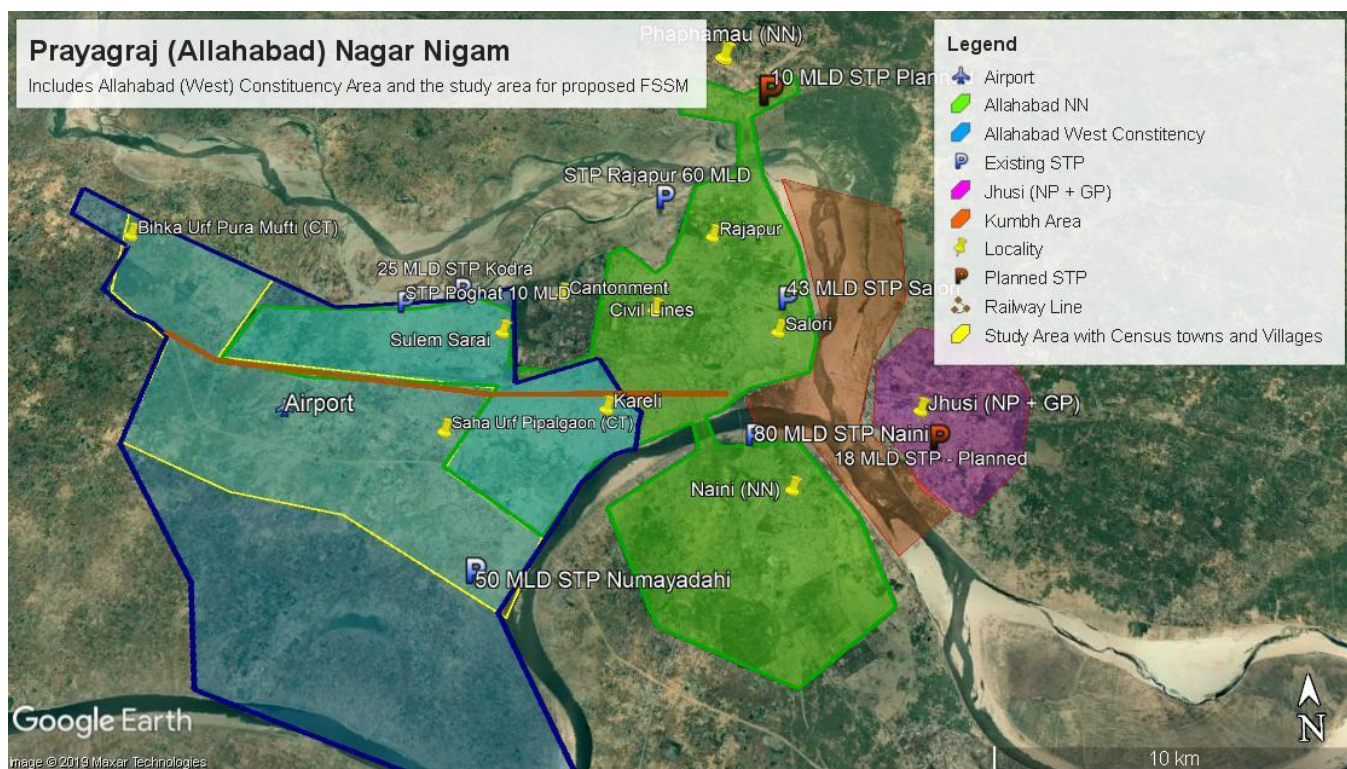
	
<p>Greywater from households discharged in open drains is a breeding ground for mosquitoes and contaminates water bodies</p>	<p>Simplified sewers can convey greywater to a decentralize treatment plant</p>

Prayagraj (West) Constituency Area

The Prayagraj (West) constituency consists for **western portion of Prayagraj Nagar Nigam and 2 no. Census Towns, cantonment board and 99 Villages** located in Prayagraj (Allahabad) Tehsil (Sub-District). The population breakup is given below:

Name	Population (in Lakhs)
Allahabad Nagar Nigam (approx. 1/3 rd)	3.87
2 No. Census Towns	0.20
1 No. Cantonment Board	0.27
99 No. Villages	1.8
Total	6.14

The constituency area is shown in the figure below **(coloured in blue)**.



There are 6 STPs are located in Prayagraj Nagar Nigam and 3 STPs proposed (includes STP proposed in Jhusi Nagar Panchayat). The Details are given below:

S No	STPs in Prayagraj	Capacity (MLD)
1	Naini (2 Units)	60 + 20 = 80
2	Rajapur	60
3	Salori (2 Units)	29+14 = 43
4	Kodra	25
5	Poghat	10
6	Numayadahi	50
7	Allahpur	11.62
	Total	279.62
1	Jhusi (Proposed)	18
2	Phaphamau (Proposed)	10
3	Naini (Propose)	35
	Total (Incl. proposed)	342.62

Out of the above, the STPs in Kodra, Poghat and Numayadahi is in Prayagraj (West) Constituency.

CSE Observations from Field Visits to Prayagraj (West):

CSE team undertook 2 visits to Prayagraj (Allahabad) Nagar Nigam to study the feasibility for interventions relating to FSSM in the study area as well as explore other interventions in the region as a whole (i.e. areas adjoining Prayagraj Nagar Nigam).

Objective of the Visits:

- Identifying non-sewered areas in the western Prayagraj Nagar Nigam and Peri-Urban areas.
- Studying the existing sanitation situation in non-sewered areas.
- Feasibility for various options for improvement of Public Health and Sanitation.

Observations and field visit:

- Sewerage network has been laid in 90% of the area and approximate 60% households have been connected in Prayagraj Nagar Nigam (including Jhusi NP). The laying of balance sewerage network and providing balance households connection is under progress. There are pockets of non-sewered areas within Prayagraj Nagar Nigam.
- Some non sewered localities in Prayagraj (West) include:
 - Khushwaha Basti of around 60 – 80 households unsewered because of approvals pending from Airforce Authority for excavation on the adjacent lane.
 - Umarpurniwa (Gram Panchayat – Peri Urban) with around 500 to 600 Households is located adjoining the Nagar Nigam. The Sewerage network is not possible here due to topography and the fact it is surrounded by Ganga and a large drain from 3 sides.
 - Census towns like Saha Urf Pipalgaon and Bihka Urf Pura Mufti do not have sewerage network.
- We visited 2 STPs i.e. Kodra and Numayadahi) located along the banks of Ganga and Yamuna respectively. Both were in shutdown since 18th August due the flooding due to rise in the level of the respective river.
- Majority of the households have connected the outlet of the septic tank to the sewerage network. These septic tanks would need to be emptied periodically.
- During interaction with Jal Kal Vibhag, it was informed that Prayagraj Nagar Nigam has 8 desludging vehicles. On an average they get 10 to 12 requests for emptying of septic tank in a month.
- During our interaction with private desludgers, it was found that the majority of the work comes from dewatering of flooded drains and other assignments from the Nagar Nigam. Emptying request from households is around 1-2 requests a month.
- In Rural Prayagraj, containment systems constructed at almost 25 to 30 feet deep which does not get emptied for 20 to 30 years. It is possible that they resort to manual scavenging.
- There were toilets observed in Saha Urf Pipal Gaon and Umarpurniwa which are connected to septic tanks which would need emptying (approx. 20 to 30% of the population have access to such toilets).

- Interaction with locals in Rural Prayagraj indicated that access to toilets are a concern, i.e. households do not have individual toilets or access to community/public toilets. Even households which had individual toilets, often its members practiced open defecation.
- Desludging of onsite containment units in villages and census towns near the Nagar Nigam boundary was carried by trucks belonging to UP Jal Nigam or private sector. However, the practice of desludging was very uncommon among households.
- Grey water discharged by the households flows through network of small and medium drains and ends up in the river Ganga and Yamuna at various outfalls. These drains often are filled with solid waste, blocking the flow and creating stagnation points. It is a common sight to see mosquitoes breeding, pigs and other rodents in and around such stagnated areas.

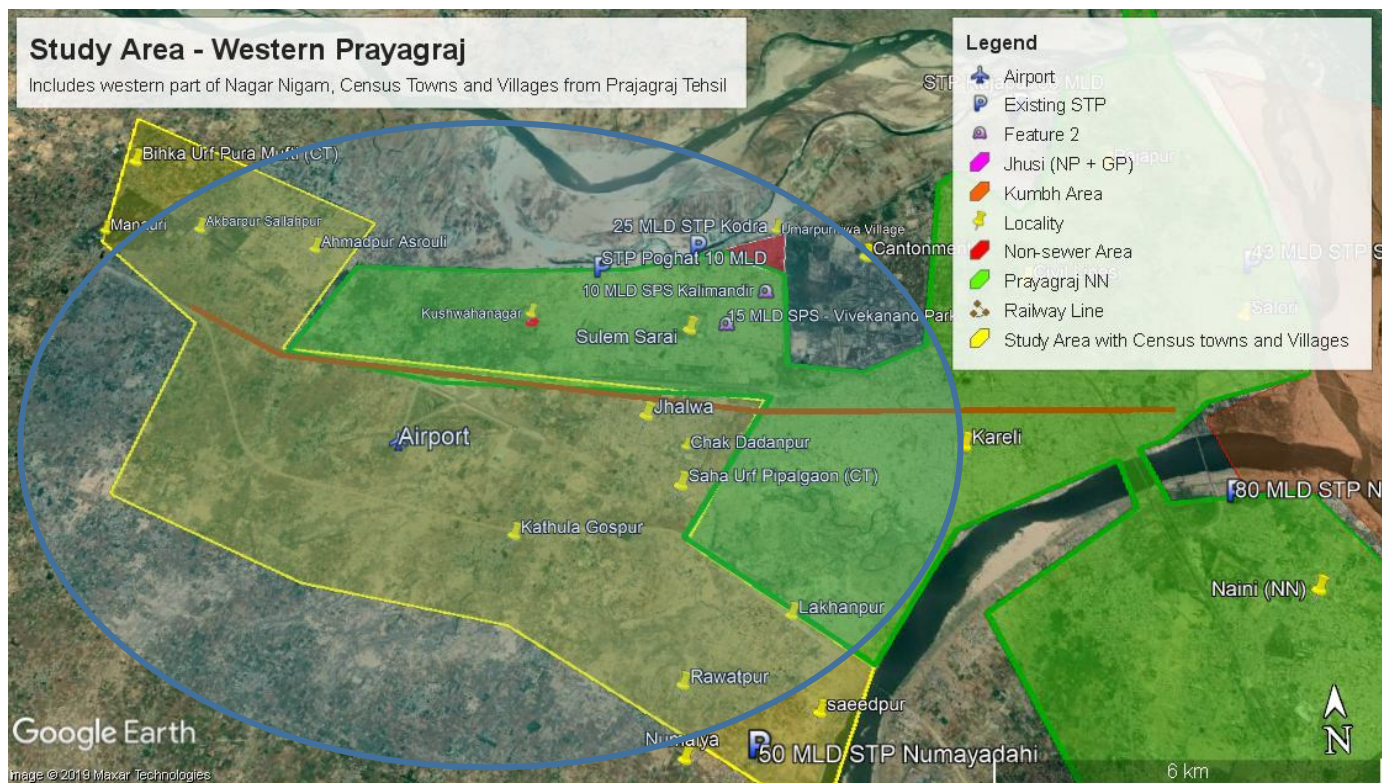
	
Saha Urf Pipalgaon (Census town) – septic tanks connected to open drains	Septic Tank outlet connected to sewerage system in Prayagraj Nagar Nigam Areas
	
Umarpurniwa – narrow lanes filled with wastewater	Umarpurniwa – septic tanks which would need emptying

	
Septic Tanks constructed below toilets – Khushwaha Basti	Umarpurniwa – septic tanks constructed below house not emptied for 10 years
	
Containment under construction in Karehada Village near Numayadahi STP (In Study Area). More than 25 feet deep. Emptying frequency more than 15 years	Wastewater (Grey + Black) from households contaminating local ponds

Study Area for proposed Public Health and Sanitation interventions

The study area for potential FSSM interventions include the western areas of Nagar Nigam which includes Sulem Saraim, Kareli etc, 2 census towns in the vicinity i.e. Saha Urf Pipalgaon and Bihka Urf Pura Mufti, and villages with 3-4 kilometers of the nagar nigam boundary with population in the range of 1000 to 5000. Some of these villages include Umarpurniwa, Kathula Gospur, Dadanpur, Akbarpur Sallahpur, Lakhanpur, Numaiya, Karaheda etc

The Study Area (i.e. Sulam Sarai & Kareli) shown in the map below (**Area beyond Nagar Nigam limits is coloured in yellow**).



Proposed interventions for improvement in Public Health and Sanitation:

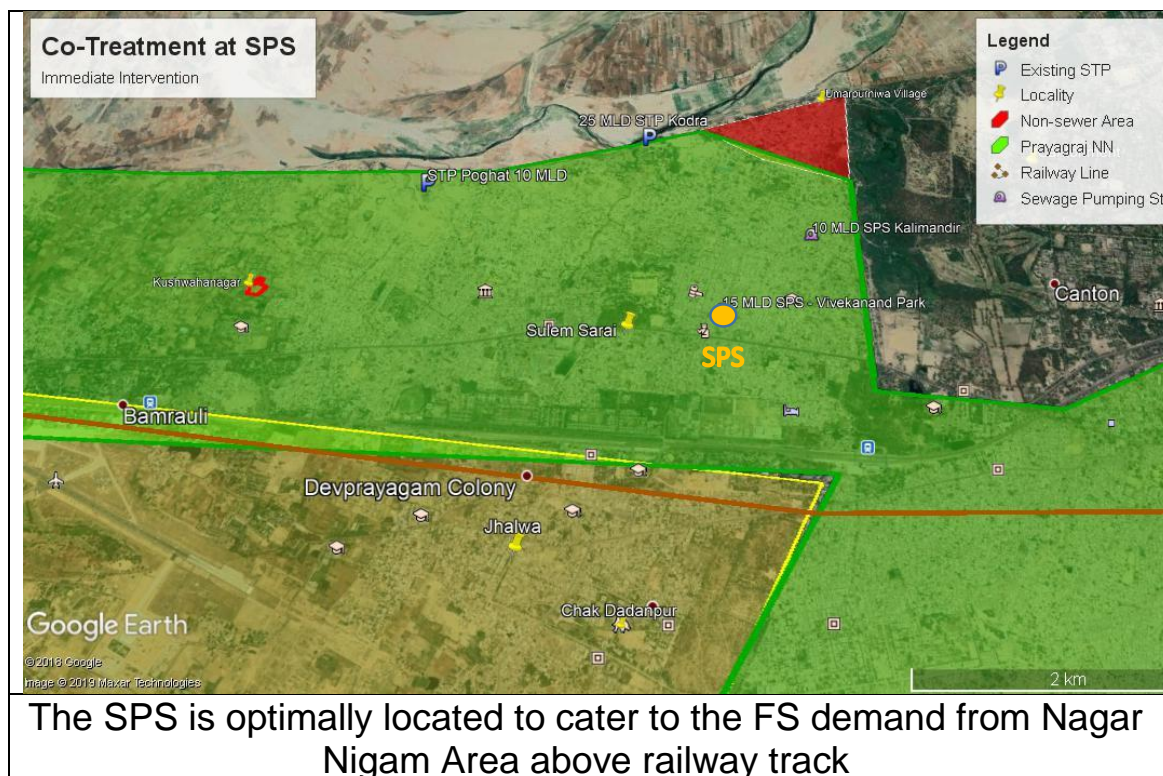
1) Co-Treatment at an SPS:

As an immediate intervention, in order to safely dispose the Faecal Sludge emptied from existing septic tanks in the Nagar Nigam Area, Co-Treatment can be done at Sewage Pumping Station at Vivekanand Park. A simple inlet pipe (receiving Station) can be constructed near the boundary wall and discharged at the Pumping Station Sump. The Pumping Station has a capacity of 15 MLD and can easily dilute 6 KLD or less Faecal Sludge from the tanker.

This Co-Treatment intervention can easily cater to the demand from Nagam Nigam above the railway track including areas like Sulem Sarai, Poghah, Transport Nagar, Kushwaha Basti as well as Umarpurniwa village (Gram Panchayat).



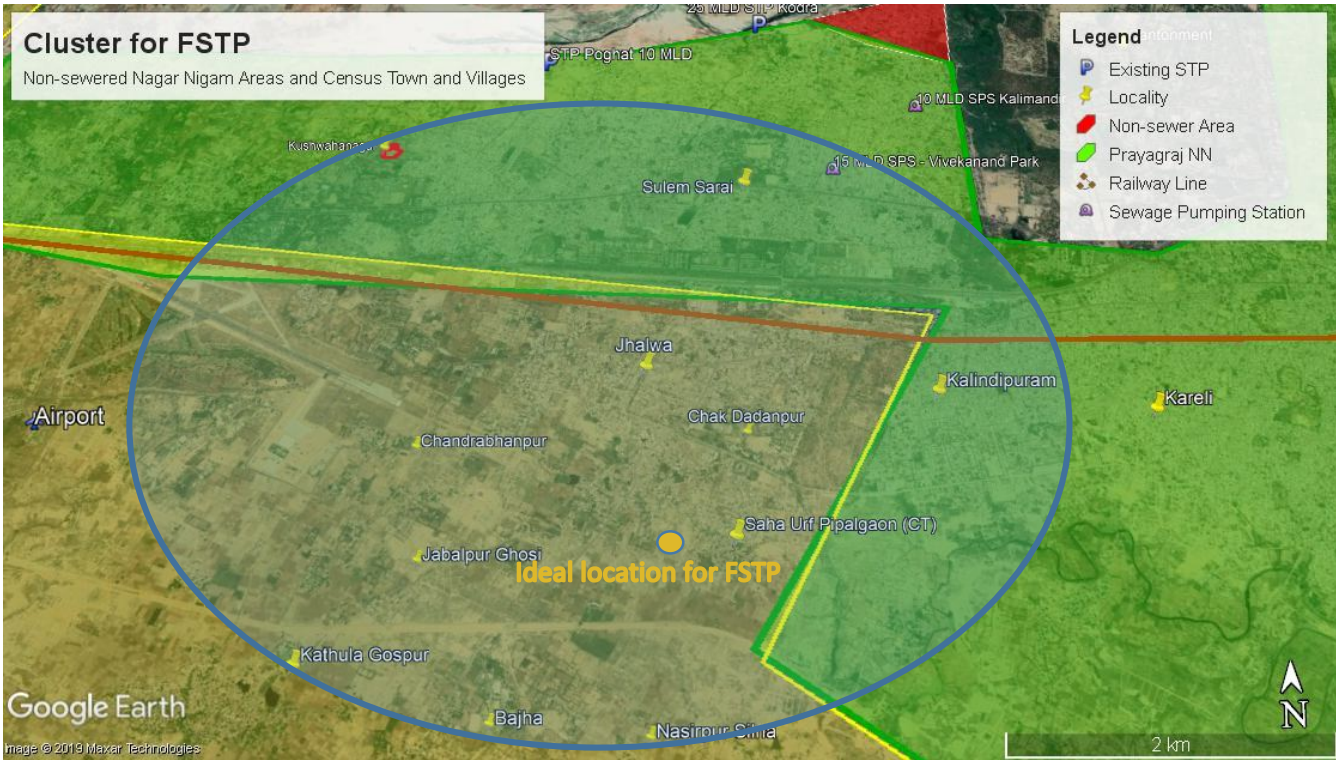
A Receiving Unit near the SPS Sump can be proposed for Co-Treatment



2) Faecal Sludge Treatment Plant for Western Areas of Nagar Nigam and Peri-Urban Areas

A small FSTP of 6 KLD can be proposed near Saha Urf Pipalgaon (Census Town). This FSTP would cater to the Faecal Sludge Emptied from a cluster which can include Prayagraj Nagar Nigam area south of railway line like Kareli, Kalindipuram and areas like Sulem Sarai, poghah close to the Kanpur Highway, Saha Urf Pipalgaon (Census Town) and villages in the vicinity like Kathula Gospur, Jabalpur Ghosi, Nasirpur Silha etc.

The capacity of the FSTP could cater to 1 – 2 truck load a week. The technology can be such that it can easily be expanded in case the Faecal Sludge load increases. A Site can be identified optimally located to cater to demand for this cluster.



3) Grey Water Management at a Pilot Scale.

The grey water in many location is a matter of concern since it creates conditions for mosquito breeding, fouls smell and public health concern. Options for technologies can be reviewed for a pilot level intervention. Possible locations for this can be Umarpurniwa (where improper grey water management has a big public health concern) or Saha Urf Pipalgaon where in addition to public health concern, the grey water is contaminating a local pond.

	
Public Health concerns relating to Wastewater at Umarpurniwa.	Wastewater being discharged at a local water body at Saha Urf Pipalgaon

Way-forward and Timeline for Public Health and Sanitation interventions

Immediate Measure (1 – 3 months)

- FS collected from households could be mandated to be discharged at designated SPS and STPs, this will arrest FS being disposed directly to water bodies and start monitoring performance of STPs – monthly.
- Identify land (1 acre approx.) for FSTP for the identified cluster and preparation of Detailed Project Report for implementation.
- Develop plan for Grey Water Management pilot project at either Umarpurniwa or Saha Urf Pipalgaon and preparation of Detailed Project Report.
- Households with no access to toilets and which do not have containment units be identified and provision made to construct these under SBM.
- Solid waste in drains be cleaned and encroachments removed to establish the flow.

Medium Term measures (3 – 18 months)

- STPs monitored quarterly and studied for the impact of co-treatment and thereby undertake necessary course correction to improve their performance.
- Identify hot spots for water stagnation in drains and develop solutions for better conveyance, through simplified sewers or closed drains. Identify key outfalls into the river and plan for interception, diversion and treatment.
- Identify other possible clusters for FSTP interventions and Grey Water Management in areas in and adjoining Prayagraj Nagar Nigam.
- Establish an FSSM cell for Prayagraj Nagar Nigam and adjoining areas, managed by UP Jal Nigam in co-ordination with Prayagraj Nagar Nigam, for improving the service quality of desludging and also increasing demand among households

Next Steps:

- Detailed Proposal for Co-treatment / Disposal of FS at SPS or STPs with UP Jal Nigam and STP operators.
- Identify sites for standalone Faecal Sludge Treatment Plant after meetings with the local bodies / DM and prepare Detailed Project Report.
- Develop detailed plan for Grey Water Management pilot at either Umarpurniwa or Saha Urf Pipalgaon in consultation with Local Bodies / DM.