

**Site Visit Observations of Team consisting for Assi River Rejuvenation by Pond
Conservation in the Catchment Area of Assi River**

Date of Visits: 23/08/22-26/08/22.

Key Institutional Stakeholders/ Government Officers During the Site Visit		
S. No.	Designation & Organization	Name
1	Municipal Commissioner, Varanasi,	
2	Additional Municipal Commissioner, Varanasi	
3	Project Manager UPJN	S K Burman
4	AE UPJN	Ashish Singh
5	Assistant Engineer, UPJN	Vikki Kashyap
6	JE, JalKal	Rakesh Yadav
7	Nagar Nigam	Jitendra Yadav
8	RO, Nagar Nigam	Munna Ram
9	EO NPP Chunar	Rajpati Bais
10	JE JalKal, Chunar	Sourabh Singh
11	Program Manager, CSE	Sumita Singhal
12	VAIDIC SRIJAN	Ashish Singh
13	Nagar Nigam	Pravin Shrivastava
14	DAIKI- AXIS	Sunil Saigal
15	VAIDIC SRIJAN	Madhukar Swayambhu
16	Project Officer, NMCG	Nidhi Dwivedi
17	PMC, NMCG (Co-lead Sewage Treatment)	Soumitra Sen
18	PMC, NMCG (Small River Rejuvenation Expert)	Harish Kumar Mahavar
19	PMC, NMCG (O & M Expert)	Dinesh Kumar Chamoli

Brief Description River Assi:

River Assi is said to originate from around Durvasha Rishi Ashram, near Allahabad and traveling around 120 km, meets the river Ganga currently near Ravidasghat, Varanasi. Baring the last around 8 km in the city area, almost its entire upstream has dried, silted and converted into palaeo channel. Banaras Locomotive Works (BLW) and Banaras Hindu University (BHU) are major establishments within the catchment of river Assi near the city.

The major challenge with the river at present is that around 90% of its channel has been silted and vanished, and only around last 8 km has some existence. This part of river Assi between Karmadeshwar Mahadeo pond and the confluence point with the river Ganga is also heavily

encroached to the extent of being nonexistent, converted into a nala and largely sewage flows through it, thereby posing a serious threat to water quality for bathing in river Ganga at its ghats,

just around 1 km downstream from the confluence point.

Background and purpose of the visit

The site visit of team was conducted to find out the best possible feasible solution among the following lines:

1. **Restoration of Catchment Wetland** at the point of origin and other wetland in the downstream to enhance the flow rate in the AssiRiver.
2. **Desilting of the RiverAssi**& use of desilting material for strengthening of embankments wherever possible.
3. **Status of Sewage waste management** entering into waterbodies in Varanasi.

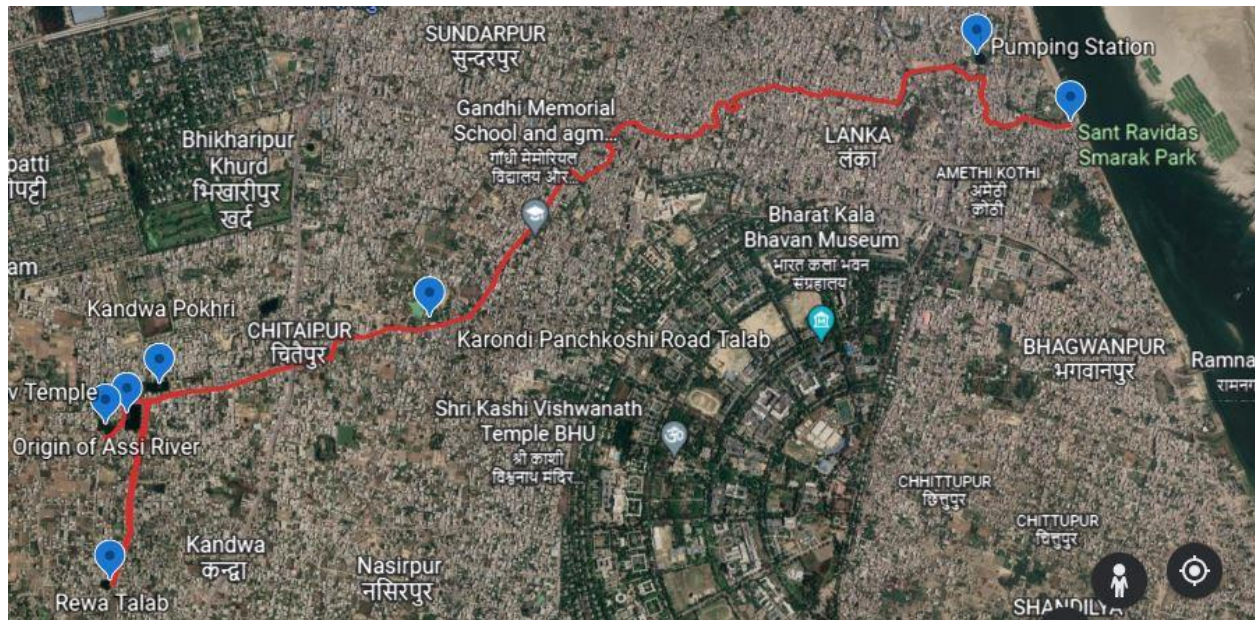
Varanasi is divided into four sewerage districts located within municipal corporation limits. These districts are

1. **District 1:** Which is the central sewerage district connected to 80 MLD Dinapur STP via 6 Pumping Stations.
2. **District 2:** It is further divided in 3 zones name 2A, 2B & 2C & Future Sewerage Area FSA1.
Zone 2A is served by 140 MLD STP at Dinapur through 140 MLD ChaukaGhat SPS.
Zone 2B & 2C is served by 120 MLD STP at Goitha.
3. **District 3:** It is the BHU/Assi District Area of city including FSA4. BHU area is fully sewerred, waste water discharges into natural drains flowing into AssiNala&NakkhiNala. FS4 is outside the municipal area limits. Currently 2 STP namely 50 MLD Ramana & 8 MLD Bhagwanpurare serving in district 3.
4. **District 4:** includes FSA-2 & FSA-3 area is outside the municipal corporation limits & bounded by Northen Eastern Railway. Currently this area has no sewage treatment facility.

At Present as per the CPCB measurement from 12-15th July 2021, the flow in the river Assi is around 92 MLD & whereas Bhagwanpur STP discharges 8 MLD, hence the total discharge in Assi is 100 MLD whereas Ramana STP is only 50 MLD capacity hence **DPR was prepared by UPJN for I & D & treatment works for Assi-BHU Area Phase-II, Varanasi at an estimated cost of ₹ 376.43 Crore.**

Under this DPR it was proposed to construct 50 MLD SPS at existing old abandoned 6 MLD SPS on Bank of Assi, construction of 55 MLD STP at existing Bhagwanpur 9.8 MLD STP, Construction of 6 MLD STP at Nakhha Drain, to lay effluent pipe line of 1400 dia RCC pipe NP-3 which will carry the treated sewage from 9.8 MLD+55 MLD STP.

S. No.	Visited Pond Name	Latitude	Longitude
1	Origin Pond of Assi River	25°16'05" N	82°57'28" E
2	Pond on KardmeshwarMahadev Temple	25°16'05" N	82°57'28" E
3	KandwaPokhri	25°16'05" N	82°57'28" E
4	RewaTalab	25°15'33" N	82°57'27" E
5	KarondiPanchkoshi Road Talab	25°16'22" N	82°28'31" E
6	PushkarTalab	25°17'01" N	83°00'12" E
7	Lahartara/ KabirPrakatiyaSthal	25°18'53.2"N	82°58'10.9"E
8	Pumping Station	25°17'01" N	83°00'12" E



Origin Pond of Assi River:



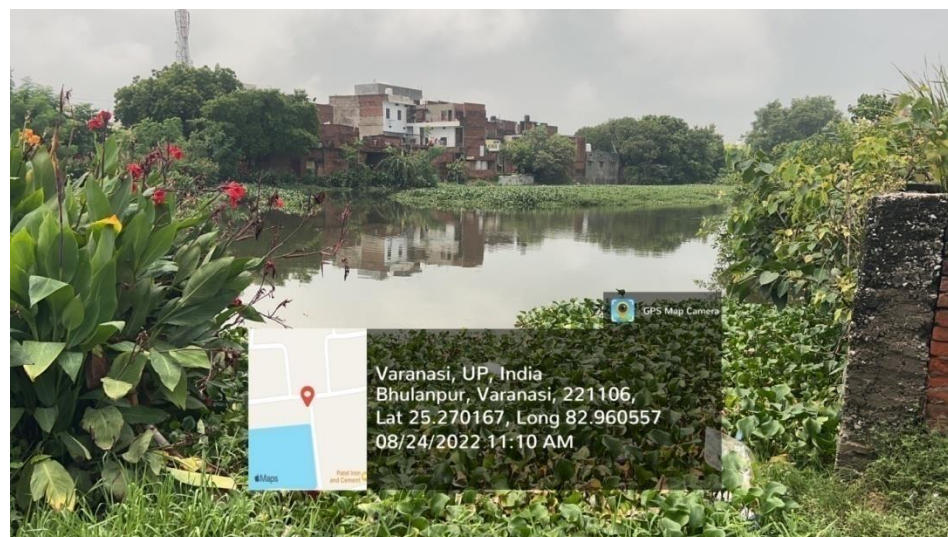
1. Pond is heavily encroached; no boundary is marked and used for fish farming allotted by local Pradhan.
2. Due to absence of Sewage network all household waste water & sewerage directly or indirectly enters into the pond.
3. Solid waste dumping was observed.

Pond on KardmeshwarMahadev Temple:



1. Pond is situated in the premises of KardmeshwarMahadev Temple.
2. bathing & laundry activities found during the site visit
3. No outlet found, however the inlet of the pond seems to be connected to the pond of origin through seepage.

KandwaPokhri:



1. A large population surrounds the Pond & also encroached upon, as it has no fixed boundary.
2. Due to absence of Sewerage network all household waste water & sewerage enters directly or indirectly into the pond
3. Assi channel/ nalla/ drain starts from here & contribute waste water & sewerage in the Ganga river as shown in figure below.



RewaTalab:

Rewatalab is already rejuvenated by VDA under phase-1 funded by NMCG. But presently pond is heavily weeded as shown in picture below.

Ponds/ Kunds	Location Ward	Amount (in Lakhs)	Pond Area in Sqm
Awleshpur (RewaTalab)	Nagwa	74	3500



KarondiPanchkoshi Road Talab:

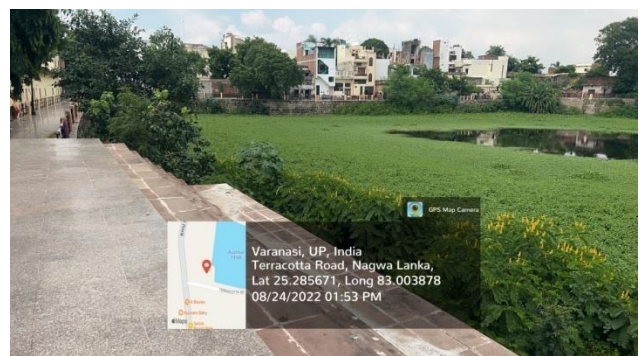
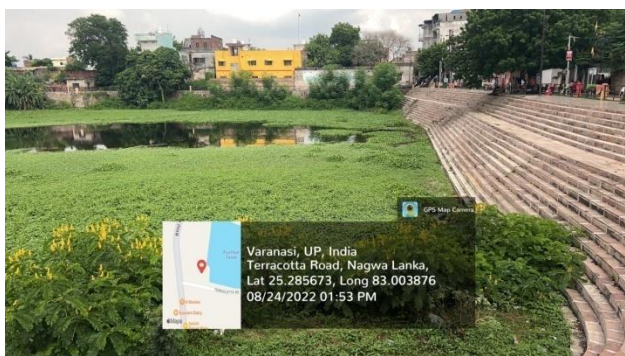
Panchkoshitalab is already rejuvenated by VDA under phase-1 funded by NMCG. However algal bloom was found within the water body.

Ponds/ Kunds	Location Ward	Amount (in Lakhs)	Pond Area in Sqm
KarondiPanchkoshi Road Talab	Nagwa	254.47	1000



PushkarTalab:

PushkarTalab is already rejuvenated by VDA funded by NMCG. According to local people pond water depth is around 40 to 45 feet and having good aqua culture like big fishes, turtles etc. At the time of rejuvenation, ponds inlet and outlet have blocked due to construction activities like bank steps & ghat development, due to this water is coming in the pond through seepage under the stairs from nearby Assi River/ Ganga River.



Lahartara/ KabirPrakatiyaSthal Pond:

No Eicchornia was found. Some work of Natural Treament was taken up by VDA however later it was stopped due to dispute between ASI and VDA. The treatment showed some sludge digestion has taken place as the level of water body has reduced. The pond was clean as compared to adjacent one.

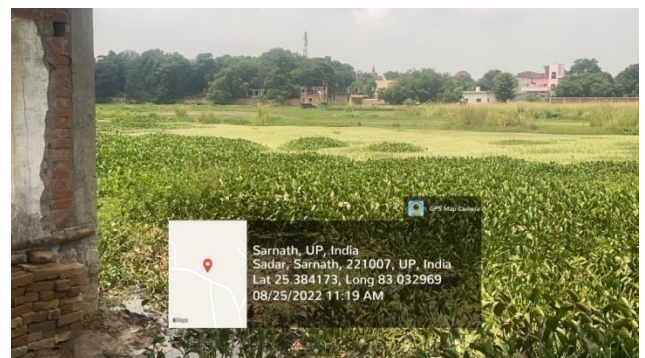


Lahartara Pond

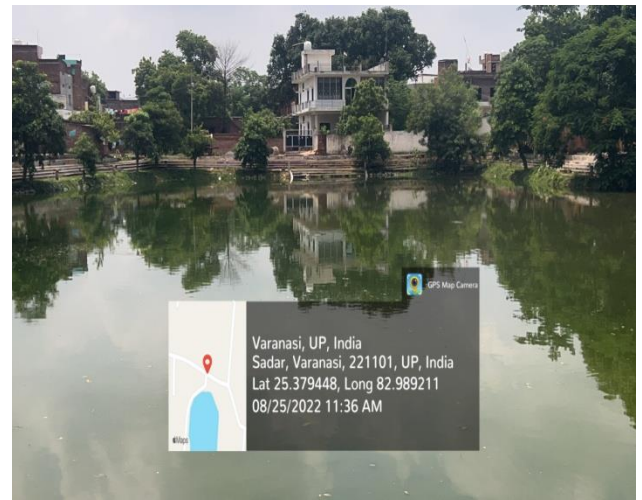
Adjacent waterbody

NarokharTalab near WTP, Sarnath, Varanasi

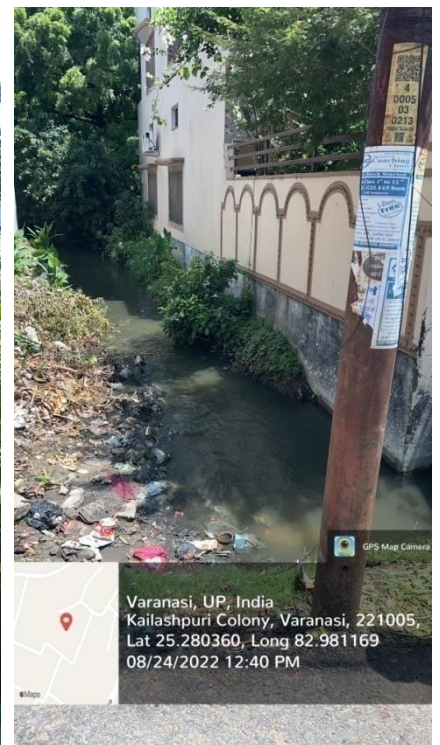
NarokharTalab is situated back side of WTP near Sarnath Railway Station and expanded in the area of 85 acres. Pond is completely filled with Eicchornia&water chest nuts are also grown by locals.

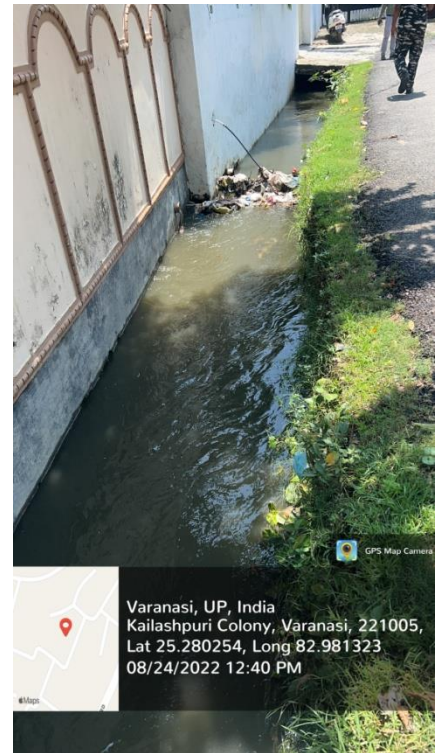


Prem Chand Sarovar: Algal growth was present.



Assi River/ Nala Encroachment Areas:





Common Observations during the visit:

1. The entire 8 km stretch of Assi River/ Nala passes through the core heavily populated area of Varanasi. All the sewage/ wastewater from District 3 Varanasi finds its way into the water bodies/ ponds/ kunds and traverses through the Assi River/ Nala, thereby generating a mix of wastewater/ fresh water in water bodies/ storm water. This mixed water is tapped at Nagwa PS and treated at 50 MLD Ramana STP. The water which reaches the STP is diluted (less BOD Load) and quantity of water available for treatment is huge resulting in large STP capacity demand and huge O&M.
2. Solid waste dumping into Assi River/ Pond/ Kunds directly.
3. Heavy encroachment at River Embankments/ waterbodies.
4. Unprecedented residential commercial growth due to VIP constituency.
5. The civil construction work done by VDA for Rejuvenation of Water bodies at embankment, raising the platform from ground level had left no room for run off and storm water to reach the waterbody. It has obstructed the natural flow and recharge of the waterbody during monsoon and also results in water logging in the vicinity.
6. Sludge deposits can be very high as raw sewage finds its way in the Varanasi Water bodies.
7. Water in few Ponds was filled with borewells as both inlets and outlets are closed.

Recommendations:

1. I/D and STP Works at Assi BHU:

- i. District C is heavily populated and there is no scope for further expansion and development. It is saturated. Since interceptor sewer and trunk sewer is already in place, laying of **Branch Sewer Network is recommended**. Sewage from households can be arrested by branch sewer network & diverted to nearest STP. This will lead to collection of Sewage of higher BOD load (>200 mg/L) and less volume of sewage will be available for treatment resulting in lesser O&M costs.
- ii. Due to laying of branch sewer network, wastewater entering into the ponds/ waterbodies will also be arrested.
- iii. **DPR for I/D and STP Works:**
 - a. **Land for construction of 55 MLD pumping station** in the existing PS land is **not adequate**; however, UPJN has proposed to design of PS according to land size. This 55 MLD flow will be transmitted to proposed Bhagwanpur STP (55 MLD). Adequate land is available for new STP.
 - b. Flow diversion to new PS has been considered about 1km upstream of existing flow diversion structure on Assinalla. Proper gate arrangement shall be proposed on Assinalla and flow diversion channel to 55MLD proposed PS so that 50 MLD flow should reach to the existing Nagwa PS.

2. Ponds/ Kunds/ Waterbodies in Assi Catchment Area:

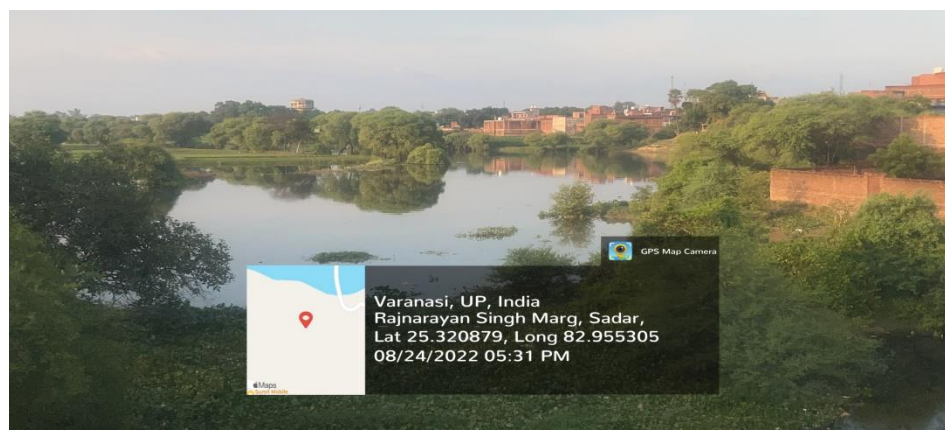
- i. The encroachment removal at Assi/ Ponds/ Kunds at Varanasi is required. Identification and marking of pond boundary with old revenue records needs to be done to restrict future encroachment.
- ii. No possibility to remove huge encroachment along Assi river channel - nearly 1000 homes, therefore the restoration plan should primarily focus towards increasing the

Water holding capacity, sludge consumption, aquifer recharge – all in-situ conditions, so that the urban flood situation could be avoided.

- iii. Natural/ Nature based solution for removal of sludge from ponds/ kunds/ waterbodies may be done which will open capillaries between surface water body and underground aquifer.
- iv. Some area (approximately 10~20 feet) should be secured around embankment of the Waterbody.
- v. Physical dredging shouldn't be done since it disturbs the limnology, rather eco-dredging, like the way it has happened in Lahartara Project (wherein the sludge has been consumed, while keeping the Water levels intact and reclaiming the space by about 5 feet) is the way to go forward on restoration projects.
- vi. Natural barriers for reducing anthropogenic interventions must be achieved through vegetative hedges and boundary plantation like vetiver or bamboo or any other vegetative growth exceeding the height of minimum six feet that restrict people from encroachment as well as strengthens soil conservation.
- vii. The planned approach must be "IN-SITU" which means no drains or inlets would be either tapped or diverted or stopped or re-routed. Although installation of gabion structures or net or bars kind of structures for preventing solid waste like plastics and thermocols entry, could be permitted on the incoming drains.
- viii. Water Quality Testing in all ponds to be done by ULB/ UPJN.

3. I/D and STP Works for Durga Drain at Varuna:

- i. Understood from UPJN that STP land belongs to a private party and process of acquisition is in progress. The present land identified for the proposed STP (picture below) is in the flood plain and submerged as backwater from Varuna flows into the durga drain. Proposed STP land is 3m below the flood protection embankment road. This will result in higher costs towards bunds, piling and land filling and delay in construction of the STP. **UPJN to identify another site for the proposed STP (away from the Varuna Flood plain).**
- ii. Proposed diversion arrangement of waste water from Durganalla and STP location is okay.



Proposed STP Land for Durga Drain

- iii. Could not approach the location where I&D works has been proposed (fig below) due to submergence in the Varuna river for flood water.



Corridor submerged in Flood Water of River Varuna

4. FSTP Chunar:

- i. UPJN to provide issuing commissioning certificate of FSTP Chunar to Elefo Biotech and start O&M.
- ii. Elefo Biotech to repair staircase and ensure proper functioning of all modules like PDB, ISAF, PGF, Collection tank and ACF/ DMF and UV disinfectant. Further Elefo Biotech needs to install electricity meter.
- iii. Executive officer from Chunar NPP to ensure intensive IEC activities to be carried out throughout Chunar.