BEFORE THE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

O. A. No. 200 of 2014

IN THE MATTER OF:

M. C. Mehta

...Petitioner

// Versus //

Union of India & Ors. **...Respondents**

4th Quarterly Progress Report on behalf of the National Mission for Clean Ganga, Ministry of Jal Shakti, New Delhi in terms of order dated 08.02.2021

NATIONAL MISSION FOR CLEAN GANGA
DEPT. OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION,
MINISTRY OF JAL SHAKTI,
GOVERNMENT OF INDIA, NEW DELHI

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4th Quarterly Progress Report on behalf of the National Mission for Clean Ganga in terms of order dated 08.02.2021

1. That vide orders/directions passed by this Hon'ble Tribunal in the matter of O. A. No. 200/2014 - M.C Mehta Vs. Union of India & Others, the concerned States viz., States of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal as well as NMCG/SPCBs/CPCB have been mandated to submit quarterly progress report(s) on progress of compliance of directions of this Tribunal dated 10.12.2015, 13.07.2017 and 06.08.2018 on the subject of preventing and remedying the pollution of River Ganga.

2. That vide order dated 08.02.2021, the Hon'ble Tribunal had directed for submission of further progress report(s) by the concerned five States to NMCG by 30.06.2021 (showing status of compliance as on 15.06.2021) with relevant information under relevant heads in terms of earlier directions and also pertaining to following aspects: -

   (a) Quantity of Sewage being discharged in river Ganga and its tributaries/connected drains and correspondingly proposed/ existing STPs to intercept the same with timelines.

   (b) Performance of STPs and their compliance, particularly for Faecal coliform.

(c) Water quality of Ganga at inter-State borders and at important public places/ Ghats, which may show the level of compliance with regard to water quality.

(d) Status of compliance of CETPs at Jajmau, Unnao and Banther (applicable only to UP).

The Hon'ble Tribunal further directed NMCG to submit its consolidated report to NGT by 15.07.2021 *inter alia* specifying reduction in pollution load, if any achieved during the interregnum, and if not, suggest further measures to achieve such reduction.

3. That vide its earlier order dated 13.08.2020, the Hon'ble Tribunal directed NMCG to convene a meeting of the concerned Chief Secretaries after clearly identifying action points needing focus under relevant heads. The first meeting was held on 07.10.2020. The Minutes of the said meeting is annexed as **Annexure – I.** However, next meeting with the Chief Secretaries of the concerned States has not been held due to constraints posed by second wave of Covid-19 pandemic and consequent lock down in States during the period.

4. That this Hon'ble Tribunal also directed for constitution of a Joint Committee comprising members from NMCG, MoJS and CPCB to look into the issue of river floodplains demarcation and protection in the State of Bihar. The status of constitution of the Joint Committee/ action

undertaken by the said committee in furtherance of Hon'ble Tribunal's order is covered under sub-para (c) of para **8.6** below.

5. That it is submitted for consideration of this Hon'ble Tribunal that the issues related to compliance of directions of this Tribunal on the subject of preventing and remedying the pollution of River Ganga and its major tributaries are also periodically monitored by the Central Monitoring Committee (CMC) in the monthly review meetings with concerned State Governments. That the meetings of the CMC were held on 05.01.2021, 04.03.2021 and 09.07.2021. The copies of minutes of meetings of the aforesaid CMC meetings are annexed as **Annexure – II**. It is also pertinent to mention that the issues of the State of U. P. related to preventing and remedying the pollution of River Ganga and its major tributaries were discussed in the review meetings of the Hon'ble Minister, Jal Shakti with the Hon'ble Chief Minister of Uttar Pradesh, held on 18.01.2021 and on 03.07.2021.

6. That vide order dated 17.06.2021 passed by the Hon'ble NGT in another matter of O. A. No. 128 of 2021 – *Saurabh Tiwari Vs. Union of India & Ors.* related amongst others to pollution caused into the rivers Ganga, Varuna and Assi at Varanasi due to discharge of untreated sewage and unauthorized construction in river bed/ floodplain of these rivers, the Hon'ble NGT constituted an independent Monitoring Committee,

comprising of members from NMCG, CPCB, UPPCB (nodal agency) and Varanasi District administration for preparing an action plan for remedial measures for rejuvenation of rivers Ganga, Varuna, and Assi in Varanasi and monitoring of actions in furtherance thereof. Based on the report of the Monitoring Committee, NMCG has been directed to submit an action taken report in the matter before 04.08.2021 inter alia giving information on (a) status of water quality of Varuna & Assi; (b) action taken on diversion and treatment of sewage; (c) water quality of u/s and d/s of confluence of Assi and Varuna to Ganga, and (d) demarcation of flood plain zones of Assi, Varuna and Ganga at Varanasi. Accordingly, status of the action taken report is covered under para **14** below.

7. That NMCG has been continuously pursuing with the State Governments and their authorities for compliance of aforementioned orders/ directions of the Hon'ble NGT. That the quarterly progress reports furnished by the States of Uttarakhand (received on 15.07.2021), Bihar (received on 30.06.2021), West Bengal (received on 30.06.2021), Jharkhand (received on 06.07.2021), and Uttar Pradesh (received on 01.08.2021) have been considered by the NMCG. Apart from the quarterly reports, the monthly progress reports submitted by the States in the matter of O. A. No. 673/2018 as well as information available in

NMCG during monitoring of implementation of projects have also been considered for preparation of this report.

8. Further specific observations of NMCG on the status furnished by the States on the issues as well as compliance status are as follows:-

8.1 Status of bio-remediation/ phyto-remediation of drains as interim remedial measures for treatment: The bioremediation related interventions are best decided at local levels and State may take up the projects as per need at their level. This would be more appropriate and would also be quick. This view has earlier been conveyed to all the States in a meeting held under Chairmanship of Director General, NMCG on 12.09.2019 and also in meeting of Supervisory Committee of NGT held on 11.10.2019. The decision was once again reaffirmed that the State government may take up the projects from their own funds in a meeting chaired by Secretary, DoWR, RD & GR held on 08.01.2020. Further, in 3rd meeting of the CMC in NGT matter OA No. 673/2018 held under Chairmanship of Secretary, DoWR,RD&GR on 23.06.2020, many of the States have apprised that they have initiated bio-remediation and phyto-remediation measures under their own funding towards compliance of NGT directions in the matter. The views as above

have been communicated to States to take necessary steps to comply with extant directions of the Hon'ble NGT. The Action undertaken by various State Governments after order of the Hon'ble NGT dated 13.08.2020 for bio-remediation/ phyto-remediation of drains as interim remedial measures for treatment are as following:

- **Uttarakhand:** Uttarakhand State Govt. earlier submitted (vide letter No. 23/SPMG/ Namami Gange/Bio-Remediation Tech) that a total of 13 untapped drains required treatment through bioremediation/ phytoremediation. Out of which, tendering for work in 9 drains have been completed and will start within one month. As regards the remaining 04 drains it has been informed that 01 drain at Swargashram is intercepted for treatment and with respect to other 03 drains at Joshimath, their water quality is being monitored regularly and their BOD level is reported to be less than 30 mg/l, hence, bioremediation is not required in these 03 drains. Further, as informed by the State, *in-situ* treatment work has been taken up in February, 2021 for 19 drains along 9 polluted river stretches identified in Uttarakhand. The independent monitoring of these works is being carried out by the Doon University. However, appraisal of water quality

status of these drains in terms of reduction in pollution load, post-bioremediation works is awaited from the State Government.

- **Uttar Pradesh:** UP State Government earlier submitted (vide letter No. 4559/No-5-19-234/19 dated 04.11.2019) that a total of 459 drains in the State needed treatment through bioremediation/ phyto-remediation. It has been informed that bio-remediation is being done in 42 drains of Prayagraj. As reported in the latest MPR submitted in the matter of O. A. No. 673 of 2018 a total of 5,500 MLD sewage is generated in 652 ULBs present in Uttar Pradesh. The State has instructed the concerned ULBs to take up interim measures for treatment of drains till permanent infrastructure for treatment of sewage is created. However, status of the interim measures in place is to be provided by the State Government. Bio-remediation in other drains is proposed through ULBs who had been directed to carry out this work. However, work in these balance drains is yet to commence.

- **Bihar:** As submitted by the State Govt. of Bihar, Bihar has 416 drains in 103 towns carrying 2,056 MLD flow. Out of these 42 drains (760 MLD flow) are discharging into Ganga and 111 drains (976 MLD flow) are discharging into various tributaries. Balance drains are discharging either into low lying areas (83

Nos.; 253 MLD flow) or are in stagnant condition (24 Nos.). It has been reported that 541 MLD of sewage is being treated through alternate technology. *In-situ* treatment through bio-remediation of 89 drains joining Ganga and other polluted rivers that started in September 2020 has been discontinued with effect from 18.06.2021 due to heavy rains. Letter of award is in process for 115 drains. Screening arrangements have been provided in a total no. of 124 out of 127 drains along the Ganga front towns in the State. In remaining 03 Nallas screening is not required as their water quality is not deteriorated.

- **Jharkhand:** The State of Jharkhand in its report has submitted that DPR for *in-situ* treatment through bioremediation of drains in identified ULBs viz. Chas, Ranchi, Mango and Adityapur, involving CSIR–NEERI has been prepared and tendering is under process. The State Govt. has projected to treat approx. 120 MLD of waste water by adopting *in-situ* treatment through bioremediation/ phyto-remediation.

As an interim measure at 04 nos. of drains at Rajmahal, that are considered as dry/ stagnant drains in which flow occurs only during monsoon season at Rajmahal, the screens at drains have been installed on dated 25.03.2019. Provisions for tapping

of 04 drains to 3.5 MLD STP have been completed under *Namami Gange Programme*. The interception and diversion work has been completed and 600 house service connections have been provided. Accordingly, flow of sewage into these drains has been arrested and bio-remediation may not be required. However, Jharkhand State PCB may continue monitoring the water quality of these drains regularly.

- **West Bengal:** There are total 56 drains reported by State Government out of which 41 drains are part of various interceptions and diversion projects while remediation in respect of balance 15 drains are yet to be planned. Amongst these 41 drains, presently in-situ treatment work is ongoing on one drain viz., Jangipur drain. The State Government of West Bengal has submitted that work for *in-situ* treatment of drains through bioremediation has been started as pilot project for drains discharging in Ganga and Churni river stretches. Besides State is implementing primary treatment of drains identified on rivers in Priority V by adopting techniques such as providing screens, sedimentation tank followed by disinfection. 82.58 MLD is proposed to be treated using such primary treatment techniques.

It is submitted by the State that 910 MLD of sewage is being treated by East Kolkata wetlands by natural process.

As reported by the State, screens has been put up in 400 drains out of 402 discharging to River Ganga in 31 Ganga towns in West Bengal. In rest 2 Nos. of drains where screening is not technically feasible, bio-remediation/ phyto-remediation measures have been undertaken. However, WBPCB may be directed to monitor and report the water quality of these drains regularly.

8.2 Monitoring & updated status of STPs/ Sewerage Infrastructure projects [as on 31.10.2021]: In respect of Status of various projects related to setting up of STPs/ sewerage infrastructure in majors cities along the main stem of River Ganga in State of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal, it is submitted that these projects are being regularly monitored by NMCG at the highest level to ensure their completion within the timelines and shortfalls, if any, are duly reported. NMCG ensures that technical hand-holding, assistance prior to grounding of project and during implementation is also provided by field monitoring and supervision visits. Since,

August' 2020, 23 monitoring/ review meetings have been held at the level of the Hon'ble Minister (Jal Shakti); Secretary, DoWR, RD&GR, Ministry of Jal Shakti and Director General, NMCG. Earlier, the meeting of National Ganga Council was held under Chairmanship of the Hon'ble Prime Minister of India on 14.12.2019. 6th, 7th and 8th meeting of Empowered Task Force under Chairmanship of the Hon'ble Minister for Jal Shakti was held on 25.09.2020, 19.03.2021 and 22.09.2021 respectively. In addition to above, seven meetings were taken by Hon'ble Minister for Jal Shakti, nine at level of Secretary DoWR, RD &GR and seven at the level of Director General, NMCG.

Besides regular review meeting as well as visit to project sites are also undertaken at level of Executive Directors of NMCG to ensure completion of project works in accordance to prescribed timelines.

The updated status of STPs/ sewerage infrastructure (as on **31.10.2021**) is enclosed as **Annexure – III.**

It emerges from the above status that in the reach of d/s Unnao to Ganga Sagar, 01 new project has been sanctioned, 07 projects have been completed and work has started for 04 projects.

Amongst others, major issues related to control and management of sewage pollution besides synopsis of sewerage infrastructure in Ganga basin area are as follows:-

Uttarakhand:

- State has made timely progress in completion of sewerage infrastructure projects. Out of 33 projects sanctioned (for towns situated on main stem of River Ganga) under *Namami Gange Programme*, 30 projects have been completed. Thus 2 more sewerage infrastructure projects have been completed since last quarterly report submitted to this tribunal.
- Hon'ble Prime Minister of India inaugurated all the major sewerage infrastructure projects in the State on 29.09.2020. These projects are:
    * 68 MLD STP at Jagjeetpur, Haridwar, 26 MLD STP at Lakkarghat, Rishikesh, 7.5 MLD STP at Chandeshwarnagar and 5 MLD STP at Chorpani, Muni-ki-Reti;
    * Upgradation of 27 MLD STP at Jagjeetpur & 18 MLD STP at Sarai;
    * 1 MLD STP and 0.01 MLD STP at Badrinath;

* Ganga Avlokan – a museum on Ganga at Chandighat, Haridwar.

- 01 STP project at Joshimath was delayed because of landslide at original STP location necessitating change of STP location. The STP is expected to be completed by June, 2022.
- 01 project for sludge management at Muni-ki-Reti which has been sanctioned by NMCG in October, 2020 has been completed and is under trial run.
- 09 Nos. of STPs having total capacity 0f 30.30 MLD to rejuvenate river Bhela – 02 STPs (3 MLD), Dhela – 03 STPs (10.80 MLD), Kichha – 01 STP (3 MLD), Kosi – 01 STP (0.50 MLD), Nandhore – 01 STP (3 MLD), and Pilankher – 01 STP (10 MLD) and 17 Nos. of I&D of drains in 06 Polluted river stretches mainly Bhela, Dhela, Kichha, Kosi, Nandhore, Pilankher, and Kashipur Sewerage (I&D) Scheme phase-1 on (Dhela River) has been sanctioned on 17.09.2021 under *Namami Gange Programme.* The work for these projects is under tendering stage and tenders will be finalized by end of December'2021.
- Towards monitoring of functioning of STPs, 16 STPs have online monitoring systems that are connected to *Ganga*

Tarang web portal. A dashboard is also being developed for monitoring the functioning of STPs.

Uttar Pradesh:

- 10 STPs (50 MLD Ramanna, Varanasi/ 10 MLD Ramnagar/ 21 MLD Etawah/ 0.01 MLD Chunar/ 24 MLD Etah/ 20 MLD Modinagar/ 67 MLD Firozabad/ 120 MLD Luckhnow/ 26 MLD Jhansi/ 15 MLD Kanpur) out of 32 STPs were expected to be completed by March'2021. Out of them, 9 projects were to be completed by December 2020. However, construction for only 5 STPs (50 MLD Ramanna, Varanasi/ 10 MLD Ramnagar/ 0.01 MLD Chunar/ 67 MLD Firozabad/ 26 MLD Jhansi) has been completed and is under trial run. In addition, 01 STP at Jhansi is also reported by the State to be under *stabilization process*. Rigorous monitoring is required at the State level. Efforts should be made to complete remaining 5 STPs at the earliest and other 22 STPs as per indicated timelines.
- The State of U.P. should make effort to complete remaining 05 STPs at the earliest and other 22 STPs as per the timelines.

- No progress since September 2020 for 03 projects at Balia, Pratapgarh, and Kanpur (Baniyapurwa). Efforts should be made to expedite the progress and complete the projects as per the timelines.
- Letter of Award (LoA) for project at Daulat Ganj, Lucknow was issued in September 2020, however, the same has run into legal issues. The work order for the project was awarded. While the Hon'ble High Court of Allahabad (Lucknow Bench) has dismissed the Writ Petition No. 15664/2020 – *M/s Geo Miller & Co. Pvt. Ltd. Vs. U. P. Jal Nigam and Others* vide order dated 17.08.2021, the Petitioner has filed a SLP against the said order dated 17.08.2021 in the Hon'ble Supreme Court. The SLP is pending for final disposal. The legal process has delayed the project by close to 02 year.
- LoA for Moradabad project was issued on 30.03.2020 but this project has also been delayed due to filing of Writ Petition No. 7155/2020 – *Kallan Vs. State of U.P. & Others* and Writ Petition No. 647/2020 – *Abdul Razzak Vs. State of U.P. & Others* in the Hon'ble High Court of Allahabad that are pending adjudication.

- In addition to sub-optimal capacity utilization, poor operation and maintenance of the created sewage and industrial effluent treatment infrastructure also appears to be a critical issue of concern evident from the fact that 13 (*03 MLD STP* Firozabad/ 13.59 MLD, Masani, Mathura/13.5 MLD Mauja Umrain, Etawah/ Kanpur/ 36 MLD Kanpur/ 130 Jajmau, Kanpur/ 14.5 MLD, Trans Yamuna, Mathura/ 16 MLD, Trans Yamuna, Laxmi Nagar, Mathura/ 2.76 MLD Goverdhan STP/ 5 MLD Hathia Nala Sultanpur)/ 12 MLD DLW, Varanasi/ 2 MLD Gretaer Noida (Badalpur)/ 15 MLD Eco-Tech -2 (Greater Noida)/ 20 MLD Eco-Tech -3 (Greater Noida)/ 137 MLD Kasna (Greater Noida) of the 103 STPs are non-complying with prescribed standards apart from 02 non-operational (20 MLD Moradabad/ 4 MLD Kanwara Road Banda STPs. 01 non-operational STP at Sultanpur (5 MLD) is currently under upgradation. Action plan for making these STPs compliant needs to be drawn along with timelines. Officials responsible for maintenance of these infrastructures need to be made accountable.

Bihar:

That with regards to status of various projects for STPs/ Sewerage infrastructure in the State of Bihar (as on October 2021), among the 29 projects; 4 nos. of project (43 MLD Beur, 37 MLD Karmalichak, 60 MLD & 55.10 km sewer network Patna, 87.69kms Sewerage at Pahari Zone IVA) has been completed. Trial run for 01 STP (10 MLD) and I&D Sultanganj is expected completion by November, 2021. The I&D and STP Scheme of Sultanganj is expected to be completed by December 2021. 03 ongoing projects (11 MLD I&D and STP at Barh, 60MLD STP – Pahari (Patna), and I&D and STP 3.5MLD Sonepur) projects are expected to be completed by December, 2021 and 14 projects (Sewerage Scheme at Pahari Zone-V 115.93kms, Beur Sewerage Network 180 km, Sewerage Scheme at Karmalichak 97Kms, Saidpur Sewerage Network 172kms, Digha 100MLD STP and Network 303kms; Kankarbagh 50 MLD STP and Network 150kms, Mokama I&D and 8 MLD STP, Begusarai STP 17 MLD and Network 114kms, Chhapra 32 MLD STP and I&D, Bhakhtiyarpur 10 MLD STP and I&D, Maner 6.5 MLD STP and I&D, Danapur 25 MLD STP and I&D,

Phulwarishariff 13 MLD STP and I&D, Fatuha 7 MLD STP and I&D are expected completion not beyond December 2022. Tenders have been floated for 6 projects and works awarded for 3 projects (namely Bhagalpur 45 MLD STP and I&D scheme, Hajipur 22 MLD STP and Sewerage Network 189.30kms and Munger 30 MLD STP and Sewerage Network 174.75kms). These projects are expected to be completed not beyond December, 2023. Tender is under evaluation for the remaining 3 projects (namely Khalagaon 6 MLD STP and I&D scheme, Barahiya 6 MLD STP and I&D scheme and Buxar 16 MLD STP and Sewerage Network 106.06kms).

- Following ongoing STP and I&D schemes/projects in Bihar have been delayed inordinately and pending because of inter departmental issues related to land NOC to be granted by State Deptt./agencies:

    * Land for 02 number IPS in Bakhtiyarpur STP project. Land NOC for STP and IPS was received very late i.e. on 02.12.2020 and 01.04.2021 respectively.

* Compensation towards land for the Begusarai STP is yet to be resolved. The issue requires faster resolution.
* Land for one IPS in Sultanganj I&D and STP project.

- These issues are being continuously flagged for early resolution and were also raised recently during 08th, 09th & 10th meeting of Central Monitoring Committee and in the review meetings taken by DG, NMCG followed with DO letter dated 01.07.2021 and 09.07.2021. Copies of letters dated 01.07.2021 and 09.07.2021 are annexed as **Annexure - IV.**

West Bengal:

- **Hooghly Chinsurah I&D and STP project**: - Revised DPR of Hooghly Chinsura has been sanctioned in 29th Executive Committee meeting and administrative approval and expenditure sanction amounting of Rs. 154.73 Crore was issued on 23.09.2020. Kolkatta Metropolitan Development Authority (KMDA) invited the tender on 23.11.2020. Now tenders have been kept on hold due to inter-Departmental

issues (Department of Education) related to land which has not been sorted out by State. Land for new STP has been finalized, which is now in possession of KMDA. Scope of work has changed due to change in STP site. A new effluent Pumping Stations has also been added in the scope. The tendering is underway. Bids have been received from 09 bidders and technical examination is undergoing.

- **Tolly Nullah I&D and STP project**: - NMCG has sanctioned a project for Pollution Abatement & Rehabilitation of Tolly's Nullah (Adi Ganga), Kolkata (Interception & Diversion with Pumping Station and STP) at a cost of Rs. 307.12 crore on 17.08.2017. Kolkata Municipal Corporation (KMC) has invited the tenders and bid have been received on 2nd call on 10.12.2020. KMC has to complete the award process at the earliest as the grounding of project is inordinately delayed. NMCG has provided necessary advice in the procurement matter. Financial bid have been opened and report submitted to World Bank for NOC. World Bank has sought few clarifications and it is informed that the State is preparing explanations to observations of the World Bank. Work will be awarded after receiving NOC from the World Bank.

- **Rehabilitation of Keorapukur & Garden Reach STP**:- NMCG has sanctioned the project on 05.03.2018 amounting of Rs. 165.16 Crores. State Government has revised the scope and submitted the revised DPR and some observations on DPR have been communicated to KMDA which are being incorporated in DPR. Proposal from the State is awaited. The State has been advised to examine the possibility of setting up new STP as proposal for upgradation of GAP –I STP to comply with new norms prescribed by the Hon'ble NGT order dated 30.04.2019 (passed in the matter of O. A. No. 1069/2018 – *Nitin Shankar Despande Vs. Union of India & Ors.*) costs more than the proposal for setting up new STPs compliant to NGT prescribed norms.

8.3 Faecal Sludge and Septage management: In the 2nd Quarterly Report it was stated that the Govt. of India issued the *National Policy on Faecal Sludge and Septage Management* in February 2017. NMCG has suggested the States Governments that FSTP implementation in all towns with population less than 1 lakh should be adopted in consonance with National Policy on FSSM. Further, NMCG had organized an online Webinar on "*Strengthening Capacity of ULBs in Planning and Implementation of FSSM across*

Cities and Towns of Ganga Basin" on 19.01.2021. The webinar aimed to reiterate the commitment and focus of NMCG towards Faecal Sludge and Septage Management (FSSM) as one of the key approaches to reducing the pollution into river Ganga. States were urged to consider the implementation of FSTPs and/ or co-treatment of *faecal* sludge in existing STPs, in all towns wherever feasible, so that dumping of the faecal sludge in water bodies/ land and thereby polluting them, can be avoided.

Major initiatives/ achievements undertaken by the States towards adoption of FSSM are as following:-

- **Uttarakhand:** The Govt. of Uttarakhand has notified the protocol for Septage Management. Septage Management Committee has been formed in all 15 priority towns/ULBs situated on the main stem of River Ganga as per the provisions of the Septage Management Protocols (SMP). State has submitted 4 DPRs to NMCG for which third party appraisal of 2 DPRs (Rishikesh and Haridwar) have been completed and examination of other 2 DPRs is underway.
- **Uttar Pradesh:** *UP Septage Management Policy' 2019* was approved in October 2019. FSTP is operational in Jhansi and Unnao and under construction in 05 towns (Chunar, Loni,

Lakhimpur, Rae Bareilly and Modinagar). Projects have been approved and Letter of Award (LoA) issued for FSTP in 31 AMRUT towns (Aligarh, Moradabad, Shahjahanpur, Ayodhya, Pilibhit, Pt. Deen Dayal Upadhayay Nagar, Shamli, Baraut, Hapur, Khurja, Chandausi, Hathras, Amroha, Badauan, Shikohabad, Farrukabad, Hardoi, Sitapur, Bahraich, Gonda, Orai, Jhansi, Lalitpur, Banda, Fatehpur, Akbarpur, Basti, Deoria, Azamgarh, Jaunpur, Maunath Bhanjan), Letter of Award (LOA) has been issued for co-treatment in 04 towns (Saharanpur, Mathura, Rampur, Muzaffarnagar); while tenders have been floated for co-treatment in 17 towns (Luckhnow, Kanpur, Agra, Meerut, Varanasi, Prayagraj, Ghaziabad, Gorakhpur, Etawah, Mirzapur, Firozabad, Mainpuri, Sultanpur, Ballia, Bulandshar, Ghazipur, Ayodhya-Faizabad). Thus, as informed by the State, tender has been also finalized and LoA issued for another 50 FSTP Plants and expected to be completed by December'2021 end.

- **Bihar:** State has prepared DPR for FSSM for three towns namely, Digwara, Manihari and Teghra. The DPR are awaiting sanction of government for their implementation. This needs to be expedited.

- **Jharkhand:** The State Government has reported that works have started for 04 projects for integrated liquid waste management through FSTP. 04 projects are in tendering stage and 15 projects are in DPR stage. The State may be requested to expedite.
- **West Bengal:** 30KLD integrated septage treatment plant of capacity 30KLD for South Dumdum Municipality had commissioned. Another 30KLD Septage treatment plant for North Dum Dum and Baranagar Municipalities is under construction stage. As reported by State, 01 FSTP in every district in the State is being planned.

8.4 Industrial Pollution Management: CPCB through the State Pollution Control Boards is the central agency responsible for controlling the discharge of industrial/ trade effluents into the rivers and water bodies and their effective treatment as per set standards through proper functioning of the ETPs/CETPs. NMCG has been regularly pursuing this issue with the apex regulator as well as the State agencies. A tabulated statement on the total number of industries, effluent load, installed treatment capacity and proposed capacity to be created in the States of Uttarakhand, U.P., Bihar, Jharkhand and West Bengal has been represented in **Table-1** below:

Table-1: Statement on Industries and Treatment Capacity established in States

State	No. of Industries	Effluent Discharge (MLD)	No. of Industries having ETPs	Treatment Capacity of ETPs (MLD)	CETPs (Nos. and capacity in MLD)
Uttarakhand	830	145	830	175	**Existing**-3 (13.2MLD) **Proposed**- 3 CETPs of 18 MLD.
Uttar Pradesh	1648	850.5	1404	NA	**Existing** – 7 (58.55 MLD) (01 non-operational, 06 operational)* **Under Construction** – 01No. (20 MLD)/ 3 Nos. of 26.65 MLD. **Sanctioned** – 2 Nos. of (7.1 MLD)
Jharkhand	190	NA	187	-	**Existing** :2 Nos. (2.2 MLD in Operation, 0.5 MLD CETP complete) **Under Construction**: 3.5 MLD at Ranchi, Tupadana Industrial Cluster.
Bihar	179	34.40	148	93.63	Existing: Nil Under Construction/ Proposed: There are 52 industrial areas under control of State Bihar Industrial Area Development Authority (BIADA) which is implementing construction of five CETP projects in

					five industrial areas out of State Plan. 5 Industrial Areas were identified in first Phase for construction of CETPs – Fathua (distt Patna), Hajipur (distt Vaishali), Bela (distt Muzaffarpur), Barari (distt Bhagalpur), Patliputra (distt Patna). In respect of four industrial areas viz., Hajipur (distt Vaishali), Fatua (distt Patna) Barari (distt Bhagalpur) and Bela (distt Muzaffarpur), State government has called tenders for five times but thebids were not successful. Sixth bid attempt for Hajipur in Vaishali distt with help of GIZ is underway and financial bids are under processing. Bihar Pollution Control Board has also sought advice from CPCB in respect of three industrial areas viz., Fatua (distt Patna) Barari (distt Bhagalpur) and Bela (distt Muzaffarpur) as to whether these areas can be

					exempted from CETP construction as volume of effluent involved is small and accordingly construction of CETP is commercially unviable vide their letter dated June 2021. CPCB vide letter dated 6.8.2021 has conveyed that State may ascertain the feasibility of CETP but industries shall remain compliant through functioning ETPs.
West Bengal	454	1360.60	454(400SPIs & 54 GPIs)	1360.60	**Existing** : 20 MLD CETP **Under Construction**: 4 module CETP of 20 MLD. No update provided.

*Earlier in July-2021 State has reported that all operational 6 CETPs in Jajmau, Banthar, Unnao, Pilakhuan, Tronica Ghaziabad, Rooma Kanpur, are compliant to norms while 01 CETP is non-operational. As per report of Oversight Committee for the same period, out of 7 CETPs only 5 are operational. Out of the operational CETPs, 3 are achieving norms while two are not. However as per status reported for October-2021, all operational 6 CETPs in Jajmau, Banthar, Unnao, Pilakhuan, Rooma Kanpur and Mathura are non-compliant to norms while 01 CETP at Tronika City Ghaziabad is non-operational.

Amongst others, major issues related to control and management of industrial pollution in Ganga basin area are as following:

- Upgradation of 6.25 MLD CETP (Rs.13.87 crore) for textile cluster at Mathura was sanctioned by NMCG with 25% contribution from industry members as well 100% O&M cost

to be borne by them. There is provision for 50% reuse of treated water. Contract agreement has been signed on 4.4.2021. The construction work has been started and proposed completion date is February-2022. The State Govt. of U.P./agencies involved should be directed to monitor the progress to ensure timely upgradation of CETP and assuring its O&M upon commissioning of CETP.

- 1.5 MLD ZLD based CETP for Farrukhabad textile cluster has been considered by NMCG for sanction. However, the project could not be sanctioned for transfer of land costing Rs. 7.95 crore, already allocated to SPV by UPSIDC as about 1.03 crore has been imposed as interest for 1.25 year towards delay in land acquisition process. A decision was taken by Hon'ble Cabinet Minister of Khadi, Village Industries, Sericulture, Textile, Micro, Small & Medium Enterprises and Export Promotion, Uttar Pradesh for exemption of overhead and Interest charges of the land from cabinet. This was discussed in meeting of Hon'ble Minister, (Jal Shakti) and the Chief Minster, State of U.P. held on 18.01.2021. The cabinet decision is awaited.

8.5 Environmental Flows: That as regards "Environmental flows" in River Ganga, as per paragraph 5 of the Notification dated 7.10.2016, every State Government shall endeavor to ensure that uninterrupted flows are maintained at all times in River Ganga. Further it is mentionable that every State Government shall also make effort to maintain adequate flows of water in River Ganga in different seasons to enable River Ganga to sustain its ecological integrity and to achieve the goal and that all concerned authorities shall take suitable actions in a time bound manner.

That the Government of India, in exercise of the powers conferred vide notification viz. 'River Ganga (Rejuvenation, Protection and Management) Authority Order, 2016, has notified on 09.10.2018 the minimum environmental flows to be maintained in river Ganga, for stretch starting from its origin to Unnao in Uttar Pradesh specifically at locations downstream of structures or projects meant for diversion of river flows for purposes like irrigation, hydropower, domestic and industrial and other requirements.

The environmental flow regime is applicable to all existing, under-construction and future projects [barring Mini and Micro projects which do not alter the flow characteristics of the river or

stream significantly]. An Expert Team comprising of officials from Central Water Commission (CWC), Central Electricity Authority and National Institute of Hydrology, Roorkee based on their inspection of projects during 12-16 June, 2019 reported that all the existing projects have provisions for releasing the mandated e-flows through controlled gated spillways/ waterways and structural modifications in the body of projects may not be required for the same. The release of mandated e-flows is not being maintained by some of the projects, mainly HEPs, due to commercial considerations. In view of this, it was decided that the three year period given in original notification may not be needed. Accordingly, the time period for complying with the environmental flow norms has been reduced from 3 years i.e., 09.10.2021 to 15.12.2019.

The CWC is the designated authority and custodian of the data, responsible for supervision, monitoring and regulation of flows. The monitoring of E-flows is being carried by Upper Ganga Basin Organization (UGBO), CWC since 01.01.2019. CWC in its capacity as the designated Authority, for supervision, monitoring and regulation of Environmental flows regime, fixed the e-flow targets for the Hydro Electric Projects (HEPs) operating in the

Ganga river Basin in the State of Uttarakhand and ensures strict adherence to the stipulated e-flow norms/targets by 15.12.2019. CWC has been submitting e-flows, monitoring-cum-compliance report on quarterly basis to NMCG.

(a) Uttarakhand: Projects currently being monitored by the CWC are Maneri Bhali Stage –I, Maneri Bhali Stage –II, Tehri Dam, Koteshwar Dam, Vishnuprayag HEP, Srinagar HEP, Singoli-Bhatwari HEP, Pashulok barrage/ Chilla HEP. The structures/ projects to be monitored are to be reviewed after each year.

The CWC started monitoring of the 11 projects from January, 2019 and findings of the quarterly monitoring cum compliance reports for year 2019 had been submitted before this Hon'ble Tribunal in the report submitted on 11.12.2019. The findings of the 9th monitoring-cum-compliance report for quarter January-March, 2021 and 10th draft monitoring-cum compliance report for quarter April-June, 2021 report are as follows:

- Most of the projects are providing the flow data on hourly basis regularly except Tehri and Kanpur barrage. The data from Tehri project is being received regularly but on daily basis instead of hourly basis while Kanpur barrage authorities are measuring and providing flow data on two hourly basis. The

project authorities are being pursued to provide the data in desired format on regular basis. During the 2nd Phase of Inspection visit from 7-9 August, 2019, it was stressed that the pond level (between 609 m to 612 m) of Koteshwar dam extends up to the toe level of Tehri dam, as such the whole river reach between Tehri and Koteshwar remains under pool of water. It was suggested that whole system of Tehri and Koteshwar should be considered as one single system for e-flow monitoring with inflows in Tehri reservoir and outflows from Koteshwar dam. The same has been agreed upon and incorporated in this report.

- The automatic data acquisition and transmission system have not been installed on projects so far except at Tehri, Koteshwar dam, Bhimgoda barrage and Narora barrage. The project authorities are being pursued to complete the installation. Project authorities of Pashulok barrage and Maneri-Bhali-II HEP have completed the installation. In case of Vishnuprayag HEP, SCADA system has been installed by the project authority on all the gates including at sluice gates and desilting chambers entrance and flow data is being shared with CWC in hourly or half hourly basis.

- Based on the data supplied by project authorities, most of the projects met the e-flow norms during the period as inflows are normally high in monsoon period. However, the Srinagar HEP (GVK) and Pashulok Barrage do not comply with the mandated e-flow norms.
- It is submitted that as per the quarterly reports, provided by CWC starting from January 2019 till June, 2021, following projects have been found non-compliant in respective quarter:
- 1st monitoring-cum-compliance quarterly report (Jan – March, 2019): Maneri Bhali-1, Maneri Bhali-2 HEP, Vishnuprayag HEP, Srinagar HEP
- 2nd monitoring-cum-compliance quarterly report (April-June 2019): Maneri Bhali-2 HEP, Vishnuprayag HEP, Srinagar HEP
- 3rd monitoring-cum-compliance quarterly report (July-Sep'2019): Maneri Bhali-2 HEP, Vishnuprayag HEP, Srinagar HEP
- 4th monitoring-cum-compliance quarterly report (Oct-Dec, 2019): Maneri Bhali-2 HEP, Vishnuprayag HEP, Srinagar HEP, Pashulok barrage.

- 5th monitoring-cum-compliance quarterly report (Jan-March, 2020): Srinagar HEP.
- 6th monitoring-cum-compliance quarterly report (April-June, 2020): Srinagar HEP.
- 7th monitoring-cum -compliance quarterly report (July-Sept, 2020): Srinagar HEP.
- 8th monitoring-cum-compliance quarterly report (Oct-Dec, 2020): Srinagar HEP.
- 9th monitoring-cum-compliance quarterly report (Jan-March, 2020): Srinagar HEP, Pashulok Barrage
- 10th monitoring-cum-compliance quarterly report (April-June, 2021): Maneri Bhali-2, Pashulok barrage, Srinagar HEP

i. That only Srinagar HEP has been found non-compliant with e-flow norms for First 10 days of January 2021 and from April to June 2021 except few days in June 2021.

ii. Pashulok barrage is in non-compliance only for Month of February, 2021and for few days in April 2021.

iii. Maneri Bhali-2 Project is broadly in compliance with the e-flow norms except for few days in April and May 2021.

That as per as per protocol for e-flow monitoring and compliance specified in SOPs *"If non-compliance continued for more than 5 days without any compelling circumstances, a penalty may be imposed on project authorities by NMCG under section 3 of Environment (Protection) Act 1986".*

(b) Uttar Pradesh: The State of Uttar Pradesh is complying with the notification dated 14.09.2019, Department of Water Resources, River Development and Ganga Rejuvenation, Government of India with regard to ecological flow in River Ganga from Bhimgoda (Haridwar), Bijnore and Narora. Kanpur barrage project authority is not providing any flow data and same is being collected on monthly basis by CWC officials from their office. It was informed that project authority has stated that diversions from barrage are made for the purposes of drinking water supply only, which has priority over environmental flows. Thus even if environmental flows are not met, State is bound to provide water for drinking needs.

The ecological flow as per notification dated 02.07.2021 in River Ganga from Bhimgoda Barrage (Haridwar), Bijnore Barrage and Narora Barrage is being complied.

The beta version of online portal for e-flows is currently under trial and same is being developed by Central Water Commission along with National Mission for Clean Ganga.

(c) Bihar: The State Govt. of Bihar vide Letter Dt. 24.04.2019 flagged issues of quantum of e-flows in upper riparian States of Uttar Pradesh/Uttarakhand and desired that e-flows should be maintained at > 36 cumecs in upper riparian States of Uttar Pradesh/ Uttarakhand. Further, it is desired that MoJS/GOI should notify the quantum of e-flows for entire stretch of Ganga as well as important tributaries. In this regard it is submitted that minimum flows observed at UP-Bihar border are of an order of not less than 400 cumecs while e-flows mandated through notification dated 09.10.2018 at Kanpur barrage during lean season (October-May) is 24 cumecs. Additional of 12 cumecs to be mandated as e-flows to be released by upper Riparian State, as being pointed out by Govt of Bihar, may be insignificant in view of more than 30 times flows availability at border location of UP-Bihar. The issues raised by the Govt. of Bihar may therefore may therefore not be relevant.

(d) Jharkhand: That the Government of Jharkhand has reported that there is no water flow/ discharge regulatory structure on river Ganga within the territory of Jharkhand, hence there is no issue regarding

the maintenance of e-flow within the stretch of river Ganga in Jharkhand which is being maintained. Installation of Real Time Data Acquisition System along with Data Center is to be established at Ranchi for analysis and information and it shall be completed by 2024. Further, in order to maintain the E-flow, installation of instruments across the barrages shall be completed by March 2024.

(e)West Bengal: The river Ganga is perennial river of Bengal. The e-flows is maintained in the river Ganga through the release of water from Farakka Barrage throughout the year.

8.6 Flood Plain Demarcation: That the Flood Plain demarcation/ Zoning is required to be done by the State Governments concerned. In this regard the provisions of the Authority's Order, 2016 also mandate the State Government to identify and demarcate the flood plains in the concerned State. This Hon'ble Tribunal in its various orders has also directed that till the action is taken by the State Government, the criterion of 1 in 25 years HLF shall be taken into consideration for flood plain demarcation/zoning. As per the information furnished to NMCG, the action taken by the State Government with respect to demarcation, protection and management of floodplain area of the river Ganga is as following:

(a) Uttarakhand: Under the provisions of Uttarakhand flood plain zoning Act 2012, State Govt. of Uttarakhand vide notification dated 28.02.2017, Notification done for Haridwar District's ChandiGhat bridge to village Kalsia; Uttarkashi District's Gangori to Badethi Chungi stretch; Gangotri to Devprayag, Bhilangana river, Badrinath to Devprayag, Mandakini river. The process has been initiated for flood plain zoning of Susva Gola and Kosi river, about 295 km, and proposal has been sent for approval. Further scope of flood plain zoning in 1st phase 13 rivers about 955 km and in 2nd phase 9 rivers about 1151 km have been identified.

(b) Uttar Pradesh: The State of Uttar Pradesh has submitted that for Phase –I (Segment B) of river Ganga, the notification for identification of flood plain zones as per the final report furnished by the Special Committee has been done. Flood plain has been notified as being either 100 m or 50 m from firm banks of river presently. In urban areas, this zone corresponds to 50 return period flood. The flood plain zone is to be physically demarcated and notified. Budget has been allocated for permanent demarcation of flood plain zones by fixing of stone pillars in Segment B of Phase–I. Additionally, demarcation of flood plain for Yamuna, Hindon, Kali-East, Varuna, Gomti, Ramganga, Betwa,

Ghagra, Rapti, Sai, Saryu and regulation of construction/ development activities are to be notified by the State Government.

NMCG has suggested the Govt. of U. P. for geo-tagging of stone pillars delineating flood plain area of the rivers. This will guard against physical damages to the pillars as geo-tagged pillar locations can always be accurately traced by simple dGPS tools and remain unaffected by physical damages.

(c) Bihar: With respect to status floodplain zonation and management in the State of Bihar, Hon'ble Tribunal in its order dated 08.02.2021 observed as following:

> *"...(c) Bihar: That the State of Bihar in its report has submitted that considering the densely populated northern plain terrain and embanked river in the State, the directions pertaining to flood plain zonation is not applicable in case of Bihar and the State Government is contemplating to approach the Hon'ble NGT in this regard. That Hon'ble NGT in its order dated 13.08.2020 has passed direction for constitution of a Joint Committee of members from NMCG, MoJS and CPCB to look into the issue of river floodplains demarcation and protection in the State of Bihar. In this regard, this Hon'ble Tribunal is to be apprised that the State Govt. of Bihar requested for modification in the definition of flood plain as described in the Gazette Notification S. 0. 3187(E) dated 07.10.2016. The State Govt. of Bihar was asked to carry out a scientific study and report action taken based on such study and accordingly, letters dated 31.07.2020, 10.12.2020 and 06.01.2021 was issued to the Secretary, Water Resource Deptt. Govt. of Bihar. Copies of afore mentioned letters are placed at Annexure - II. No information in this respect has been furnished by the State Govt. of Bihar till date. The Joint Committee could look into issues pertaining to demarcation and protection of floodplains in State of Bihar once this study is in place and the requisite data is provided for examination."*

In this regard the Hon'ble Tribunal is to be apprised that the Govt. of Bihar has furnished on 10.08.2021 a *'Report on Scientific study on the feasibility of Flood Plain Zoning in the State of Bihar'* prepared by the Flood Management Improvement Support Centre (FMISC), Water Resource Deptt., Govt. of Bihar (Copy annexed as **Annexure – V**). Further, an inter-departmental Joint Committee has been constituted for reviewing the report submitted by the Govt. of Bihar and examining the request of the State of Bihar as regards their claim that (i) demarcation of floodplains of the river Ganga in Bihar cannot be done, and (ii) provisions of flood plain zoning in subsection (1) (l) of Section 3 and subsection (3) of Section 6 of the River Ganga (Rejuvenation, Protection and Management) Order, 2016 needs revisiting and amended thereof, for having special provisions for Bihar State. The 1st meeting of the Committee is proposed to be held on 23.11.2021 with participation of officials of State Govt. of Bihar.

(d) Jharkhand: That the State of Jharkhand in its report has submitted that demarcation of flood plain zones necessitates earmarking in the vicinity of its existing water bodies which in turn requires regulation to ascertain flood plain zones for which the Water Resources Department (WRD), Government of Jharkhand has appointed Consultant. Further,

for accurate assessment of the food pain zone, hydrology of the rivers is also required. That the Government of India sponsored National Hydrology Project in underway and is likely to provide the requisite data by the end of March 2024. Hence, the demarcation of the flood plains of the rivers in Jharkhand will be done during 2024-2025. Under National Hydrology Project, Central Water Commission is working on developing advance flood warning monitoring system. Demarcation of flood plain zone along river Ganga as per available data has been completed.

NMCG, after examination of this information observes that scientific studies for flood plain zonation are to be undertaken by State. There is no case for awaiting the outcome of National Hydrology Project before decision on flood plain zoning in State is taken.

(e) West Bengal: The State Govt. of West Bengal has submitted that a report regarding demarcation of flood plain has been prepared by Department of Geography, University of Calcutta that has been received on 28.06.2021. This report is being examined by the Environment Deptt. and the Urban Development & Municipal Affairs Deptt., Govt. of West Bengal. The State has submitted that action will be taken after through study and review of the report. Further, the State has submitted status of various protection works which is provided in **Table – 2** below.

Table-2: Status of protection and management of floodplain zones in the State of West Bengal

Sr. No.	**Protection and management of flood plain zones (FPZ)**	Current Status	Revised Target	Action taken or suggested for violation of timelines or non-achieving of targets
1	**North 24 Parganas** - Protection to the severely damaged left bank of river Hooghly in between ChaiotanyaGhat and KanchMandirGhat by providing cement concrete block pitching for a length of 170 mm and boulder sausage protection work for a length of 50 m within Ward no. 30 & 31 of Baranagar municipality in P.S. Baranagar, District North 24 Parganas.	10% physical progress achieved.	Sep-21	All out effort has been laid to complete in revised target.
2	**North 24 Parganas** - Protection to the severely damaged left bank of river Hooghly in between Alambazar Government Quarter campus toRamlochanBabuGhat by providing cement concrete block pitching for a length of 215 m and reconstruction of 50 m guard wall in front of Bhabkunja Ashram undre Ward no. 4 of Baranagar municipality in P.S. Baranagar, District North 24 Parganas.	29% physical progress achieved.	Jun-21	Allout effort has been laid to complete in revised target.
3	**North 24 Parganas** - Protection to the left bank of river Hooghly from Mangal Pandey Ghat to Malanch Tourist Lodge near Vivekananda State Police Academy for a length of 135 m including renovation of sluice under Barrackpore Municipality	Completed	NA	NA

	in P.S. - Barrackpore, Dist. - North 24 Pgs.			
4	**South 24 Parganas -** Protection work to the left bank of Hooghly embankment at SulapaniGhat near Harna Sluice for a length of 200m in Block - Diamond Harbour-I, P.S. Diamond harbour, Dist-South 24 Parganas.	Administrative approval issued by the Finance Department on 02.02.2021, tender hasbeen invited.	Dec-21	All out effort has been laid to complete in revised target.
5	**South 24 Parganas -** Protection on left embankment of the Hooghly River for a length of 150 m by dumping Geo-Bag below L.W.L with slope protection by HDPE bags at pujali in P.S – Budge Budge ,Dist- South 24 Parganas.	85% physical progress achieved.	NA	NA
6	**South 24 Parganas**- Protection of Hooghly left embankment with Brick Block Pitching for a length of 250 M at KanchantalaShasanGhat kali Mandir within Ward No 140 of KMC in P.S – Nadial , Dist- South 24 Parganas	Administrative approval issued by the Finance Department on 21.01.2021, tender has been invited.	Dec-21	All out effort has been laid to complete in revised target.
7	**Howrah -** Protection to right embankment of Hooghly River at the confluence of Chapa Khal for a length of 210 m at Kalinagar in Block Uluberia -I, P.S. Uluberia, District Howrah.	Completed	NA	NA
8	**Howrah -**Protection to right embankment of Hooghly River at Tetikhola for a length of 150 m in Block Shyampur-I, P.S Shyampur, District Howrah.	Completed	NA	NA

9	**Howrah** - Protection to right embankment of Hooghly River at the confluence of Gouriganga Khal at Chalkashi for a length of 240 m in Block Uluberia-I, PS Uluberia, District Howrah.	Completed	NA	NA
10	**Howrah** - Protection of Hooghly right embankment for a length of 300 m at Sirishtala, Gadiara, in Block Shyampur-I, P.S Shyampur, District Howrah.	Completed	NA	NA

NMCG, after examination of this information observes that these works are flood protection works undertaken by the State government. Decision on above mentioned report on flood plain zonation followed with protection and management of identified floodplain areas, are yet to be undertaken by the State.

8.7 Depicting biological diversity of Ganga in public domain: One of NMCG's long term visions for Ganga Rejuvenation is to restore the viable populations of all endemic and endangered biodiversity of the river so that the biological communities occupy their full historical range and fulfill their role in maintaining the integrity of the Ganga River ecosystems.

Presence of rich biodiversity in a river ecosystem is the ultimate indicator of the river's health. The Ganga river ecosystem supports more than 25,000 floral and faunal species. Biodiversity of any ecosystem is

threatened foremost by the loss or degradation of its habitat. Major threats to River Ganga's biodiversity can be grouped under five overlapping categories: over-exploitation, water pollution, flow modification, destruction or degradation of habitat and invasion by exotic species, with global scale environmental changes being superimposed upon all of them.

Under *Namami Gange Programme*, biological water quality is assessed using Bio-monitoring field protocol towards semi-quantitative monitoring developed by Central Pollution Control Board. Community structure of the benthic macro-invertebrates of River Ganga and its tributaries reflects taxonomic richness with representative distributed taxa.

As mentioned above, under *Namami Gange Programme*, since 2014 onwards bio-monitoring of River Ganga and its tributaries is being carried out on regular basis to know the spatio-temporal trends in biological water quality for better understanding of health of the river system. In total, 8 rounds of bio-monitoring along the entire course of River Ganga were carried out during 2014-2020.

The biological data is available for 93 unique locations of River Ganga covered so far. Based on comparative bio-assessment study of same period carried out at 41 locations and covered in eight rounds of

bio-monitoring during 2014-2020, the spatio-temporal picture of biological water quality status of an entire river is reported.

It is revealed that there is improvement in biological water quality from moderate to good class at maximum number of (29 out of 41) locations during present investigation. These locations include Jagjeetpur u/s; Sukartal; Anupshahar; Narora; Kachla Ghat; Ghatia Ghat, Farrukhabad; Kannauj; Kannauj d/s; Bithoor; Kanpur u/s; Asni Village Fatehpur; Sirsa, Prayagraj Bridge; GT Road, Prayagraj; Varanasi u/s ; Varanasi, Rajghat; Rajwari a/c Gomti; Patna, Digha ghat; Patna, Fatuha (Bihar); Patna Malsalami; Falgu River (WB); Falgu River; Murshidabad; Behrampore d/s; Srirampore d/s; Belgharia; Ballykhal,; Howrah Bridge; Garden Reach. Location of Khudaganj shows improvement in the water quality from moderate to clean class during 2014-2018. In Uttarakhand stretch, biological water quality at Haridwar Barrage (UK) recorded improvement from slight pollution or clean to very good class during 2014-2018. Towards post-monsoon 2020, the water quality at this location, however, fell to moderate class. Biological water quality of the river in Uttar Pradesh at Bijnour (UP); Varanasi d/s and Bihar at Patna Gandhi Ghat remained moderate during 2014-2020 however; some improvement upto clean class level was obtained during intermediate periods of investigation. Jagjeetpur d/s is the exceptional

location of River Ganga in Uttarakhand where biological water quality deteriorated from clean or slight pollution (2014-2015) to poor class (post monsoon 2018-2019) during present investigation. Decline in the biological water from clean to moderate class was observed in the Kanpur stretch of river at Shakula Ganj, Deorighat during 2014-2019.

As reflected from the above comparative analysis, improvement with respect to biological water quality of River Ganga has been found which indicates the river environment in tendency of enhancing its ecological health.

Further, in order to address the threats to the aquatic biodiversity of Ganga, NMCG is working with Wildlife Institute of India (WII), Dehradun, Central Inland Fishery Research Institute (CIFRI), Barrackpore and State Forest Departments. All the reports generated from the study are uploaded in NMCG website: https://nmcg.nic.in/biodiversity_reports.aspx. Summary of these reports is as below:-

- 49% Ganga River has rich biodiversity value while sustained actions have to be continued to improve bio-diversity in the remaining reach.
- Six High Biodiversity Areas and Twelve Conservation Priority Zones exists

- Rescue & rehabilitation center established in Narora, Sarnath Bhagalpur and Kolkata.
- Cadre of more than 1300 volunteers (*Ganga Praharis*) developed and trained. These *Ganga Praharis* are actively involved in the *Namami Gange Programme* and carrying out awareness programmes, cleanliness drives and plantation drives contributing towards the mission of the *Namami Gange Programme*.
- Key ecosystem services of Ganga River identified and an assessment framework developed.
- The floating interpretation Centre at Varanasi "*Ganga Tarini*" and interpretation Centre at Sarnath "*Ganga Darpan*" established. Floating livelihood Centre "*Jalaj*" established at Varanasi. Model was also adopted by District Administration in Jharkhand.
- Assessment of fish and fisheries conducted and a total of 190 fish species mapped in GIS platform to understand the fish status and distribution in Ganga.
- Tagging procedures have been initiated to see whether the selected fishes like Hilsa can negotiate existing barrages.
- Conducted ranching cum awareness programmes and released more than 30 lakhs of fish seed in river Ganga for conservation and restoration of IMC &Mahseer.

- New sightings of Gangetic dolphins were recorded from downstream of Kanpur barrage, Smooth coated otters from Bhagalpur, Gharials at downstream of Rishikesh barrage and nesting of Indian skimmers near Prayagraj.
- On the basis of the recommendations by WII, a 30 km stretch near Varanasi was declared as '*Turtle Wildlife Sanctuary*' by Government of Uttar Pradesh for the protection of the aquatic biodiversity and their habitat in the Ganga River.
- Continued engagement of the riverside communities was ensured in the conservation process through skill development trainings conducted for *Women Ganga Praharis* from Uttar Pradesh and Jharkhand. The training and establishment of linkages are helping in improving livelihood and also linked with conservation.
- Training manuals created and distributed to teachers as resource material in Ganga bank districts.

8.8 Plantation Activities and setting up biodiversity parks: Plantations and setting up biodiversity parks along the floodplain of the rivers plays significant role in protection of floodplain area as well as restoration of river ecology. The initiatives and achievements of the States regarding plantation activities and setting up biodiversity parks are as following:-

- **Uttarakhand:** The plantation activities are being carried out in the larger catchment area of River Ganga. In the year 2020-2021 about 4,151 ha of plantation activities have been completed under the various schemes of CAMPA.
- **Uttar Pradesh:** As per the latest MPR, status of plantation activities undertaken and proposed by the State Govt. of Uttar Pradesh in the State are enumerated in the **Table - 3** below:

Table-3: Status of plantation activities

River Stretch	No. of Sampling	
	Planted Year 2019-20	Proposed for 2020-21
Hindon	55.34	55.64
Kali	65.93	69.35
Varuna	25.62	14.79
Yamuna	175.68	252.00
Gomti	180.26	151.99
Ganga	183.24	226.39
Ramganga	77.28	68.97
Betwa	24.61	49.78
Ghaghara	39.72	26.22
Sai	77.20	71.36
Rapti	57.25	29.08
Saryu	35.29	34.13
Total	**997.42**	**1049.70**

As per the MPR, Uttar Pradesh has identified the sites for the development of Bio-diversity parks in 25 districts in the main stem of Ganga and 02 districts in Yamuna covering a total area of 3591.984 ha. The project proposals for development of Bio-diversity

parks are prepared under the supervision of Prof. C.R. Babu, former Pro Vice Chancellor, University of Delhi/ Emeritus Professor, CEMDE/ Incharge, Yamuna Bio Diversity Park and his scientific team.

It is relevant to mention that a project for 'Conserving and Sustainably Managing Gangetic Floodplain Wetlands of Uttar Pradesh' has been sanctioned to Uttar Pradesh State Forest Department under *Namami Gange Programme* at a cost of Rs. 4.16 Crores. The project under implementation since June 2020 and an amount of Rs 2.49 Crores has been released by NMCG till date for the project. The project involves comprehensive and management of Gangetic floodplain wetlands of U.P. within buffer of 10kms each side from the flood plain of river Ganga main stem in the 27 Ganga river bank districts in Uttar Pradesh. The major components of project include – Wetland Inventory and Assessment, Wetland Management Planning, Wetland Monitoring and Capacity Building and Outreach.

The UP State Forest Department has reported that out of 282 wetlands identified, 197 wetlands have been reviewed and brief documents of 118 wetlands have been prepared. The 'Rapid Wetlands Ecosystem Services Assessment Protocol' has been

developed, strengthening of GIS infrastructure and lab development has been done, and training and workshops of wetland managers has been completed at Prayagraj, Badaun , Kanpur, Meerut and Varanasi and hydro-geomorphic based wetland classification for the model district (Meerut) has been completed.

- **Bihar:** Plantation is being done under *Namami Gange* Scheme and Krishi Road Map wherein the polluted river stretches will be prioritized. The Bihar state has successfully achieved the total tree cover target of 15% for the Phase-I of Bihar Agriculture Road Map. For the Phase-II of Bihar Agriculture Road Map for the period 2017-18 to 2021-22 a target of 17% total tree cover has to be achieved by 2022. A team from the State Government had visited Yamuna Biodiversity Park in Delhi and at present are exploring possibilities of developing the replication of the same in the State.
- **Jharkhand:** Plantation activities along the rivers: Total – 124.69 Kms. 9 (Jumar – 20 Kms, Swarnrekha – 65 Kms, Damodar-20.69 Kms, Konar – 6 Kms, Sankh -8 Kms and Garga - 5 Kms).
- **West Bengal:** 24 biodiversity parks construction projects are ongoing in the State.

9. **Quantity of Sewage being discharged in river Ganga and its tributaries/connected drains and correspondingly proposed/existing STPs to intercept the same with timelines.**

States in the Ganga Basin have submitted updated information with regard to the sewage generation and existing sewage infrastructure in the States. Therefore, as per the updated information, 10,139.30 MLD of sewage (from urban settlements) is being generated in 5 States in the Ganga Basin and 5,586.74 MLD capacity of STPs (226 nos.) is existing which approximates to about 50% of sewage generation. Against the existing capacity, only 61% of the capacity is being utilized for treatment of municipal sewage. Rest of the existing capacity remains unutilized because of various reasons, including lack of availability of conveyance of sewage to treatment plants, technology issues requiring up-gradation of plants, or dysfunctionality on various counts. This leaves a gap of 4,619.96 MLD in treatment capacity for which States are regularly being asked to provide details with regards to their plans to fill the gap, including that for financing the creation of infrastructure. It is also important that operational STPs remain compliant to the STP outlet standards as per environmental norms. The details of sewage

generation, existing sewage treatment capacity, its utilization and gap thereof is presented in **Table-4.**

Table-4: Details of Existing Sewage Infrastructure in the 5 Ganga Basin States

No.	State	Sewage generation (MLD)	Existing STP (capacity in MLD and Nos.)	Capacity Utilization (MLD)	Gap in Treatment at present (MLD)
1	Bihar	1100	230 (6 STPs)	100 (44%)	870
2	Jharkhand	452	103.5 (15 STPs)	77%	348.45
3	Uttarakhand	329.3	396.75 (66 STPs)	235.82 (59%)	-
4	Uttar Pradesh	5500	3471.8 (108 STPs)	2616.7 (75%)	2028.2
5	West Bengal	2758	474.69 (31 STPs) +910 MLD addl. Treatment through EKW	1201 (86%)	1373.31
	Total	**10,139.3**	**5586.74 (226 STPs)**	**68%**	**4619.96**

*State reported that 910 MLD of sewage is being treated by East Kolkata Wetlands by natural process.

10. Performance of STPs and their compliance, particularly for Faecal coliform.

As per the information received from CPCB on the basis of the inspections undertaken for verifying the compliance status of STPs, it is observed that out of 128 STPs being monitored by CPCB (102 operational STPs at the time of inspections), **09 STPs were found complying and 74 were found non-complying for *Fecal Coliform* as per Hon'ble NGT prescribed norms (<230 MPN/100ml) dated**

30.04.2019 passed in the matter of O. A. No. 1069/2018 – *Nitin Shankar Despande Vs. Union of India & Ors.* Details of the compliance status of STPs in five Ganga basin States (as on 31.10.2021) is depicted in **Table- 5** below:

Table- 5: Compliance Status of STPs in 5 Ganga Basin States (Till October 31st 2021)

State	Towns covered by 128 STPs	Average Sewage Generation in Ganga Front towns (MLD)	Installed sewage treatment capacity (MLD)	Utilized Capacity (MLD)	Total STPs monitored	Operational STPs	No. of non-complying STPs	No. of STPs Non-Complying for Fecal Coliform (<230 MPN/100 ml) norms
Uttarakhand	16	239.8	347.2	214.1	54	51	36	35*
Uttar Pradesh	11	1255.2	1137.9	930.11	32	29	26	19
Bihar	01	480	205	64	05	04	4	04
Jharkhand	01	12	12	07	02	02	2	2
West Bengal	22	1571.5	545.7	184.9	35	16	15	14
Total	**51**	**3558.5**	**2247.8**	**1400.1**	**128**	**102**	**83**	**74**

Note: 1. For 2020 and 2021 compliance status is based on norms prescribed by Hon'ble NGT in order dated 30.04.2019 (passed in OA No. 1069/2018).
2. STPs in Jharkhand and Bihar were not monitored in 2021 and last reported status is given in the Table-5.

* As reported by Uttarakhand Govt., all the STPs have been reported to be compliant with respect to Faecal Coliform norms, based on inspections carried out during January-October'2021.

The State of U. P. has informed that directions have been issued by the State PCB for starting monitoring of Faecal Coliform in STP

treated water. Presently, Faecal Coliform is being monitored for STPs in Chitrakoot and Lucknow only and the value is found to be within prescribed limits. It is to be submitted that it is responsibility of the State to ensure that all operational STPs are compliant to prescribed outlet standard, including that for Faecal Coliform norms and compliance to directions issued is reported accordingly.

Further, in view of contradictory claims of CPCB and Uttarakhand Govt. in respect of compliance status of existing STPs it for consideration of the Hon'ble Tribunal that the compliance monitoring may be carried out jointly by the Central and State regulators and the raw data may be shared with NMCG. In many of projects inspected by NMCG officials, it is seen that residual chlorine is being reported at the outlet while significantly higher Faecal Coliform levels are also being reported. This may not be physically and scientifically possible. Therefore, reconciliation of scientific finding by both State and Central regulator is necessary. It is also to be verified by State PCB and CPCB alike that availability of the OCEMS sensors in respect of various parameters like pH, DO, BOD (or TOC wherever applicable), COD, Total Nitrogen and Total Phosphorous at STPs (in all five Ganga basin States) including their

operational status and connectivity on real time basis with CPCB, SPCB and NMCG be ascertained and reported upon.

11. Water quality of Ganga at inter-State borders and at important public places/Ghats, which may show the level of compliance with regard to water quality.

(A) Water Quality assessment at Inter State Borders: Water Quality of River Ganga at inter-state borders were comparatively assessed at 07 locations of Inter State Border in the Ganga main stem States namely Uttarakhand, Uttar Pradesh, Bihar and West Bengal namely; border of Uttarakhand and U.P - D/s Roorkee, Garhmukteshwar; border of U.P and Bihar – Tarighat (Ghazipur), Buxar; border of Bihar and W.B. – Kahalgaon, Berhampore; border end of W. B. - Diamond Harbour. The comparative assessment of median data of Biochemical Oxygen Demand (BOD) of year 2014 and 2021 reveals that BOD levels have improved at all the 6 out of 7 identified water quality locations at the Inter-State Borders (except for Tarighat, Ghazipur).

The comparative assessment of water quality median data was done for water quality parameters viz. Dissolved Oxygen (DO) and

Biochemical Oxygen Demand (BOD) for the year 2014 and 2021 is depicted in **Fig.1** and **Fig. 2** resp. at **Annexure – VI.**

(B) Compliance to water quality standards: Under the *Namami Gange Programme*, CPCB is carrying out the manual water quality monitoring of River Ganga at 97 water quality locations in association with SPCBs. As per CPCB data for the year 2021 (January to July), the observed water quality of River Ganga indicates that DO has been found to be within acceptable limits of notified primary bathing water quality criteria.

As per comparison of median data of water quality parameters viz., DO, BOD and Faecal Coliform of year 2014 and 2021 (January to July), Dissolved Oxygen has improved at 40 locations, BOD at 41 locations and Faecal Coliform at 21 locations, respectively. Graphic representation of the comparative assessment for DO, BOD and Faecal Coliform is depicted in annexed **Fig. 3, Fig. 4** and **Fig. 5** resp. at **Annexure – VII.**

(C) Water Quality in Polluted River Stretches: The water quality data presented by the 5 Ganga Basin States during period since January 2020 up to December 2020 has been analyzed and the same has been summarized in **Table-6** given below:

Table - 6: Water Quality Status Stretch wise for States of Bihar, Jharkhand, Uttarakhand, Uttar Pradesh, West Bengal.

Sl. No.	State	Water Quality Status Stretch wise	
		Stretch	Range of BoD (mg/l)
1	**Bihar**	Ganga River, Buxar to Manihari; P-V	1.2-5
		Punpun River, Fatuha; P-V	1.8-5.6
		Ramrekha River Harinagar (Ramnagar) ; P-V	1.9-4.0
		Sikrahna River, Narkatiaganj; P-V	1.1-3.2
		Parmar River, Jogbani; P-V	1.9- 4.0
		Sirsia River, Raxual; P-III	3-5
2	**Jharkhand**	Garga, Along Talmuchu; P-IV	3.7
		Sankh, Kongserabasar to Bolba; P-IV	8.4
		Swarnrekha, Hatia Dam to Jamshedpur, P-IV	3.4-10
		Damodar, Phusro Road Bdg to Turio; P-V	3.9
		Jumar, Kanke Dam to Kadal; P-V	2.1- 3.3
		Konar, Along Tilaya and Komar; P-V	3.4-3.6
		Nalkari, Along Patratu; P-V	3.8
3	**Uttar Pradesh**	Based on Water Quality report for August& September 2020, as reported in the MPR provided.	
		Ganga	2.1-4.8
		Yamuna	1.9-27
		Kali East	4.6 – 66
		Hindon	14-52

Sl. No.	State	Water Quality Status Stretch wise	
		Stretch	Range of BoD (mg/l)
		Gomti	2.8 – 14
		Sai	3.2 – 4.6
		Ami	5.8 -20
		Rapti	4-5.4
		Saryu	3.2
		Betwa	5.4
4	**Uttarakhand**	Dhella	1.8-16
		Bhella	4-17
		Kichha	3-9
		Suswa	2-28
		Kalayni	2.4-18
		Kosi	3-7.8
		Pilakhar	4.1-10
		Nandhour	2.5- 5
		Ganga	1- 1.2
5	**West Bengal**	Vidyadhari	5.42-10
		Mahananda	1.20-21
		Ganga	1-3.20
		Churni	2-7.3
		Dwarka	3.05-4.20
		Damodar	1.65-3.75
		Mathanbhanga	4-5.88
		Kansi	0.6-2.40

Sl. No.	State	Water Quality Status Stretch wise	
		Stretch	**Range of BoD (mg/l)**
		Jalangi	2.25-2.85
		Rupnarayan	0.90-1.70
		Mayurakshi	<2
		Dwarakeshwar	1.85 - 2.80
		Silabati	<2
		Barakar	2.15-2.45
		Kaljani	1.20-2.10
		Karola	<2
		Teesta	0.80-1.4

As informed by the State of U. P., water quality of River Ganga is being monitored by UPPCB at 32 sampling points in U. P. and data is uploaded at UPPCB website. Water quality of River Ganga at borders and important public places-ghats is reported to show improvement from 2017 to 2021.

It is relevant to mention that the Oversight Committee has reported that as per the latest available report for the period Jan-May, 2021, water quality at 22 locations in U.P. is critically polluted. Out of the 22 locations, at 8, water quality falls in category C which means that water is suitable for drinking purpose after conventional treatment

and disinfection while at 14 locations the water quality falls in category D which suggests that water is not suitable for drinking or bathing purposes but only for propagation of wildlife and fisheries.

12. Status of compliance of CETPs at Jajmau, Unnao and Banther (applicable only to UP)

As per the recent inspections of these three CETPs, the status is presented in **Table -7** below.

Table -7: Status of CETPs in Ganga Main stem (As on October, 2021)

CETP Name/ District	Installed Capacity (MLD)	Utilized capacity (MLD)	Type & nos. of Operational member Units	Compliance status/ date of monitoring	Issues/Action taken
CETP Jajmau Kanpur, UP	36 (09 MLD industrial + 27 MLD sewage)	34.5- 36 (11.26 - 12 industrial effluent + 23.3 - 24 Sewage)	Tannery (345)	Latest inspection: 06.09.2021 Compliance status: Non-complying w.r.t. BOD (176 mg/l against norm of 30 mg/l), COD (391 mg/l against norm of 250 mg/l), TSS (151 mg/l against norm of 100 mg/l), chloride (1428 mg/l against norm of 1000 mg/l), Oil & Grease (28.2 mg/l against norm of 10 mg/l) and Chromium (4 mg/l against norm of 2.0 mg/l).	• CETP was found operational and non-complying during inspection carried out on 06.09.2021. • CPCB issued direction dated 23.07.2021 to UPPCB under section 18 (1) (b) of Water Act, 1974 regarding non-compliance of CETP Jajmau. • Letter dated 20.09.2019 issued to UPPCB regarding non-compliance of CETP. • Direction dated 13.05.2019 issued to UPPCB under Section 18 (1) (b) of Water Act, 1974.
CETP, Site-II, Unnao Unnao City, UP	2.15	0.786 to 0.999	Tannery (15)	Latest inspection: 07.09.2021 Compliance status: Non-complying w.r.t. FDS (3490	• CETP was found operational and non-complying during inspection carried out on 07.09.2021.

CETP Name/ District	Installed Capacity (MLD)	Utilized capacity (MLD)	Type & nos. of Operational member Units	Compliance status/ date of monitoring	Issues/Action taken
				mg/l against norm-2100 mg/l) and Chloride (1521 mg/l against norm-1000 mg/l).	• Letter was issued on 06.09.2021 to Unnao Tanneries Pollution Control Company (UTPCC) for non-compliance of CETP Unnao. • CPCB issued directions dated 10.05.2019 under 18 (1) (b) of Water Act, 1974 based on inspection of CETPs Site-II, Unnao.
CETP, Banthar Unnao, UP	4.5	0.918 to 1.098	Tannery (27)	Latest inspection: 07.09.2021 Compliance status: Non-complying w.r.t. BOD (140 mg/l against 30 mg/l), COD (466 mg/l against 250 mg/l), TSS (118 mg/l against norm-100 mg/l), FDS (11057 mg/l against norm-2100 mg/l) and Chloride (3911 mg/l against norm-1000 mg/l).	• CETP was found operational and non-complying during inspection carried out on 07.09.2021. • Show Cause Notice dated 21.10.2021 was issued to Banthar Industrial Pollution Control Company (BIPCC) and directed to show cause as to, why environmental compensation should not be levied on the BIPCC for the non-compliance period from 15.03.2021 to 15.06.2021. • CPCB issued directions dated 10.05.2019 under 18 (1)(b) of Water Act, 1974 based on inspection of CETPs, Banthar.
CETP, Rooma Kanpur, UP	1.55	0.498 MLD (August, 2021)	Textile (18)	Latest inspection: 02.09.2021 Compliance status: Non-complying w.r.t. BOD (75.6 mg/l against norm-30 mg/l) and FDS	• CETP was found operational and non-complying during inspection carried out on 02.09.2021. • CETP was found operational and non-complying during inspection on 04.03.2021. Show Cause Notice dated

CETP Name/ District	Installed Capacity (MLD)	Utilized capacity (MLD)	Type & nos. of Operational member Units	Compliance status/ date of monitoring	Issues/Action taken
				(3689 mg/l against norm-2100 mg/l).	15.06.2021 was issued to CETP under Section 5 of E (P) A, 1986 regarding non-compliance of CETP Rooma. • Show Cause Notice dated 15.07.2019 was issued to CETP under Section 5 of E(P)A, 1986. • Closure directions dated 12.06.2018 issued to all member units for continuous non-complying of CETP. Member units are permitted to operate on 50% of operational capacity.
CETP, Pilakhuwa, Hapur, UP	2.1	500-800 KLD	Textile (11)	Latest inspection: 12.10.2021 Compliance status: Non-complying w.r.t. BOD (53 mg/l against 30 mg/l) and FDS (2972 mg/l against 2100 mg/l).	• CETP was found operational and non-complying during inspection carried out on 12.10.2021. • CETP was found complying w.r.t. treated effluent discharge norms on 13.07.2021. Revocation of closure direction dated 11.05.2021 is proposed. As proposed by NMCG, re-inspection of CETP Pilakhuwa to verify compliance status of CPCB directions dated 11.05.2021 was carried out by officials of CPCB, NMCG and UPPCB on 12.10.2021. • CETP was found operational and non-complying during inspection on 22.03.2021. Direction dated 11.05.2021 issued

CETP Name/ District	Installed Capacity (MLD)	Utilized capacity (MLD)	Type & nos. of Operational member Units	Compliance status/ date of monitoring	Issues/Action taken
					under Section 5 of E(P) A, 1986 regarding non-compliance w.r.t. treated effluent discharge standards. UPPCB issued letter dated 12.07.2021 to HPDA to comply with CPCB directions dated 11.05.2021. • Letter dated 21.02.2020 issued to HPDA, Hapur to explain the reason for high TDS at outlet. • Show Cause Notice dated 24.09.2019 issued under Section 5 of E(P)A, 1986.
CETP SIDCUL, Haridwar, UK	4.5	4.8-5.0	Mixed type industries (516)	Latest inspection: 29.09.2021 Compliance status: Non-complying w.r.t. BOD (31 mg/l against norm-30 mg/l).	• CETP was found operational and non-complying during inspection carried out on 29.09.2021. • CETP was found operational and non-complying during inspection on 17.03.2021. Letter dated 31.08.2021 issued to SIDCUL Haridwar. • A meeting was held on 16.01.2019 under NGT directions dated 29.11.2018 regarding installation of bio-digester and ZLD system for CETP. • Show Cause Notice dated 11.05.2018 issued to SIDCUL.
CETP, Pantnagar (SIDCUL) US Nagar, UK	4.0	2.3	Mixed type industries (309)	Latest inspection: 22.09.2021 Compliance status: Non-complying w.r.t. Fluoride (2.1 mg/l against 2.0	• CETP was found operational and non-complying during inspection carried out on 22.09.2021. • CETP was found operational and complying during

CETP Name/ District	Installed Capacity (MLD)	Utilized capacity (MLD)	Type & nos. of Operational member Units	Compliance status/ date of monitoring	Issues/Action taken
				mg/l) and Boron (15.48 mg/l against 2.0 mg/l).	inspection on 19.08.2021. Letter dated 01.11.2021 issued to CETP Operator (M/s Ramky Infrastructures Pvt. Ltd.). • Direction dated 16/20.09.2019 issued under 18(1)(b) for OCEMS connectivity and flow meters operationalization.
CETP, Sitarganj US Nagar, UK	4.0	1.3-1.9	Mixed type industries (Agro based and Engineering) (67)	Latest inspection: 23.09.2021 Compliance status: Non-complying w.r.t. TDS (2456 mg/l against norm-2100 mg/l), Fluoride (11.83 mg/l against 2.0 mg/l), Cyanide (0.42 mg/l against 0.2 mg/l) and Boron (8.34 mg/l against 2.0 mg/l).	• CETP was found operational and non-complying during inspection carried out on 23.09.2021. • CETP was found operational and non-complying during inspection on 22.03.2021. Letter dated 18.08.2021 issued to Jindal ESIPL. • Show Cause direction dated 03.07.2019 under Section 5 of E(P) A, 1986 issued by CPCB, reply from the unit received on 19.07.2019 & 20.09.2019. • Matter is prejudice and NGT is monitoring the case of CETP non-compliance. NGT imposed an EC of Rs. 5,70,000 on the operating agency which was deposited by the unit. • NGT imposed another EC for Rs. 1.00 Crore vide order dated 07.09.2019 in the matter of OA No. 200/2014.

13. **Authorities at State and District Level:** The River Ganga (Rejuvenation, Protection and Management) Authorities order under Environment (Protection) Act, 1986 by the Government of India dated 7th October, 2016, creates mechanism at the State and District Level (State Ganga Committees and District Ganga Committees) for addressing the challenge of pollution abatement and rejuvenation of river Ganga. The SGCs have been formed in all five Ganga States and DGCs have been constituted for all the 52 Ganga main stem districts and 7 on tributaries. In total 59 DGCs have been notified.

A symbiotic and close functional relationship is now evolving, one - between NMCG and SGCs, two- between NMCG and DGCs directly and three - between SGCs and DGCs leading to joint partnership and ownership in Ganga rejuvenation efforts.

Regular meetings of SGCs and DGCs are taking place under the chairmanship of respective Chief Secretaries and the DMs on matters relating to various aspects of Ganga rejuvenation. NMCG is closely associating the DGCs in river rejuvenation activities directly addressing bottlenecks on the ground and playing a greater coordination role with Central Government departments as well as with State level agencies to resolve the issues.

The DGCs have also been directly provided with funds by NMCG to begin their activities and set up requisite secretariat for Ganga Rejuvenation and DGCs. The NMCG is also holding regular dialogues with the concerned line departments of the respective States to resolve the inter-department issues and to speed up clearances and grounding of projects. The line departments of the State Governments have also been asked to involve various agencies of the States in Ganga rejuvenation efforts to make the programme more organic and comprehensive.

NMCG has also held a number of Virtual Conferences directly with DGCs across states to sensitize them on the Ganga restoration initiatives, appraising their work on river rejuvenation efforts and guiding them further for bringing the river Ganga as the key focus of their planning and development in the districts.

NMCG is working continuously to develop an organic and three tiered relationship between the State and District level authorities to converge all efforts and resources specially in Ganga towns and villages to not only restore the health of the river but also to bring about Ganga centric development in the areas abutting the river for a symbiotic relation between the river ecology and sustainable growth in livelihood opportunities. States have also been requested

to suitably strengthen the institution of DGC, so that it can start performing various tasks assigned to it in the Authority Notification.

As of now, the following District Ganga Committees (DGCs) have been constituted, on main stem of river Ganga and on tributaries of River Ganga:

Table- 8: District Ganga Committees in States

States	Number of Districts	
	Main Stem of River Ganga	Tributaries
Uttarakhand	7	6
Uttar Pradesh	25	23
Bihar	12	26
Jharkhand	1	3
West Bengal	7	2
Total	**52**	**60**
Grand Total	**112**	

Moving ahead with rejuvenation of tributaries of Ganga, DGCs are being constituted for districts on major tributaries and the State and respective District authorities have been asked to nominate members for the DGCs.

14. That vide order dated 17.06.2021 passed by the Hon'ble NGT in another matter of O. A. No. 128 of 2021 – *Saurabh Tiwari Vs. Union of India & Ors.* related amongst others to pollution caused into the rivers Ganga, Varuna and Assi at Varanasi due to discharge of

untreated sewage and unauthorized construction in river bed/floodplain of these rivers, the Hon'ble NGT directed for constitution of a Monitoring Committee comprising of members from NMCG, CPCB, UPPCB and Varanasi District administration for monitoring action for remedial measures for rejuvenation of rivers Ganga, Varuna, and Assi in Varanasi. UPPCB is nodal agency for this Committee. Further, based on the report of the Committee, NMCG has been directed to submit action taken report in the matter before 04.08.2021 inter alia giving information on (a) status of water quality of Varuna & Assi; (b) action taken on diversion and treatment of sewage; (c) water quality of u/s and d/s of confluence of Assi and Varuna to Ganga, and (d) demarcation of flood plain zones of Assi, Varuna and Ganga at Varanasi.

It is submitted for consideration of this Hon'ble Tribunal that in furtherance of compliance of above said order, the Monitoring Committee has been constituted and the Committee held its first meeting on 03.07.2021. The copy of minutes of the Monitoring Committee held on 03.07.2021 is annexed as **Annexure – VIII**. Further follow up including site visits and field assessment has also been carried out.

That in the above said meeting it was decided amongst others that NMCG may engage experts from the Center for Environmental Management of Degraded Ecosystems (CEMDE) for guidance and preparing Action Plans for revival of river ecosystem activity and experts from Deptt. of Civil Engineering, IIT-Roorkee may be engaged for review of existing sewage master plan and to suggest further action points on Sewage Management, industrial Waste Management, Solid Waste & Flood Plain Zone Management, Ground Water Management, E-monitoring & Evaluation. Accordingly, NMCG vide letters dated 20.07.2021 requested Prof. C. R. Babu, CEMDE and Prof. A. A. Kazmi, IIT-Roorkee for preparation of Action Plan and to start field works in Varanasi in consultation with the Monitoring Committee. The Copies of aforesaid letters are annexed as **Annexure – IX.** Further, the Hon'ble Tribunal is to be apprised that Action Plan has been submitted by UPPCB to NMCG on 16.08.2021 (copy annexed as **Annexure – X**).

Following are the significant observations/recommendations in the Action Plan:

- The river Varuna traverses the districts of Prayagraj, Bhadohi and Varanasi of Uttar Pradesh. For restoration of the river it is

divided into three stretches with specific activities to be undertaken.

- Stretch I constitute the origin of the river Varuna which is a highly silted wetland, converted to paddy fields that receives agricultural run-offs. Suitable intervention proposed for it is to acquire cultivated land and convert it back into wetland as well as biodiversity park. Also, desilting may be carried out for restoration.
- Stretch II has two tributaries of river Varuna which carry agricultural run-off, excess water from canals and catchments from agricultural fields may carry high levels of nutrients & pesticides. Depending upon the results of assessment of nutrient load & pesticides, these may be remediated by riparian vegetation along the embankments. Besides, Burbuspur drain (Rampur) and Chauri drain (Kom, Bhadahi) were found to discharge sewage into Morwa river. Basuhi carries both sewage and industrial waste water. The sewage of Burbuspur drain and Chauri drain is suggested to be treated by Constructed Wetland System (CWS) at the mouth of the drains.
- Dhoraira drain, Basti Bazar drain and Durga drain discharges into the river Varuna. Basti Bazar drain carries sewage and industrial

effluents from carpet industries. Durga drain carries sewage and industrial effluents from Lohta of Varanasi. In-situ bioremediation through CWS is suggested for treatment of these drains.

- Stretch III is the most polluted stretch that carries that carries untapped and tapped drains. Untapped drains is to be tapped via interception/diversion to the related STPs. If overflow exists even after interception/ diversion that could be tapped into Constructed Wetlands System for in-situ remediation.
- The floodplains on either side of Ganga, particularly the side where Varuna joins Ganga (Adikeshwar Ghat) and the area between ghat and bridge in d/s of Ganga, is suggested to be developed into floodplain Biodiversity Park.
- River Assi originates from Kardmeshwar Kund – Khandwa Pokhiri, Varanasi. Continued illegal constructions along the river course and encroachment of the river bed/flood plain, obstructed the flow of the river especially from Kardmeshwar kund to pond near Kadmeshwar Inter College. This blockage of the river path led to back flow of wastewater into the Kardmeshwar kund that caused pollution of the kund. The outlet of the Kardmeshwar kund is sealed that changed the origin of River Assi, thus

effecting flow and pollution status of the river. River Assi is polluted and encroached all along its course starting from origin till it joins River Ganga.

- For rejuvenation of the River Assi it is divided into two stretches out of which Stretch I is relatively clean and do not require any major intervention. Pollution is not the pressing issue in this stretch but it is the restoration of the origin, identification of the lost path of the river Assi and allowing freshwater from the Kardmeshwar kund into the channel. The presumed path is heavily encroached therefore it is required that the encroachment may be removed and channel is restored by excavation / desilting.
- In Stretch II, Drains mainly, DLW-1 and DLW-2 coming from DLW area and discharges sewage load from Indira Nagar Colony, Newada area, into Assi.
- The present confluence points of River Assi, behind Ravidas Ghat Park is situated 770 meters u/s of original confluence point at Assi Ghat. A bandh is constructed on the River Assi just before the old confluence with River Ganga near the Assi Ghat. The old channel of River Assi carries household sewage from the point of bandh onwards and is encroached at diversion point.

- It is recommended that the first step, towards the rejuvenation of this stretch of Assi river, should be removal of the encroachments (wherever required and possible) through coordinated action by State and district administrations.
- The Khandwa Pokhri near Kardmeshwar Mahadev Inter College, Kandwa, from which it originates is a wetland and it could be restored by desilting it upto its bed level and the desilted material will be used for making embankments. The embankments should be vegetated. The sewage that enters into this pond should be channelized and treated by CWS that will be setup at the mouth of channel that discharge sewage into wetland. A series of CWS (minimum 5 units) is suggested to be setup at stretches where width of Assi river is maximum. Also, CWS is suggested at the mouth of DLW-2 drain (an open storm drain) where this drain empties into River Assi. The BOD level of the drain is 16.1 mg/L that could be easily taken care by CWS and can help reduce it further.
- A floodplain Biodiversity Park may be developed concurrently in d/s upto 5 km of the area where once River Assi used to confluence with River Ganga around Assi ghat. Once this biodiversity park is constructed having functional CWS, the

channel of River Assi can be restored back by passing the river water through treatment wetlands of Biodiversity Park before it is discharged into Ganga.

Views of NMCG:

The views of NMCG on Action Plan that emerged during discussions with Prof. C. R. Babu and Prof. A. A. Kazmi are as below:

- Water quality of u/s and d/s of confluence of Assi and Varuna to Ganga as per reported monitoring data for the period January to July 2021 is tabulated below in Table - 9.

Table - 9: Water quality of u/s and d/s of confluence of Assi and Varuna

Stretch	DO (mg/L)	BOD (mg/L)	Faecal Coliform (MPN/100ml)
U/s Varanasi (Assi Ghat)	8.8	2.3	800
Varanasi D/s (Malviya Bridge)	7.9	3.8	11,000

- Regarding sewerage management in sewerage district 3, the current estimation of Assi flow appears to consider monsoon runoffs, hence, there is a need for assessment of dry weather flow of Assi river post monsoon, sometime in October-

November'2021 through scientific measurements using V-notch etc.

- Non-revenue water need to be checked and controlled. There has been significantly higher per capita water supply/ uses compared to CPHEEO guidelines and the non-revenue water is around 40-50% as against the norm of less than 15%. It is worth mentioning that JICA in its sewerage master plan estimated the need for 37 MLD STP at Ramana for year 2015 and 75 MLD for year 2030 (with de-commissioning of Bhagwanpur STP) which was reviewed in 2014-15 by JICA and revised the proposed 75 MLD STP capacity at Ramana to 50 MLD with continuation of 9.8 MLD STP at Bhagwanpur. Recently, a visit was undertaken in Varanasi by a senior official of NMCG to look into the aforementioned issue of excess flow into the Ramana STP. Various interventions have been suggested to control excess flow in this STP. These interventions are being studied so that further cation plan can be finalized.
- There has been storm water drain, with smaller drains and sewerage connections, constructed under JNNURM programme connecting part of sewerage district 2 to sewerage district 3 leading to river Assi. These drains should be only be used as

storm water drain only. Thus controlling waste water from other sewerage districts reaching Assi has also to remain under focus.

- Biodiversity park near Assi Ghat with sewage feed on the flood plains may not be desirable considering it to be right at the upstream of all major ghats of Varanasi.
- 12 MLD DLW STP is treating around 5-6 MLD and the treated water is discharged to the DLW-1 drain leading to river Assi which not only is required to be treated again at Ramana STP but also increases the hydraulic load. The feasibility of optimum utilization of DLW STP i.e. 12 MLD and laying a separate pipeline for discharging the treated water to river Ganga/ Varuna without its mixing with flows of Assi through DLW-I drain (leading to double treatment of treated water) has to be explored and ensured by UPJN. This alone may reduce the flows at Ramana STP by about 10-12 MLD.
- An interceptor sewer network has been laid all along Assi and the feasibility of connecting all inlets/ outfalls, currently into the Assi river, to this interceptor sewer may need to be examined. This will ensure that sewage from contributing catchment is trapped and conveyed to downstream instead of sewage diluted with raw ground water allowed to flow into Assi. Thereafter, the collected

sewage from interceptor can be conveyed to OTS or RTS through a link conveyance to be treated at existing 140 MLD STP at Dinapur where spare capacity is available. This can be explored provided discharging capacity is available in OTS/ RTS and space for laying of link conveyance and a pumping station, if required, is available. Actions in this respect have to be ensured by UPJN.

- Recommendations for an additional STP of requisite capacity can always be considered as part of long term futuristic planning based on merits but since the entire process is time consuming starting from conceptualizing the project, its sanction, procurement and implementation, the priority has to ensure using the spare capacity available in existing STPs located in other sewerage zones by providing inter-sewerage zonal linkages, which can be implemented in comparatively shorter time span.
- Short term measures indicated by the experts pertaining to restoration of the wetlands and development of the constructed wetlands for river Varuna and Assi appears to be in order and can be accepted for further actions i.e. detailed feasibility / project report and implementation. Regarding sewage management, re-assessment of the dry weather flow post monsoon is necessary

before any investment decision is taken. The engineered transfer of water may be reviewed internally after examination of JICA sewerage plans as well as follow-up meetings with relevant stakeholders i.e. UPPCB, CPCB, UPJN, department of Irrigation, NMCG, UPSMCG etc. before arriving at final recommendations. It is submitted for consideration of this Hon'ble Tribunal that as far as the short-term measures such as constructed wetlands system, ecological restoration, Biodiversity parks and bio-remediation/phyto-remediation etc. are concerned, NMCG is in agreement with the recommendations and these measures may be taken up by the State agencies as it would also add not only to aesthetic beauty of the riverscape in Varanasi but will also contribute towards pollution abatement and river rejuvenation. The Dept. of Irrigation, Govt. of U.P. is being consulted for their input in this regards as they are the custodian of the land along the rivers that will be used for initiating these short-term measures. As regards long term measures in the form of setting up additional STPs, laying of interceptor and diversion lines, NMCG is in discussion with all stakeholders and requests this Hon'ble Tribunal to grant two months' time to come up with firm recommendation/suggestions in this regards.

15. The 4th Quarterly Progress Report of the NMCG is submitted for consideration by this Hon'ble Tribunal in the next hearing.

12.11.21

(D.P. Mathuria)
Executive Director (Technical)
National Mission for Clean Ganga

Annexure - I

L-25012(11)/2/2020/NMCG/699
National Mission for Clean Ganga
Department of Water Resources, River Development
& Ganga Rejuvenation, Ministry of Jal Shakti

1st Floor,
Major Dhyan Chand National Stadium
India Gate, New Delhi-110002
Dated: 12th October 2020

OFFICE MEMORANDUM

Subject: Minutes of the First joint meeting of the Chief Secretaries of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand & West Bengal in the NGT matter O. A. No. 200 – M. C. Mehta Vs. Union of India &Ors. held on 07.10.2020 form 03:00 PM onwards

Kindly recall the joint meeting inthe NGT matter O. A. No. 200 – M. C. Mehta Vs. Union of India &Ors. held through video conferencing on 07.10.2020 from 03:00 PM onwards under the Chairmanship of Secretary, Ministry of Jal Shakti. A copy of the said meeting is forwarded herewith for your kind information and necessary action.

(D. P. Mathuria) 12.X.2020
Executive Director -Technical
National Mission for Clean Ganga
uyrb-mowr@nic.in

Encl.: As above

To,

1. Chief Secretary, Government of Uttarakhand, 4 Subhash Road, Uttarakhand, Secretariat Dehradun – 248 001
2. Chief Secretary, Government of Uttar Pradesh, 1st floor, Room No. 110, Lal bahadur Sastri Bhawan, Uttar Pradesh Secretariat, Lucknow – 226 001
3. Chief Secretary, Government of Bihar, Main Secretariat, Patna – 800015
4. Chief Secretary, Government of Jharkhand, 1st Floor, Project Building, Dhurwa, Ranchi-834 004
5. Chief Secretary, Government of West Bengal, Nabanna, 13th Floor, 325, Sarat Chatterjee Road, Mandirtala, Shibpur, Howrah – 711 102
6. Sh. Anurag Jain, Vice Chairman, DDA, Vikas Sadan, New Delhi – 110 016
7. Ms. Keshani Anand Arora, Former Chief Secretary, Government of Haryana
8. Ms. Shilaja Chandra, Former Chief Secretary, Govt. of NCT of Delhi
9. Ms. Vini Mahajan, Former Chief Secretary, Government of Punjab
10. Sh. Anup Chandra Pandey, Former Chief Secretary, Government of Uttar Pradesh

Copy To:

1. Principal Secretary, Department of Environment, U.P., Room No. 601, Bapu Bhawan Secretariat, Vidhan Sabha Marg, Lucknow – 226001.

2. Principal Secretary, Department of Environment, Forest and Climate Change, Van Vibhag Road, Nehru Nagar, Patliputra Colony, Patna – 800 013, Bihar
3. Secretary, Environment & Forest, Govt. of Uttarakhand, 4 Subhash Road, Secretariat, Fourth Floor, New Building Dehradun – 248 001
4. Principal Secretary, Department of Environment, 5th Floor, Pranisampada Bhawan, Block LB-II, Salt Lake, Sector III, Bidhannagar, Kolkata – 700 106
5. Additional Chief Secretary Forest, Environment & Climate Change Deptt., Nepal House, Doranda, Ranchi – 834 002, Jharkhand
6. The Member Secretary, Bihar State Pollution Control Board, Parivesh Bhawan, Plot No. NS-B/2 Patliputra Industrial Area, Patliputra, Patna – 800 010, Bihar
7. The Member Secretary, Jharkhand Pollution Control Board, T.A Building, HEC, P.O. Dhurwa, Ranchi – 834 004
8. The Member Secretary, Uttarakhand Environmental Protection & Pollution Control Board, 29/20, Nemi Road, Dehradun, Uttarakhand – 248 001
9. The Member Secretary, Uttar Pradesh Pollution Control Board, Building. No. TC-12V, Vibhutikhand, Gomti Nagar, Lucknow – 226 010
10. The Member Secretary, West Bengal Pollution Control Board, Paribesh Bhavan, 10A, Block-L.A., Sector III, Salt Lake City, Kolkata – 700 106

Copy for kind information:

1. PPS to Secretary, Ministry of Jal Shakti, Shram Shakti Bhavan, Rafi Marg, Sansad Marg Area, New Delhi – 110 001
2. PS to Director General, NMCG-cum-Project Director, NRCD
3. Chairman, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi – 110 032
4. Member Secretary, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi –110 032
5. PS to ED (Project/ Finance), NMCG

****

Minutes of the First Joint Meeting of the Chief Secretaries of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand & West Bengal in NGT matter O. A. No. 200 – M. C. Mehta Vs. Union of India & Ors. held in the Conference Room, National Mission for Clean Ganga on 07.10.2020, 3 PM (through video conferencing)

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Present:

1.	Sh. U. P. Singh	Secretary, Ministry of Jal Shakti (MoJS)
2.	Sh. Rajiv Ranjan Mishra	D. G., NMCG
3.	Sh. Om Prakash	Chief Secretary, Govt. of Uttarakhand
4.	Sh. Ashok Singh	Executive Director (Projects), NMCG
5.	Sh. D. P. Mathuria	Executive Director (Technical), NMCG
6.	Sh. Vivek Kumar	Principal Secretary, Dept. of Environment, Govt. of W. B.
7.	Sh. Anurag Jain	Vice Chairman, DDA
8.	Sh. A.K. Vidyarathi	Addl. Director, CPCB
9.	Sh. Vinay Kr. Chaubey	Secretary, State Urban Development authority, Jharkhand
10.	Sh. Anurag Srivastava	Principal Secretary, Jal Shakti Dept., Govt. of U.P.
11.	Sh. Ishwer Singh	Consultant (Legal), NMCG
12.	Sh. Kumar Ajitabh	Project Officer (Legal), NMCG

Special Invitee

1.	Smt. Shailaja Chandra	Former Chief Secretary, Govt. of NCT of Delhi
2.	Dr. Anup Chandra Pandey	Former Chief Secretary, Govt. of U.P.
3.	Smt. Keshani Anand Arora	Former Chief Secretary, Govt. of Haryana

Following deliberations were made in the meeting:

1. DG, NMCG welcomed the participants and invited Chairperson, Secretary, Ministry of Jal Shakti, for his inaugural address.

2. Chairperson, while welcoming the dignitaries in his inaugural address informed that there are number of orders passed by the Hon'ble NGT related to River Ganga and other polluted River stretches in the country stressing upon various issues that should be collectively looked into by the States/ UTs administration and Central Govt. for successful implementation of different programs related to abatement of pollution and rejuvenation of rivers. The Hon'ble NGT in its recent order dated 13.08.2020 in *O. A. No. 200/2014* has categorically mentioned that there should be a joint discussion between the Chief Secretaries of five Ganga States i.e. Uttarakhand, Uttar Pradesh, Bihar, Jharkhand & West Bengal. The Chair remarked that in today's meeting only the Chief Secretary of Uttarakhand is present. Except for the Chief Secretary of West Bengal who has been courteous enough to inform that he could not attend the meeting as he is on tour, there has been no communication from the Chief Secretaries of other Ganga States. It is unfortunate that none of them submitted their feedback for joint discussion in terms of NGT order. The Chair further remarked that since, the NGT orders are very specific, the chair is not inclined to hear and discuss with delegated Officers from the State Government, as such approach would negate the very purpose of calling such a meeting and render it futile. The Order of the Hon'ble NGT was for

a joint meeting and not a review meeting by Secretary, Ministry of Jal Shakti. Due to absence of 4 out of 5 Chief Secretaries, it was not possible to have a meaningful discussion.

3. The Chair expressed that basic idea behind this meeting is that the issues related to implementation of projects for pollution abatement in River Ganga should have attention of the highest-level bureaucrats of the concerned State Governments. The emphasis is on establishing a common platform for dissemination of best practises that have been successfully adopted for containment of pollution and rejuvenation of rivers & water bodies. The obvious objective is to jointly deliberate upon how the Uttarakhand administration managed to achieve remarkable progress in rejuvenation of River Ganga and the reasons behind poor performance by other Ganga States so that there is no perpetual obliviousness amongst the riparian States. This is not a normal/routine review meeting akin to those convened at the National level by the Central Monitoring Committee (CMC) constituted in *O. A. No.673/2018*, as there would be review of not only those projects which are funded under *Namami Gange Programme,* but also projects which are funded/sponsored under various schemes or programmes of Central and/ or State Govts.

4. Chairperson raised concern that despite the projects in the five Ganga States are being regularly monitored in monthly meetings of the CMC, followed by sending of minutes of the meetings with DO letters to the Chief Secretaries regarding compliances on specific issues and bringing those issues into the attention of Chief Secretaries, none of the States have exhaustive data on STP infrastructure providing details about existing STPs, commissioning date, installed capacity, capacity utilized, etc. Besides, there is lack of single body monitoring of STP functionality in almost every State. It is high time that State administrators have a handy data of sewerage infrastructure.

5. Executive Director (Technical), NMCG briefly presented directions passed by the Hon'ble NGT in order Dt. 13.08.2020. He also mentioned about pertinent observations of the Hon'ble NGT and salient points of discussion. He mentioned that Hon'ble Tribunal observed that vide its order dated 29.05.2019, it was directed that Ganga pollution be monitored directly by the Chief Secretaries of Uttarakhand, U.P., Jharkhand, Bihar and W.B, in view of such monitoring having already been directed in respect of 351 polluted river stretches in different States by the Chief Secretaries. Further road map, including identification of accountable persons and taking actions for the lapses was also to be prepared.

6. He further mentioned that Hon'ble NGT also observed that there should be periodic joint meetings of the Chief Secretaries of the concerned States to consider vital issues like pooling of human resources and sharing best practices for rejuvenation of Ganga, particularly preventing discharge of sewage and other pollutants therein directly or in its tributaries or drains connected thereto. There is

a need to take a holistic approach of treating river Ganga as a single entity and eco-system which requires pooling of fiscal resources by different stakeholders. For the said meeting Chief Secretaries would compile their feedback beforehand for an effective interaction and joint discussion. Further, such meetings may be held at least once in 03 months with specific targets.

7. He also mentioned that Hon'ble NGT directed for constitution of a Joint Committee of members from NMCG, MoJS and CPCB to look into the issue of river floodplains demarcation and protection in the State of Bihar. He informed that the CWC and CPCB have nominated officials for the said joint committee. The committee should decide the scope of work, line of action and time lines at the earliest.

8. Smt. Shailaja Chandra, former Chief Secretary, Govt. of NCT of Delhi thanked Chair & DG, NMCG for inviting to speak on issues pertaining to abatement of pollution in rivers & water bodies and share experience on best practises that have been successfully adopted for containment of pollution and rejuvenation of rivers & water bodies. She talked about some of the generic issues with respect to pollution of water bodies that have been dealt during the monitoring of pollution abatement projects for River Yamuna in Delhi. She opined that these can be broadly categorised into: (i) STPs and their functioning; (ii) Septage Management; and (iii) Softer issues like utilizations of treated waste-water, phytoremediation, bioremediation as interim majors, Ground water contamination and recharge related issues, biodiversity and wetland conservation. She further stated that the first category related to STPs and their functioning can be further categorised into four sub-categories viz. (a) setting of new STPs; (b) capacity utilization; (c) the conveyance system being placed in positions and its synchronisation with the STPs constructed; and (d) the treatment as per the standard norms, requirement of upgradation in view of new standards along with the issue of non-functional STPs for want of proper monitoring. She also cited the example of the Panipat STP where the STP has been rendered useless because of lack of proper conveyance system.

9. With respect to second issue related to septage management, she raised concern about the problem of large number of unauthorised colonies/slum bastis in Delhi which are devoid of sewerage systems. She suggested that if the Govt. is desirous of tackling these issues related to setting up of septic tanks, collection of septage and its disposal as per the norms, then the issues related to charges/finances also needs to be settled. For this she gave the example of arrangement made in Delhi by which probably DISCOMS/ Electricity Regulatory Authority will collect annual charges from dwellers of unauthorised colonies/slum bastis for facilitation of septage management that is as per the septage management policy of the Govt. of Delhi.

10. With respect to softer issues she was of the view that the softer issues are more related to conservation of river ecology and therefore, may be taken up as third priority.

11. She suggested that it is almost impossible to deliberate/grapple on all the three issues simultaneously in a single meeting and therefore, the glaring question are that of prioritizing the issues so that they can be dealt with effectively within the busy schedule of the State administrators.

12. Dr. Anup Chandra Pandey, former Chief Secretary, Govt. of U.P. highlighted that due to their keen attention bestowed by the Secretary, MoJS and DG, NMCG, the planning and implementation of various projects for pollution abatement and rejuvenation of rivers & water bodies in the State of U.P. have gained momentum. He expressed his confidence that this team would certainly cover the gaps and achieve goals. He felt there was a lot of work required to be done at the ground level in relation to creation of sewerage capacity, management of legacy wastes, re-use of treated waste-water, solid waste management facility, adoption of FSTPs and phytoremediation- bioremediation initiatives in the State of U.P.

13. He also drew attention towards non-functioning of the Pratapgarh STP even after a decade of its sanction. He suggested that the strike should be on rendering the existent sewerage capacity functional and making them compliant to standards. The issues related to operation and maintenance should be dealt thorough impact evaluation /audit of the 'One City-One Operator' arrangement that has been adopted since last year.

14. He spoke about the importance of community participation and involvement of local public for restoration and rejuvenation of rivers/water bodies. He suggested that the success story of the rejuvenation of Tamsa river in Ayodhya through *shram-daan* by local public under MANREGA scheme should be shared with all District Magistrates and they should be asked to identify and take up similar activities, with the involvement of local public, that may help in restoring the water bodies/rivers/ground water with minimum financial burden.

15. He also recommended that efforts be made in close coordination with technical bodies to tap excess run-off of rivers/canal during rainy season to recharge old water bodies and retain water in new ponds to be constructed specifically for the purpose. Such simple interventions have been taken up in Mathura district to increase groundwater level and rejuvenate water bodies. He suggested that the Mathura experiment be technically vetted by some technical body under the MoJS for replicating it in other places with deplorable groundwater levels.

16. Several other related examples of restoration of ponds/lakes/wetlands etc. were also cited by the Chair and it was suggested that District Magistrates should strive to rejuvenate every water body in the district by next monsoon.

17. Chief Secretary, State of Uttarakhand apprised the committee that there were total 32 new STPs proposed to be constructed on the main stem of River Ganga with support of NMCG and out of which 29 STPs have been completed. Remaining 03 STPs will be completed by 31.03.2021. All the STPs are complying with the environmental norms, 12 STPs have been connected with OCMS. Periodical inspection is being conducted by Uttarakhand Pollution Control Board. There were 131 drains that were draining into River Ganga and all these drains have been intercepted by 46 STPs (14 existing, 32 new).

18. He informed that State Govt. of Uttarakhand has constituted a committee to monitor steps for conservation of ground water and directed Forest Department to develop catchment area treatment plants and pooling/ dovetailing of financial resources for restoration of water bodies and ponds etc. from CAMPA and MANREGA funds.

19. He spoke about the funding crunch for solid waste management programs but assured that Govt. of Uttarakhand is looking forward towards exploring CSR schemes of willing corporate houses for this purpose.

20. Since, Chief Secretaries from the States of Uttar Pradesh, Bihar, Jharkhand and West Bengal were absent their view could not be taken up for discussion. The delegated officials from these States who were present in the meeting were suggested to convey accordingly.

21. The chair approved for convening the next meeting in December 2020 at suitable date and time, provided the Chief Secretaries of States concerned get themselves acquainted with details /issues to be discussed and give their feedbacks in advance.

The meeting ended with thanks to the Chair.

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Annexure II

Legal/OA673/2018/NMCG/2019
National Mission for Clean Ganga
Department of Water Resources, River Development
& Ganga Rejuvenation, Ministry of Jal Shakti

1st Floor,
Major Dhyan Chand National Stadium
India Gate, New Delhi-110002
Dated: 14th January 2021

OFFICE MEMORANDUM

Subject: **Minutes of the 8th meeting of Central Monitoring Committee in the NGT Matter OA No.673 of 2018 held on 05.01.2021 from 10.00 AM on-wards**

A copy of Minutes of the 8th Meeting of Central Monitoring Committee in the NGT matter O.A. No. 673 of 2018 held through Video Conferencing on 05.01.2021 from 10.00 AM on-wards, under the Chairmanship of Secretary, Ministry of Jal Shakti is forwarded herewith for information/ necessary action.

(D. P. Mathuria) 14.1.2021
Executive Director-Technical, NMCG
uyrb-mowr@nic.in

Encl: As above.

To,

1. Chief Secretary, Government of Andhra Pradesh, I st Block, A.P Secretariat Office, Velagapudi – 522503
2. Chief Secretary, Government of Assam, Block- C, 3rd Floor, Assam Sachivalaya, Dispur - 781006, Guwahati
3. Chief Secretary, Government of Bihar, Main Secretariat, Patna – 800015
4. Chief Secretary, Government of Chhattisgarh, Mahanadi Bhawan, Mantralaya, Naya, Raipur – 492002
5. Chief Secretary, Government of Goa, Secretariat, Porvroim, Bardez, Goa – 403521
6. Chief Secretary, Government of Gujarat, 1st Block, 5th Floor, Sachivalaya, Gandhinagar – 382010
7. Chief Secretary, Government of Haryana, 4th Floor, Haryana Civil Secretariat, Sector-1, Chandigarh – 160019
8. Chief Secretary, Government of Himachal Pradesh, H P Secretariat, Shimla –171002
9. Chief Secretary, Government of Jammu & Kashmir, R. No. 2/7, 2nd Floor, Main Building, Civil Secretariat, Jammu -180001
10. Chief Secretary, Government of Jharkhand, 1st Floor, Project Building, Dhurwa, Ranchi-834004

11. Chief Secretary, Government of Karnataka, Room No. 320, 3rd Floor, Vidhana Soudha, Bengaluru -560001
12. Chief Secretary, Government of Kerala, Secretariat, Thiruvananthapuram -695001
13. Chief Secretary, Government of Madhya Pradesh, MP Mantralaya, Vallabh Bhavan, Bhopal – 462004
14. Chief Secretary, Government of Maharashtra, CS office main Building, Mantralaya, 6th floor, Madame Cama Road, Mumbai – 400032
15. Chief Secretary, Government of Manipur, South Block, Old Secretariat, Imphal – 795001
16. Chief Secretary, Government of Meghalaya, Main Secretariat Building, Room no 316, Shillong – 793001
17. Chief Secretary, Government of Mizoram, New Secretariat Complex, Aizwal – 796001
18. Chief Secretary, Government of Nagaland, Civil Secretariat, Kohima – 797004
19. Chief Secretary, Government of Odisha, General Administration Department, Odisha Secretariat, Bhubaneswar – 751001
20. Chief Secretary, Government of Punjab, Chandigarh – 160001
21. Chief Secretary, Government of Rajasthan, Secretariat, Jaipur – 302005
22. Chief Secretary, Government of Sikkim, New Secretariat, Gangtok – 737101
23. Chief Secretary, Government of Tamil Nadu, Secretariat, Chennai-600009
24. Chief Secretary, Government of Telangana, Block C, 3rd floor, Telangana Secretariat Khairatabad, Hyderabad, Telangana
25. Chief Secretary, Government of Tripura, New Secretariat Complex Secretariat – 799010, Agartala, West Tripura
26. Chief Secretary, Government of Uttar Pradesh, 1st floor, Room No. 110, Lal bahadur Sastri Bhawan, Uttar Pradesh Secretariat, Lucknow – 226001
27. Chief Secretary, Government of Uttarakhand, 4 Subhash Road, Uttarakhand, Secretariat Dehradun – 248001
28. Chief Secretary, Government of West Bengal, Nabanna, 13th Floor, 325, Sarat Chatterjee Road, Mandirtala, Shibpur, Howrah – 711102
29. Administrator, Daman & Diu and Dadra and Nagar Haveli, Secretariat, Moti, Daman -396220
30. Chief Secretary, Govt. of NCT of Delhi, Delhi Secretariat, IP Estate, New Delhi – 110002
31. Chief Secretary, Govt. of Puducherry, Main Building, Chief Secretariat, Puducherry-605001
32. Chief Secretary, Andaman & Nicobar, Secretariat, Port Blair
33. Administrator, Lakshadweep

Copy To:

1. Secretary, Department of Forest, Ecology & Environment, J&K, Room no. 2/33-34, Main Building, Civil Secretariat, J&K, Jammu.
2. Secretary, Department of Environment, Science and Technology Paryavaran Bhawan, Near US Club, Shimla, Himachal Pradesh-171001
3. Principal Secretary, MGSIPA Complex, Sector-26, adjacent Sacred Heart School, Chandigarh, 160019

4. Additional Chief Secretary to Govt. of Haryana, Environment Department of Environment & Climate Change, R.No. 108, 7th Floor, Main Secretariat Sec16, Chandigarh 160017
5. Principal Secretary, Department of Environment, U.P., Room No. 601, Bapu Bhawan Secretariat, Vidhan Sabha Marg, Lucknow – 226001.
6. Special Chief Secretary, Department of Environment, Forest, Science & technology, 4th Block, Ground Floor,Room No:268, A.P Secretariat Office, Velagapudi
7. Secretary, Department of Environment and Forest, H-Block, 2nd Floor Janata Bhawan, Dispur, Guwahati 781006, Assam
8. Principal Secretary, Department of Environment, Forest and Climate Change, Van Vibhag Rd, Nehru Nagar, Patliputra Colony, Patna, Bihar 800013
9. Additional Chief Secretary (Forests & Environment), Forests & Environment Department, Block 14, 8 th floor, Sachivalaya, Gandhinagar - 382 010 Gujarat.
10. Principal Secretary, Department of Environment, Room No. S-2/23, Mahanadi bhawan, Mantralaya, Nava Raipur, Atal Nagar, Raipur - 492001
11. Additional Chief Secretary to Government, Forest, Environment and Ecology, Department, Karnataka Government Secretariat, Room No. 447, 4th Floor, Gate no. 2, Multi-storey Building, Bangalore-560001.
12. Principal Secretary, Department of Environment, Room No. 406 4th Floor Annex II, Secretariat, Kerala Thiruvananthapuram, Kerala, PIN- 695001
13. Principal Secretary, Department of Housing and Environment, Government of Madhya Pradesh, Paryavaran Parisar, E- 5, Arera Colony, Bhopal, Madhya Pradesh, 462016
14. Principal Secretary, Environment Department, Maharashtra 15th Floor, New Administrative Building, Madam Cama Road, Mantralaya, Mumbai – 400032
15. Additional Secretary, Forests & Environment Deptt, Secretariat Building, North Range, Forest Colony, Khasi Hills, Shillong, Meghalaya 793001
16. Deputy Conservator of Forest (Headquarters) Environment, Forests & Climate Change Department Tuikhuahtlang, Aizawl Mizoram.
17. Principal Secretary, Department of Environment, Forest & Climate Change, New Secretariat, Kohima, Nagaland Tel.- 0370-2243025
18. Additional Chief Secretary, State Silvicultural garden, Khandagiri, Bhubaneswar, Odisha 751003
19. Principal Secretary, Forest and Environment Department, Rajasthan 4, Jhalana Institutional Area, Jhalana Doongri, Jaipur, Rajasthan 302004
20. Principal Secretary, Chief Project Director (SBFP-JICA), Forests, Environment & Wildlife Management Department, Government of Sikkim
21. Principal Secretary, Namakkal Kavignar Maaligai, Fort St. George, Chennai 600 009
22. Secretary, Department of Science, Technology & Environment, Vigyan Prajukti O Paribesh Bhawan, P.N. Complex, Gorkhabasti, Agartala,West Tripura, PIN-799006
23. Special. Chief Secretary, TSCOST, 4th Floor, Aranya Bhavan, Saifabad, Hyderabad, Telangana State, Pin – 500004
24. Deputy Conservator of Forests, (Territorial Division), Department of Environment & Forest Office of the Deputy Conservator of Forest, Daman, Fort Area, Post Office Moti Daman Daman cz

25. Deputy Conservator of Forests, (Territorial Division), Van Bhavan, Dadra and Nagar Haveli
26. Secretary, Department of Environment, Govt. of NCT of Delhi, 6th Floor, Delhi Secretariat, IP Estate, New Delhi 110002
27. Secretary, Environment & Forest, Govt. of Uttarakhand, 4 Subhash Road, Secretariat, Forth Floor, New Building Dehradun, Pin code-248001
28. Joint Secretary, Department of Science, Technology & Environment, 1st Floor, Pandit Deendayal Upadhay Bhavan, Behind Pundalik Devasthan, Near Sanjay School, Porvorim, Bardez - Goa
29. Secretary, Environment, Office of Environment, Chief Secretariat, Goubert Avenue, Puducherry 605001
30. Principal Secretary, Department of Environment, 5th Floor, Pranisampad Bhawan, Block LB-II, Salt Lake, Sector III, Bidhannagar, Kolkata – 700 106
31. Additional Chief Secretary Forest, Environment & Climate Change Deptt., Nepal House, Doranda, Ranchi-834002, Jharkhand
32. Additional Chief Secretary, Forest and Environment Department, Government of Manipur, Secretariat, Imphal- 705001
33. The Member Secretary, Assam Pollution Control Board, Bamunimaidam, Guwahati – 781021
34. The Member Secretary, Andhra Pradesh Pollution Control Board D.No. 33-26-14 D/2, Near Sunrise Hospital, Pushpa Hotel Centre, Chalamalavari Street, Kasturibaipet, Vijayawada – 520 010
35. The Member Secretary, Bihar State Pollution Control Board, Parivesh Bhawan, Plot No. NS-B/2 Paliputra Industrial Area, Patliputra, Patna (Bihar) - 800 010
36. The Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas Bhavan, North Block Sector-19, Atal Nagar Dist- Raipur (C.G.) 492002
37. The Member Secretary, Delhi Pollution Control Committee, Government of N.C.T. Delhi 4th Floor, ISBT Building, Kashmere Gate, Delhi-110006
38. The Member Secretary, Daman, Diu & Dadra Nagar Haveli Pollution Control Committee, Office of the Deputy Conservator of Forests, Fort Area, Court Compound, Moti Daman, Daman – 396220
39. The Member Secretary, Goa State Pollution Control Board, 1st Floor, Dempo Tower, EDC Patto Plaza, Panaji, Goa-403 001
40. The Member Secretary, Gujarat Pollution Control Board Paryavan Bhavan, Sector 10- A, Gandhinagar – 382 043
41. The Member Secretary, Haryana State Pollution Control Board, C-11, Sector-6, Panchkula-134109, Haryana
42. The Member Secretary, Himachal Pradesh Pollution Control Board, Him Parivesh, Phase-III, New Shimla, Himachal Pradesh 171009
43. The Member Secretary, Jammu & Kashmir State Pollution Control Board, Parivesh Bhawan, Forest Complex, Gladni, Narwal, transport Nagar, Jammu, Jammu and Kashmir 180004
44. The Member Secretary, Jammu & Kashmir State Pollution Control Board, Shiekh-ul-Campus, behind Govt. Silk Factory, Raj Bagh, Srinagar (J&K)

45. The Member Secretary, Jharkhand Pollution Control Board, T.A Building, HEC, P.O. Dhurwa, Ranchi – 834004
46. The Member Secretary, Karnataka State Pollution Control Board, Parisara Bhavan, 4th & 5th Floor, # 49, Church St., Bengaluru-560 001
47. The Member Secretary, Kerala State Pollution Control Board, Plamoodu Jn., Pattom Palace P.O. Thiruvananthapuram - 695 004
48. The Member Secretary, Manipur Pollution Control Board, Lamphelpat, Imphal West D.C. Office Complex Imphal– 795004
49. The Member Secretary, Meghalaya Pollution Control Board Arden- Lumpyngngad Shillong: 793014
50. The Member Secretary, Nagaland Pollution Control Board, Signal Point, Dimapur Nagaland – 797112
51. The Member Secretary, Madhya Pradesh Pollution Control Board, E-5, Arera Colony, Paryavaran Parisar, Bhopal - 462 016, Madhya Pradesh
52. The Member Secretary, Maharashtra Pollution Control Board, Kalpataru Point, 2nd – 4th Floor Opp. Cine Planet Cinema, Nr. Sion Circle, Sion (E) Mumbai – 400 022
53. The Member Secretary, Mizoram Pollution Control Board, New Secretariat Complex, Khatla Thlanmual Peng, Khatla, Aizawl, Mizoram: 796001
54. The Member Secretary, Puducherry Pollution Control Committee, Housing Board Complex, Anna Nagar, Puducherry -600 005
55. The Member Secretary, Punjab Pollution Control Board, Vatavaran Bhawan, Nabha Road, Patiala, Punjab 147001
56. The Member Secretary, Odisha Pollution Control Board, A-118, Nilakanta Nagar, Unit – VIII, Bhubaneshwar – 751012
57. The Member Secretary, Rajasthan Pollution Control Board, 4, Jhalana Institutional Area, Jhalana Doongri, Jaipur (Rajasthan) - 302 004
58. The Member Secretary, Sikkim State Pollution Control Board, Department of Forest, Environment & Wildlife Management Government of Sikkim, Deorali, Gangtok, - 737102
59. The Member Secretary, Telangana State Pollution Control Board, Paryavaran Bhawan, A-3, I.E. Sanath Nagar, Hyderabad-500 018
60. The Member Secretary, Tripura Pollution Control Board, Vigyan Bhawan, Pandit Nehru Complex, Gorkhabasti, PO: Kunjaban Agartala – 799006
61. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032
62. The Member Secretary, Uttarakhand Environmental Protection & Pollution Control Board, 29/20, Nemi Road, Dehradun, Uttarakhand – 248001
63. The Member Secretary, Uttar Pradesh Pollution Control Board, Building.No. TC-12V, Vibhuti Khand, Gomti Nagar, Lucknow-226 010
64. The Member Secretary, West Bengal Pollution Control Board, Paribesh Bhavan, 10A, Block-L.A., Sector III, Salt Lake City, Kolkata - 700 106
65. The Member Secretary, Andaman & Nicobar Islands Pollution Control Committee, Department of Science & Technology, Dollygunj Van Sadan, Haddo P.O., Port Blair – 744102

66. The Member Secretary, Lakshadweep Pollution Control Committee, Department of Science, Technology & Environment, Kavarati-682555

Copy for kind information:

1. PPS to Secretary, Department of Water Resources, RD&GR, Ministry of Jal Shakti, Shram Shakti Bhavan, Rafi Marg, Sansad Marg Area, New Delhi- 110001
2. PS to Director General, NMCG cum Project Director NRCD
3. PS to Additional Secretary, Ministry of Housing and Urban Affairs, Nirman Bhawan, Maulana Azad Road, New Delhi – 110011.
4. Joint Secretary, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhavan, Jorbagh Road, New Delhi – 110003
5. Member Secretary, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi-110032
6. PS to ED (Project/ Finance), NMCG
7. Adviser, NRCD

Minutes of the 8th meeting of the Central Monitoring Committee held on 05.01.2021 through Video Conferencing regarding 351 polluted river stretches based on the directions of Hon'ble NGT in the matter OA No. 673 of 2018

The 8th meeting of the Central Monitoring Committee (CMC) constituted by Hon'ble NGT in the matter OA No. 673 of 2018 was held through video conferencing with the States on 05.01.2021 from 10.00 AM onwards in Conference Room, NMCG under the Chairmanship of Secretary, Ministry of Jal Shakti. The list of participants of NMCG, NRCD, MoHUA and CPCB present at the meeting is at ***Annexure-I.***

II. Secretary, Ministry of Jal Shakti welcomed all participants and highlighted that it has been observed that not much progress is being made by States since the last meeting of CMC. The States need to provide correct and adequate details in their MPR, as it may not be possible to discuss the progress made on all the actionable points in the meetings. Further, based on the information provided by the States, the 3rd Quarterly Report is to be submitted to NGT by end of January, 2021. Incremental progress made by the State needs to be highlighted in the MPRs. Secretary also directed that the presentation made by the Ministry may be shared with the States for submission of inputs for incorporation in the Quarterly Report.

III. Subsequently, State-wise discussions held are as follows:

Executive Director Technical (ED Tech), NMCG through a presentation briefed about the progress made by the States and highlighted the issues related to sewage, industrial and solid waste management in the States based on the information submitted in MPR. It was informed that in compliance to NGT's order dated 26.09.2020, 13 Coastal States were supposed to submit Action Plan with regard to Coastal Pollution Management to CPCB by November, 2020 and as informed by CPCB, Action Plan has only been submitted by Andhra Pradesh recently. Therefore, the remaining Coastal States were directed to ensure compliance to NGT orders.

1. **<u>Punjab</u>**

ED Tech, NMCG informed that State has 116 STPs existing, of which 37 STPs were reported to be non-complying previously, but as per the latest reports 42 STPs are now reported to be non-complying. However, as reasons for non-compliance and proposed measures taken for correcting

the defects have only been provided for 28 STPs, the State may provide details for the remaining 14 STPs. Out of 28 non-complying STPs, 14 have major technological issues and rest are non-compliant w.r.t. faecal coliform. Similarly, there is 1 CETP which is constantly non- compliant. It was flagged that as per the MPR, the progress of the 2 CETPs of 40 and 50 MLD at Ludhiana remains stagnant and 1 STP of 48 MLD at Ludhiana is found to be non-operational. It was further informed that 36 STPs of 339 MLD are under construction, of which 5 STPs of 84.5 MLD have been recently completed and are under stabilization and 6 STPs of 28 MLD are to be completed by March, 2021. There are 96 STPs proposed and work orders for none of them have been issued so far. The State needs to provide status of award of the works for Budha Nallah project which was scheduled in November / December, 2020 and also to provide the status of under construction STPs for Ghaggar river. On comparing the progress made by the State in the on-going STP projects from September-November 2020, it was found that progress have only been made in only 2 projects out of 36 indicating that either not much progress has been made by the State or the same has not been reflected in the MPR.

Chief Secretary, Punjab informed that work for Budha Nallah has already been awarded. Further, Principal Secretary, Department of Local Government, Punjab informed that 25 STPs were found to be non-complying in the month of November, 2020, out of which 15 STPs are based on old technology and 10 are based on SBR/MBBR technology for which efforts are being made to achieve the prescribed standards. It was informed that work for Budha Nallah project in Ludhiana has already been awarded on 02.12.2020 to M/s KIPL-GVPR (JV) for Rs. 839.79 crore, which includes capital works and 10 years of O&M. The capital works includes construction of STPs having total treatment capacity of 285 MLD (225+60), these works will replace the defunct 48 MLD STP at Jamalpur. The STPs at Ferozpur and Jaito as well as STPs in non-river towns of Barnala, Sahkot, Tarantaran and Amritsar (South) have been completed. Works on other ongoing STPs is progressing and is expected to be completed on scheduled timelines. Regarding land issues, it was informed that presently there are only 3 cases in PRS towns, out of which cases of Dhuri and Bassi Pathana have been resolved and are in final stage of acquisition. Land issue only at Sangrur is pending for which efforts are being made by the State.

Secretary, Environment, Punjab informed that work of 40 MLD CETP has been completed and trial run is in progress and the plant expected to be fully operational by end of February, 2021. The work of 50 MLD CETP got delayed due to non-availability of some mechanical equipment, which is expected to arrive shortly and it is scheduled to start the trial run of this CETP by end of February, 2021. 15 MLD existing CETP is non-complying as the same is under stabilization and efforts are being put in to improve the plant.

Secretary, Ministry of Jal Shakti stated that there are discrepancies in the data presented during the meeting by the Ministry based on the MPRs and data given in the response by the State, which needs to be reconciled. It was directed that henceforth, copy of the issues to be discussed during the CMC meeting should be provided to all the States / UTs in advance so that they can respond properly during the discussions.

2. <u>Assam</u>

ED Tech, NMCG informed that total sewage generation in the State is reported to be about 824.07 KLD, which appears to be incorrect and needs to be reconciled. In the MPR, details of implementation of works in Guwahati have not been provided. He also informed that tenders for 5 STPs at Naugaon, Silchar, Mangaldoi, Jorhat and Tezpur were scheduled to be floated in November / December, 2020 and the State needs to provide the latest status on award of these works. 10 industries in catchment area of Bharalu river and 12 in catchment of Borsola Beel are reported to be operating without consent and State is to provide updated status on the above issues. Hazardous waste of 43 TPD is generated with no treatment facility/ TSDF existing. Status of operation of 50 TPD existing trommel plant for segregation of legacy waste at Boragaon along with status of Integrated Solid Waste Management Plant at Byarnihat needs to be provided. Model River needs to be identified. Inadequate information has been provided in the DPR with regard to ground water regulation, RWH, floodplain and e-flow management, reuse of treated water and development of Biodiversity Parks.

Principal Secretary, Guwahati Development Department (GDD) informed that for JICA assisted sewerage project at Guwahati, survey for revision of DPR is already under progress and inception report shall be submitted shortly by the Consultants. Design work for sewerage network shall also be commenced from mid-January and DPR will be completed by 9th March,

2021. Advertisement to fill up the requisite post in project implementation unit for the sewerage project has already been published by the GDD and will be filled up shortly after interviews on 21st January, 2021. It was informed that the tenders for Boragaon dumping site has already been issued and trommels have already arrived in Guwahati and the work shall commence from 7th January, 2021. There is land issue in respect to setting up of Integrated Solid Waste Management Plant at Byarnihat. However, State has now identified another land at Sonaguli for setting up of the integrated solid waste management plant.

Secretary, UDD, Assam informed that DPR has been prepared for STPs at Naugaon, Mangaldoi, Jorhat and Tezpur, and administrative approval is to be issued. Land has been finalized and DPR is under preparation for STP at Silchar.

Official from Assam Pollution Control Board informed that EOI has been received for establishment of TSDF in Assam and RFP is to be issued.

Principal Secretary, GDD, informed that as per information from State Pollution Control Board all the industries which are not complying have been shut down by them.

Regarding discrepancy in the figure of total sewage generation in the State reported to be 824.07 KLD, a message was received from the State on 6th January, 2021 clarifying that the figure of sewage generation of 824.07 KLD is correct and relates to sewage generation from catchment area of 3 polluted river stretches falling under the jurisdiction of P&RD Department of the State. The figure does not account for total sewage generation of the State. The State was requested to provide the total sewage generation in the State and not separate figures under the jurisdiction of different departments.

Secretary, Ministry of Jal Shakti directed that the presentation made during the CMC meeting should be shared with the States for their response and requested the States to send their response in writing on the issues raised during the meeting.

3. Jammu & Kashmir

ED Tech, NMCG informed that presently J&K has 15 STPs having total treatment capacity of 139.40 MLD, out of which 11 STPs are operational with a treatment capacity of 120 MLD and

having utilization capacity of only 82.9 MLD. It was informed that 27 MLD STP at Jammu is under testing and commissioning since long. Similarly, 10 MLD STP at Jammu is under refurbishment. Efforts are needed to operationalize it on full capacity. STPs at Badami Bagh in Kashmir and Ardhkuwari in Katra are not in operation. Progress of Devika river project is still very slow, and the detailed time line to complete the project by the completion date of March, 2021 has not been provided inspite of repeated requests. Similarly, progress in providing house connections in Jammu is also not progressing well and progress of 4MLD STP is also negligible. Out of 450 water polluting industries, only 239 units are having ETPs and only 199 ETPs are compliant. Incremental progress with regard to on-going STP projects appears to be NIL, State needs to provide the latest status of the progress and also to reconcile the figures of water polluting industries reported in the MPR.

Secretary, Ministry of Jal Shakti expressed serious concern over the slow progress in implementation of works, especially Devika river project which was scheduled to be completed by March, 2021, as well as not taking seriously O&M of the existing assets including lower capacity utilization of available treatment capacity. During the discussions on non-utilization of existing treatment capacity, use of online monitoring system at all the STPs for better monitoring was emphasized. Further, it was directed to provide action plan for bridging the gap to treat about 383 MLD of sewage balance from total sewage generation of 583 MLD in the U.T of J&K.

Principal Secretary, (HUDD), Jammu & Kashmir informed that about 1500 MT/day of MSW is being generated in the U.T, out of which 550 MT is being treated and tenders for treatment of legacy waste of 1.2 lakh MT in Jammu has already awarded in August, 2020 and shall be completed by December, 2021. In addition, work has been awarded to NAFED in January, 2021 to treat 3.0 lakh MT of legacy waste at Kotbhalwal in Jammu and it shall be completed in the next 18 months. For treatment of legacy waste of 8.5 lakh MT in Srinagar, contract is being finalized and is expected to be awarded in January, 2021. It was informed that door to door collection of MSW in UT is about 85% and segregation is about 50%, and efforts are being made to increase it. Regarding waste processing for Jammu, agreement has being finalized with NAFED for bio-gasification of waste and by March, 2022 all the 76 ULBs of UT shall be equipped with the bio- disposal facility for MSW.

Further, it was informed that efforts are being made by the UT Government to operationalize the existing STPs on optimum capacity. Regarding non-operation of STP at Bhagwati Nagar in Jammu, it was acknowledged that there were issues with contractor for which the contract has been amended & the matter has now been resolved and the plant shall be made fully operational by March, 2021. In addition to the house connections in NBCC project in Jammu which are expected to be completed by June 2021, and to further augment the flow to the STPs, a DPR for Jammu has also been submitted to MoJS for funding under NRCP along with other DPRs. Similarly, respective authorities have been requested to operationalize the STPs at Ardhkwari and Badami bagh. DPRs for bio-remediation has been prepared and submitted to U.T. Government for funding. With regard to Devika river project, it was informed that due to Covid-19 as well as other issues like NOC from NHAI, BRO and land issues, works got delayed. All the issues has now been resolved and the sewerage work shall be completed by December, 2021 with works related to ghat development completed by March, 2021.

State was directed to submit details to the Ministry for incorporation in the Quarterly Report for onward submission to Hon'ble NGT.

4. <u>Sikkim</u>

ED Tech, NMCG that there are 7 STPs of 19.5 MLD in the State and their capacity utilization is about 60%, which has been reduced from earlier reported utilization of 84%. 3 STPs of 6.25 MLD capacity are under construction and 7 more STPs of 11.33 MLD capacity are proposed. Total solid waste generation in the State is 77 TPD against which 50.8 TPD treatment facilities is available. Maney Khola is being adopted as Model River. 3 STPs (at Gangtok zone II, Melli and Rangpo) are almost complete but not made operational for quite sometime. State needs to provide latest status on these 3 STPs and also on the issue related to preparation of DPRs for STPs at Namchi, Jorethang, Geyzing, Rabong, Soreng and Mangan, except Chungthang for which DPR was already submitted.

PCE-cum-Secretary, PHED, Govt. of Sikkim informed that the STP at Zone –II shall be commissioned by end of January, 2021 and STP at Rangpo is complete. However, some sewer lines need to be realigned, and therefore the STP shall be commissioned by March, 2021.

Similarly, the STP at Melli will also be made operational by March, 2021. Land acquisition process for Namchi STP is under process and for Jorethang STP, process for land acquisition is also underway, as this land requires diversion from forest land. It was informed that most of the DPRs have been prepared and shall be submitted for funding. Ministry of Jal Shakti was requested to reconsider the funding of Chungthang DPR under NRCP funds.

Secretary, Ministry of Jal Shakti highlighted that State should complete verification and finalize the DPRs first, as the projects are turning to be very costly. Further, as the STPs proposed are in the range of 1-3 MLD capacity, the State was suggested to explore alternate treatment technology such as Faceal Sludge Management.

5. <u>Tripura</u>

ED Tech, NMCG informed that the State generates around 82.4 MLD of sewage with existing treatment capacity of only 8.72 MLD (8 MLD STP & 720 KLD FSTP at Agartala), thus leaving a huge gap in sewage treatment which needs to be addressed urgently by the State. The capacity utilization of the existing STP is low i.e. 3 MLD. House sewer connections to the existing 8 MLD STP, 15 FSTPs of 600 KLD and 8 MLD under construction STP needs to be expedited. Status of the proposed STPs (4 MLD at Bishalgarh, 8 MLD at Udaipur, 8 MLD at middle point between Dharmanagar and Kailasahar) needs to be provided. Status of the in-situ bio-remediation for all identified drains (210 nos) discharging into polluted river stretches needs to be updated. Municipal solid waste processing facility exists for 256 TPD (250 TPD composting plant at Agartala & 6 TPD at District Dhalai) against total waste generation of 411.32 TPD. Compliance with the provisions of the Solid Waste Management Rules, 2016 needs to be made. Request for revising details of polluted river stretches based on water quality monitoring carried out during recent periods has been made to CPCB for their consideration.

Additional Secretary, Science, Technology & Environment, Tripura, informed that Haora river stretch has been identified as a model river. It was informed that to increase the utilization capacity of the 8 MLD STP at Agartala, expansion of sewer network and house service connections are in progress, and are likely to be completed in 18 months. Work has started on 8 MLD STP at Akhaora. For in-situ bio-remediation, survey work is going on for preparation of

baseline information for pollution abatement of 205 drains and tender evaluation for bio-remediation on 5 drains on pilot basis at Agartala has been completed. With regard to bio-remediation of legacy waste, 50% of the work has been completed. To bridge the gap in solid waste management, setting up of 17 Tertiary Processing Plants has been started and all of them shall be made functional by March, 2021. Land has been identified and tendering process has been initiated by the ULBs for the 15 FSTPs of 600 KLD.

Secretary, Ministry of Jal Shakti directed the State to expedite the on-going and proposed projects.

6. <u>Manipur</u>

ED Tech, NMCG informed that the MPR submitted in December, 2020 is a repetition of the MPR submitted for October, 2020. The report does not provide much information on rainwater harvesting, groundwater regulation and flood plain management and other issues. The State has 1 STP of 27 MLD with capacity utilization is only 9 MLD, thus, having a huge gap in treatment. The State has 2 STPs under construction, a 1 MLD STP with hardly any progress and a 16 MLD STP with 10% progress. 1 STP of 49 MLD is proposed at Imphal and the State has plans for bio-remediation and Faecal Sludge and Septage Management (FSSM) of 16.75 MLD for which DPR is being prepared. The State also reported that there are 989 non-polluting industries and 5 industrial units are connected to CETP of 400 KLD which is non-operational. Industries remain non-compliant as per CPCB norms where the CETP is non-operational, and the State needs to take urgent action on the same. There are about 334 automobile industries that produce 1 TPD of hazardous waste, for which the State does not have any treatment facility.

The State official informed that the CETP is operational and requires minor repairs for proper functioning of the plant.

Secretary, Ministry of Jal Shakti highlighted that sewage management is a major concern as the 27 MLD existing STP in the State is being utilized at only 9MLD capacity. Not much progress has been achieved in the under construction STPs of 17 MLD. Also, the cost of proposed 49 MLD STP seems to be very high and suggested that State should reconsider the project and submit details to the Ministry urgently.

7. Meghalaya

ED Tech, NMCG informed that the MPR submitted in December, 2020 is a repetition of the MPR submitted for October, 2020. As reported, the State generates 75 MLD of sewage, against which 8 STPs of 1.85 MLD capacity are existing and about 22.8 MLD of sewage is being treated through septic tank. There is still a gap in treatment of 50.37 MLD. All the STPs are reported to be complying and one septage treatment plant of 115 KLD is under construction with 75% of work having been completed. 245 industries are having ETPs, all of which are complying. State has identified River Nonbah as Model River. With regard to solid waste management, 8 TPD plant remains functional and 65 TPD plant was to be commissioned by December 2020. The State has proposed 10 plants of 166 TPD capacity.

Secretary Ministry of Jal Shakti, highlighted the issue of sewage management as treatment of sewage only through septic tank is not adequate. It was suggested that there should be a plan of either septage management/ Faecal Sludge Treatment Plant or Sewage Treatment Plant. However, this kind of planning remains unclear for Meghalaya. Therefore, the State was directed to submit the detailed plan for sewage management envisaged for the State.

Officials from Meghalaya informed that apart from the one septage treatment plant under construction, tender has been floated for 0.35 MLD FSSM plant and land has been identified for 5 onsite treatment plant of 13.45 MLD.

8. Nagaland

ED Tech, NMCG informed that against the estimated sewage generation of 44.3 MLD in the State, no sewage treatment facility exists. One STP of 25.43 MLD capacity is under construction with 95% progress and 55% progress in case of related sewer network. It is due for completion for June, 2021. In the 7th CMC meeting, State informed that for other areas they are planning for bioremediation as well as septage treatment. However, 2 units of Faecal Sludge Treatment Plant (20 KLD and 90 KLD) are in place and serviced by 13 cesspool vehicles at Dimapur and Kohima respectively. The State has 5 water polluting industries and no CETP, 3 ETPs are operational and complying the norms, while 2 ETPs are under process. With regard to municipal

solid waste, against the generation of 304 TPD, 132 TPD of waste is treated and 50 TPD processing plant is being installed.

Secretary, Ministry of Jal Shakti raised concern over the slow progress of on-going STP and sewerage works which were sanctioned around 15 years ago. State was directed to ensure that rivers in the State are not polluted by adopting appropriate treatment technologies.

9. Mizoram

ED Tech, NMCG informed that the State has 68 MLD of sewage generation. One STP of 10 MLD capacity at Aizwal is under construction, which is 99% complete, while the progress of sewage network is 75%. Earlier State has informed that they will be completing this STP by October, 2020. However the status remains the same from last 6-7 months. State needs to provide updated status in the MPRs as the information will be included in the report and affidavit to be filed in NGT.

Secretary, Ministry of Jal Shakti directed the State to provide updated information in writing to the Ministry immediately.

10. Telangana

ED Tech, NMCG informed that the State has 31 existing STPs of total capacity 888 MLD with utilization of 735 MLD and gap in treatment of 1724 MLD. 31 STPs are operational, although it has been stated in the annexure of MPR that 2 STPs of 3 MLD capacity are non-functional. 29 STPs are complying and 17 STPs of 210 MLD capacity are under construction, with 11 STPs (144 MLD capacity) out of these 17 STPs are yet to be started. 1 STP of Miryalguda was proposed to be completed by December, 2020, and its status of commissioning needs to be provided. 175 STPs of 1574 MLD capacity are proposed, out of which the Package 3 comprising of 17 STPs of 376 MLD (proposed under HAM model) in Hyderabad are under tendering, the date of which has been extended to mid of January due to no response from agencies. There are 2 other packages; Package I and Package II, which are yet to be sanctioned. For all proposed STPs, the projects are yet to be grounded. As reported by the State, out of 2178 water polluting industries, 2110 industries are complying and for remaining non-complying industries, notices/

closure directions have been issued. 4 CETPs of 7 MLD capacity are operational and a 0.5 MLD CETP is under construction. It was further informed that 3720 TPD of solid waste is generated in the State and there exists treatment facilities of 1451 TPD. For the bioremediation works, the State has involved NEERI for conducting pilot project on one of the drains at Kuttapallynala and for the other 4 drains DPRs has been prepared and is under sanctioning stage. It was highlighted that on comparing the progress of on-going projects, the progress reported in December MPR remains same as reported in the October MPR. With regard to the on-going CETP, completion timeline in October MPR was indicated to be March, 2021 and in the December MPR, this has been shifted to June, 2021.

Managing Director, HMWSSB informed that the tenders were called for under 60:40 ratio HAM model. EOI was called for by the State for the 17 smaller STPs and 14 agencies had showed interest, but when the tender called for none of the parties responded. Further, a discussion with the parties was held again and Minister along with Chief Secretary had taken review on the issue. It was highlighted that the agencies were interested in taking up the bigger STP projects of 100 MLD/ 120 MLD on Musi River, which are included in two other packages. As the STP projects shall take 2 more years to be implemented, the State is focusing on setting up of 6 FSTPs on the land identified for STPs. Out of the 6 FSTPs, 2 plants will be completed by the end of January 2021, 1 FSTP under CSR funding is expected to be completed by February, 2021. Further, it was informed that GPS is being put up on the tankers collecting septage from the septic tanks to ensure no pollution is discharged into the water bodies. Decentralized STPs are being put up near to Hussain Sagar lake to address the pollution reaching through one big nallah. Installation of Flow meters and OCEMs is in progress and are expected to be placed by January, 2021.

Secretary, Ministry of Jal Shakti highlighted that though the State fairs pretty well in capacity utilization of the existing STPs still there is a large gap in sewage treatment in the State. For bridging the gap, the State appears to have a plan for establishment of large capacity of STPs. However, an area of concern is that for sanctioned package no company has submitted tender. Therefore, it was suggested that marketing consultation/ discussion with all the companies may be carried out by the State. Further it was suggested that Director General, NMCG may obtain

details of the companies that showed interest in the EOIs floated by the State and clarifications may be sought from the agencies for not responding to the tenders.

Director General, NMCG suggested that it is likely that the companies may consider the other unsanctioned packages which may contain less number of STPs of higher capacity as compared to the sanctioned package. Therefore, the queries raised by the companies needs to be looked upon and the same may be forwarded for a conclusive meeting.

Managing Director, HMWSSB responded that the State followed Namami Gange model wherein 40% of the project cost was to be paid on completion and 60% of the project cost was to be paid in 15 years annuities and O& M was also proposed to be kept for 15 years. The next two packages are also proposed to be sanctioned shortly.

Secretary, Ministry of Jal Shakti highlighted that the HAM model based STPs are seen to have better performance as compared to other STPs. Further, concern was raised with regard to on-going STPs having NIL progress being reported in the MPRs and State was directed to expedite the ongoing STP projects.

11. <u>Daman Diu and Dadra Nagar Haveli</u>

ED Tech, NMCG informed that there are two existing STPs of 4.2 and 13 MLD capacity at Daman and DNH respectively. The STP at Daman is operational to its full capacity, whereas the STP at DNH is being utilized at only 2 MLD. A STP of 16 MLD at Nani Daman is proposed and 7 MLD STP at Diu has been approved and is under implementation. There are no CETPs and all the industries have ETPs and 100% solid waste generated is processed. Phyto-remediation and bioremediation proposal for the identified drain has been received from NEERI and the same is under process. The drain near Rajiv Gandhi Setu, Daman is being taken up for in-situ treatment on pilot basis. Integrated Coastal Zone Management plan for Daman & Diu is proposed under ENCORE project funded by World Bank and MoEF&CC.

Member Secretary, Pollution Control Committee informed that with regard to Silvasa, number of household connections have increased marginally and work is going on to increase the flow to the STP. Tender will be floated for 7 MLD STP at Diu by January, 2021. For 16 MLD STP proposed at Daman under World Bank ENCORE Project, sanction order is awaited and

accordingly tender will be floated. With regards to preparation of Coastal Management plan, the State has already tied-up with National Centre for Coastal Research, Chennai to take up the study as advised by CPCB after which State will be submitting the plan at the earliest. All the polluting industries have installed the ETPs, and in these ETPs energy meters and flow meters have been installed and these are regularly monitored. For highly polluting industries, online monitoring facility is available where they directly upload the data and on day to day basis it is being monitored by CPCB and PCC.

12. <u>Andhra Pradesh</u>

ED Tech, NMCG informed that there are 43 STPs of 515.85 MLD capacity, and all are reported to be operational and complying. However, in 6 STPs of 36 MLD capacity, inflow is indicated as NIL as either these are under upgradation or rehabilitation. Therefore, State needs to ascertain whether all the STPs are operational. On comparing the progress made in the on-going STP projects from September-November, significant progress has only been made in the STP at Srikakulam and progress in rest of the STPs remains same. Compliance of the existing CETPs needs to be provided by the State. Data with regard to Solid Waste Management needs to be verified by the State. Details on other action plans such as – Action Plan for coastal areas, ground water regulation, RHW, floodplain & eflow management, plantation, biodiversity, mining activity regulation, adoption of Model River and action against defaulters has not been provided in the MPR.

Secretary, Ministry of Jal Shakti expressed serious concern over the absence of senior level officers in the meetings, especially the nodal Principal Secretary, which reflects the lack of seriousness on the part of the State. This has been observed in the previous meetings of CMC as well and has also been highlighted at highest level. On continuation of such behavior, the State shall not be taken up henceforth. If all the STPs are operational and complying, still the utilization capacity is 63%. It was suggested that the nodal department should analyze each and every STP in terms of capacity utilization of individual STPs and this could clarify the reason for lower capacity utilization. Almost no progress of the on-going STP projects in the non-monsoon period is also a matter of serious concern.

Chief Engineer, Andhra Pradesh informed that 75 MLD STP at Nellore has been recently commissioned and flow is yet to be received at the STP, post completion of sewer line connections. It was informed that Commissioner has been requested for HSCs in mass scale and several works of HSCs are in progress. It is expected that within 2 to 3 months all HSCs shall be completed. Other STP works are delayed due to Nivar cyclone in the State. As most of the contractors are from outside State, and due to Covid19 the workforce was demobilized. However, the work is pacing up now and rapid progress is expected to be achieved in 2 to 3 months. Regarding future projects, plan to take up STP works through HAM model for all 16 Municipal corporations in First Phase are being envisaged.

Director General, NMCG suggested detailed briefing is necessary for the matter stated above. For completed STPs, capacity and utilization and action plan for enhancing capacity utilization is to be sent along with strategy for HSCs. For under construction STPs, as per the report it appears all construction work has paused in the State due to COVID19, which is unacceptable. The State's response has been poor in view of the meeting held and needs to be improved. For projects to be sanctioned, detailed specified information STP wise and under which grant it is to be sanctioned is to be reported. It was suggested that if required guidance with regard to HAM model can be provided to the State.

13. <u>Kerala</u>

ED Tech, NMCG informed that a detailed meeting with the State was held under Chairmanship of Director General, NMCG on 21st December, 2020 wherein all the issues were discussed. The State had elaborated on the plans and committed to provide the action plans for coastal zones conservation. However, written information is still awaited. Further, it was informed that the sewage generation in the State remains 1192 MLD including 875 MLD from rural areas, there are 13 common STPs of 124 MLD with capacity utilization of 91 MLD (73%). Out of 3 common FSTPs of 0.21 MLD, 1 FSTP is being made functional shortly. Work has been awarded for 9 STPs of 32.18 MLD and 4 FSTPs/ Septage plants of 0.4 MLD. Further, 26 STPs of 58.26 MLD and 8 FSTPs/ Septage plants of 0.97 MLD are proposed. Many of the projects have been retendered because of various reasons. State had informed that 1 STP of at Muthathara of 107

MLD capacity is operational at 70-80 %. For increasing the utilization capacity of the STP, 116 short term works are being implemented, out of which 72 have been completed and balance are to be completed soon. The State has a larger plan to handle solid waste and liquid waste through FSTP and smaller STPs. Therefore, State was requested to provide the written submissions at the earliest for incorporation in the quarterly report.

Principal Secretaries of Environment, Urban Development and Water Resources Department, Kerala attended the meeting along with other State officials. Member Secretary, Kerala Pollution Control Board informed that a Dossier has been prepared, wherein sewage and sullage in the State have been separately highlighted. It was informed that 13 proposals are in DPR stage, 10 proposals have been tendered, works have been awarded for 5 projects, work has started in 4 projects, technical sanction is yet to be issued for 1 proposal and remaining 6 projects are to be re-tendered. For a large number of residential areas in the State, septic tank and soak pit arrangements have been made and for 69 residential complexes, individual STPs have been installed. Incremental progress have been achieved in 5 STPs. With regard to coastal management action plan, discussions have been held, survey in 6 districts have been completed and is in progress in 10 districts. State has committed to submit the action plan by the week end. With regard to solid waste management, 8 Waste to Energy Plants are planned, there is complete ban on single use plastic and inventories have been made for biomedical waste and hazardous waste. For non-complying industries, directions and penalties have been imposed.

Chief Engineer, Kerala Water Authority reported that sewerage plan for the State is being prepared and after administrative approval is granted for the plan, the remaining gap in sewage treatment shall be taken care of.

Secretary, Ministry of Jal Shakti suggested that the prime focus is river rejuvenation and tackling sewage that is reaching river and water bodies. Focus on capacity utilization of existing plants, early completion of under construction works and the fulfillment of gap is of prime importance.

14. <u>Puducherry</u>

ED Tech, NMCG informed that UT has 5 STPs of 56 MLD capacity having utilization of 35 MLD. As reported by the UT, 3 STPs of 51 MLD are operational and non-compliant due to high

BOD levels in effluent, 2 existing STPs of 5 MLD are non-operational as the STPs are not receiving the minimum flow required to run the STPs. Further, 2 new STPs of total 6 MLD are in tendering stage. Out of 96 industries, 95 industries are having ETPs and 87 ETPs are complying.

Secretary, Ministry of Jal Shakti, directed that nodal officers of the Ministry should regularly interact with the State/UTs allocated to them and get details of reasons of STPs not in operation, not complying with the discharge norms, reasons for delay in on-going and proposed STPs.

Secretary (Environment), Puducherry informed that 2 STPs are non-operational due to lack of sewerage connections. Directions have been issued to defaulting industries. Not much progress has been made with regard to solid waste management and municipalities have been issued directions and Environmental Compensation shall be collected from the defaulting industries.

Chief Engineer, PWD, Puducherry informed that house connections are expected to be completed by March, 2021 and the 3 STPs shall be fully functional by June, 2021.

Secretary, Ministry of Jal Shakti directed the UT to provide the requisite details in writing and also highlighted the key issue, which is the low capacity utilization of operational plants. Information regarding tenders for proposed works was sought to which the UT responded that WAPCOS is being perused for providing the Consultancy services.

15. <u>Gujarat</u>

ED Tech, NMCG informed that as reported in the MPR, out of the 73 existing STPs of 3485 MLD, 22 STPs of 1271.46 MLD are non-complying. Further, out 34 existing CETPs, 11 CETPs have been reported to be non-complying. A 53 MLD STP at Surat Gavier commissioned in 2016, is having utilization capacity of only 5.37 MLD. No significant progress has been made with regard to bioremediation of drains. On comparing the progress made in the on-going STP projects in October and November MPR, it was noted that no progress was made in two consecutive months. State was directed to provide details of land issues for the Tapi Shuddhikaran project.

Secretary, Ministry of Jal Shakti pointed out that the officers of appropriate level/rank of the concerned implementing departments/ authorities should remain present along with the Gujarat

Pollution Control Board, a co-coordinating body. Further, the State was directed to provide information only on the issues highlighted. Concern was raised over the slow progress of the on-going 97 STPs in the State and low utilization of the 53 MLD STP at Surat.

Dy. Chief Environment Engineer, GPCB informed that the officers from Gujarat Urban Development Mission, Gujarat Water Supply & Sewerage Board, Surat Municipal Corporation, Ahmedabad Municipal Corporation, Vadodara Municipal Corporation and Panchayats, Rural Housing and Rural Development Department were attending the meeting. With regard to Tapi Shuddhikaran project, it was informed that out of 53 STPs, land issues in 16 STPs have been sorted out, and in 3 STPs work is in progress.

Additional City Engineer, Ahmedabad Municipal Corporation reported that short & long term planning is under process for up-gradation of existing STPs and to rectify the issues of non-compliance of the STPs.

State was directed to provide the details of the issues highlighted in the meeting in writing to the Ministry for incorporation in the Quarterly report.

16. <u>Karnataka</u>

ED Tech, NMCG informed that the number of existing STPs in the State is reported as 125 of 2242 MLD capacity, whereas earlier it was reported to be 146 STPs. Such type of discrepancies in submission of data creates a problem while submitting the reports to Hon'ble NGT. Compliance status of STPs is yet to be provided and as reported by the State, status is yet to be compiled. There are 10 existing CETPs of 5.8 MLD capacity, of which 1 CETP is non-operational and 6 CETPs are non-compliant, for which the State has initiated actions. With regard to the solid waste management, 11800 TPD is generated and 10198 TPD is collected and 50-58 % is being processed in the State. DPRs for adding 9159 TPD capacity have been approved. State is yet to submit the Action Plan for coastal pollution management. Furthermore, land issues were highlighted for 2 STPs at Kamaje and Kaikunje. The action plan for the Ramdurga Malaprabha River, where 14.51 TPD of waste was dumped and washed away due to floods, is to be made a part of the report.

Secretary, Ministry of Jal Shakti highlighted that the State Pollution Control Board should regularly monitor the STPs and should have data readily available with regard to the compliance status of the existing STPs. Online monitoring of the STPs and CETPs was emphasized. It was directed that progress made by the State with regard to on-going and proposed projects be clearly indicated in the presentation being made in the meeting.

Member Secretary, Karnataka State Pollution Control Board informed that compliance status of CETPs along with action taken by PCB has been provided in the MPR. With regard to compliance status of the existing STPs, status has only been received from 2 regional offices of the KSPCB and further a State level meeting is scheduled for 16th January, 2021 to obtain the status report of all the STPs. The same shall be submitted along with the next MPR. At Chikkodi, while there are 2 STPs of 3.72 MLD STP at Sadalaga village and 5.8 MLD STP in Chikkodi, the STPs are hardly receiving 2 MLD of sewage as UGD is still to be completed. The land procurement issue is yet to be sorted out at Kamaje, and the same is being pursued with the Deputy Commissioner, while the work of UGD at Bantwala in Mangalaru is progressing.

In the 17 polluted river stretches, there are 39 ULBs. In the 33 ULBs managed by KUWSB, STPs have already been commissioned in 5 ULBs, STPs works are ongoing in 5 ULBs, DPRs have been submitted to State Government for 19 ULBs and DPRs for STPs are under preparation for the remaining 4 ULBs. In the 4 ULBs managed by KUID, there are 7 STPs, out of which 3 STPs have been commissioned and 4 STPs are under construction. 2 ULBs are under DMA. With regard to the Solid waste management, the State acknowledged the huge gap of 5810 TPD, and stated out that of 286 ULBs, 219 ULBs have finalized the SWM DPRs with total design capacity of 9159 TPD at an estimated cost of Rs. 1501 crore. For the remaining 67 ULBs, DPR preparation is pending. 14.51 TPD of waste dumped along the Ramdurga Malaprabha River has been cleared.

Further, it was informed that all the CETPs have been equipped with flow meters at inflow and outflow outlet, which are connected with an online database integrated with AI setup to monitor the CETPs. 35 vehicles that carry effluents of CETPs and 26 hazardous waste carrying vehicles have installed GPS to ensure proper disposal of the waste. The data is being displayed on KSPCB website. It was reported that the action plan for coastal pollution management is under consideration at the State head office.

There are 7 Waste to Energy plant in pipeline and recently the State has inaugurated an 11.5 MW WTE plant at Bidabi which has been made operational. Further, a 6 MLD STP has been commissioned in the last one month. With regard the issue of dumping of illegal waste into the Vrishabhavathi Valley, the State has engaged marshals for patrolling to prevent any illegal dumping of sewage/ septage waste. The State assured that strict monitoring of SWM is in track.

Director General, NMCG acknowledging the State's brief on the initiatives taken up and requested the State to send a comprehensive report with details of real time monitoring of CETPs along with other initiatives provided by the State.

17. <u>Tamil Nadu</u>

ED Tech, NMCG informed that there are 66 STPs of 1616 MLD capacity existing, out of these 3 STPs are reported to be non-complying. 40 STPs of capacity 971 MLD are under construction and 37 STPs are proposed. 49 FSTPs are proposed, of which 5 have been completed. River Bhavani has been adopted as the Model River. Out of 36 CETPs, 4 are non-complying and further 10 CETPs of 41 MLD are proposed. 15,666 TPD of municipal solid waste is generated, for which 3229 processing facilities are existing wih 7859.2 TPD installed capacity. On comparing the progress of the on-going 40 STPs for the months from September-November 2020, progress appears to be stagnant except for 6 STPs at Sriperumbudur, Vellore, Trichirapalli-STP1, Mettupalayam, Velankanni and Thiruporur. With regard to proposed STPs, it was informed that all projects are in DPR preparation stage or are in approval stage.

Secretary, Ministry of Jal Shakti raised concern over low utilization capacity of the existing STPs and the progress of on-going STP projects.

DG, NMCG mentioned that there is a huge gap between the sewage generation and total capacity created. However, STPs which are under construction and at proposal stage would bridge the large gap between sewage generation and capacity created to a large extent. However, it was observed that capacity utilization of 919 MLD against the installed capacity of 1616 MLD means average utilization of about only 57%, which is not satisfactory. It shouldn't be less than 80%, as these STPs were created 5-10 years back and by this time the corresponding conveyance system should have been completed.

Additional Chief Secretary (Environment), Tamil Nadu informed that the biggest problem in the State is the conveyance system from households to the STP not being strong due which the STPs are not being optimally utilized. Therefore, the State is emphasizing on the improving the conveyance system. With regard to the non-complying 4 CETPs, it was informed that notices have been issued to the concerned CETPs. The slow progress in the on-going projects was attributed to the retreating monsoon and huge rainfall received in the last 2 months. It was informed that the software (OCEMS) is working properly and the entire data is collected from the local bodies which include baseline data, what have been proposed and how they are progressing i.e planning stage, utilization capacity and execution. With the help of this data, the State is able to identify the gap to improve utilization capacity. The Action Plan for Coastal Pollution Management shall be completed by January 2021. PWD has made a very comprehensive plan for rejuvenation of the river Cauvery called Nadanthai Vaazhi-Cauvery, which will also improve the e-flow in the river. Details have been already shared with Ministry of Jal Shakti in this regard. Biomedical Waste and Hazardous waste is being 100% complied with. Plastic waste disposal is also very closely followed up. Plantation activities have been taken up in all the polluted river stretches. Forest Department is doing plantation in those reaches where there is reserve forest, while on other places local bodies & PWD are doing plantation work.

18. <u>Maharashtra</u>

ED Tech, NMCG informed that of the 139 STPs of 7747 MLD existing in the State, 37 STPs of 2538.5 MLD are reported to be non-complying (three STPs of 757 MLD, 240 MLD and 386 MLD in Mumbai are non-complying aggregating to 54% of total non-compliant capacity). State needs to provide the status of 4 STPs of total capacity 83.76 MLD in Ulhasnagar & Akola due for completion by December, 2020. 9 STPs are non-operational, out of which 3 STPs of 112.76 MLD are under commissioning, 2 STPs of 62.02 MLD are awaiting sewer network connections, 2 STPs shall be dismantled and new STPs shall be created, maintenance of 1 STPs is under progress and 1 STP is non-operational. There are 26 CETPs with capacity of 244.85 MLD, of which 2 CETPs are non-complying and 1 CETP is closed. Commissioning of the proposed CETPs (4 nos) needs to be expedited. None of the 81 drains (56 of P-I & 25 of P-II) discharging

untreated sewage into identified river stretches have been provided with in-situ bio-remediation. Out of 14 on-going STP projects, progress of only 4 STP projects due for completion in December, 2020 have been provided. State needs to provide progress of the remaining projects.

Member Secretary, Maharashtra Pollution Control Board (MPCB) confirmed that the total estimated sewage generation in the State is 9757 MLD, which includes nearly 2500 MLD of sewage from Mumbai city. It was informed that in December 2020, 8 MLD STP at Wasim and 20.5 MLD STP at Ulhasnagar was completed. Out of 139 existing STPs, 133 STPs have been made operational. The compliance status of the STPs has also been increased and 121 STPs are now complying. 11 STPs of 1549 MLD are yet to be made compliant. With regard to land issues for STPs, it was informed that land issues will be resolved shortly for STPs at Baner and Warje. It was agreed to provide details of all the proposed STPs. In gram panchayats along the polluted river stretches, funds have been sanctioned for preparation of DPR for abatement of pollution.

Secretary, Ministry of Jal Shakti highlighted that details of low utilization of the STPs should be collected and raised concern over the large number of non-complying STPs in the State. Further, it was directed to provide action being taken by the State to increase the utilization capacity of the existing STPs, and to make non-complying STPs complying. It was suggested that higher officials of State's Urban Development Department or concerned agency dealing with the STPs in the State should attend the meeting henceforth along with Member Secretary PCB for clarifications.

19. <u>Odisha</u>

ED Tech, NMCG informed that 6 STPs of 131 MLD are existing and 7 STPs of 240 MLD are under construction. There are 10 Septage Treatment Plants of 440 KLD, 1 plant of 12 KLD is under trial, 30 plants of 555 KLD are under construction with completion timeline of March, 2021 and 58 plants of 776 KLD are expected to be completed by December, 2021. State needs to provide plans for bioremediation projects and status of preparation of Action Plan for the Coastal Pollution Management.

Principal Secretary, Housing & Urban Development Department, Odisha informed that works of all balance Septage Treatment Plants shall be completed by December, 2021. With regard to

STPs, it was informed that 4 STPs at Bhubaneswar have been successfully tested and formal commissioning of these plants shall be completed by March, 2021. STPs at Cuttack, Sambalpur and Rourkela are also progressing satisfactorily and shall be completed by June, 2021. Further, efforts are being put in to complete the house sewer connections. With regard to solid waste generation, 159 micro composting plants have been completed by December, 2020 in 110 ULBs and remaining 57 sites are in different stages of implementation.

Secretary, Ministry of Jal Shakti suggested that the State needs to improve the utilization capacity of the existing STPs.

20. <u>Goa</u>

ED (Tech), NMCG informed that against total sewage generation of 112.53 MLD, State has 9 exising STPs of 78.35 MLD. All the STPs are reported to be operational and complying. The utilization capacity of the STP remains 29 MLD due to low number of house sewer connections. 5 STPs of 35.5 MLD are under construction, 1-2% increase in progress has been reported from September – November 2020. 3 STPs of 43 MLD are proposed but STP work could not be started due to local issues. State has adopted Septic Tank-Soak Pit arrangement for treatment of the waste. Sal River has been adopted as the Model River. State needs to provide details of preparation of Action Plan with regard to Coastal Pollution Management.

Secretary, Environment, Goa informed that efforts are being made to manage the solid and liquid waste. It was informed that of the 5 STPs under construction, 5.6 MLD STP at Baga Calangute and 7.5 STP at Colva have been completed and trial run is going on. With regard to solid waste management, 150 TPD existing plant is being upgraded to 250 TPD and 600 TPD plants are under various stages of implementation. Action Plan for Coastal Pollution Management is being prepared.

Director General NMCG suggested the State to submit completion timeline for on-going projects and proposed projects.

21. Andaman & Nicobar

ED (Tech), NMCG informed that Monthly Progress Report has not been received from the UT. With regard to the letter received from UT flagging the issue of floating garbage of foreign origin being received at the UT, it was informed that the issue has been communicated to MoEF&CC and Ministry of External Affairs for necessary action. Further, MoEF&CC has directed NCSCM to inspect the site and to look into the matter. UT also needs to provide the status of preparation of Action Plan for Coastal Pollution Management.

Secretary (Environment), Andaman & Nicobar informed that the UT generates estimated sewage of 14.17 MLD and 1.7 MLD is treated and tenders have been called for STPs of 10 MLD. Faceal Sludge Treatment Plants are also being constructed and shall be completed within 3 months.

Due to issues in the audio, Director General, NMCG directed the UT to provide details in the Monthly Progress Report at the earliest, format of which is being circulated with the minutes as the same needs to be incorporated in the Quarterly Report being submitted to NGT.

22. Lakshadweep

ED (Tech), NMCG informed that Monthly Progress Report has not been received from the UT. Further, UT needs to provide the status of preparation of Action Plan for Coastal Pollution Management.

Secretary (Environment), Lakshadweep joined by Secretary (PWD), Lakshadweep informed that 2.8 MLD of sewage is generated and due to high water table STPs are not technically feasible in the UT. 1 STP has been installed in a private resort and 1 STP is existing in Navy area. Lakshadweep is Open Defecation Free and sewage is being managed through septic tanks and bio-toilets. Septage Treatment Plant option is being explored as a pilot project. NCSCM is preparing the Action Plan for Coastal Pollution Management and it shall be submitted shortly. Further, Integrated Island Management Plan has already been prepared and notified by Lakshadweep.

Director General, NMCG directed the UT to provide details in the Monthly Progress Report at the earliest, format of which is being circulated with the minutes as the same needs to be incorporated in the Quarterly Report being submitted to NGT.

23. <u>Delhi</u>

Director Technical, NMCG informed that out of 35 operational STPs, 11 STPs are complying with the standards of BOD -10mg/l, COD -50mg/l & TSS - 10mg/l. Out of 13 CETPs, only 2 CETPs are complying. With regard to on-going STP projects under YAP-III, not much progress has been reported in the last two months and the release of funds to the contractor remains a concern.

Secretary, Ministry of Jal Shakti highlighted that until the adoption of new measures, STPs designed for treating water up to BOD 30 mg/l, would not be able to treat water to the BOD level of 10mg/l. Therefore the remaining 24 STPs may be complying with its design capacity. It was suggested that joint inspection of the CETPs and Interception Projects may be carried out. State was directed to provide status of liquidity to contractors and tree plantation/ cutting permission.

Member Drainage, DJB informed that payment as on 18th December, 2020 has been made to all the contractors. Further, it was informed that 8 STPs were designed for BOD-10 mg/L parameter, 12 STPs are being upgraded and for remaining 15 STPs, budget for upgradation is being sought from the Government. Tree cutting permission for STPs at Okhla and Rithala is pending with the Minister. Further, it was informed that ISP project has been completed and STP at Coronation Pillar shall be completed by June 2021.

Secretary (Environment), Delhi informed that approval for tree cutting permission for 2 STPs from Minister is awaited.

Director Technical, NMCG informed that joint inspection of STPs and drains were planned, but the same could not be conducted and discussions with the contractors were done telephonically. It was informed that delay in projects is attributed to non-release of payment to the contractors by the DJB.

24. <u>Uttar Pradesh</u>

Senior Solid Waste Management Specialist, NMCG informed that as per September, 2020 MPR, there were 9 STPs which were expected to be completed by December, 2020. Out of these 9 STPs only 1 STP at Firozabad is under trial run and remaining 8 STPs (expected completion by December, 2020) and 23 other STPs are under construction. The LoA for Lucknow STP was issued on 17.09.2020 which has gone into sub-judice. The land issue for Moradabad STP is yet to be resolved. There are still 5 STPs which are non-operational, 19 STPs are non-complying to discharge standards (6-7 STPs are non-complying on BOD marginally above the discharge standards). For Farrukhabad project, NOC from NMCG has been given, however the State is to issue LoA. For 4 projects namely Balia, Pratapgarh, Jhansi & Kanpur (Baniyapurwa), no progress has been achieved since September, 2020. With respect to SWM facilities at Jaunpur & Fatehpur, the plants have still not been made operational as against the target date of 31.10.2020. There are land issues for 8 SWM plants at Bareily, Firozabad, Loni, Nazibabad, Bhadoi, Basti, Gorakhpur & Akbarpur. Noida construction & demolition (C&D) waste management facility has commenced its operation w.e.f. 05.10.2020 as scheduled. 4 C&D facilities at Lucknow, Agra, Varanasi & Prayagraj scheduled for commissioning by 31.12.2020 have not been achieved.

Secretary (Urban Development Department), Uttar Pradesh informed that out of 5 non-operational STPs, the STPs at Loni, Banda & Ghaziabad will be completed by 31.03.2021. With respect to non-compliance of STPs, it was informed that State is trying to bring O&M maintenance of STPs, which are not under the purview of UP Jal Nigam, under centralized agency. For increasing capacity utilization, it was informed that State is taking necessary steps such as increasing house service connections so as to ensure proper utilization of STP capacity. With respect to SWM facility at Jaunpur, it was informed that the construction is almost complete and it will be operational within a week. For Fatepur SWM facility, tenders have been floated. For the land issues for SWM facilities, it was informed that land issues have been resolved and either tenders have been floated or LoA has been issued. For processing of SW in rural & urban areas, State has finalized a policy and plants have been sanctioned. 37 new SW plants have been sanctioned, out of which tenders have been closed for 15, while the remaining are under tendering. State is planning to achieve 100% solid waste processing capacity by

December, 2021. With respect to C&D waste facility, it was informed that at Varanasi & Prayagraj the facilities are operational, Kanpur is under commissioning and for Lucknow bids have been invited thrice but to no success.

Secretary, Ministry of Jal Shakti requested State to indicate whether upgradation of existing STPs, if required, is a part of One City One Operator or not. With respect to Moradabad, it was indicated that 1 STP of 58 MLD has been sanctioned by NMCG in which sanction for laying of network was pending and another STP of 25 MLD capacity has been sanctioned by NMCG for which land issue is pending for long. Secretary (UDD), UP informed that the same has been sanctioned and works are under progress. Secretary, Jal Shakti further indicated that another STP of 20 MLD at Moradabad is non-operational and directed State to ensure that the same may be revived. He reiterated that efforts should be taken to complete the complete the projects at earliest and directed State to ensure proper utilization of STP. He raised his concerns over solid waste dumping during his recent visits to Etawah, Bulandshahr & Khurja indicating that large dumps of plastic waste are visible in both urban & rural areas, and directed the State to take necessary action at the earliest.

25. <u>Rajasthan</u>

Secretary, Ministry of Jal Shakti stated that in previous meetings no senior officers were present and indicated that a major concern is poor capacity utilization of the existing STPs. He also indicated about slow progress of Kota project funded by NMCG since last couple of years.

Director General, NMCG informed that a review meeting with the State was held under his Chairmanship with the State on 21.12.2020.

Senior Solid Waste Management Specialist, NMCG informed that the State has now sent the State dossier, households connected with sewer network has increased from 57% to 61%, 2 STPs have been completed & operationalized, 24 STPs are in advanced stages of completion with a progress of more than 90% and are expected to be completed by March 2021, capacity utilization has increased from 47% to 69%, for Kota project the clarifications received from the State have been sent for third party appraisal.

Some of the major issues include poor O&M of STPs & CETPs as 39 STPs out of 78 are non-complying and 11 CETPs out of 14 operational are reported to be non-complying. The State needs to develop a mechanism for daily assessment & reporting in terms of capacity utilization and compliance for all existing STPs and CETPs. In addition, municipal solid waste processing against the generation is very low (only 37%), incremental progress is not being provided as per directions of NMCG, legal issues for Hanumangarh STP & Bhiwadi STP need to be sorted out. 2 STPs at Mandiya and Nokha are completed since last 2 months, but are not yet operational. The action plan submitted by the State is very vague and needs to be specific indicating realistic timelines.

Secretary, LSG, Rajasthan informed that currently 67 STPs are under construction and the timelines have been provided in the MPR. It was further indicated that online monitoring of all STPs is being developed under Asian Development Bank funding and is likely to be completed soon. With respect to Kota project, it was informed that State has agreed for its increased share and is pending with Central Sanctioning Committee. With respect to household connections, it was informed that gradually number of connections are increasing and State is tying up funds under AMRUT and other schemes.

Secretary, Ministry of Jal Shakti indicated that it is the primary responsibility of the State to ensure that the STPs are working properly with proper capacity utilization.

26. <u>Haryana</u>

Director Technical, NMCG informed that out of 115 existing STPs in the State, 32 STPs are reported to be non-complying (7 in Ghaggar, 14 in Yamuna, 11 in others). The 7 non-complying STPs in River Ghaggar basin are not complying with the design standard of BOD 10 mg/l. As per the latest water quality reports, significant improvement in drains joining in River Ghaggar is being observed. The 14 non-complying STPs along River Yamuna basin are critical as these are having major impacts on the water quality of river upstream of Delhi and the quality in Najafgarh drain, Delhi. Compliance status of the existing CETPs needs to be provided.

Secretary, Ministry of Jal Shakti indicated that Haryana has fairly good treatment capacity, with Faridabad the only city having lesser treatment capacity in the State and work for STPs to bridge

the gap has begun. The issue of high concentration of ammonia in the river Yamuna was flagged. State needs to addresses the pollution in Drain no. 2, 6 and 8 and ensure compliance of the STPs and CETPs.

Additional Chief Secretary (Environment), Haryana attended the meeting along with other State officials. Member Secretary, Haryana Pollution Control Board informed that STPs are being monitored regularly and a centralized system is being installed for getting real time monitoring done. With regard to the issue of high ammonia concentration, monitoring has been conducted and ammonia level has been found to be within permissible levels. Further, illegal tankers discharging into the drains/rivers have also been addressed by conducting special drives. Online river monitoring station is being installed near Palla. With regard to issue of mixing of effluent water of DD-8 with DD-6, it was informed that Irrigation Department Haryana has started constructing a culvert pipe for segregating waste effluent and after completion of the work the issue shall be resolved. Large number illegal industrial units have been closed down in Panipat. Most of the non-complying STPs are having BOD more than 10 mg/L and the State agencies are upgrading the STPs either by altering the chemical dosing or by addressing the structural changes requirement. Only 1 CETP in Jind was found to be non-complying and the same is being upgraded.

Additional Chief Secretary (Irrigation), Haryana informed that to divert the effluent discharging from drain 6 to drain 8 in Haryana, a pipe has been planned to be constructed by 30.06.2021. As the STPs are constructed for 15 year design period, therefore all the STPs may not be able to achieve 100% of the utilization and works of untapped sewer is being expedited. With regard to STPs at Panipat, it was informed that the 20 and 25 MLD STP were monitored continuously for a week and it was found to be achieving the discharge norms of BOD level 10 mg/L, while on the remaining 2 STPs online monitoring systems are being installed. For increasing the utilization capacity of the STPs at Panipat, sewer lines are being laid in unapproved colonies.

ED Tech, NMCG suggested that the flow of Panipat drain running near to the 2 STPs of 60 MLD may be diverted to the STPs for treatment, in order to abate pollution and increase the utilization capacity. This suggestion of intercepting the Panipat drains to adjacent STP was also discussed during visit of Hon. Minister Sh Ratan Lal Katraia to Panipat-Sonepat. The characteristics of

drain have been found fit for treatment in STP by HSPCB. A D.O. letter to CS Haryana has also been written for this interception by DG, NMCG on 04th January, 2021. State was requested to complete this assignment on priority.

27. <u>Himachal Pradesh</u>

Director Technical, NMCG informed that MPR from the State was received on 04.01.2021 and as per the MPR, the State generates 163 MLD of sewage and there are 65 existing STPs of 120.5 MLD capacity of which 59 STPs are complying and there is a utilization capacity of 76.8 MLD, 28 STPs are under construction and 32 STPs are proposed. A 25 MLD CETP is existing at Baddi, which is reported to be non-complying, a 5 MLD CETP at Kala Amb is under construction, which was scheduled to be completed by 31.12.2020 and a 2 MLD CETP at Paonta Sahib is proposed.

Member Secretary, Himachal Pradesh Pollution Control Board informed that 25 MLD CETP existing at Baddi is non-complying with regard to FDS and Chloride, PCB has shut down the dyeing units of the defaulting industries till upgradation of the ETPs. 5 MLD CETP at Kala Amb is under progress and shall be completed by February 2021. 2 MLD CETP proposed at Paonta is awaiting funding.

Secretary, Ministry of Jal Shakti directed NMCG to get clearer picture of the State, as the figures provided are not reconciling with the information provided by the State official.

28. <u>West Bengal</u>

Director Technical, NMCG informed that 2758 MLD of sewage is being generated in the State, there are 41 existing STPs of 692 MLD with capacity utilization of 272 MLD. 26 STPs are operational of which only 8 are reported to be complying with the norms. Most of the partially complying STPs are under renovation while 9 STPs are non-operational. STPs of large capacity, operated by KMC are also non-complying at Bangur, Garden Reach (funding already sanctioned by NMCG and lying idle) and Keorapukur (recently upgraded under KEIIP). Status of STP at Churni (under tendering) is reported to be same since past 2 years. The report talks about many of the STPs as partially compliant but details of non-compliance parameter have not been given,

and thus it becomes difficult to understand from the report what sort of action is required to make those STPs complaint to design norms/ regulatory norms.

Secretary, Ministry of Jal Shakti raised serious concern over the status of STPs in the State.

CEO, KMDA informed that the work order for STP at Churni shall be issued shortly, but in the meanwhile phytoremediation works at the Churni River have begun. Principal Secretary (Environment), West Bengal informed that phytoremediation works have resulted in improvement in quality of the river. Further, it was informed that following the Odisha model, the State is planning to adopt decentralized faceal sludge plants across the State and one has already been constructed. OCEMS are being planned to be adopted for all the STPs and empanelment list of all the agencies by NMCG is being awaited. It was further informed that Finance Department, West Bengal has released funds for remediation of legacy waste and various solid waste management projects. 20 MLD CETP is operational at Kolkata Leather complex and another 20 MLD CETP shall be completed by 2022, after which there is no pollution into the rivers from the industry.

Secretary, Ministry of Jal Shakti highlighted that as laying sewer network takes good amount of time, therefore the Ministry has focused on interception and diversion of drains with STP projects in order to abate the pollution of rivers. Further, monitoring of the STPs also plays an important role in ensuring that existing infrastructure is in good position. It was suggested that State can take guidance from Odisha for adopting the Faceal Sludge and Septage Management. It was also highlighted that for operationalizing 2 STPs at Hoogly and North 24 Paraganas sanctioned under Namami Gange were cancelled after award of work. It was suggested that the State may indicate the compliance status of the STPs with regard to the standards notified by MoEF&CC and those not meeting the standards of NGT may be highlighted separately.

Executive Director Projects, NMCG informed that NMCG has proposed that an empanelment list of agencies who have successfully installed online monitoring systems on STPs shall be prepared and shared with the States.

With regard to Action Plan for Coastal Pollution Management, it was informed that the same shall be submitted to CPCB shortly. There were some legal issues in the works awarded for

upgradation of STPs in Hoogly district and work was on hold due the same. State official informed that all legal issues have been resolved and now work has started again.

NMCG has provided support for preparation of DPR for KMC area only under EAP funding. Final DPR is yet to be prepared by KMC's consultant. Once DPR is finalised, KMC has to explore funding sources for these. NMCG has not committed any funds for the works proposed in these DPR as these are primarily sewer network DPR. This has been informed many times but the status in MPR of the State remains same.

It was informed that, bid has been opened for Tolly's Nallah project and one bid has been received, and technical evaluation is under progress. For rejuvenation of oxidation pond at Jiaganj, civil work estimates have been submitted and estimates for electro- mechanical works are to be finalized. State RRC has approved action plans for 8 Priority-V Rivers. There are 2 units of FSTP of 50 MLD each planned, of which 1 is functional and 1 shall be functional by January, 2021. For treatment of legacy waste, plants are already operational, further work order have been given for 5 tenders and 12 tenders have been matured. With regard to solid waste management in 125 ULBs, tenders for 32 projects are to be revised and are to be floated again, tenders for 37 are to be floated shortly and for 40 projects RFP has been completed but land is yet to be finalized. About 11,930 TPD of processing waste capacity is proposed to be developed. With regard to the industries, it was informed that 16259 industries are existing in the State of which 454 are water polluting industries, having industrial discharge of 1360.64 MLD. All 454 have individual ETPs, 20 MLD CETP is operational in leather complex and another 20 MLD CETP is under construction, which shall be completed by late 2021- mid 2022. A team of NMCG will be visiting the State from 11th January to understand the ground realities of the STPs in the State and will provide guidance to State in resolving the pending issues in ongoing works to speed-up the progress of work.

29. Uttarakhand

Secretary, Ministry of Jal Shakti highlighted that there are not many issues in the State, therefore the State was directed to ensure compliance and operation status of the existing STPs. To increase the utilization capacity of 26 MLD at Rishikesh, works are to be expedited. 68 MLD

STP constructed at Dehardun is receiving only 8 MLD of sewage, for which I&D of drains have also been sanctioned, which shall lead to addition of about 20 MLD of sewage. State may explore the possibility to connect Sapera basti drain (about 5-8 MLD flow) also with existing STP of 68 MLD. This will improve the capacity utilization of STP in Dehradun. Similarly, a 30 MLD STP at Roorkee is constructed and is receiving only 4-5 MLD of sewage. State was directed to ensure optimum utilization capacity of these 2 STPs. Further, 3 STPs are reported to be non-complying at Nainital, Almora and Pithorgarh. Solid waste management is also a major concern in the State.

Principal Secretary (Environment), Uttarakhand informed that as the 3 non-complying STPs are old and of small capacity, possibility of upgradation of these STPs is being explored. For Joshimath, solid waste management facility is being planned.

30. <u>Madhya Pradesh</u>

Director Technical, NMCG informed that as reported by the State, Madhya Pradesh has developed an "Env Alert App" on Google play store and a Whatsapp group has also been created for monitoring the status of existing STPs. This has also helped in improving the utilization capacity of the STPs. Further, 11 STP projects have been completed by December, 2020 and are currently under trial run. State needs to provide incremental progress of the projects in the MPR.

Principal Secretary (Environment), Madhya Pradesh informed that App developed is in under testing and details of major STPs such as inflow, outflow and BOD level of treated effluent are being received on daily basis.

Principal Secretary (Urban Development Department), Madhya Pradesh informed that bio-remediation works of the Mandideep and Nagdwa are to be commissioned in January and March 2021 respectively. 2 non-operational plants have been made operational and 2 shall be made functional by March, 2021. Further, 15 STPs of 305 MLD are under trial and shall be commissioned by March, 2021. STPs of 55.4 MLD are under tendering and shall be awarded by March, 2021.

Secretary, Ministry of Jal Shakti praised the efforts made by MPPCB for monitoring the STPs and state of Madhya Pradesh for completing 15 more STPs of 305 MLD capacity. Secretary also advised state to remain focused on completion of more STPs as very good number of STPs are under advance stage of completion and with full attention more STPs could be completed shortly. Further, State needs to ensure optimum utilization of the 15 STPs to be commissioned by March 2021.

31. <u>Chhattisgarh</u>

Senior Environmental Specialist, NMCG informed that total sewage generation in Chhattisgarh is 600 MLD, against which at present the installed capacity is only 73.1 MLD. Issue of low capacity utilization is being addressed by the State. 238 MLD STPs are under construction and slight progress has been observed in the on-going projects. Matter regarding the purchase of treated waste water from the 35 MLD proposed STP at Korba needs to be sorted out with NTPC. For other STPs like Rajim (2.8 MLD), Simga (2.8 MLD), Kanker (7.88 MLD), Dhamtiri (19.6 MLD) and Nawapara (7.5 MLD), DPRs are ready. However, it was informed that funding for these schemes are not yet finalized and NMCG has been requested to provide financial assistance. Further, State has a number of FSTPs for addressing the pollution.

Additional Chief Secretary (Housing & Environment), Chhattisgarh informed that the STP at Korba was proposed to be taken up on PPP mode and NTPC was supposed to provide partial financial assistance. Tender floated has not been finalized by the NTPC, due which the progress has been delayed.

Senior Environmental Specialist, NMCG informed that as reported by the State earlier, it is a PP project, in which NTPC was bound to purchase the treated waste water from the STP and agreement in this regard and the quality of water has not been made yet.

Additional Chief Secretary (Housing & Environment), Chhattisgarh informed that pipeline and a tertiary treatment plant are to be established by NTPC Korba and the Municipal Corporation of Korba shall provide treated waste water at the rate of Rs.25/cubic metre after finalization of the bid subjected to slight changes in the rate quoted. NTPC is currently purchasing water from

Water Resource Department at the cost of Rs. 12/cubic metre. The rates to be further negotiated at the State level.

Secretary, Ministry of Jal Shakti suggested that the works of on-going projects may be expedited. Further, the notification of Ministry of Power with regard to utilization of treated water by NTPC located in the 50 kms vicinity of the STP was stressed.

32. Jharkhand

Senior Environmental Specialist, NMCG informed that the State reported sewage generation of 452 MLD in the State. There are 14 STPs of 108 MLD existing with utilization capacity of 74%. 4 STPs of 92.5 MLD STP are under construction and STPs of 242 MLD are proposed. It was informed that updated MPR from the State was not received. Trial run of the STP at Rajmahal has started and work is in progress for sewer network.

Secretary (Housing & Urban Development Department), Jharkhand informed that STP at Phusro has been sanctioned by NMCG. Industrial associations are being approached for providing financial assistance for the STP projects at Dhanbad and Ramgarh. For Chas, Ranchi and Mango, STPs will take time for implementation, and phytoremediation based STPs by NEERI are proposed. For Chas, a FSTP is being planned. On-going STP projects at Adityapur shall be by completed 2021 and at Ranchi by 2022.

Secretary, Ministry of Jal Shakti suggested that primarily NMCG funded projects on mainstream of River Ganga and therefore based on polluters pay principle, industries should be approached for financial assistance.

33. Bihar

Senior Environmental Specialist, NMCG informed that the State generates 1100 MLD of sewage, of which 651 MLD of sewage is being generated in the polluted river stretches. There exists old STPs of 90 MLD treatment capacity and new 3 STPs of 140 MLD have been completed. Utilization Capacity of the STPs is around 90-100 MLD and there are 22 STPs proposed which are at various stages of implementation (15 ongoing/awarded, 1being awarded, 6

under tendering). 604.50 km of the sewer length has been laid as reported in December, 2020 MPR. There are STPs of 362 MLD under construction and 129 MLD STPs are to be tendered out. It was informed that land NOC has been received for Digha (STP), Sultanganj (2 IPS), Chhapra (3 IPS), Barh (1 IPS), Bakhtiyarpur (STP) and Land NOC is still pending for STP and IPS for Maner I&D and STP scheme, and for the 2 IPS in Bakhtiyarpur. Land for the IPS-1 in Kankarbagh and IPS-B in Digha is pending. Land for the Begusarai STP is cleared and the compensation issue has been resolved. RCD and NHAI permission is still pending for 39km from RCD and 5.62km from NH is pending in Patna. Outside of Patna, 30.22km from RCD, 8.66km from NHAI (Naugachia and Begusarai, Chhapra), Railway crossings at Mokama, Begusarai and Sonepur is pending.

Secretary, Ministry of Jal Shakti suggested that officials from Ministry should regularly visit the States to take note of the progress and based on the site visits, issues may be flagged to the State. Further, the State needs to resolve the issues with regards to delay in tendering of the sanctioned projects. It was also directed that State Mission for Clean Ganga needs to be strengthened.

Principal Secretary (Urban Development Department), Bihar informed that the recent visit of officials from NMCG was beneficial in clearing the bottlenecks in a number of projects. Further, LoA has been issued for Bhagalpur STP, STP at Beur are expected to be completed by January 2021, 5 STP projects to be completed by March 2021, 4 STPs to be completed by May 2021. Land issue has been resolved and work is about to start for STP at Bhaktiyapur and land issue also resolved for STP at Munger. Further, issues with NOC from Railway have been resolved and tender has been issued for Buxar.

All the States were directed to urgently submit to NMCG information with regard to the issues highlighted and the presentation made in the meeting, for incorporation in the Quarterly Report for onward submission in Hon'ble NGT.

The meeting ended with thanks to the Chair.

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Annexure-I

List of participants:

1. Shri U. P. Singh, Secretary, Ministry of Jal Shakti – *in Chair*
2. Shri Rajiv Ranjan Mishra, Director General, NMCG cum Project Director, NRCD
3. Shri Ashok Kumar Singh, Executive Director (Projects), NMCG
4. Shri D.P.Mathuria, Executive Director (Technical), NMCG
5. Dr. Prashant Gargava, Member Secretary, CPCB
6. Shri Brijesh Sikka, Senior Consultant, NMCG
7. Shri. B.B. Barman, Advisor, NRCD
8. Shri J.C. Babu, Additional Director, CPCB
9. Dr. Pravin Kumar, Director Technical, NMCG
10. Shri Ankit Jain, Assistant Adviser, MoHUA
11. Shri Ishwer Singh, Consultant (Legal) NMCG
12. Shri S.K. Srivastava, Director, NRCD
13. Shri Sanjay K. Singh, Deputy Director, NRCD
14. Shri A.P. Singh, Scientist E, NRCD
15. Dr. Sabita Madhvi Singh, Joint Director, NRCD
16. Shri Rajat Gupta, Senior Solid Waste Management Specialist, NMCG
17. Shri Saumya Mukhopadhyay, Senior Environmental Specialist, NMCG
18. Shri G.K.Murty, Team Leader, NRCD
19. Shri Manish Kumar, Sewage Treatment and Wastewater Expert, NMCG
20. Shri Vijay Kumar, Assistant Civil Engineer, NMCG
21. Shri Rachit Andley, Project Manager, NMCG
22. Shri Avshesh Chauhan, Assistant System Analyst, NMCG
23. Shri Kumar Ajitabh, Project Officer Legal, NMCG
24. Mrs. Ruby Raju, Project Engineer, NMCG
25. Shri Kallol Choudhary, Industrial Process Expert, NMCG
26. Shri Rishabh Choudhary, Support Engineer, NMCG

Legal/OA673/2018/NMCG/2019
National Mission for Clean Ganga
Department of Water Resources, River Development
& Ganga Rejuvenation, Ministry of Jal Shakti

1st Floor,
Major Dhyan Chand National Stadium
India Gate, New Delhi-110002
Dated: 5th April 2021

OFFICE MEMORANDUM

Subject: **Minutes of the 9th meeting of Central Monitoring Committee in the NGT Matter OA No.673 of 2018 held on 04.03.2021 from 10.00 AM on-wards**

A copy of Minutes of the 9th Meeting of Central Monitoring Committee in the NGT matter O.A. No. 673 of 2018 held through Video Conferencing on 04.03.2021 from 10.00 AM on-wards, under the Chairmanship of Secretary, Ministry of Jal Shakti is forwarded herewith for information/ necessary action.

05.4.2021

(D. P. Mathuria)
Executive Director-Technical, NMCG
uyrb-mowr@nic.in

Encl: As above.

To,

1. Chief Secretary, Government of Andhra Pradesh, Ist Block, A.P Secretariat Office, Velagapudi – 522503
2. Chief Secretary, Government of Assam, Block- C, 3rd Floor, Assam Sachivalaya, Dispur - 781006, Guwahati
3. Chief Secretary, Government of Bihar, Main Secretariat, Patna – 800015
4. Chief Secretary, Government of Chhattisgarh, Mahanadi Bhawan, Mantralaya, Naya, Raipur – 492002
5. Chief Secretary, Government of Goa, Secretariat, Porvroim, Bardez, Goa – 403521
6. Chief Secretary, Government of Gujarat, 1st Block, 5th Floor, Sachivalaya, Gandhinagar – 382010
7. Chief Secretary, Government of Haryana, 4th Floor, Haryana Civil Secretariat, Sector-1, Chandigarh – 160019
8. Chief Secretary, Government of Himachal Pradesh, H P Secretariat, Shimla –171002
9. Chief Secretary, Government of Jammu & Kashmir, R. No. 2/7, 2nd Floor, Main Building, Civil Secretariat, Jammu -180001
10. Chief Secretary, Government of Jharkhand, 1st Floor, Project Building, Dhurwa, Ranchi-834004

11. Chief Secretary, Government of Karnataka, Room No. 320, 3rd Floor, Vidhana Soudha, Bengaluru -560001
12. Chief Secretary, Government of Kerala, Secretariat, Thiruvananthapuram -695001
13. Chief Secretary, Government of Madhya Pradesh, MP Mantralaya, Vallabh Bhavan, Bhopal 462004
14. Chief Secretary, Government of Maharashtra, CS office main Building, Mantralaya, 6th floor, Madame Cama Road, Mumbai – 400032
15. Chief Secretary, Government of Manipur, South Block, Old Secretariat, Imphal – 795001
16. Chief Secretary, Government of Meghalaya, Main Secretariat Building, Room no 316, Shillong – 793001
17. Chief Secretary, Government of Mizoram, New Secretariat Complex, Aizwal – 796001
18. Chief Secretary, Government of Nagaland, Civil Secretariat, Kohima – 797004
19. Chief Secretary, Government of Odisha, General Administration Department, Odisha Secretariat, Bhubaneswar – 751001
20. Chief Secretary, Government of Punjab, Chandigarh – 160001
21. Chief Secretary, Government of Rajasthan, Secretariat, Jaipur – 302005
22. Chief Secretary, Government of Sikkim, New Secretariat, Gangtok – 737101
23. Chief Secretary, Government of Tamil Nadu, Secretariat, Chennai-600009
24. Chief Secretary. Government of Telangana, Block C, 3rd floor, Telangana Secretariat Khairatabad, Hyderabad, Telangana
25. Chief Secretary, Government of Tripura, New Secretariat Complex Secretariat – 799010, Agartala, West Tripura
26. Chief Secretary, Government of Uttar Pradesh, 1st floor, Room No. 110, Lal bahadur Sastri Bhawan, Uttar Pradesh Secretariat, Lucknow – 226001
27. Chief Secretary, Government of Uttarakhand, 4 Subhash Road, Uttarakhand, Secretariat Dehradun – 248001
28. Chief Secretary, Government of West Bengal, Nabanna, 13th Floor, 325, Sarat Chatterjee Road, Mandirtala, Shibpur, Howrah – 711102
29. Administrator, Daman & Diu and Dadra and Nagar Haveli, Secretariat, Moti, Daman -396220
30. Chief Secretary, Govt. of NCT of Delhi, Delhi Secretariat, IP Estate, New Delhi – 110002
31. Chief Secretary, Govt. of Puducherry, Main Building, Chief Secretariat, Puducherry-605001
32. Chief Secretary, Andaman & Nicobar, Secretariat, Port Blair
33. Administrator, Lakshadweep

Copy To:

1. Secretary, Department of Forest, Ecology & Environment, J&K, Room no. 2/33-34, Main Building, Civil Secretariat, J&K, Jammu.
2. Secretary, Department of Environment, Science and Technology Paryavaran Bhawan, Near US Club. Shimla, Himachal Pradesh-171001
3. Principal Secretary, MGSIPA Complex, Sector-26, adjacent Sacred Heart School, Chandigarh, 160019

4. Additional Chief Secretary to Govt. of Haryana, Environment Department of Environment & Climate Change, R.No. 108, 7th Floor, Main Secretariat Sec16, Chandigarh 160017
5. Principal Secretary, Department of Environment, U.P., Room No. 601, Bapu Bhawan Secretariat, Vidhan Sabha Marg, Lucknow – 226001.
6. Special Chief Secretary, Department of Environment, Forest, Science & technology, 4th Block, Ground Floor,Room No:268, A.P Secretariat Office, Velagapudi
7. Secretary, Department of Environment and Forest, H-Block, 2nd Floor Janata Bhawan, Dispur, Guwahati 781006, Assam
8. Principal Secretary, Department of Environment, Forest and Climate Change, Van Vibhag Rd, Nehru Nagar, Patliputra Colony, Patna, Bihar 800013
9. Additional Chief Secretary (Forests & Environment), Forests & Environment Department, Block 14, 8 th floor, Sachivalaya, Gandhinagar - 382 010 Gujarat.
10. Principal Secretary, Department of Environment, Room No. S-2/23, Mahanadi bhawan, Mantralaya, Nava Raipur, Atal Nagar, Raipur - 492001
11. Additional Chief Secretary to Government, Forest, Environment and Ecology, Department, Karnataka Government Secretariat, Room No. 447, 4th Floor, Gate no. 2, Multi-storey Building, Bangalore-560001.
12. Principal Secretary, Department of Environment, Room No. 406 4th Floor Annex II, Secretariat, Kerala Thiruvananthapuram, Kerala, PIN- 695001
13. Principal Secretary, Department of Housing and Environment, Government of Madhya Pradesh, Paryavaran Parisar, E- 5, Arera Colony, Bhopal, Madhya Pradesh, 462016
14. Principal Secretary, Environment Department, Maharashtra 15th Floor, New Administrative Building, Madam Cama Road, Mantralaya, Mumbai – 400032
15. Additional Secretary, Forests & Environment Deptt, Secretariat Building, North Range, Forest Colony, Khasi Hills, Shillong, Meghalaya 793001
16. Deputy Conservator of Forest (Headquarters) Environment, Forests & Climate Change Department Tuikhuahtlang, Aizawl Mizoram.
17. Principal Secretary, Department of Environment, Forest & Climate Change, New Secretariat, Kohima, Nagaland Tel.- 0370-2243025
18. Additional Chief Secretary, State Silvicultural garden, Khandagiri, Bhubaneswar, Odisha 751003
19. Principal Secretary, Forest and Environment Department, Rajasthan 4, Jhalana Institutional Area, Jhalana Doongri, Jaipur, Rajasthan 302004
20. Principal Secretary, Chief Project Director (SBFP-JICA), Forests, Environment & Wildlife Management Department, Government of Sikkim
21. Principal Secretary, Namakkal Kavignar Maaligai, Fort St. George, Chennai 600 009
22. Secretary, Department of Science, Technology & Environment, Vigyan Prajukti O Paribesh Bhawan, P.N. Complex, Gorkhabasti, Agartala,West Tripura, PIN-799006
23. Special Chief Secretary, TSCOST. 4th Floor, Aranya Bhavan. Saifabad, Hyderabad, Telangana State, Pin – 500004
24. Deputy Conservator of Forests, (Territorial Division), Department of Environment & Forest Office of the Deputy Conservator of Forest, Daman, Fort Area, Post Office Moti Daman Daman cz

25. Deputy Conservator of Forests, (Territorial Division), Van Bhavan, Dadra and Nagar Haveli
26. Secretary, Department of Environment, Govt. of NCT of Delhi, 6th Floor, Delhi Secretariat, IP Estate, New Delhi 110002
27. Secretary, Environment & Forest, Govt. of Uttarakhand, 4 Subhash Road, Secretariat, Forth Floor, New Building Dehradun, Pin code-248001
28. Joint Secretary, Department of Science, Technology & Environment, 1st Floor, Pandit Deendayal Upadhay Bhavan, Behind Pundalik Devasthan, Near Sanjay School, Porvorim, Bardez - Goa
29. Secretary, Environment, Office of Environment, Chief Secretariat, Goubert Avenue, Puducherry 605001
30. Principal Secretary, Department of Environment, 5th Floor, Pranisampad Bhawan, Block LB-II, Salt Lake, Sector III, Bidhannagar, Kolkata – 700 106
31. Additional Chief Secretary Forest, Environment & Climate Change Deptt., Nepal House, Doranda, Ranchi-834002, Jharkhand
32. Additional Chief Secretary, Forest and Environment Department, Government of Manipur, Secretariat, Imphal- 705001
33. The Member Secretary, Assam Pollution Control Board, Bamunimaidam, Guwahati – 781021
34. The Member Secretary, Andhra Pradesh Pollution Control Board D.No. 33-26-14 D/2, Near Sunrise Hospital, Pushpa Hotel Centre, Chalamalavari Street, Kasturibaipet, Vijayawada – 520 010
35. The Member Secretary, Bihar State Pollution Control Board, Parivesh Bhawan, Plot No. NS-B/2 Paliputra Industrial Area, Patliputra, Patna (Bihar) - 800 010
36. The Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas Bhavan, North Block Sector-19, Atal Nagar Dist- Raipur (C.G.) 492002
37. The Member Secretary, Delhi Pollution Control Committee, Government of N.C.T. Delhi 4th Floor, ISBT Building, Kashmere Gate, Delhi-110006
38. The Member Secretary, Daman, Diu & Dadra Nagar Haveli Pollution Control Committee, Office of the Deputy Conservator of Forests, Fort Area, Court Compound, Moti Daman, Daman – 396220
39. The Member Secretary, Goa State Pollution Control Board, 1st Floor, Dempo Tower, EDC Patto Plaza, Panaji, Goa-403 001
40. The Member Secretary, Gujarat Pollution Control Board Paryavan Bhavan, Sector 10- A, Gandhinagar – 382 043
41. The Member Secretary, Haryana State Pollution Control Board, C-11, Sector-6, Panchkula-134109, Haryana
42. The Member Secretary, Himachal Pradesh Pollution Control Board, Him Parivesh, Phase-III, New Shimla, Himachal Pradesh 171009
43. The Member Secretary, Jammu & Kashmir State Pollution Control Board, Parivesh Bhawan, Forest Complex, Gladni, Narwal, transport Nagar, Jammu, Jammu and Kashmir 180004
44. The Member Secretary, Jammu & Kashmir State Pollution Control Board, Shiekh-ul-Campus, behind Govt. Silk Factory, Raj Bagh, Srinagar (J&K)

45. The Member Secretary, Jharkhand Pollution Control Board, T.A Building, HEC, P.O. Dhurwa, Ranchi – 834004
46. The Member Secretary, Karnataka State Pollution Control Board. Parisara Bhavan, 4th & 5th Floor, # 49, Church St., Bengaluru-560 001
47. The Member Secretary, Kerala State Pollution Control Board, Plamoodu Jn., Pattom Palace P.O. Thiruvananthapuram - 695 004
48. The Member Secretary, Manipur Pollution Control Board, Lamphelpat, Imphal West D.C. Office Complex Imphal– 795004
49. The Member Secretary, Meghalaya Pollution Control Board Arden- Lumpyngngad Shillong: 793014
50. The Member Secretary, Nagaland Pollution Control Board, Signal Point, Dimapur Nagaland – 797112
51. The Member Secretary, Madhya Pradesh Pollution Control Board, E-5, Arera Colony, Paryavaran Parisar, Bhopal - 462 016, Madhya Pradesh
52. The Member Secretary, Maharashtra Pollution Control Board, Kalpataru Point, 2nd – 4th Floor Opp. Cine Planet Cinema, Nr. Sion Circle, Sion (E) Mumbai – 400 022
53. The Member Secretary, Mizoram Pollution Control Board, New Secretariat Complex, Khatla Thlanmual Peng, Khatla, Aizawl, Mizoram: 796001
54. The Member Secretary, Puducherry Pollution Control Committee, Housing Board Complex, Anna Nagar, Puducherry -600 005
55. The Member Secretary, Punjab Pollution Control Board, Vatavaran Bhawan, Nabha Road, Patiala, Punjab 147001
56. The Member Secretary, Odisha Pollution Control Board, A-118, Nilakanta Nagar, Unit – VIII, Bhubaneshwar – 751012
57. The Member Secretary, Rajasthan Pollution Control Board, 4, Jhalana Institutional Area, Jhalana Doongri, Jaipur (Rajasthan) - 302 004
58. The Member Secretary, Sikkim State Pollution Control Board, Department of Forest, Environment & Wildlife Management Government of Sikkim, Deorali, Gangtok, - 737102
59. The Member Secretary, Telangana State Pollution Control Board, Paryavaran Bhawan, A-3, I.E. Sanath Nagar, Hyderabad-500 018
60. The Member Secretary, Tripura Pollution Control Board, Vigyan Bhawan, Pandit Nehru Complex, Gorkhabasti, PO: Kunjaban Agartala – 799006
61. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032
62. The Member Secretary, Uttarakhand Environmental Protection & Pollution Control Board, 29/20, Nemi Road, Dehradun, Uttarakhand – 248001
63. The Member Secretary, Uttar Pradesh Pollution Control Board, Building.No. TC-12V, Vibhuti Khand, Gomti Nagar, Lucknow-226 010
64. The Member Secretary, West Bengal Pollution Control Board, Paribesh Bhavan, 10A, Block-L.A., Sector III, Salt Lake City, Kolkata - 700 106
65. The Member Secretary, Andaman & Nicobar Islands Pollution Control Committee, Department of Science & Technology, Dollygunj Van Sadan, Haddo P.O., Port Blair – 744102

66. The Member Secretary, Lakshadweep Pollution Control Committee, Department of Science, Technology & Environment, Kavarati-682555

Copy for kind information:

1. PPS to Secretary, Department of Water Resources, RD&GR, Ministry of Jal Shakti, Shram Shakti Bhavan, Rafi Marg, Sansad Marg Area, New Delhi- 110001
2. PS to Director General, NMCG cum Project Director NRCD
3. PS to Additional Secretary, Ministry of Housing and Urban Affairs, Nirman Bhawan, Maulana Azad Road, New Delhi – 110011.
4. Joint Secretary, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhavan, Jorbagh Road, New Delhi – 110003
5. Member Secretary, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi-110032
6. PS to ED (Project/ Finance), NMCG
7. Adviser, NRCD

Minutes of the 9th meeting of the Central Monitoring Committee held on 04.03.2021 through Video Conferencing regarding 351 polluted river stretches based on the directions of Hon'ble NGT in the matter OA No. 673 of 2018

The 9th meeting of the Central Monitoring Committee (CMC) constituted by Hon'ble NGT in the matter OA No. 673 of 2018 was held through video conferencing with the States on 04.03.2021 from 10.00 AM onwards in Conference Room, NMCG under the Chairmanship of Secretary, Ministry of Jal Shakti (MoJS). The list of participants of NMCG, NRCD, MoHUA and CPCB present at the meeting is at ***Annexure-I.***

II. Director General, NMCG welcomed all the participants and the new Secretary, Ministry of Jal Shakti. DG, NMCG briefed about the directions given by NGT in its previous orders and the compliance achieved thereof. Further, directions passed by NGT vide its latest order dated 22.02.2021 were spelt out as given below and the States were directed to ensure compliance with the orders.

- River Rejuvenation Committees in the States/UTs and CMC to continue functioning.
- Statutory mechanism existing in form of October, 2016 Ganga Authority Notification may be adopted for all the river stretches as issues involved are common. States were requested to refer to the Authority notification available on NMCG website.
- The Empowered Task Force on river Ganga headed by Union Minister of Jal Shakti may exercise all powers and discharge all functions in relation to all the polluted river stretches in the same manner as the functions entrusted to it under the Ganga Authority Notification, 2016.
- MoJS may issue appropriate statutory order to give effect to the above directions under the EP Act, 1986 and this mechanism may be called "*National River Rejuvenation Mechanism*" (NRRM) or given any other suitable name. NRRM may also consider the observations with regard to setting up of National/State/District Environment Data Grid at appropriate levels as an effective monitoring strategy. MoJS is in process of developing the mechanism and the same shall be consulted with the States shortly.
- States/UTs to ensure that all the rivers in the country should attain good health and to ensure the quality is not degraded.

In his opening remarks Secretary, MoJS welcomed all participants and mentioned that it is collective responsibility of all concerned to ensure that our rivers and water bodies are rejuvenated and conserved.

ED (Tech), NMCG informed that as per NGT order, fecal coliform should be a parameter for monitoring of polluted river stretches. Further, if any offence by way of violation of environmental laws is committed by a Government Department, the Head of Department is deemed to be guilty. Cognizance of such offence can be taken by a Court on a complaint of the Central Government or any other person who has given notice to the Central Government or its authorized representative. The complaint can be filed before a Court of 1st Class Magistrate. It was also highlighted by NGT that regular monitoring at State level under the chairmanship of Chief Secretaries should continue.

DG, NMCG requested the States to monitor the fecal coliform in the polluted river stretches.

III. Subsequently, State-wise discussions held are as follows:

Through a presentation, progress made by the States was highlighted and the issues related to sewage, industrial and solid waste management in the States based on the information submitted in MPRs were brought out for review.

1. **<u>Punjab</u>**

Deputy Director, NRCD informed that State has 117 STPs having total treatment capacity of 1,677.5 MLD against the total sewage generation of 2,111 MLD. Sewage is also being treated by alternate technology in 2 STPs having capacity of 500 KLD each. State has recently awarded the work for construction of 8 STPs having total treatment capacity of 294.8 MLD. As reported by the State in the MPR, 108 existing STPs were monitored in the month of January 2021, out of which 43 STPs were found to be non-complying with the discharge standards, which was higher than the numbers reported previously. Further, it was informed that State has 4,037 water polluting industry units having total industrial discharge of about 398 MLD. 1,738 industries have installed ETPs with a treatment capacity of 396.42 MLD. 86 ETPs were monitored in January 2021, of which 72 ETPs were found to be complying with the discharge norms. Letter of award for construction of STPs at Ludhiana was issued in December, 2020. State Government was requested to provide latest status on the progress made in this regard so far. State was also requested to provide the progress made in

installation and functioning of 3 CETPs at Ludhiana as well as status of land acquisition for STP proposed at Sangrur.

DG, NMCG asked the State to share its notification with regard to management of e-flow in the rivers in the State. It was also highlighted that the issue of pollution abatement of River Ghaggar also needs to be properly addressed by the State.

Secretary (Department of Environment), Punjab informed that recently works of 5 STPs have been completed and 1 STP has been made operational. Presently, 29 STPs are under construction in towns along the polluted river stretches and are expected to be completed within 3 months to 1 year time. With regard to the non-complying 43 STPs, it was informed that the State Pollution Control Board has been asked to urgently take necessary measures.

Principal Secretary (Local Government), Punjab informed that under the Budha Nalla project the agreement with the Contractor for construction of 2 STPs having treatment capacity of 225 MLD and 60 MLD has been signed and work has started at site. The contractor has already submitted design and drawings for these STPs which has been approved by the Department. These STPs are scheduled to be completed by December, 2022 and the up-gradation work of STPs shall be completed by December, 2021.

ED (Tech), NMCG highlighted that as per 3rd Quarterly report of CMC, Punjab has completed 7 STPs of 107 MLD capacity and the State Govt. needs to ensure that adequate quantity of sewage is reaching these STPs for treatment.

Secretary, MoJS advised the State Government to thoroughly review all the 43 non-complying STPs and provide the timelines by which these STPs would be made compliant. State Government was also requested to speed up its efforts for timely completion of under-construction STPs.

2. <u>Assam</u>

Deputy Director, NRCD informed that in the MPR of January 2021, sewage generation has been reported as 824.07 KLD which is incorrect as in the State dossier it has earlier been informed that the total sewage generation in the State is 436.53 MLD. This issue was also raised in the 8th CMC meeting as in the MPR of December, 2020 same figure was reflected and State was asked to reconcile the figures of sewage generation. However, the same has not been rectified till date. It was further informed that in the MPR no information regarding

status of JICA project in Guwahati as well as award of work for 5 STPs in Mangaldoi, Tejpur, Nagaon, Silchar, etc have been provided. It was informed in the 8th CMC meeting that tenders for the 5 STPs would be floated by December, 2020 while in the January, 2021 MPR it has been mentioned that Administrative Approval for above mentioned STPs are being issued. The status given by the State regarding these STPs is not as per the information given by the State in the last CMC meeting. Similarly, in the last CMC meeting it was informed that for integrated solid waste management, a new site at Sonaguli has been identified. The State needs to provide the latest status in this regard.

Principal Secretary, Department of Environment, Assam along with officials from Assam Pollution Control Board, Urban Development Department and Commissioner, Guwahati Municipal Corporation attended the meeting. The official from Urban Development Department, Assam informed that out of 5 STPs proposed outside Guwahati region, Administrative Approval has only been issued for STP at Nagaon, but due to model code of conduct, tender could not be floated.

DG, NMCG inquired about the progress made in JICA project at Guwahati. However, none of the officials of the State Government present during the meeting was in a position to brief about the progress under the JICA project, which involves construction of 14 STPs in Guwahati. The DG, NMCG expressed his concern over the non-responsiveness of the State Government officials and directed them to send a written reply to all the queries raised.

3. Jammu & Kashmir

Deputy Director, NRCD informed that major issue in J&K is related with the slow progress of Devika river project, which is also being monitored by PMO on regular basis. It was also informed that recently UEED, the implementing agency of the project has imposed a penalty of Rs. 2 crore on the contractor. It was informed that under-utilization of STPs in Jammu town is a critical activity which needs to be urgently resolved by the Govt. of J&K.

Commissioner-cum-Secretary, Department of Forest, Ecology & Environment, J&K informed that the work on Devika river project is going on and there are some issues which will be resolved shortly. Member Secretary, J&K PCB informed that total sewage generation from urban areas in UT of J&K is about 523 MLD, which also includes 145 MLD of sewage being generated in the catchment area of 9 polluted river stretches (PRS) in UT of J&K. The

project sanctioned for pollution abatement of river Devika is being monitored regularly at different levels in the Govt. of J&K. Further, Chief Engineer, UEED informed that the Devika project has been awarded in 2 contract packages and Package – I related to Ghat Development works is progressing well and expected to be completed by April, 2021. The work under Package – II related to laying of sewer lines and construction of STPs is getting inordinately delayed, and as a result a penalty of Rs. 2.00 crore has been imposed on the contractor. A detailed timeline along with bar chart for monitoring of the project is being prepared and the project is expected to be completed by December, 2021. It was informed that land issues with NHAI and BRO has been resolved and assured expediting the works for completion of the project. On a query related to land issue for IPS No. 5, it was informed that issue has been resolved and the land will be in possession within a fortnight.

DG, NMCG directed State to send photographs of the on-going projects for pollution abatement of river Devika within a week. Further, the State was requested to provide the status of implementation of Action Plan regarding construction of STPs for other polluted river stretches and their funding. Nodal officer of NRCD was directed to visit the State before the next meeting of CMC.

4. <u>Sikkim</u>

Deputy Director, NRCD informed that there are no major issues related to sewage and industrial effluent management in the State. However, the main issue of the State pertains to completion of the 3 STPs at Zone-I- Namchi, Rangpo and Gangtok Zone - II.

DG, NMCG requested the State to provide the status of the 7 proposed STPs of 11.33 MLD and ongoing STP work at Gangtok Zone –II, Rangpo and Namchi which are scheduled to be completed by March, 2021. It was highlighted that completion year of some very small STPs has been indicated as 2028, which needs to be relooked and the State was advised to explore other low cost/ decentralized sewage treatment options to reduce the cost and time to complete the STPs.

Additional Chief Secretary (Environment), Sikkim informed that as per NGT directions, State Government is regularly monitoring the progress of implementation through River Rejuvenation Committee. Water quality of river is also being monitored regularly and all the

parameters are within the prescribed limits. Environmental compensation has also been imposed on the industries not complying with the environmental norms.

Secretary, PHED, Sikkim informed that there are 7 STPs operational in the State and all are complying with the discharge standards. The works in ongoing STPs at Rangpo, Melli and Gangtok Zone-II have been completed and STPs will be made functional by end of the month and consumers have been advised to connect their houses with the sewer lines. Further, it was informed that DPR for Chungthan was returned by NRCD with the recommendation to explore the possibility of establishment of FSSM. However, due to topography of the area, FSSM may not be technically feasible in the Chungthan town; therefore NRCD was requested to reconsider the proposal for Chungthan town. It was also informed that DPR for Mangan town is being prepared.

DG, NMCG requested the State to explore the possibility of decentralized/ modular STPs and other low cost sewage treatment option to reduce the cost. Further, State was requested to implement the projects from their own funds/ CSR funds.

5. Tripura

Director, NRCD informed that out of total sewage generation of 82.4 MLD in the State, sewage treatment capacity exists only for 8.72 MLD (8 MLD STP & 720 KLD FSTP at Agartala), thus leaving the huge gap of 73.68 MLD between sewage generation and treatment, which needs to be addressed urgently. It was highlighted that solid waste processing facility exists for 256 TPD (250 TPD composting plant at Agartala & 6 TPD at Kamalpur Nagar Pachayat of District Dhalai) out of total municipal waste generation of 411.32 TPD in the State.

Member Secretary, Tripura Pollution Control Board informed that for increasing the capacity utilization of the existing STP of 8 MLD at Agartala, expansion of sewer network and house service connections are in progress and are likely to be completed in 18 months. Also, civil work has started for 8 MLD STP at Akhuaura ICP, Agartala. With regard to the proposed Faecal Sludge Treatment Plants (15 nos) of total capacity 600 KLD for all ULBs in the State, technical specifications/tender documents have been finalized and uploaded on the website of Urban Development Department, Tripura. Also, land has been identified and tendering process has been initiated by the ULBs. City Sanitation Plan to be prepared by Urban

Development Department, Tripura. 210 drains have been identified by ULBs for in-situ bio-remediation. Presently, survey work is going on for preparation of baseline information for pollution abatement of storm water drains through in-situ remediation in 20 ULBs. Tender evaluation for bio-remediation on 5 drains on pilot basis at Agartala has been completed. Tertiary processing centers for solid waste management for 17 ULBs are proposed, of which 13 tertiary processing centers to be made operational by March 2021.

DG, NMCG directed State to expedite progress of the proposed FSTPs and the ongoing 8 MLD STP. For the 8 MLD existing STP at Agartala, capacity utilization is to be increased. State needs to expedite in-situ bio-remediation works for all the identified drains discharging into polluted river stretches as per the directions of NGT.

6. Manipur

Scientist B, NRCD highlighted the major issues in the State, including low utilization capacity of the existing 27 MLD STP at Imphal, which is presently treating only 10 MLD of sewage. The 16 MLD STP which is under construction in Imphal is reported to be only 24% complete and is expected to be completed only by March, 2022. There is also slow progress in materializing of the 49 MLD STP proposed at Imphal. DPR has been submitted by the State to NRCD for treatment of 16.75 MLD sewage through bioremediation and FSSM for 50 KLD faecal sludge, and the 400 KLD existing CETP is yet to be made operational to which 5 water polluting industries are connected. It was also informed that water is released from the dams and reservoirs from time to time to maintain e-flow of various rivers in the State.

DG, NMCG directed the State Government to enhance the utilization capacity of the existing 27 MLD STP, expedite the implementation of ongoing project of 1 MLD and 16 MLD STPs sanctioned under NRCP and to have a proper implementation plan for sewerage projects being proposed at Imphal town for rational utilization of funds. Further, the State Government needs to put in efforts to operationalize the existing CETP and to ensure that the industrial discharge from the industrial units is meeting the industrial discharge standards/ norms. The State Pollution Control Board was directed to verify that the industries are complying with the conditions provided in the Consent to Operate (CTO).

Member Secretary, Manipur Pollution Control Board informed that the 5 industrial units connected to the non-operational CETP are small scale industries having minimal discharge

and the CETP is currently under repair. Efforts are being made to fully utilize the existing 27 MLD STP by April, 2021. Further, it was mentioned that stringent terms and conditions have been put in the CTOs granted to the industries, regular inspections are being carried out and directions are issued to the defaulting industrial units for rectification within in time limit, failing which closure notices are being issued.

7. Meghalaya

Scientist B, NRCD highlighted the major issues in the State - huge gap in sewage treatment in the State, i.e. 50.37 MLD, slow progress in implementation of proposed 13.42 MLD On-Site Treatment Plant at Shillong, persisting land availability issues and low utilization capacity of existing solid waste treatment facilities in the State, i.e. out of 243 TPD installed capacity only 6 TPD is being utilized.

Assistant Director (Urban Development Department), Meghalaya informed that bids evaluation has been completed for 0.35 MLD FSSM and 5 onsite treatment plants of 13.42 MLD capacity at Shillong, and work orders for the same are to be issued shortly with works expected to be started from March, 2021. With regard to the land issues associated with the said 5 On-site Treatment Plants proposed at Shillong, it was informed that land has been cleared for 4 while negotiations is in process for the remaining one land parcel. 80% of civil work has been completed for the ongoing 0.115 MLD FSTP at Shillong and it is expected to be completed by March, 2021. With regard to the in-situ bioremediation for 5 major drains, it was informed that tenders will be issued within March, 2021.

DG, NMCG directed the State to submit the updated status in writing.

8. Nagaland

Scientist B, NRCD informed that the progress of under construction 25.43 MLD STP at Dimapur and related sewer laying works remains the same at 95% and 54.73% respectively. Out of 304 TPD of solid waste generated, only 132 TPD is being processed. Repetition of data in MPRs and delay in submitting the same to the Ministry is a matter of concern.

Member Secretary, Nagaland Pollution Control Board stated that the progress of ongoing project for setting up of 25.43 MLD STP at Dimapur was greatly affected in the previous year due to absence of skilled labourers on account of Covid-19 pandemic and the work

could only be resumed just before the monsoon. It was also informed that the State Government has now planned to connect 3 main drains/ nallahs viz, Sugar Mill Nallah, Lengri Nallah and Hospital Nallah, which are the main sewage carrying drains in Dimapur, to the STP through Interception & Diversion works. It was informed that before the start of upcoming monsoon, Sugar Mill Nallah will be connected to the STP and 30 to 40% utilization capacity of the STP will be achieved. A proposal for setting up of 38 units of FSTPs and 3 units of STP in all ULBs for an estimated cost of Rs. 204.3 crore has been recently submitted to Ministry of Jal Shakti on 26th February, 2021. 2 main water polluting industries are equipped with ETPs.

State Government has been directed to submit updated MPRs by 20th of every month.

9. <u>Mizoram</u>

Scientist B, NRCD informed that the under construction 10 MLD STP is still reported to be 99% complete, with only 3,033 households connections as against the proposed 19000 households connections. Action Plan to bridge the gap of sewage treatment of about 58 MLD sewage in the State needs to be provided. Also, the MPR does not indicate the Model river identified by the State.

Joint Secretary, Irrigation & Water Resources Department, Mizoram responded that the 10 MLD capacity STP at Aizawl has been made operational from 6th February, 2021 and 0.5 MLD of sewage is being received. Works for sewer network and households connections are still ongoing. 12,000 households will be connected to the STP, and after 15 years of operation the STP will cater to sewage to be generated from 20,000 households. With regard to bridging the gap in sewage treatment in the State, it was told that the State Government is preparing Feasibility Reports for addressing the sewage pollution in all ULBs as per new schemes available with the Ministry of Housing & Urban Affairs. It was informed that Chite River has been identified as the model river for rejuvenation.

DG, NMCG directed the State Government that details of the ongoing projects and action plan for bridging the gap should be reflected in the MPR.

10. Telangana

Scientist E, NRCD briefed about the status of sewage, industrial and solid waste management in the State as per the MPR received. It was informed that out of 31 STPs existing in State, 29 are operational and complying with the discharge norms. 17 STPs of 210.41 MLD are under construction, tender notification was issued for construction of the STPs under Priority I & II on HAM mode for 17 more STPs with a capacity of 376.5MLD and agency is finalized, with works likely to commence in 1st week of April, 2021. 103 STPs of 1,574.5 MLD are proposed in the State. Out of 2,178 industrial units in the State, 2,110 industries are complying, and action is to be taken by State PCB against the defaulting industries. 4 CETPs of 7 MLD are operational in the State. 1 CETP of 480 KLD is under construction and is expected to be completed by June 2021. In the latest MPR, Municipal Solid Waste Generation is reported to be 9,285 TPD, however as per the ULB wise table provided in Annexure IV of the MPR, it is reported that 3,720 TPD of MSW is being generated by the ULBs. The State needs to reconcile the figures. Model River is yet to be identified by the State and latest water quality monitoring data of the rivers is to be regularly provided in the MPRs.

DG, NMCG directed the State to provide policy for reuse of treated water notified by the State. It was also highlighted that the progress in the ongoing projects as reported in the MPR remains same as reported previously. As the monitoring is being done based on the inputs provided by the State in the MPRs, it was directed that the MPR should be submitted after properly updating the information, clearly depicting the status of latest development taken place in the State. Further, State was directed to submit updated MPRs by 20th of every month.

MD, HWSSB informed that about 2,000 MLD of sewage is being generated in Hyderabad against which 25 STPs of 770 MLD capacity exists and the utilization capacity of the STPs is 680 MLD. Some existing STPs are under repair and maintenance subsequent to the recent floods and the utilization capacity shall enhance by 70 MLD after the works are completed. With regard to establishment of STPs of 1,178 MLD in Hyderabad, it was informed that 31 STPs have been proposed under HAM model on 60:40 funding basis. One package consisting of 17 STPs of 376 MLD has been successfully tendered and works are expected to begin from April, 2021. These are proposed to be built upstream of Hussain Sagar lake for Kobatpalli Nallah and shall take care of pollution in Hussain Sagar lake in the city.

It was informed that proposal for 2 more packages of 14 STPs with 880 MLD capacity for pollution abatement of Musi river is with the State Government and are expected to be considered in the upcoming budget. It was also informed that of the existing 20 STPs, co-treatment of septage is being taken up in 8 STPs, of which 7 are functioning well. 87 septic tankers have been equipped with GPS and an App has been developed to monitor the status. The sludge from the non-sewered areas is to be treated in STPs as co-treatment. Further, 6 FSTPs are proposed in Hyderabad. 3 FSTPs are under construction and are expected to be completed within 2 months and the remaining 3 are being taken up under CSR funding. Work has been tendered for installation of OCEMS in the 20 existing STPs under Metro Water Board and shall be operational by 1st week of May 2021. With regard to the in-situ remediation component by NEERI, work has begun in one package. However, due to high cost (Rs. 45 lakhs per MLD excluding civil works), work on other 2 packages is yet to begin as the State Govt. is reviewing feasibility of the project.

Member Secretary, Telangana Pollution Control Board informed that rivers Maneru, Kakarvagu, Godavari and Krishna are under the jurisdiction of PHED, Telangana. Along the catchment area of these rivers, 72 STPs of 315 MLD capacity are proposed, of which DPRs have been prepared for 41 STPs and DPRs are under preparation for 31 STPs. Sanction for the projects are awaited from the State Government. It was informed that River Krishna is being adopted by the State as Model River. However, as per the monitoring data, Krishna is achieving the desired BOD level of less than 3 mg/l and State requests to remove Krishna from the polluted river stretch category of priority V. Further, out of 400 km, 200 km of polluted river stretch of Krishna falls in forest area where only 4 municipal administrations are present. Measures to abate pollution are being taken up in these 4 municipalities and in remaining 371 villages as well.

With regard to solid waste management, Director, Municipal Administration, Telangana informed that out of 10 clusters other than Hyderabad, works for establishment of 1,400 TPD processing plants have been awarded in 4 clusters, which shall be completed within 9 months. For remaining processing plants of 12,200 TPD, tenders and are under finalization, and these are expected to be operational within 1 year. Further, 2 C&D processing plants have been made operational in Hyderabad. With regard to FSTPs in areas other than Hyderabad, it was informed that FSTPs are getting operational in 17 municipalities, tender process has been completed for FSTPs of 1,565 KLD in 71 ULBs under HAM and for remaining 68 newly

formed ULBs, administrative approval for establishment of 495 KLD FSTPs have been accorded by State Government and tenders for the same are being called.

DG, NMCG highlighted that issue of change in priority of the rivers and removal of polluted river stretch is to be looked in by CPCB. Further, as per directions of NGT, State should ensure that all the rivers attain bathing quality standards and consistent efforts are needed for keeping them clean. Shri Madhava Kumar, Economic & Financial Adviser, NMCG was introduced for providing assistance to the State with regard to the HAM projects.

11. <u>Daman Diu and Dadra Nagar Haveli (DNH)</u>

Scientist B, NRCD informed that the 4.2 MLD STP at Daman is operational at full capacity and the 13 MLD STP at DNH is operating at 2.1 MLD capacity. Out of 24,105 household connections, 4,313 households have been connected to the 13 MLD STP at DNH. The 16 MLD STP proposed under ENCORE project at Nani Daman is under DPR stage and tenders are to be floated for 7 MLD STP at Diu. 262 water polluting industries are operational in the UT generating about 6.5 MLD of effluent and all industries are having individual ETPs having 11.4 MLD of capacity. All the ETPs are reported to be complying. Total municipal solid waste generation is 89 TPD and 100% of the waste generated is processed. 2 compost plants of 250 TPD exist in the UT. Daman District Panchayat is working out the details for preparation of DPR for standalone modular STPs at 4 Panchayats namely, Damanwada, Magarwada, Pariyari and Patlara. Proposal for phyto-remediation of 13 identified drains have been received from NEERI and work has been initiated on pilot basis.

Member Secretary, Pollution Control Committee, Daman, Diu & DNH informed that approval is awaited for 16 MLD STP proposed at Nani Daman and for the 7 MLD STP proposed at Diu, tenders could not be floated in January, 2021 due to slight issue with the design of the STP. The issue has now been resolved and tenders will now be floated by 15th March, 2021. Further, it was informed that DPR for standalone modular STP for 4 Panchayats is ready and the same will be placed before UT level Committee for approval in the next 2 or 3 weeks. With regard to phyto-remediation/ bio-remediation of the 13 identified drains, it was informed that NEERI has started assessing flow, depth and other important parameters of the drains and works will be started by March, 2021. More than 60 check dams have already been constructed in major nallahs. An area of 300 ha in the upper reaches of the

river has been identified for catchment area treatment and plantations will be carried out in the coming monsoon. Following the directions of CPCB, Mobile App will be used to monitor the operational status of the STPs on real time basis.

12. <u>Andhra Pradesh</u>

Scientist E, NRCD briefed about the status of sewage, industrial and solid waste management in the State as per the MPR received. It was informed that 43 STPs of 515.85 MLD capacity are existing in the State and all are reported to be operational and complying. Utilization capacity of the existing STPs is 326.97 MLD. State needs to provide STP-wise utilization capacity. STPs of 474.07 MLD are under construction. Technical bids have been opened for STPs of 52.40 MLD and STPs of 1,215.27 MLD are proposed.

DG, NMCG highlighted that on comparing the progress made by the State in the ongoing projects as reported in the MPRs from November 20- January 21, it can be inferred that no incremental physical progress has been made. Progress in Srikakulam, which was earlier reported to be 45% is now indicated to be 23%. Therefore, State must verify the information before submission of the MPRs and State may also provide information on other aspects as well such as ground water regulation, RHW, floodplain & eflow management, plantation, biodiversity, mining activity regulation, adoption of Model River, action against defaulters, etc. Further, it was observed that there exists a huge capacity gap in sewage treatment in the State and action being taken by the State to bridge the gap is to be provided. It was also suggested that HAM can be adopted for construction of STPs.

Secretary (Environment & Forest), Andhra Pradesh agreed that the updated information will be incorporated in MPR submissions. It was informed that gap in treatment capacity of 987 MLD shall be reduced to 461 MLD, after completion of ongoing projects of 474 MLD and recently awarded 52 MLD STPs. Further, considering the remaining gap and future requirements, State shall be taking up projects and shall be exploring affordable model such as HAM. With regard to the industries, it was informed that all 1,069 water polluting industries have installed ETPs.

Secretary, Ministry of Jal Shakti highlighted that the progress of the projects needs to be thoroughly reviewed at State level as the progress of the ongoing STP project of 19 MLD at Yemmiganur having completion date of March, 2021 has been reported to be 96 % since

November 2020. Similarly, the progress of ongoing 2 MLD STP at GVMC having progress 50% since November 2020 is also reported to be completed by March 2021. Similar observations were made for other on-going STP projects. Therefore, the State was directed to provide the realistic expected date of completion of projects, instead of date of completion as per the contract.

13. <u>Kerala</u>

ED (Tech) NMCG, briefed about the status of sewage, industrial and solid waste management in the State as per the MPR received. Gap in existing treatment capacity is calculated to be 123.36 MLD. Not much progress was observed in the ongoing projects. There are 1,401 water polluting industries in the State generating 156.3 MLD of effluent discharge. Out of the 5,166 ETPs installed, 5,146 ETPs are reported to be complying. 64 industrial units are connected to 8 CETPs of 12.425 MLD. Tirur-Ponnai river, Malappuram was adopted as Model River.

Additional Chief Secretary (Environment), Kerala informed that the works got delayed due to recent Panchayat election in the State. Further, the State assembly elections are scheduled for 6th April, 2021 due to which there may not be much progress in the projects.

Member Secretary, Kerala State Pollution Control Board informed that as per the calculation of State, there exists a gap of 56.37 MLD in sewage treatment. The gap of 123 MLD indicated in the presentation shall be looked into and details shall be provided soon. It was informed that 87 projects for treatment of 93.1 MLD of sewage was proposed, of which 5 STPs have been completed and made functional, 31 projects are under tendering stage and 37 projects are at DPR stage. The existing 107 MLD STP at Thiruvanathapuram is operating at 80% capacity. It was informed that the Action Plan for the control of coastal pollution has already been submitted to CPCB for approval on 13th January, 2021.

DG, NMCG suggested that all the information should be clearly highlighted in the MPR and gap in sewage treatment in the State must be verified/ reconciled.

Secretary, Ministry of Jal Shakti suggested that the ongoing works in the State should not be affected by the imposition of model code of conduct. Further, he enquired about the best practices being followed by the State in managing plastic waste.

Additional Chief Secretary (LSGD), Kerala informed that for liquid waste management, 134 local governments, including 99 gram panchayats, 4 corporations and 11 municipalities have taken up liquid waste management projects and details would be submitted in the next meeting. Based on the study conducted by the State supported by World Bank, 16 municipal areas were identified as vulnerable with respect to septage and sewage requirement. With regard to plastic waste management, it was informed that Kerala had banned single use plastic in 2019 and groups were identified for creation and introduction of plastic substitutes. Further Green Audits have been adopted in which 10,000 government offices have been made Green offices. "Haritha Karma Sena" units have been formed for collecting and segregating the wastes. The segregated plastic waste is then sent to material recovery units and the plastic is used in cement industry as well as in road construction. Under Re-build Kerala, 2 Integrated Plastic Waste Processing units are being implemented, which shall be responsible for plastic waste recycling and substitution.

Additional Chief Secretary (Water Resources), Kerala reported that the Department has tied up with Engineering Colleges in the State for preparation of DPR for pollution abatement of 44 rivers in the State from source to sea. In first phase, 21 rivers have been surveyed by the professors and students of 40 Engineering Colleges and they have submitted DPRs for the same, the actionable points have been identified and State Planning Board has been approached for implementation post Elections.

DG, NMCG appreciated the involvement of Engineering Colleges and suggested the State to provide brief documentation in this regard so that the same can be implemented in other States.

14. Puducherry

ED (Tech), NMCG highlighted that the State needs to provide compliance status of the existing STPs in the UT. 3 MLD STP at Chunnambar was scheduled to be completed by February 2021. With regard to the proposed 2 new STPs of 3 MLD each, it was reported that the cost estimate was under consideration of the Government. For solid waste management, the processing capacity is only 61 TPD against 406 TPD generation and the utilization of existing facility is only 20 %. UT has proposed solid waste management facilities and WTE plants. For 172 drains, grill gratings and bar screen have been completed as insitu remediation.

Secretary (Science, Technology and Environment), Puducherry informed that there were difference in opinion by the UT - PCC and PWD with regard to the compliance standards of the STPs, therefore the same was not reported in the MPR. BOD values are being met by the STPs as per the standards while the total Fecal Coliform, Nitrogen, Phosphorous levels are not complying with the standards. Therefore, a third party intervention is sought and the result shall be reported in the next MPR. It was informed that the 3 MLD STP at Boat house, Chunnambar is about to be operational. 87 ETPs are complying and action is being taken against the non-complying industries. For solid waste management, the total MSW processed is 61 TPD, and other proposals are in RFP and initial stages. Fines have been imposed on PWD and local administration for utilization of only 20% of existing facility in MSW management.

15. <u>Gujarat</u>

Joint Director, NRCD informed that the estimated sewage generation in the State is 4,003 MLD for which 73 STPs of 3,485 MLD capacity exists, which leaves a gap in treatment of 518 MLD. The utilization capacity is reported to be 2,739 MLD. 97 STPs of 1,706.34 MLD are under construction, including 5 under trial STPs of 51.9 MLD and 80 STPs of 1,008.44 MLD are proposed. With the completion of 5 STPs, no. of operational STPs will increase to 78. 21 STPs are reported to be non-complying. Number of non-complying CETPs increased from 11 to 14 CETPs. State needs to provide status with regard to the action taken to resolve the land acquisition issues for Tapi rejuvenation project as well as for treatment and capacity utilization of biomedical waste & hazardous waste for the State and along the polluted river stretches. State also needs to indicate the status of deep sea disposal project in the MPR.

DG, NMCG highlighted that the land issues for Tapi project, wherein several identified land parcels are yet to be acquired, is one of the major issues in the State. It was informed that earlier a letter has also been written to Chief Secretary, Gujarat highlighting issues of non-compliance of STPs and CETPs, land acquisition issues, status of deep sea project, etc. The State was directed to provide clarifications with regard observations made in the presentation.

Chief Engineer, Surat Municipal Corporation informed that for River Tapi Pollution Abatement Project, Surat Municipal Corporation is implementing agency for SMC and SUDA area and there are 18 STPs proposed to cater the need, out of which 4 existing STPs

within SMC area are to be used with augmented capacity and 14 STPs were proposed for SUDA area, which have now been reduced to 12 STPs by merging 2 STPs. Capacity of the 2 eliminated STPs have been accommodated in the rest 12 STPs with rerouting and redesigning. Land is available in case of all the STPs of SMC & SUDA area. In SMC area 1 STP (Gavier) is operational with 53 MLD capacity, 1 STP at Bhesan is completed with augmenting the capacity to 200 MLD and 2 STPs are expected to be completed by July 2021 with modified capacity of 532 MLD. In SUDA area, work in progress for 4 STPs, principal sanction received for 6 STPs and accordingly 10 % advance payment has been made and physical possession is expected within 10 days. For remaining 2 STPs, land possession is expected in one month and accordingly the same will also be started thereafter. The work order for all above STPs have already been given and hence the work will be started immediately upon receiving the remaining possession of land as mentioned above.

DG, NMCG directed SMC to submit location wise latest status of STPs under Tapi Shuddhikaran within two days. State was also directed to provide the action taken by State PCB with regard to non-complying CETPs.

Commissioner, Municipalities Administration & Additional Chief Executive Officer, GUDM (Member RRC) informed that Tapi Shuddhikaran project is an important project for the State and the land issues were taken up during the meeting held under the Chairmanship of Chief Secretary, Gujarat wherein the Revenue Department was asked to resolve the issues. Land issues of 20 STPs under Tapi Shuddhikaran Project have been resolved. Further revised timeline for completion of the project have been submitted to CPCB & NMCG.

With regard to the deep-sea disposal pipeline project, Member Secretary, Gujarat Pollution Control Board replied that DPR of the project is ready and tenders for the project have been floated. The Industries & Mines Department is an implementing agency and construction work will be carried out by GWIL.

Secretary, Ministry of Jal Shakti directed that higher officials of concerned departments of the State should be present the status in the CMC meetings and further directed State to provide details in writing to the Ministry.

16. Karnataka

Joint Director, NRCD briefed about the status of sewage, industrial and solid waste management in the State as per the MPR received. Major issues of the State were highlighted. Existing sewage treatment facilities are utilized at only 67.5%. Status of the 5.80 MLD STP at Chikkodi and the sewer network under phase-II which were scheduled for completion by January 2021 are to be provided. Out of 10 existing CETPs, 1 CETP is reported to be non-operational and 6 CETPs are reported as non-complying. State needs to provide status of the land issues for 2 STPs at Kamaje and Kaikunje. State is also to provide compliance status of the 4.27 MLD STP at Hadagalli, 6.29 MLD STP at Kanakpura and 3.27 MLD STP at Sadalga. Status of house service connections for 9.2 MLD STP at Rabkavi Banahatti have not been provided as the STP is reported to be non-operational. Incremental progress with regard to the under construction STPs has not been provided in the MPR. Action Plan for Coastal Pollution is yet to be submitted to CPCB.

Additional Chief Secretary (Water Resources), Karnataka informed that slight improvement has been achieved in utilization capacity of the STPs from 67.9% to 69.4% and ensured that the State Government is constantly reviewing the progress which shall result in improved results. It was informed that 5.8 MLD STP at Chikkodi and the sewer network under phase-II has been completed. The non-operational CETP has been closed down on its own and Karnataka PCB is monitoring and following up with the non-complying CETPs. With regard to the land issue of 2 STPs at Kamaje and Kaikunje, it was informed that ULB Administration is trying to purchase the land directly. The farmers are expressing interest in this regard and quick resolution of the issue is assured by the administrators. It was agreed to provide compliance of the STPs at Hadagalli, Kanakapura and Sadalga. Further it was informed that delay in house service connections for the 9.2 MLD STP at Rabkavi Banhatti is due to local issues. The issue shall be resolved within a week and the updated status shall be provided. It was assured that State shall provide incremental progress with regard to the on-going projects in the State.

Principal Secretary (Environment & Ecology), Karnataka informed that a detailed map has to be prepared by the State as per the CRZ notification of 2019 and National Centre for Sustainable Coastal Management has been engaged to prepare the detailed maps and it shall be completed within 3-4 months.

Director, NRCD informed that as per NGT order, States need to prepare Action Plans for abatement of pollution from the Coastal Areas of the State and this is different from the Coastal Zone Management Plan as per CRZ notification 2019.

DG, NMCG directed the State to review the order of NGT in this regard and after consultation with CPCB, Action Plan is to be prepared by the State accordingly. Further, report on the special initiatives/ best practiced regarding the continuous online monitoring of the CETPs may be provided so that consultative workshop may be organized at national level.

17. <u>Tamil Nadu</u>

Joint Director, NRCD briefed about the status of sewage, industrial and solid waste management in the State. It was highlighted that there is data discrepancy in the submissions made by the State in the MPRs. As per the latest MPR of January 2021, there is increase in sewage generation and number of existing STPs from 66 to 69. Utilization capacity was reported to be 919 MLD in November 2020 MPR, then 1002 MLD in December 2020 MPR and now it is reported to be 988 MLD in January 2021 MPR. Progress of the 37 STPs under proposal stage is observed to be very slow, despite having gap in sewage treatment of 1,353.6 MLD. Further, as 4 CETPs are reported as non-complying, action taken by SPCB is to be provided.

DG, NMCG highlighted that not much progress has been made and physical progress of many of the ongoing STP projects have been indicated to be declining, Therefore, State may thoroughly review the progress and verify the same before submission of MPRs.

Additional Chief Secretary (Environment and Forest), Karnataka informed that 1 non-complying CETP is permanently closed and notice has been issued to the remaining 3 non-complying CETPs. It was also informed that an online module has been developed by the State for collection of information from various departments and now the data is directly fed into the system by the officials and this shall reduce the issue of discrepancies in the information being submitted.

Additional Chief Secretary (Urban Development Department), Tamil Nadu informed that they have reassessed the data, and now for 51 existing STPs total capacity has increased to 864 MLD, with capacity utilization alone having gone up from 344 MLD to 358 MLD and

there is even an increase in capacity of ongoing projects. A number of projects are under DPR stage, 3 projects of 45 MLD have been tendered out, which reflects the progress made in the past one month. With regard to the solid waste management, capacity utilization has increased from 4,500 MT to 4,830 MT as Micro Compost Centre (MCC) is being adopted as a decentralized approach. These MCCs are at the ULBs where is waste is treated, segregated. It was learnt that as low utilization of the existing STPs were due to pending house sewer connections, now the house service connections project are being carried out simultaneously with the STP works so that full capacity utilization is obtained. In 35 towns, about 4 lakh house hold connections are to be provided in next few months so that the utilization capacity of the STPs is enhanced. Comprehensive re-use water policy has been adopted by the State and details have been provided.

DG, NMCG appreciated that carrying out the house service connections simultaneously is a good approach.

18. <u>Maharashtra</u>

Director, NRCD presented the status of sewage, industrial effluent and solid waste management in the State and also for the 53 polluted river stretches. Total estimated sewage generation in the State is 9,757 MLD which includes nearly 2,500 MLD of sewage from Mumbai city. Sewage treatment capacity exists for 7,747 MLD with 142 STPs installed and their utilization is 4,123 MLD. Out of 142 STPs, 7 STPs of total capacity 227.56 MLD were reported to be non-operational. State is to take necessary action on priority to expedite commissioning of these STPs. 27 STPs of total capacity 2,071.5 MLD were reported to be non-compliant, including 3 STPs of 757 MLD, 240 MLD & 386 MLD in Mumbai, MPCB to ensure proper functioning of all the STPs in the State to meet the prescribed norms. In case of polluted river stretches, there is a gap of 1,023.26 MLD between sewage generation and treatment. To address the said gap, present status of the proposed STPs was informed as below:

Status	STPs	Capacity (in MLD)
DPR preparation under progress	15	115.30
Awaiting sanction of DPR	15	235.00

Under tendering and/or works to be awarded	20	528.00
Under construction	28	419.86
Total	**78**	**1,298.16**

With regard to the industrial effluent management in polluted river stretches, it was informed that Common Effluent Treatment Plants (CETPs) of total capacity 83.3 MLD are operational in different industrial estates/areas. 3 CETPs of total 2.84 MLD capacity (1 MLD at Satpur in District Nashik, 0.64 MLD at Sangli and 1.2 MLD at Ichalkaranji in District Kolhapur) are proposed which are still in initial stages of implementation. Maharashtra PCB is to expedite implementation of the proposed CETPs and also to ensure proper functioning of all the CETPs in the State so that prescribed norms are achieved. With regard to solid waste management in the State, it was informed that processing facilities of 17,420 TPD exists against total generation of 22,945 TPD. These include 337 composting plants, 82 vermi-composting facilities, 62 bio-methanization plants, one waste to energy (W to E) plant and 26 RDF plants. Also, 18 landfill sites are presently under development out of 320 sites proposed to cater to solid waste generation from 394 ULBs in the State. For C&D wastes, processing facilities for 5 major ULBs (MCGM, Navi Mumbai MC, Thane MC, Pimpri-Chinchwad MC, Pune MC) are proposed to cater to 2,050 TPD of such waste.

With regard to the land acquisition for 11 STPs under the project for pollution abatement of river Mula Mutha at Pune, it was informed that the State Government of Maharashtra has allowed construction of STPs in the floodplain line and thus facilitating land acquisition for 3 STPs at Botanical Garden, Dhanori and Warje. In view of tenders invited for the project by Pune Municipal Corporation on 24th February, 2021, the State Government was insisted for early possession of land for all the STPs in the name of PMC.

Joint Director (WPC), Maharashtra PCB and Additional Municipal Commissioner, BMC were present in the meeting. However, due to connectivity issues response from the State could not be interpreted.

DG, NMCG directed State to urgently ensure possession of land for the 11 proposed STPs at Pune to the Municipal Corporation so as to avoid any further delays.

Secretary, Ministry of Jal Shakti directed that higher officials of concerned departments of the State should be present in the CMC meetings and further directed State to provide details in writing to the Ministry.

19. Odisha

Director, NRCD informed that the State has reported total estimated sewage generation from six major towns in the State as 367 MLD (Bhubaneswar, Cuttack, Puri, Sambalpur, Rourkela and Talcher). However, sewage treatment capacity created so far is 91 MLD only with 5 STPs installed in these towns. 2 STPs are reported to be non-complying. To bridge in the gap in treatment, 8 STPs of total capacity 280 MLD were under construction from the resources mobilized by the State. Out of these, 4 STPs of total capacity 136 MLD at Bhubaneswar (Meherpalli-56 MLD, Basuaghai-28 MLD, Kochilaput-43.5 MLD & Paikarpur-8.5 MLD) and 40 MLD at Rourkela were reported to be under trial run. One STP of 48 MLD at Rokat is scheduled for completion by June, 2021. STPs of 40 MLD at Dhanupalli, Sambalpur and 16 MLD at Mattagajpur, Cuttack were reported to be 93% & 78% complete. State Government needs to expedite the house service connections works and ensure adequate flow reaches these STPs for their optimal utilization. State has still not submitted MPR for January 2021.

Member Secretary, Odisha Water Supply & Sewerage Board informed that Faecal Sludge Treatment Plants (FSTP/SeTPs) are proposed to cover all 114 ULBs in the State. Out of these, 11 FSTPs are operational in major towns with the installed capacity of 452 KLD. 30 FSTPs are in final stages of implementation and are likely to be commissioned by March, 2021. Further, 58 FSTPs are in different stages of implementation and are scheduled to be completed by December, 2021. It was informed that 1,030 water polluting industries have been identified in the State generating 886 MLD of effluent and all the units are equipped with ETPs. No CETP exists in the State. State Government was directed to ensure compliance by the industrial units with regard to the stipulated norms. With regard to solid waste management, it was informed that decentralized MCC approach has been adopted by the State, 100% solid waste is being collected, 88% of the waste collected is being segregated, compost plants of 766 TPD capacity and MRFs of 557 TPD are existing.

20. Goa

Director, NRCD informed that installed capacity of 9 STPs in the State is 78.35 MLD against total sewage generation of 112.53 MLD. As reported by the State, remaining areas including the rural areas are covered through septic/ soak pit arrangement and thus do not require

designed treatment facilities/ plants. 5 STPs of 35.5 MLD are under construction and 3 STPs of 43 MLD are proposed, but the work could not be started due to local issues.

Principal Secretary (Environment), Goa informed that low utilization capacity (29 MLD) of existing STPs against installed treatment capacity of 78.35 MLD is due to 30 years design period of the STPs. STPs under construction at Colva (7.5 MLD), Calangute (5.6 MLD) and Mapusa (5.4 MLD) are nearing completion in terms of civil works along with installation of electrical and mechanical equipments. However, their commissioning is delayed for want of house service connections, electrical connections, pumping arrangements etc. and are expected to be completed by December, 2021 only.

In compliance of the directions of NGT, Sal River (Priority-III) has been adopted to be developed as a Model River. Different conservation works are being implemented as per the approved Action Plan with the target completion date of March, 2021. For solid waste management, integrated processing facilities exist only for 150 TPD at Saligao out of total 766 TPD municipal waste generated in the State. The same shall be enhanced by 200 TPD (100 TPD at Saligao & 100 TPD at Cacora) by December, 2021. Efforts are being put in to complete the projects in a time bound manner. Integrated solid waste management processing plants of 250 TPD each are coming up at Bainguinim and Verna.

DG, NMCG directed State to ensure that the issues with regard to the proposed STPs are resolved at the earliest and works are initiated quickly.

21. <u>Andaman & Nicobar</u>

ED (Tech), NMCG informed that as per the MPR submitted by the UT, sewage generation in the UT is estimated to be around 14.175 MLD, for which 93 STPs of 1.98 MLD capacity exists. However, out of 93 STPs, 69 STPs are reported to be non-complying. Further 3 decentralized STPs of total 9.75 MLD are proposed. It was mentioned that the UT has highlighted previously in the CMC meeting that the major issue in the UT relates to large amount of floating solid waste of foreign origin which is being received at the Nicobar islands. This issue was brought to the notice of MoEF&CC and it was informed by MoEF&CC that a special team was constituted to visit the UT and to further investigate the matter.

Secretary (Science & Technology), Andaman & Nicobar informed that 14 MLD of sewage is being generated in the UT and STPs of 2 MLD capacity exists. STPs of around 10 MLD are under tendering process. With regard to the industrial pollution in the UT, action is being taken against the defaulters and results will be visible from the next month. Further it was informed that for bioremediation of the sanitary landfill sites, RFP has been called and work will be awarded soon. With regard to the area under Port Blair Municipal Corporation, 15 remaining SLRM are likely to be completed in next 3 months. In the rural area, out of 26 clusters, 10 SLRM are in operation and 14 others have been constructed for separation of plastic waste and other waste, with the plastic waste then sent to the mainland for proper disposal. Around 230 tonnes of plastic waste has been transported to the mainland and another 500 tonnes shall be sent soon so as to make the island plastic neutral territory. C&D waste collected is being used as filling in maintenance work.

DG, NMCG directed the UT to submit the Action Plan for management of Coastal Pollution to CPCB expeditiously. It was informed that a Committee has been constituted in UT for addressing the issue.

22. <u>Lakshadweep</u>

ED (Tech), NMCG informed that as per the MPR submitted by the UT, 2.8 MLD of sewage is being generated, 1 STP of 24 KLD exists, which is being utilized at 18 KLD and another 23 KLD STP is being constructed at INS Dweeprakshak. No industrial unit is operational and the entire solid waste generated in the UT is being processed (35 TPD). UT was directed to submit Action Plan for management of Coastal Pollution to CPCB expeditiously.

Secretary (Environment & Forest), Lakshadweep informed that individual household septic tank are operational in the UT and 1 STP is existing at Bangaram and 1 STP at Kavirati is under construction. Further a septage treatment plant of 4.5 KLD at Kavirati is being planned and DPR for the same has been got appraised by NIT Calicut. 282 MT of solid waste segregated has been sent to mainland for recycling and other waste such as biomedical waste is being managed by the UT. Holistic approach is being adopted by the UT to properly manage the waste.

23. Delhi

Director (Technical), NMCG informed that a detailed review meeting with Delhi was taken by DG, NMCG on 1st March, 2021. The status of sewage generation and existing STPs remains same. Out of 35 STPs operational in the State, 9 STPs are reported as complying with the standards of BOD -10mg/l, COD -50mg/l & TSS - 10mg/l. However, it is observed that 24 STPs are complying with the design parameters of the respective STPs (BOD-20/ 30mg/l). 2 conveyance projects under YAP-III have been recently completed. Interceptor Sewer Project is almost complete, but the works of the receiving STPs are yet to be completed. Major issue in Delhi is non-compliance of all the 13 existing CETPs of 212.3 MLD. Further, DDA was requested to provide status of the ongoing project of Restoration and Rejuvenation of River Yamuna floodplains, especially with regard to the 162 hectare of land under the jurisdiction of Uttar Pradesh Government.

DG, NMCG highlighted that while substantial progress have been achieved by the State with regard to STP projects in the last quarter, sustained efforts need to be continued by the State to maintain the progress and to adhere with the completion timeline. Further, a team from NMCG is to visit the project sites shortly. Serious concerns were raised with regard to the status of the existing CETPs.

Secretary, Ministry of Jal Shakti directed the State to provide justification for non-compliance of the CETPs, and the action being taken against these CETPs and the connected industrial member units.

CEO, Delhi Jal Board informed that the obstacles with regard to the on-going projects are being overcome, every month detailed review is being taken by Delhi Government, which has resulted in considerable progress in the projects. 318 MLD STP at Coronation Pillar is to be made 50% operational by March 2021 and remaining 50% by June 2021, which shall further enhance the treatment capacity. Further, efforts are being put in to complete the 3 STP projects at Kondli, Rithala and Okhla by December, 2022. The existing STPs have been made operational at different time periods and accordingly were designed as per the standard discharge parameters at that time period. Action has been initiated to augment the treatment capacity and improve the treated water quality of the existing STPs. With regard to the ISP project, it was informed that out of 242 MGD, 169 MGD is being treated at present in various STPs, and for diverting the remain 73 MGD of sewage, infrastructure has been created.

However, the same shall be treated only after completion of the 3 STPs projects. Payments as on 20th February 2021 have been made in respect of the YAP-III projects. Permission for tree cutting is not a hindrance anymore and is being obtained subsequently.

DG, NMCG suggested that tree cutting permission for Kondli Phase II may also be obtained immediately so as to avoid delay in execution of the project.

Special Secretary (Environment), Delhi informed that DPCC is monitoring all the CETPs and has directed the CETP associations to upgrade their CETPs in order to achieve the desired design standards. DSIIDC is the agency looking into the matter of non-compliance of the CETPs in Delhi and along with NEERI is implementing proposal for upgradation of 9 CETPs.

DG, NMCG stated that since the beginning of monitoring by CMC in January 2020, same status has been reported with regard to upgradation of the CETPs. It was suggested that if no progress is being made in this regard, DPCC should consider closing down of the member industrial units of the CETPs. Further, it was highlighted that if no action is being taken by DPCC, as directed by NGT, Ministry of Jal Shakti shall initiate prosecution or impose Environmental Compensation on DPCC.

ED (Tech), NMCG suggested that until upgradation of the CETPs, the industries may be directed to reuse the water which is being discharged by them into the drains/ river in order to achieve compliance.

Special Secretary (Environment), Delhi informed that DPCC is in process of imposing Environmental Compensation on the defaulting CETP associations.

Secretary, Ministry of Jal Shakti suggested that a meeting may be convened with Chief Secretary, Delhi in order to flag the major issues and to bring seriousness in the matter.

24. <u>Haryana</u>

Director (Technical), NMCG informed that the State generates approximately 1,350 MLD of sewage, 153 STPs of 1795 MLD exists, which is being utilized at 1,081.90 MLD capacity. Out of these 23 STPs are reported to be non-complying (1 in Ghaggar, 13 in Yamuna and 9 others). Of the 13 non-complying STPs reported in Yamuna basin, 4 STPs in Panipat, which have been recently upgraded, are found to be non-complying. Further, these 4 STPs are being

operated at about 25% of its installed capacity. In the previous meeting of CMC, State was suggested to intercept Panipat drain which is close vicinity to the Sewah Road STP so as to increase the utilization capacity. However, the State responded that inflow from the drain cannot be treated in the STP owing to the presence of industrial effluents in the drain. As per the reports of the Haryana PCB, it has been observed that the Panipat drain can be easily intercepted and diverted for treatment in Sewah Road STP at Panipat. Similarly 2 STPs are reported to be non-complying at Sonepat, one of which is reported to be non-operational. This STP was built and recently upgraded under Namami Gange funding. The STP remains a critical project as it is built just upstream of Barrage from where water is being abstracted for drinking water supply to Delhi. A 100 MLD STP at Gurugram is at times reported as compliant and at times reported as non-compliant. It was highlighted that State is regularly updating and reporting progress of the ongoing STPs along with completion timeline. Further, it has been reported that all the 19 CETPs of 190 MLD are complying.

Engineer-in Chief (PHED), Haryana informed that tertiary treatment connections have been made in the 1 STP reported as non-complying at Ellenabad in Ghaggar river basin and now satisfactory results are being achieved. With regard to STPs at Panipat, the capacity utilization has increased from 25% to 50%. 40 MLD STP at Rohtak reported as non-complying, is based on UASB technology and is functioning efficiently (BOD of around 30mg/l is being reported in the treated water), and augmentation of the STP is proposed. Similarly, STP existing at Bahadurgarh based on UASB technology is functioning well and BOD of 30-40 mg/l is being achieved in treated water. However, industrial waste having high COD is also being received at the plant. Minor issues in STPs at Hasanpur and Hodal have been resolved and the plants are operating well. STPs at Baddi and Bhuna are to be completed by March 2021. Further, it was informed that the matter is being seriously looked in by the State Government and Chief Secretary, Haryana is closely monitoring the issues.

25. <u>Himachal Pradesh</u>

Director (Technical), NMCG informed that as per the latest water quality reports of the rivers and the MPR submitted by the State, it is reported that except Markanda river, remaining 6 identified rivers in the State are now achieving BOD of less than 3 mg/l. It was informed that out of 65 existing STPs in the State, 11 STPs were reported to be non-complying with

standards. The gap in sewage treatment is being managed by soak pits and septic tanks. 1 CETP of 25 MLD is existing at Baddi, which is reported to be non-complying.

Serious concern was raised with regard to the non-compliance of the existing CETP at Baddi.

Member Secretary, Himachal Pradesh Pollution Control Board informed that PCB on 1st January, 2021 had issued directions to the textile units responsible for non-compliance of the CETP at Baadi. However, these units have obtained stay from High Court of Himachal Pradesh on the closure directions issued by HPPCB. Subsequently, Chief Secretary, HP held meeting with the industrial associations and industrial units and directed them to alter their products and design of their captive ETPs so that the effluent being received at the CETP is partially treated. This has been agreed upon by the industrial units and it is anticipated that by 15th March 2021, captive ETPs will be installed in all the industries. Non-compliance of the CETP is due to FDS and Chloride levels. DPR has been prepared for upgradation of the CETP at Baadi and the matter is being taken up with Ministry of Pharmaceutical and Ministry of Commerce by the Industrial Department, HP.

With regard to the BOD level of 18 mg/l being reported in Markanda River, it was informed that the quality of the river is anticipated to improve with the completion of on-going projects - STP at Trilokpur, STP at Kala Amb, 5 MLD CETP at Kala Amb and the phytoremediation project. The STP and CETP projects are expected to be completed by March 2021.

State was directed to closely monitor the ongoing projects which are expected to be completed by March, 2021 so that the timelines are adhered to.

26. <u>West Bengal</u>

Director (Technical), NMCG appreciated the quality of MPR submitted by the State as most of the details have been covered. It was informed that as per the MPR, 2,758 MLD of sewage is being generated from urban area and 29 STPs of 441 MLD exist. 910 MLD of sewage is being treated using natural process by East Kolkata Wetland and further around 8 MLD sewage is being treated using bioremediation. There exists a gap in treatment capacity of 412 MLD and 11 new STPs of 377 MLD are under construction, 18 STPs of 334.96 MLD are under renovation and 21 STPs of 351 MLD are under proposal/ tender stage. Out of the 29 operational STPs, 18 STPs are reported to be non-complying with the new discharge

standards. River Karola has been adopted as a Model River, and it is being reported that BOD level of less than 3mg/l have been achieved.

Further, it was informed that Draft Technical Bid Evaluation Report of Tolly Nullah project has been received in NMCG on 04.03.2021 for approval. As Hooghly Chinsurah I&D and STP project had land issues, KMDA has now found an alternative site at Taldanga. Accordingly, KMDA has revised the DPR and submitted to NMCG for approval. LOA has been issued on 25.01.2021 for Mahesthala I&D and STP project. With regard to Howrah, Bally & Kamarhati-Baranagar HAM project, financial closure has been signed on 17.02.2021. KMC has deployed a Consultant to prepare the assessment report as well as DPR for Garden Reach-Keorapukur Rehabilitation Project, which is expected to be submitted by March 2021. It has been reported that de-siltation of the oxidation ponds at Jiaganj-Azimganj has been completed and for further augmentation, revised civil estimate would be submitted to the Department by the next week. It was also informed that progress on each Action Plan for the 17 rivers have been indicated in the MPR. Meeting for finalization of tender for Churni River is scheduled. In case of Mahananda River, DPR has been vetted by KMD and expert opinion is sought, after which tender will be floated. State needs to provide timeline for the project. Similarly for Damodar river, 7 STPs are proposed. With regard to industrial pollution, status reported remains same.

Principal Secretary (Environment), West Bengal informed that State is trying to achieve considerable progress in the ongoing and proposed projects and are trying to adhere to the timelines. It was highlighted that State is preparing for State Legislative Election and the process shall be over by May 2021. Further, it was highlighted that as per the calculation of the State, gap in treatment capacity of 383 MLD exists, for which 550 MLD treatment plants are being proposed and proposal for the same was submitted to NMCG on 4th March itself. It was informed that 2nd round of tenders for Tolly Nallah Project are to be called post approval from NMCG. With regard to river Karola, it was informed that improvement in water quality has been achieved by installing horizontal filters at 47 locations, followed by aeration and chlorination. With regard to Mahananda river, it was informed that tender has been floated with regard to 2 STPs. With regard to the industries, it was informed that 454 water polluting industries are operational in the State having industrial discharge of 1,360.64 MLD. All 454 units have individual ETPs, 20 MLD CETP is operational in leather complex and another 20

MLD CETP (4 modules each of 5 MLD) is under construction, civil construction of CETP modules no. 5, 6, 7 & 8 is almost complete. Trial run has started for CETP 5 & 6 in wet condition. Trial run for CETP 7 & 8 is to be started within March 2021. As highlighted by CMC in its 3rd quarterly report dated 12.02.2021, out of 17 rivers in West Bengal, water quality of 10 rivers in the State has improved. Further it was informed that the Forest Department, West Bengal has planted 15 lakh saplings in 2019-20. During 2020-21, it has planted 5.40 crore saplings, with a total outlay of Rs 26 crore. This figure includes the 5 crore saplings planted in the Sundarban wetlands in the last six months. Further, 100% advance nursery work has been completed for river bank plantations to be taken up over 425 hectares at a cost of Rs.7 crore; the transplantation is scheduled to be completed by July 2021.

It was informed that Environment Department, West Bengal has sanctioned a project for biodiversity parks at 9 locations in the State. It was also informed that Action Plan for management of Coastal Pollution in the State has been submitted to CPCB. As per new initiative taken by the State, about 122 MT of compost was generated from the solid waste collected from the Gangasagar Mela and the compost was distributed to the farmers. A 500 TPD C&D plant is coming up in the State. The city of Kolkata is surrounded by a huge low-lying marshy land called East Kolkata Wetland (EKW) on the east which is fed by a number of water channels carrying and discharging city wastewater (dry weather flow & storm water flow) in the Kulti-Vidyadhari river after natural treatment –sedimentation, oxidation. Government of West Bengal is planning to rehabilitate the EKW and for that a 5 year plan for Rs. 220 crore has been developed and financial support was requested from NMCG.

DG, NMCG suggested that the proposal of East Kolkata Wetland should ideally be funded by MoEF&CC. However, the proposal can be shared with NMCG for part/ joint funding for the project.

Senior Consultant, NMCG highlighted that the proposal of East Kolkata Wetland should be as per the NPCA (National Plan for Conservation of Aquatic Ecosystems) guidelines of MoEF&CC. Principal Secretary (Environment), West Bengal informed that the proposal has been prepared considering the technical guidelines and it has been observed that the water area of the wetland has increased over the past 10 years.

27. Uttarakhand

Director (Technical), NMCG highlighted that recently one more STP of 7 MLD has been completed at Ramnagar. Out of 59 operational STPs in the State, 3 STPs were reported to be non-complying-these are old STPs of 1.25 MLD at Bheemtal, 2 MLD at Almora & 1.25 MLD at Pithoragarh. State needs to provide updated figures in the MPRs.

Member Secretary, Uttarakhand Pollution Control Board informed that STPs of 60 MLD are under construction and STPs of 106 MLD are under proposal stage. To increase the capacity utilization of the STP, proposal is in progress for I&D of drains and connections of household sewers. Further, possibility of septage management and co-treatment is being explored in the State. Proposal for co-treatment of septage at Devprayag, Srinagar, Haridwar and Rishikesh has been prepared. It was informed that all 530 units have been connected to 4.5 MLD CETP at Haridwar, all 75 units connected to CETP at Sitarganj and 24 units are yet to be connected to the CETP at Pantnagar. With regard to solid waste processing plants, DPR of 89 ULBs have been approved by State out of total 93 proposed plants. Work for remediation of legacy waste has started in 5 ULBs and DPR is under preparation for 19 ULBs. Further, it was informed that out of 63 STPs, only 3 STPs are found to be non-complying, while as per the reports of CPCB, 16 STPs were reported to be non-complying. Therefore, it is proposed to carry out inspection of the STPs to verify the status of compliance.

28. Uttar Pradesh

Senior Waste Management Specialist, NMCG informed that in addition to the proposed STPs reported previously, an additional STP of 15 MLD at Kairana has been added for which NIT has been published. Number of complying STPs since last meeting has increased to 90 from 80 and presently 11 STPs are reported as non-complying. Out of 7 CETPs, 6 are complying and 1 CETP of Mathura is non-complying which is under rehabilitation under Namami Gange. It was informed that the contract for rehabilitation has been signed and work is yet to commence.

DG, NMCG directed that all the non-complying industries should be issued closure notices and action against the concerned officials responsible for ensuring compliance of CETP should also be taken.

With respect to municipal solid waste management, it was informed that the completion timeline of the on-going processing plants are being shifted from the deadline of 31.03.2021. 2 plants at Jaunpur & Fatehpur are expected to be operationalized by 31.06.2021. 7 plants at Sambhal, Badaun, Mirzapur, Balia, Rampur, Jhansi & Meerut were under arbitration and it has been reported that that the arbitration is now complete and operationalization of these plants is expected by 31.10.2021. The land issues for 8 SWM plants at Bareily, Firozabad, Loni, Nazibabad, Bhadoi, Basti, Gorakhpur & Akbarpur still remains unresolved. 37 new proposed plants are expected to be operational by 31.12.2021.

With respect to progress of on-going STPs, it was informed that construction works at Ramnagar STP has been completed and sewage intake has started by tapping one of Nalas. For Chunar FSTP, construction has been completed and soft commissioning is planned during March 2021. Ramana STP is expected to complete by March 2021. The issues pertaining to Jaunpur STP were discussed and ED (Projects), NMCG requested MD, UPJN to relook at the proposal of laying the pipe along the proposed highway instead of going for trenchless technology.

DG, NMCG requested MD, UPJN to expedite progress of projects and ensure timely completion of the projects.

MD, UPJN informed that regarding non-complying STPs, 67 MLD STP at Mohamadpur is under trail run; the Jajmau STP has been handed over and is expected to be complying within 6 months; 3 STPs at Mathura are under rehabilitation and expect completion by April 2021. Regarding on-going projects, for Ramnagar STP & Chunar FSTP trial run has started. These projects and STP at Ramana is expected to be completed by March 2021. Regarding Lucknow project, it was informed that the matter has been transferred to Supreme Court, and for the Moradabad land issue, the matter has been transferred to High Court. Regarding land issues for SWM plants it was informed that the land has been identified. The construction has started at Bareily, Firozabad & Loni. Regarding C&D plants at Lucknow, Agra, Kanpur, Prayagraj & Varanasi, the work order has been issued and construction has started at Lucknow, Agra, Prayagraj & Varanasi.

ED (Projects), NMCG raised the issue of tendering for Kairana project, as NMCG has already approved the tender documents. The issue of tree cutting permission for Agra project was also raised as approval from World Bank is expected soon. Poor capacity utilization and

compliance of Sajari & Bingawan STP was also raised. The issue of reducing performance security from 10% to 4% has been approved by Department of Economic Affairs was flagged and UPJN requested to consider it for the existing projects. MD, UPJN informed that changes to the tender conditions for Kairana project need to be approved by the Board.

Senior Waste Management Specialist, NMCG further indicated no/ minimal progress of certain projects such as GH Canal Lucknow (30% progress), Balia (80% progress), Pratapgarh, Bingawan-Kanpur (poor capacity utilization) & Farrukhabad (NOC given by NMCG in January but LoA not yet issued). MD-UPJN informed that GH Canal project is proposed under AMRUT.

DG, NMCG raised the issue of non-operational STPs of Ghaziabad and requested SPCB to have a special cell for monitoring of drains & proper running of STPs and submit a weekly status report to NMCG.

29. <u>Rajasthan</u>

Senior Waste Management Specialist, NMCG indicated that there has been not much change since last review meeting and no progress has been reported for under construction STPs, indicating either the projects are standstill or there is monitoring fault. O&M of STPs and CETPs still remains a critical aspect wherein 39 STPs out of 84 and 11 CETPs out of 14 are non-complaint.

State representative indicated that 24 STPs out of 89 are non-complying. Further 7 STPs are under upgradation. With regards to direction for developing of monitoring mechanism of STPs, DPR and bid document is under preparation by RUIDP and nodal officer has been appointed. Municipal SW processing has increased to 38.5% and for 36.6% is under progress and for 10% is under tendering. The legal issues for 2 Hanumangarh STPs & Bhiwadi STP are yet to be sorted out. 15 MLD STP at Mandiya has been commissioned and the work of house service connections has started. 1 MLD STP at Nokha still remains not operational. Out of the 67 under construction STPs, 9 have been completed and commissioned. Further work at 8 STPs is to be started at Fatehpur (LoA issued), Ratangarh, Ratangarh Gaushala, Pratapgarh, Sadpur, Manpur, Nehrunagar & Revdar Road. Regarding Kota project, State has agreed for its increased share and revised work order has been issued. It was also informed that updated MPR for the State was by submitted on 4th March 2021, itself.

DG, NMCG directed the State to timely submit the Monthly Progress Reports.

30. <u>Madhya Pradesh</u>

Director (Technical), NMCG informed that as reported in the last meeting of CMC, Madhya Pradesh has developed an app called "Env Alert app" and a WhatsApp group "M.R STP Cap. Utilization" has been framed for day-to-day monitoring of STPs by the senior officials of the State. However, as data of only 3-4 STPs is being indicated in the App, the State may include details of remaining existing STPs in the State in the App. Details of the WhatsApp group has not been shared, therefore real time status of the STPs is not known. In the last meeting, it was informed that 15 STPs were to be completed, but the same is not reflected in the MPRs. Physical progress of on-going projects reported in the MPR submitted for January 2021 is same as submitted in MPR of November 2020, which reflects no progress has been achieved or the MPR has not been updated properly.

Engineer-in-Chief (Urban Development Department), Madhya Pradesh informed that at present 26 STPs are operational in the State and agreed to provide updated status in the MPRs. It was highlighted that out of the 15 STPs which were previously reported to be completed, 5 STPs have been completed and made operational, 6 STPs are under trial and are expected to be operational by March 2021 and 4 STPs shall be completed by 30th April 2021.

31. <u>Chhattisgarh</u>

Senior Environmental Specialist, NMCG highlighted that slight progress have been achieved in the on-going STP projects in the State as reported in MPRs from November 2020 to January 2021. Work has been awarded for STP projects at Kanker, Nawapara and Rajim. Approval of DPR for STP at Korba town from NTPC is still pending.

Additional Chief Secretary (Housing & Environment), Chhattisgarh informed that NTPC is not agreeing to re-utilize the treated water and therefore, tenders for the STP at Korba could not be finalized. State has sent requests in this regard to the Ministry of Mines, Power and Jal Shakti to intervene so that the issue is resolved at the earliest, but the response is awaited.

DG, NMCG informed that request has been received at NMCG and the matter is being pursued. Further, State is yet to identify and adopt a model River.

32. Jharkhand

Senior Environmental Specialist, NMCG highlighted that 452 MLD of sewage is generated in the State, for which 15 STPs of 103.55 MLD exist. Slow progress is observed in the ongoing STP project at 36 MLD at Adityapur. With regard to treatment facilities proposed for Dhanbad, Ramgarh and Mango, the State has been directed to identify alternate funding options. Bid document for the project of I&D and 15 MLD STP at Phusro is yet to be finalized.

DG, NMCG directed the State to expedite the ongoing projects as well Phusro project sanctioned under Namami Gange programme.

Director (SUDA), Jharkhand informed that observations on the bid document for 15 MLD STP at Phusro was received on 26th February, 2021 and Cabinet approval from the State Government is being pursued. Further, NEERI has been engaged for preparation of DPR for treatment of 100 MLD sewage, which will cover Mango, Ramgarh and Chas. It was also informed that due to land disputes, not much progress has been made in STP at Adityapur and the 37 MLD STP at Ranchi has been re-awarded. 2132.45 MTPD of municipal solid waste is generated in the State, of which 1132.10 MTPD waste is being processed. A project has been finalized with GAIL, wherein 310 TPD of wet waste is proposed to be processed. Further, tenders have been floated under Jamshedpur Urban Agglomeration for 5 ULBs.

33. Bihar

Senior Environmental Specialist, NMCG highlighted the major issues in the State. It was informed that along polluted river stretch other than river Ganga, DPRs are yet to be sanctioned and funds to be tied up for towns of Raxaul, Jogbani, Harinagar and Narkatiaganj by the State Government. Along the river Ganga, revised DPR for Manihari and Jamalpur are awaited and DPR for Dighwara and Teghra is being reviewed by CSE. With regard to the Saidpur sewerage project, crucial RCD permission is pending for the 2 rising mains each of 2.6 km length from Exhibition Road and Ambedkar Colony IPS. PMC permission is pending for the removal of pipes in Beur and Saidpur. Revised TBER for the Munger town is awaited. Land NOC is still pending for IPS land at Maner, Bakhtiyarpur, Sultanganj and Digha. RCD

and NHAI permissions are still pending for Naugachia, Begusarai, Chhapra, Mokama, Sonepur & Sultanganj.

ED (Tech), NMCG highlighted that the State had informed that floodplain demarcation is not possible along the rivers. Therefore, it was suggested that State has to carry out a study and provide information to Centre for deliberations. Principal Secretary (Urban Development Department), Bihar highlighted that based on the suggestions of NGT in the hearing held in Ganga matter, Irrigation Department, Bihar has initiated scientific study with regard to demarcation of floodplains and the comprehensive report in this regard shall be submitted to NMCG and NGT by March, 2021.

DG, NMCG suggested that detailed review of the projects in the State shall be taken up in the upcoming week as team from NMCG shall be visiting the State.

The meeting ended with thanks to the Chair.

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Annexure-I

List of participants:

1. Shri Pankaj Kumar, Secretary, Ministry of Jal Shakti – *in Chair*
2. Shri Rajiv Ranjan Mishra, Director General, NMCG cum Project Director, NRCD
3. Shri Ashok Kumar Singh, Executive Director (Projects), NMCG
4. Shri D.P.Mathuria, Executive Director (Technical), NMCG
5. Shri Brijesh Sikka, Senior Consultant, NMCG
6. Shri. B.B. Barman, Advisor, NRCD
7. Dr. Pravin Kumar, Director Technical, NMCG
8. Shri J.C. Babu, Additional Director, CPCB
9. Shri J.B.Ravinder, Deputy Adviser, MoHUA
10. Shri Rohit Kakkar, Deputy Adviser, MoHUA
11. Shri Ishwer Singh, Consultant (Legal) NMCG
12. Shri S.K. Srivastava, Director, NRCD
13. Shri Sanjay K. Singh, Deputy Director, NRCD
14. Shri A.P. Singh, Scientist E, NRCD
15. Dr. Sabita Madhvi Singh, Joint Director, NRCD
16. Shri Rajat Gupta, Senior Waste Management Specialist, NMCG
17. Shri Saumya Mukhopadhyay, Senior Environmental Specialist, NMCG
18. Dr. P.N.Rymbai, Scientist B, NRCD
19. Shri G.K.Murty, Team Leader, NRCD
20. Shri Manish Kumar, Sewage Treatment and Wastewater Expert, NMCG
21. Shri Vijay Kumar, Assistant Civil Engineer, NMCG
22. Shri Rachit Andley, Project Manager, NMCG
23. Shri Avshesh Chauhan, Assistant System Analyst, NMCG
24. Shri Kumar Ajitabh, Project Officer Legal, NMCG
25. Mrs. Ruby Raju, Project Engineer, NMCG
26. Shri Kallol Choudhary, Industrial Process Expert, NMCG
27. Shri Rishabh Choudhary, Support Engineer, NMCG
28. Ms. Preeti, Research Associate, NRCD
29. Shri Debarshi, Research Associate, NRCD

Legal/OA673/2018/NMCG/2019
National Mission for Clean Ganga
Department of Water Resources, River Development
& Ganga Rejuvenation, Ministry of Jal Shakti

1st Floor,
Major Dhyan Chand National Stadium
India Gate, New Delhi-110002
Dated: 4th August 2021

OFFICE MEMORANDUM

Subject: **Minutes of the 10th meeting of Central Monitoring Committee in the NGT Matter OA No.673 of 2018 held on 09.07.2021 from 10.30 AM on-wards**

A copy of Minutes of the 10th Meeting of Central Monitoring Committee in the NGT matter O.A. No. 673 of 2018 held through Video Conferencing on 09.07.2021 from 10.30 AM on-wards, under the Chairmanship of Secretary, Ministry of Jal Shakti is forwarded herewith for information/ necessary action.

(D. P. Mathuria)
Executive Director-Technical, NMCG
ed-technical@nmcg.nic.in

Encl: As above.

To,

1. Chief Secretary, Government of Andhra Pradesh, Ist Block, A.P Secretariat Office, Velagapudi – 522503
2. Chief Secretary, Government of Assam, Block- C, 3rd Floor, Assam Sachivalaya, Dispur - 781006, Guwahati
3. Chief Secretary, Government of Bihar, Main Secretariat, Patna – 800015
4. Chief Secretary, Government of Chhattisgarh, Mahanadi Bhawan, Mantralaya, Naya, Raipur – 492002
5. Chief Secretary, Government of Goa, Secretariat, Porvroim, Bardez, Goa – 403521
6. Chief Secretary, Government of Gujarat, 1st Block, 5th Floor, Sachivalaya, Gandhinagar – 382010
7. Chief Secretary, Government of Haryana, 4th Floor, Haryana Civil Secretariat, Sector-1, Chandigarh – 160019
8. Chief Secretary, Government of Himachal Pradesh, H P Secretariat, Shimla –171002
9. Chief Secretary, Government of Jammu & Kashmir, R. No. 2/7, 2nd Floor, Main Building, Civil Secretariat, Jammu -180001
10. Chief Secretary, Government of Jharkhand, 1st Floor, Project Building, Dhurwa, Ranchi-834004

11. Chief Secretary, Government of Karnataka, Room No. 320, 3rd Floor, Vidhana Soudha, Bengaluru -560001
12. Chief Secretary, Government of Kerala, Secretariat, Thiruvananthapuram -695001
13. Chief Secretary, Government of Madhya Pradesh, MP Mantralaya, Vallabh Bhavan, Bhopal – 462004
14. Chief Secretary, Government of Maharashtra, CS office main Building, Mantralaya, 6th floor, Madame Cama Road, Mumbai – 400032
15. Chief Secretary, Government of Manipur, South Block, Old Secretariat, Imphal – 795001
16. Chief Secretary, Government of Meghalaya, Main Secretariat Building, Room no 316, Shillong – 793001
17. Chief Secretary, Government of Mizoram, New Secretariat Complex, Aizwal – 796001
18. Chief Secretary, Government of Nagaland, Civil Secretariat, Kohima – 797004
19. Chief Secretary, Government of Odisha, General Administration Department, Odisha Secretariat, Bhubaneswar – 751001
20. Chief Secretary, Government of Punjab, Chandigarh – 160001
21. Chief Secretary, Government of Rajasthan, Secretariat, Jaipur – 302005
22. Chief Secretary, Government of Sikkim, New Secretariat, Gangtok – 737101
23. Chief Secretary, Government of Tamil Nadu, Secretariat, Chennai-600009
24. Chief Secretary, Government of Telangana, Block C, 3rd floor, Telangana Secretariat Khairatabad, Hyderabad, Telangana
25. Chief Secretary, Government of Tripura, New Secretariat Complex Secretariat – 799010, Agartala, West Tripura
26. Chief Secretary, Government of Uttar Pradesh, 1st floor, Room No. 110, Lal bahadur Sastri Bhawan, Uttar Pradesh Secretariat, Lucknow – 226001
27. Chief Secretary, Government of Uttarakhand, 4 Subhash Road, Uttarakhand, Secretariat Dehradun – 248001
28. Chief Secretary, Government of West Bengal, Nabanna, 13th Floor, 325, Sarat Chatterjee Road, Mandirtala, Shibpur, Howrah – 711102
29. Administrator, Daman & Diu and Dadra and Nagar Haveli, Secretariat, Moti, Daman -396220
30. Chief Secretary, Govt. of NCT of Delhi, Delhi Secretariat, IP Estate, New Delhi – 110002
31. Chief Secretary, Govt. of Puducherry, Main Building, Chief Secretariat, Puducherry-605001
32. Chief Secretary, Andaman & Nicobar, Secretariat, Port Blair
33. Administrator, Lakshadweep

Copy To:

1. Secretary, Department of Forest, Ecology & Environment, J&K, Room no. 2/33-34, Main Building, Civil Secretariat, J&K, Jammu.
2. Secretary, Department of Environment, Science and Technology Paryavaran Bhawan, Near US Club, Shimla, Himachal Pradesh-171001
3. Principal Secretary, MGSIPA Complex, Sector-26, adjacent Sacred Heart School, Chandigarh, 160019

4. Additional Chief Secretary to Govt. of Haryana, Environment Department of Environment & Climate Change, R.No. 108, 7th Floor, Main Secretariat Sec16, Chandigarh 160017
5. Principal Secretary, Department of Environment, U.P., Room No. 601, Bapu Bhawan Secretariat, Vidhan Sabha Marg, Lucknow – 226001.
6. Special Chief Secretary, Department of Environment, Forest, Science & technology, 4th Block, Ground Floor,Room No:268, A.P Secretariat Office, Velagapudi
7. Secretary, Department of Environment and Forest, H-Block, 2nd Floor Janata Bhawan, Dispur, Guwahati 781006, Assam
8. Principal Secretary, Department of Environment, Forest and Climate Change, Van Vibhag Rd, Nehru Nagar, Patliputra Colony, Patna, Bihar 800013
9. Additional Chief Secretary (Forests & Environment), Forests & Environment Department, Block 14, 8 th floor, Sachivalaya, Gandhinagar - 382 010 Gujarat.
10. Principal Secretary, Department of Environment, Room No. S-2/23, Mahanadi bhawan, Mantralaya, Nava Raipur, Atal Nagar, Raipur - 492001
11. Additional Chief Secretary to Government, Forest, Environment and Ecology, Department, Karnataka Government Secretariat, Room No. 447, 4th Floor, Gate no. 2, Multi-storey Building, Bangalore-560001.
12. Principal Secretary, Department of Environment, Room No. 406 4th Floor Annex II, Secretariat, Kerala Thiruvananthapuram, Kerala, PIN- 695001
13. Principal Secretary, Department of Housing and Environment, Government of Madhya Pradesh, Paryavaran Parisar, E- 5, Arera Colony, Bhopal, Madhya Pradesh, 462016
14. Principal Secretary, Environment Department, Maharashtra 15th Floor, New Administrative Building, Madam Cama Road, Mantralaya, Mumbai – 400032
15. Additional Secretary, Forests & Environment Deptt, Secretariat Building, North Range, Forest Colony, Khasi Hills, Shillong, Meghalaya 793001
16. Deputy Conservator of Forest (Headquarters) Environment, Forests & Climate Change Department Tuikhuahtlang, Aizawl Mizoram.
17. Principal Secretary, Department of Environment, Forest & Climate Change, New Secretariat, Kohima, Nagaland Tel.- 0370-2243025
18. Additional Chief Secretary, State Silvicultural garden, Khandagiri, Bhubaneswar, Odisha 751003
19. Principal Secretary, Forest and Environment Department, Rajasthan 4, Jhalana Institutional Area, Jhalana Doongri, Jaipur, Rajasthan 302004
20. Principal Secretary, Chief Project Director (SBFP-JICA), Forests, Environment & Wildlife Management Department, Government of Sikkim
21. Principal Secretary, Namakkal Kavignar Maaligai, Fort St. George, Chennai 600 009
22. Secretary, Department of Science, Technology & Environment, Vigyan Prajukti O Paribesh Bhawan, P.N. Complex, Gorkhabasti, Agartala,West Tripura, PIN-799006
23. Special. Chief Secretary, TSCOST, 4th Floor, Aranya Bhavan, Saifabad, Hyderabad, Telangana State, Pin – 500004
24. Deputy Conservator of Forests, (Territorial Division), Department of Environment & Forest Office of the Deputy Conservator of Forest, Daman, Fort Area, Post Office Moti Daman Daman cz

25. Deputy Conservator of Forests, (Territorial Division), Van Bhavan, Dadra and Nagar Haveli
26. Secretary, Department of Environment, Govt. of NCT of Delhi, 6th Floor, Delhi Secretariat, IP Estate, New Delhi 110002
27. Secretary, Environment & Forest, Govt. of Uttarakhand, 4 Subhash Road, Secretariat, Forth Floor, New Building Dehradun, Pin code-248001
28. Joint Secretary, Department of Science, Technology & Environment, 1st Floor, Pandit Deendayal Upadhay Bhavan, Behind Pundalik Devasthan, Near Sanjay School, Porvorim, Bardez - Goa
29. Secretary, Environment, Office of Environment, Chief Secretariat, Goubert Avenue, Puducherry 605001
30. Principal Secretary, Department of Environment, 5th Floor, Pranisampad Bhawan, Block LB-II, Salt Lake, Sector III, Bidhannagar, Kolkata – 700 106
31. Additional Chief Secretary Forest, Environment & Climate Change Deptt., Nepal House, Doranda, Ranchi-834002, Jharkhand
32. Additional Chief Secretary, Forest and Environment Department, Government of Manipur, Secretariat, Imphal- 705001
33. The Member Secretary, Assam Pollution Control Board, Bamunimaidam, Guwahati – 781021
34. The Member Secretary, Andhra Pradesh Pollution Control Board D.No. 33-26-14 D/2, Near Sunrise Hospital, Pushpa Hotel Centre, Chalamalavari Street, Kasturibaipet, Vijayawada – 520 010
35. The Member Secretary, Bihar State Pollution Control Board, Parivesh Bhawan, Plot No. NS-B/2 Paliputra Industrial Area, Patliputra, Patna (Bihar) - 800 010
36. The Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas Bhavan, North Block Sector-19, Atal Nagar Dist- Raipur (C.G.) 492002
37. The Member Secretary, Delhi Pollution Control Committee, Government of N.C.T. Delhi 4th Floor, ISBT Building, Kashmere Gate, Delhi-110006
38. The Member Secretary, Daman, Diu & Dadra Nagar Haveli Pollution Control Committee, Office of the Deputy Conservator of Forests, Fort Area, Court Compound, Moti Daman, Daman – 396220
39. The Member Secretary, Goa State Pollution Control Board, 1st Floor, Dempo Tower, EDC Patto Plaza, Panaji, Goa-403 001
40. The Member Secretary, Gujarat Pollution Control Board Paryavan Bhavan, Sector 10- A, Gandhinagar – 382 043
41. The Member Secretary, Haryana State Pollution Control Board, C-11, Sector-6, Panchkula-134109, Haryana
42. The Member Secretary, Himachal Pradesh Pollution Control Board, Him Parivesh, Phase-III, New Shimla, Himachal Pradesh 171009
43. The Member Secretary, Jammu & Kashmir State Pollution Control Board, Parivesh Bhawan, Forest Complex, Gladni, Narwal, transport Nagar, Jammu, Jammu and Kashmir 180004
44. The Member Secretary, Jammu & Kashmir State Pollution Control Board, Shiekh-ul-Campus, behind Govt. Silk Factory, Raj Bagh, Srinagar (J&K)

45. The Member Secretary, Jharkhand Pollution Control Board, T.A Building, HEC, P.O. Dhurwa, Ranchi – 834004
46. The Member Secretary, Karnataka State Pollution Control Board, Parisara Bhavan, 4th & 5th Floor, # 49, Church St., Bengaluru-560 001
47. The Member Secretary, Kerala State Pollution Control Board, Plamoodu Jn., Pattom Palace P.O. Thiruvananthapuram - 695 004
48. The Member Secretary, Manipur Pollution Control Board, Lamphelpat, Imphal West D.C. Office Complex Imphal– 795004
49. The Member Secretary, Meghalaya Pollution Control Board Arden- Lumpyngngad Shillong: 793014
50. The Member Secretary, Nagaland Pollution Control Board, Signal Point, Dimapur Nagaland – 797112
51. The Member Secretary, Madhya Pradesh Pollution Control Board, E-5, Arera Colony, Paryavaran Parisar, Bhopal - 462 016, Madhya Pradesh
52. The Member Secretary, Maharashtra Pollution Control Board, Kalpataru Point, 2nd – 4th Floor Opp. Cine Planet Cinema, Nr. Sion Circle, Sion (E) Mumbai – 400 022
53. The Member Secretary, Mizoram Pollution Control Board, New Secretariat Complex, Khatla Thlanmual Peng, Khatla, Aizawl, Mizoram: 796001
54. The Member Secretary, Puducherry Pollution Control Committee, Housing Board Complex, Anna Nagar, Puducherry -600 005
55. The Member Secretary, Punjab Pollution Control Board, Vatavaran Bhawan, Nabha Road, Patiala, Punjab 147001
56. The Member Secretary, Odisha Pollution Control Board, A-118, Nilakanta Nagar, Unit – VIII, Bhubaneshwar – 751012
57. The Member Secretary, Rajasthan Pollution Control Board, 4, Jhalana Institutional Area, Jhalana Doongri, Jaipur (Rajasthan) - 302 004
58. The Member Secretary, Sikkim State Pollution Control Board, Department of Forest, Environment & Wildlife Management Government of Sikkim, Deorali, Gangtok, - 737102
59. The Member Secretary, Telangana State Pollution Control Board, Paryavaran Bhawan, A-3, I.E. Sanath Nagar, Hyderabad-500 018
60. The Member Secretary, Tripura Pollution Control Board, Vigyan Bhawan, Pandit Nehru Complex, Gorkhabasti, PO: Kunjaban Agartala – 799006
61. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032
62. The Member Secretary, Uttarakhand Environmental Protection & Pollution Control Board, 29/20, Nemi Road, Dehradun, Uttarakhand – 248001
63. The Member Secretary, Uttar Pradesh Pollution Control Board, Building.No. TC-12V, Vibhuti Khand, Gomti Nagar, Lucknow-226 010
64. The Member Secretary, West Bengal Pollution Control Board, Paribesh Bhavan, 10A, Block-L.A., Sector III, Salt Lake City, Kolkata - 700 106
65. The Member Secretary, Andaman & Nicobar Islands Pollution Control Committee, Department of Science & Technology, Dollygunj Van Sadan, Haddo P.O., Port Blair – 744102

66. The Member Secretary, Lakshadweep Pollution Control Committee, Department of Science, Technology & Environment, Kavarati-682555

Copy for kind information:

1. PPS to Secretary, Department of Water Resources, RD&GR, Ministry of Jal Shakti, Shram Shakti Bhavan, Rafi Marg, Sansad Marg Area, New Delhi- 110001
2. PS to Director General, NMCG cum Project Director NRCD
3. PS to Additional Secretary, Ministry of Housing and Urban Affairs, Nirman Bhawan, Maulana Azad Road, New Delhi – 110011.
4. Joint Secretary, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhavan, Jorbagh Road, New Delhi – 110003
5. Member Secretary, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi-110032
6. PS to ED (Project/ Finance), NMCG
7. Adviser, NRCD

Minutes of the 10th meeting of the Central Monitoring Committee held on 09.07.2021 through Video Conferencing regarding 351 polluted river stretches based on the directions of Hon'ble NGT in the matter OA No. 673 of 2018

The 10th meeting of the Central Monitoring Committee (CMC) constituted by Hon'ble NGT in the matter OA No. 673 of 2018 was held through video conferencing with the States on 09.07.2021 from 10.30 AM onwards in Conference Room, NMCG under the chairmanship of Secretary, Ministry of Jal Shakti (MoJS). The list of participants of NMCG, NRCD, MoHUA and CPCB present at the meeting is at ***Annexure-I.***

II. Director General, NMCG welcomed all the participants. It was highlighted that although the NGT orders covers various aspects, in the CMC meetings the focus primarily remains on sewage infrastructure, solid waste management and industrial pollution abatement measures taken by the States. However, measures to tackle various other issues also need to be adopted as they play a very important role in conservation and rejuvenation of rivers. State should take steps to maintain e-flow in the rivers, in order to ensure sustenance of river ecology. Similarly, in compliance to the directions of NGT in the matter OA No 325 of 2015, States should take steps in inventorizing the existing water bodies and efforts should be made in maintaining/improving the water quality and conserving of the water bodies. Further, it was informed that NMCG along with MoHUA have come up with a document regarding rivers and Cities Master plan titled *'Strategic Guidelines for Mainstreaming Urban River Sensitive Master Plans'*. The document is available on NMCG website, which the States and its agencies may like to go through.

ED (Tech), NMCG informed that most of the States had submitted MPRs for the month of May 2021, and a few of the States had also submitted MPR for June 2021. States were requested to ensure regular and timely submission of MPRs. Due to rise in number of COVID-19 cases and restrictions imposed by the States/UTs, progress with regard to sewerage infrastructure projects in the past few months has been insignificant. For monitoring the capacity utilization of the existing STPs, few States have installed online monitoring systems and have developed online portals/ Apps/ WhatsApp groups. Other States may also adopt such a mechanism. States also need to take necessary steps to make non-operational STPs functional at the earliest. As per the water quality monitoring data submitted by the States, improvement in BOD levels can be seen in some stretches. Many of the States have installed or are in process of installation of FSTPs for treatment of sewage as

an alternative to STPs. However, bioremediation measures are yet to be adopted by most of the States.

Director General, NMCG highlighted that the timeline of NGT for completion of STPs is already over and the States need to take fresh permission from NGT for extension of the timelines. As the progress in Assam has been very slow since the start of monitoring by CMC, Assam needs to understand the sense of urgency and urgently expedite the progress in the proposed projects.

III. Subsequently, State-wise discussions held are as follows:

Through a presentation, progress made by the States was highlighted and the issues related to sewage, industrial and solid waste management in the States, based on the information submitted in MPRs, were brought out for review.

1. **Punjab**

Director, NRCD informed that 4 polluted river stretches have been identified in the State. As reported by the State in the MPR, there is a sewage generation of 2108 MLD and 124 STPs of 1785 MLD are existing. As 1 STP is not operational, there is a gap of 371 MLD in sewage treatment capacity. Out of 103 STPs monitored, 27 STPs of 552.3 MLD are reported to be non-complying. State Government needs to ascertain whether non-compliance of STPs has been reported by the agency responsible for O&M or the regulators, and the actions taken by the regulators against the non-complying units. Out of 47 STPs of 605.3 MLD under construction, 11 STPs have been completed and are under stabilization, State Government needs to ensure these STPs are made operational at the earliest. No bio-remediation works have been initiated in Punjab. With regards to pollution due to Buddha Nallah, it was informed that State is implementing the Buddha Nallah Rejuvenation Project with an estimated budget of Rs. 840 crore (Rs. 519 crore – Capital cost and Rs. 321 crore - O&M cost for 10 years), which includes establishment of 2 new STPs and refurbishment of 4 existing STPs. 3 CETPs were envisaged in Ludhiana, of which works have been completed for 40 MLD and 50 MLD CETPs and works of 0.15 MLD STP have been halted due to Court stay.

ED (Tech), NMCG informed that a meeting was held under the Chairmanship of Hon'ble Minister of Jal Shakti on 17.06.2021 regarding pollution from Buddha Nallah. Based on the discussions held in the meeting, a joint inspection team under the supervision of CPCB

inspected the catchment area of Buddha Nallah. Results of the random inspection were received by NMCG on 08.07.2021 and as per the results, out of 4 CETPs inspected, 2 CETPs were found to be non-complying, out of 29 industrial units inspected, 15 units were found to be non-complying and out of 14 STPs inspected, 12 STPs were found to be non-complying.

Chief Secretary, Punjab attended the meeting along with Principal Secretary (LG), Principal Secretary (ST&E) and Chairman, Punjab Pollution Control Board (PPCB). Principal Secretary (LG), Punjab informed that while previously 43 STPs were reported to be non-complying, now the number has reduced to 27 STPs. Of the 27 STPs reported to be non-compliant, 8 STPs (2 STPs are SBR and 6 STPs are WSP) are not complying with the BOD standards and remaining 19 STPs are not complying with the Fecal Coliform standards. Efforts are being put in by the State to resolve these issues by constructing chlorination tank etc. and it is expected that in 1-2 months the compliance status of the STPs in Punjab shall drastically improve. Out of 500 MLD STPs reported to be non-compliant, 3 STPs of 350 MLD in Ludhiana are being refurbished under the Buddha Nallah Rejuvenation Project and are expected to be completed by December 2021. The compliance status of the STPs are being monitored by PPCB. With regards to the on-going and proposed STP projects, it was informed that finances for the projects have been arranged. Work is in progress for 41 STPs of 598 MLD and the State Government is rigorously monitoring the progress and most of the STPs are expected to be completed by March 2022, except for bigger projects such as Buddha Nallah, which shall be completed by end of 2022. With regard to bioremediation, it was informed that works have started at 3 locations and are providing satisfactory results. Most of the drains are to be tapped and treated in the existing/ proposed STPs. With regard to the shifting of diaries, it was informed that proposal was considered by the High Level Committee, but land for shifting is yet to be finalized and procured. Further, till shifting diaries take place, State Government has included provision for establishment of ETPs/ CETPs in the area under the Buddha Nallah Project.

Director General, NMCG highlighted that considering the issues relating to Buddha Nallah, the ongoing STP projects need to be monitored closely and the CETPs should be made functional and operated optimally at the earliest.

Principal Secretary (ST&E), Punjab informed that release of electric connections has been requested from Electricity Department for the 2 CETPs of 40 and 50 MLD. These CETPs are expected to be operational by August 2021. Previously, 2 CETPs were reported to be non-

complying, of which 15 MLD CETP at Ludhiana has been stabilized and is now complying with the standards and the 5 MLD CETP at Jalandar is non-complying due to high BOD of 45 mg/l. Some maintenance works are in progress and this CETP shall be complying shortly. Of the 1400 industrial units inspected during one year, due to non-compliance 25 units have been closed down, environmental compensation of Rs. 3.5 crore have been imposed on 78 units and advisory has been issued to 150 units.

Chief Secretary, Punjab informed that CMD, PSPCL is aware of the request for electrical connections for the two newly constructed CETPs of 40 & 50 MLD and after due strengthening, these shall be made operational shortly.

Shri A. Sudhakar, Additional Director, CPCB informed that CPCB has completed the inspection in the catchment area of river Satluj by June 2021. Industries non-complying to the norms have been identified and action is being taken against the defaulting units. 12 STPs, 2 CETPs and 15 industrial units have been identified as non-complying to the norms.

Secretary, Ministry of Jal Shakti directed CPCB to keep a close watch on the industries and to initiate appropriate action against the defaulters.

2. <u>Assam</u>

Director, NRCD informed that 44 polluted river stretches have been identified in the State. 436 MLD of sewage is generated in the State whereas the treatment capacity available is NIL. Previously, the State had informed that for the area in and around Guwahati region (covering 5 polluted river stretches), 14 decentralized STPs of 157 MLD capacity were proposed with financial assistance of JICA. However, in the latest MPR of May 2021 submitted by the State, it has been reported that DPR for 4 STPs of total 202 MLD capacity (including 8 FSTPs) for Guwahati has been forwarded to CPHEEO, Ministry of Housing & Urban Affairs. Previously it was reported that DPRs for STPs at Mangaldoi, Tejpur, Nagaon, Jorhat and Silichar are awaiting sanction, however now it is reported that the DPRs for these towns are under preparation. As per MPR, total Municipal Solid Waste processing facility available for 95 ULBs is about 983.5 TPD and capacity utilization is only 404 TPD. Capacity utilization of the existing solid waste processing units is very low. Latest status of setting up of Integrated Solid Waste Management Plant at Sonaguli and removal of legacy waste at Boragaon dumping site in the catchment area of Deepor Beel (Ramsar Site) needs to be provided.

Principal Secretary (Environment), Assam informed that there are no sewage treatment plants existing in the State. The site for development of Integrated Solid Waste Management Plant has been shifted to Chandrapur and the issue of legacy waste at Boragaon shall be addressed. 15-20% of the legacy waste has been treated, and in another 6 months it is expected that the entire legacy waste shall be treated. It was informed that previously, it was planned to have 14 STPs of 157 MLD for Guwahati. However, after detailed assessment it is now proposed to have 4 STPs of 187 MLD at Guwahati.

Secretary (GDD), Assam informed that the JICA had appointed NJS Consultants for carrying out detailed survey and preparation of DPR for areas around Guwahati and based on the survey, it was suggested that instead of 14 decentralized STPs, 4 STPS of 187 MLD should be established. Further, the proposal/ DPR was submitted to CPHEEO in April 2021 for approval. Deputy Adviser, CPHEEO in a meeting held with State Government, JICA and DEA in June 2021 raised the issue with regard to specification of pipes and the response has been submitted. The meeting is again fixed for July 2021 and it is expected that approval for proposal/ DPR shall be obtained shortly thereafter.

Director General, NMCG highlighted that the timeline of NGT for completion of STPs is over and the States may take fresh permission from NGT for extension of timelines. Progress in Assam has been slow since the beginning of monitoring by CMC and the State Government needs to expedite the progress of the proposed projects.

Deputy Adviser, CPHEEO informed that the issues of designs of pipes and clear NOC of the land parcels for 4 STPs & intermediate pumping stations are required to be urgently finalized, as the earlier proposed 14 STP projects could not be initiated due to non-availability of land.

Principal Secretary (Environment), Assam informed that NOCs are in place and after approval of DPRs, tender shall be floated. Further, with regard to number of polluted river stretches, it was informed that Assam has provided details to CPCB and has requested reduction in number of polluted stretches.

Shri A. Sudhakar, Additional Director, CPCB informed that as per the directions of NGT, all the river stretches should achieve the MoEF&CC notified bathing standards and unless these rivers achieve the standards as per the 5 parameters (including BOD & fecal coliform), the polluted river stretches cannot be removed or considered as not polluted. Submission for de-listing made by States should have 2 years' continuous water quality monitoring data with 8

sets of reading for each year. This data will be verified by CPCB and recommendations of the CPCB shall be submitted to Hon'ble NGT for approval. This has already been communicated to all the States/UTs.

3. Jammu & Kashmir

Director, NRCD informed that there are 9 polluted river stretches identified in the State. The State has sewage generation of 523 MLD and there are 15 STPs of 139 MLD capacity, but only 11 STPs are operational. There is gap in sewage generation of 384 MLD. 10 STPs of 92.01 MLD are under construction and 28 STPs of 153 MLD are proposed. Even after these STPs are put in place, the gap of 138 MLD in sewage treatment shall still remain. State Government needs to inform the action proposed for bridging the remaining gap. Bio-remediation on identified polluted river stretches has not yet been taken up. 2 CETPs of 1.05 MLD are functional, 9 CETPs of 7.5 MLD are under construction and 10 CETPs of 5.1 MLD are proposed. Against the total municipal solid waste generation of 1526 TPD, 244 TPD of waste is being processed and work for 125 TPD and 270 TPD plants was to start from March, 2021. Progress of Devika river project is very slow, and work on construction of remaining 2 STPs has still not started. HUDD and UEED need to expedite finalisation of design and start the construction work. Out of 130 kms. of sewer lines to be laid, only 48 kms. has been laid till date since award of contract in January, 2019. Govt. of UT of J&K needs to expedite implementation of the project.

Principal Secretary (Housing & Urban), J&K informed that out of 139 MLD existing sewage treatment capacity, only 63% is being utilized. Efforts are being put in to utilize 100% of the existing STPs by increasing the household connections and interception and diversion of 13 Nallahs. 11 STPs of 96 MLD are under construction and plan has been approved for 13 STPs of 168 MLD and these shall roll out in the next month. Of the existing 15 STPs, 10 MLD STP at Bhagwati Nagar is under refurbishment and shall be operationalized by August 2021, after which all the 15 existing STPs in J&K shall be fully functional and compliant.

Director General, NMCG highlighted that the foundation stone for Devika project was laid by Hon'ble PM and the State should closely monitor the progress of the project. It was directed that NRCD officials should visit J&K and review the project on the ground.

Principal Secretary (Housing & Urban), J&K informed that project is being regularly monitored and penalties are being imposed on the contractors for delay. There were issues due to migration of labourers, the site was turned into micro-containment zone, land acquisition and utility shifting, which have been recently resolved. Issues in design and drawings have also been resolved. Laying of sewer network has progressed and the STPs under Devika Project are expected to be commissioned by March 2022. Development of Ghat in Package II is almost ready and will be completed by August 2021.

Secretary, Ministry of Jal Shakti also highlighted that the Devika project should be handled with utmost priority and be completed in a defined time frame.

4. <u>Sikkim</u>

Director, NRCD informed that there are 4 polluted river stretches (in Priority V) identified in the State. State has sewage generation of 47.7 MLD and there are 9 STPs of 22.5 MLD capacity having utilization capacity of 54.3%. State Government needs to put in efforts to increase the utilization capacity. Gap in sewage treatment capacity is 25.18 MLD (including rural areas). 1 STP of 3.25 MLD is under construction and 7 STPs of 11.33 MLD are proposed. The status of proposed STPs remains the same for the last few months.

ED (Tech), NMCG informed that the completion timeline for the proposed 7 STPs varies between December 2022 – 2028, which is not acceptable. Further, MPR from Sikkim was last received for the month of March 2021 and the State Governments needs to ensure timely submission of MPRs.

Chief Conservator (Forest), Sikkim attended the meeting with the concerned State Department officers. The State PHED official informed that 6 STPs are operational and complying with the norms, 3 new STPs have been commissioned, but the household connections are yet to be completed due to recent lockdown in the State. With regard to Zone II sewerage system, part of main trunk line got affected due to landslide. Land acquisition is in process for STP proposed at Namchi and as land identified for STP at Jorthang was objected by public, new land has been identified and process of acquisition is in progress. With regard to new STPs, funding avenues are being explored by the State and NRCD has been approached for STP at Chungthang.

Secretary, Ministry of Jal Shakti indicated that in absence of Chief Secretary of the State, respective Principal Secretaries should attend the CMC meetings.

5. <u>Daman, Diu and Dadra Nagar Haveli (DD & DNH)</u>

Scientist B, NRCD informed that out of 2 STPs operational in UT, one STP of 13 MLD capacity at Dadra Nagar Haveli is highly underutilized (2.8 MLD). This is mainly due to non-completion of household connections as reported in May 2021 MPR. 4870 households connections have been made out of proposed 24105 connections, which implies only 2% progress have been made since February 2021. Status of proposed 16 MLD STP at Daman (at DPR stage) remains same. With regard to 7 MLD STP at Diu, technical sanction has been accorded and NIT is to be published soon. Status with regard to phyto-remediation and bioremediation for 13 drains and the status of standalone modular STPs for Damanwada, Magarwada, Pariyari and Patlara panchayats remains the same as reported previously. Status with regard to industrial pollution management and solid waste management also remains the same. The UT needs to submit more information with regard to groundwater regulation and management of e-flow of rivers (including details of assessment of e-flow, notification of minimum e-flow to be maintained in the rivers and mechanism adopted for monitoring the e-flow in the rivers). Action Plan for management of coastal pollution is yet to be submitted by the UT to CPCB.

Chief Conservator of Forest cum Member Secretary, Pollution Control Committee, DD & DNH informed that only one river i.e. Damanganga has been identified as the polluted river stretch in the UT. The river is being regularly monitored by PCC at 9 locations and since past 2 years while BOD levels in the river are observed to be within the limit of less than 3 mg/l, Fecal Coliform levels are yet to achieve the desired limit at 2 locations. This issue is to be addressed by deploying phytoremediation measures. However, due to recent rise in COVID cases and the impact of cyclone Tauktae, not much progress could be achieved in this regard. Further, it was informed that out of 24105 proposed households connections, 4870 households have been connected to the 13 MLD STP at Dadra Nagar Haveli and the STP is now receiving 4 MLD of sewage. All ETPs are functional. With regard to the Action Plan for Management of Pollution in Coastal Plain, it was informed that National Centre for Coastal Research (NCCR), Chennai has been engaged for preparation of DPRs. Further, Zoological Survey of India has also been approached for the same. NIO has conducted a study across the

UT and had reported that no major pollution issues relates to marine and coastal areas of the UT. For construction of 7 MLD STP at Diu, tenders will be invited shortly. DPR for 16 MLD STP at Daman was submitted to MoEF&CC for financial assistance, and alternate funding sources are to be explored in case of non-responsiveness from MoEF&CC. All drains in the UT have been cleared before monsoon and all encroachments have been removed. Massive plantation has been carried out in mangroves and other forest lands for protection of coastal areas at Diu.

6. Manipur

ED Tech, NMCG highlighted that the on-going STP projects of 16 MLD and 1 MLD for Nambul river project have shown significant progress from February 2021 onwards. State needs to closely monitor the progress in order to keep up the pace. Status of proposed 49 MLD STP remains the same and no completion timeline has been provided in the MPR. 1 CETP of 400 KLD existing in the State is yet to be made operational. The MPRs for the months of March, April and May were submitted along with the MPR of June 2021 on 1st July 2021. State should ensure timely submission of MPRs in future. Status of Multi Segregation Shed at Chothe Village of 630.75 cum capacity mentioned in the earlier MPR of February, 2021 has not been reflected in the June, 2021 MPR.

Scientist B, NRCD highlighted that in the 9th meeting of CMC held on 4th March 2021, State Govt was directed to provide details regarding effluent quality of the 5 industrial units connected to CETPs and their compliance in the MPR. This has still not been provided in the subsequent MPRs. Further, previously it was reported that 269.5 TPD of solid waste management facilities are existing in the State, but in the updated MPRs it is mentioned that 116.5 TPD of processing facilities are existing. State needs to provide justification for the same.

Additional Chief Secretary (Environment & Forest), Manipur attended the meeting physically and informed that works of the on-going 16 MLD (62%) and 1 MLD (30%) STPs are being closely monitored by the State. Efforts are being made to complete the projects before the expected completion timeline of March 2022. It was informed that out of proposed 12000 household connections, 4600 household connections have been made and the 27 MLD existing STP is presently operational at 10.35 MLD. The works were greatly affected by the rise in COVID-19 cases and recent lockdown imposed in the State. The household

connections are expected to be complete by December 2021. 49 MLD STP proposed has been cleared by DEA for external funding opportunities and vetted by IIT Guwahati. Further, DPR has been submitted to NRCD for treatment of 16.75 MLD of sewage through bio-remediation and 50 KLD Faecal Sludge and Septage Management (FSSM). With regard to the DPRs for 7 polluted stretches (in Priority V), it was informed that these are under preparation and shall be submitted shortly to the Ministry of Jal Shakti for sanction. With regard to the non-functional CETP, it was informed that Manipur Industrial Development Corporation is preparing DPR with an estimated cost of Rs. 1.77 crore and after sanctioning of the DPR, implementation will take 3 months to complete and connect the industries to CETP. Health Department, Manipur is taking action for treatment of biomedical waste and is establishing Biomedical Waste Treatment Plant, which is proposed to become operational by end of 2021. Further, it was informed that the Multi Segregation Shed at Chothe Village has been completed and shall be inaugurated shortly by the Chief Minister. With regard to the incomplete information and discrepancies in the data submitted, it was assured that shortcomings in the MPR will be rectified in next submission and State shall ensure timely submissions of MPRs to the Ministry.

Secretary, Ministry of Jal Shakti directed NRCD to look into the proposal submitted by the State and to provide appropriate response to the State.

7. Meghalaya

Scientist B, NRCD informed that there is gap in sewage treatment of 73 MLD. 8 STPs of 1.85 MLD are existing in the State. 1 Septage Treatment Plant of 0.115 MLD at Shillong (90%) is under construction and works got delayed due recent lockdown in State. 0.04 MLD Faecal Sludge Treatment Plant at Khliehriat is at 70% progress. FSSM of 0.35 MLD at Shillong is having 10% physical progress. With regard to 5 number of Onsite treatment plants proposed at Shillong, land for 4 have been cleared while negotiation is in process for the remaining one which got delayed due to lockdown. Status with regard to 0.105 STP at Eastern Air Command, Shillong has not been provided in the MPR. There are 260 water polluting industries having discharge of 3.5 MLD. 254 industries are having functional ETPs. It has been reported that 10 ETPs of 0.002 MLD each at Tura are under progress, but their status and completion timeline has not been provided. The State generates 245 TPD of municipal solid waste and processing plant of 8 TPD is functional. 65 MLD processing plant

has been completed, but it is yet to be operationalized. Processing facility of 170 TPD is under trial and plant of 0.1 TPD at Khliehriat is under progress. Further, 10 processing plants of 166 TPD are proposed. The State Government needs to provide latest status.

Additional PCCF, Meghalaya informed that 90% works have been completed of the 0.115 MLD FSTP at Shillong. Machinery for the plant is yet to be procured, after which the plant shall be made functional. Regarding scheduled date of completion for 0.04 MLD FSTP at Khliehriat and status of 0.105 MLD STP at Shillong, it was told that information will be submitted in the next MPR. 0.04 MLD FSTP at Khliehriat is 70% completed. FSSM of 0.35 MLD having 10% physical progress is expected to be completed by March 2023. With regard to the 5 onsite STPs of total 13.42 MLD capacity at Shillong and STP at Eastern Air Command, State shall be submitting the status separately. With regard to the FSSM at Jowai town, it was informed that the Meghalaya Government has approached Government of Odisha for providing technical assistance for the FSSM project and the Odisha Government has agreed to provide assistance. Some of the solid waste processing plants are under trial and some are yet to be made operational due to which the capacity utilization of the solid waste processing facilities is low. It was informed that NIT has been floated for in-situ bioremediation of 5 drains (out of 32 drains) falling to Umkhrah and Umshyrpi rivers at Shillong. Also, bioremediation works for Kyrhuhkhla and Lukha Rivers (of Priority IV & V respectively) are being implemented by District Administration under Meghalaya Environment Protection & Restoration fund.

State Government was directed to update information in their MPR submissions.

8. <u>Nagaland</u>

Scientist B, NRCD informed that 25.43 MLD STP at Dimapur is yet to be made operational and 79% of the related sewer network works have been completed. Previously it was reported that 2 FSTPs of 20 KLD and 90 KLD are existing at Dimapur and Kohima respectively, however in the latest MPRs details of these 2 FSTPs have not been provided. There are 5 water polluting industries in the State, generating 102 KLD of industrial discharge. 3 ETPs of 102 KLD capacity are operational and complying, and 2 ETPs of 30 KLD are reported to be under process. Their status and completion timeline needs to be provided. The State generates 304.3 TPD of municipal solid waste, of which 132.05 TPD is being processed. However,

there exists only 50 TPD capacity processing plant and a plastic recycling unit. Action plan to bridge the gap in solid waste processing is to be provided by the State Government.

The official from PHED, Nagaland informed the project at Dimapur got delayed due to non-availability of land for sewer laying. The issue has been resolved and the project is now making good progress and is expected to be complete within its revised timeline. With regard to the shortcomings in the MPR, the State Representative stated that the matter will be looked into and rectified.

9. Mizoram

ED Tech, NMCG highlighted that the low utilization of the existing 10 MLD STP at Aizawl is a concern, which is due to pending house service connections. After augmentation in the flow reaching the STP, State Government needs to ensure that treated water from the STP is optimally reused.

Secretary, IWRD, Mizoram along with concerned official from State Department attended the meeting. He informed that the STP is receiving only 0.3 MLD of sewage, as only 3125 of 19,000 households have been connected to the STP. The progress of work was halted in the last 2 months due to complete lockdown imposed in the State, and the work is now being resumed.

10. Tripura

Director, NRCD informed that out of total sewage generation of 82.4 MLD in the State, sewage treatment capacity exists only for 8.72 MLD (8 MLD STP & 720 KLD FSTP at Agartala), thus leaving a huge gap of 73.68 MLD in sewage treatment which needs to be addressed urgently. Low capacity utilization of existing 8 MLD STP due to incomplete laterals/house service connections and slow progress on STP of 8 MLD (under construction) were also highlighted.

Due to connectivity issues, response from the State could not be properly heard and State was directed to submit written information. As per the information provided by the State Government, progress on different conservation measures taken up and/or implemented vis-à-vis the approved action plan is as under:-

(i) As per the directions of NGT, Haora river has been identified for rejuvenation, which would serve as a model for other polluted stretches.

(ii) To increase capacity utilization of STP of 8 MLD at Agartala, expansion of sewer network and house service connections are in progress and are likely to be completed in 18 months. Also, works for STP of 8 MLD proposed at Akhuaura ICP, Agartala are under progress.

(iii) As many as 210 drains discharging into polluted river stretches have been identified by ULBs for in-situ bio-remediation. Presently, survey work is going on to collect baseline information of these drains. Tender evaluation for bio-remediation on 5 drains on pilot basis at Agartala has been completed.

(iv) In case of proposed 15 nos. of Faecal Sludge Treatment Plants of total capacity 600 KLD for all ULBs in the State approved under Swachh Bharat Mission (SBM), technical specifications/tender documents have been finalized and uploaded on the website of Urban Development Department, Govt of Tripura. Also, land has been identified and tendering process has been initiated by the ULBs.

(v) Solid waste processing facility exists for 256 TPD (250 TPD composting plant at Agartala & 6 TPD at Kamalpur Nagar Pachayat of District Dhalai) out of total municipal waste generation of 411.32 TPD in the State.

The State Government is required to expedite progress of the proposed FSTPs and the STP under construction to meet the timelines stipulated by NGT. For the existing STP of 8 MLD at Agartala town, capacity utilization is to be increased. The State Government was also asked to expedite in-situ bio-remediation for all identified drains discharging into polluted river stretches as per the directions of NGT.

11. <u>Maharashtra</u>

Director, NRCD informed that total sewage generation in the State is estimated as 9757 MLD, which includes nearly 2500 MLD of sewage from Mumbai city. 142 STPs of 7747 MLD are installed with utilization capacity of 4123 MLD. Out of 142 STPs, 7 STPs of 227.56 MLD capacity were reported to be non-operational. State Government needs to take necessary action on priority to expedite commissioning of these STPs. In case of 34 non-compliant STPs which includes 2 STPs of 757 MLD & 240 MLD in Mumbai, MPCB was requested to ensure proper functioning of all STPs in the State to meet the prescribed norms.

In case of 53 polluted river stretches, there is a gap of 1023.26 MLD between sewage generation and treatment. To address the said gap, present status of the proposed STPs was informed as below:

Status	STPs	Capacity (in MLD)
DPR preparation under progress	14	97.30
Awaiting sanction of DPR	15	235.00
Under tendering and/or works to be awarded	20	528.00
Under construction	29	437.86
Total	**78**	**1298.16**

With regard to industrial effluent management in polluted river stretches, it was informed that CETPs of total capacity 83.3 MLD are operational in different industrial estates/areas. To meet the gap of effluent treatment, three CETPs of capacity 2.84 MLD (1 MLD at Satpur in District Nashik, 0.64 MLD at Sangli and 1.2 MLD at Ichalkaranji in District Kolhapur) are proposed, which are still in the initial stages of implementation. MPCB needs to expedite implementation of the proposed CETPs, and also ensure proper functioning of all the CETPs in the State to meet the prescribed norms. In case of solid waste management in the State, it was informed that processing facilities exist for 16037 TPD of municipal solid waste against total generation of 22945 TPD. These include 337 composting plants, 82 vermi-composting facilities, 62 bio-methanization plants, one waste to energy (W to E) plant and 26 RDF plants. Also, 18 landfill sites are presently under development out of 320 sites proposed to cater to solid waste generation from 394 ULBs in the State. For C&D wastes, processing facilities for 5 major ULBs (MCGM, Navi Mumbai MC, Thane MC, Pimpri-Chinchwad MC and Pune MC) are proposed to cater to 2050 TPD of such waste. In case of the project for pollution abatement of river Mula Mutha at Pune under NRCP, concerns were raised on negligible progress. In case of land acquisition for 11 STPs under the project, it was informed that the State Government has allowed construction of STPs in the flood line and thus facilitating land acquisition for 3 STPs at Botanical Garden, Dhanori and Warje. However, land parcels for 4 of the STPs are yet to be acquired by the project implementing agency Pune Municipal Corporation (PMC). In view of tenders invited for the project by PMC on 24th February, 2021, the State Government was asked to ensure immediate possession of land for all the STPs by PMC.

It was also informed that penalty of Rs.29.75 crore was imposed by NGT on BMC for letting untreated sewage into the sea through 85 major outfalls, and to pay Rs.4.25 crore as compensation for environmental damage to CPCB till remedial measures are taken.

In this regard, Chief Engineer, BMC stated that compliance of Hon'ble NGT order is in progress. Colaba STP of 37 MLD has been commissioned in 2020. For other 7 STPs of 2464 MLD, tenders have been invited. Review committee has been appointed for scrutiny of the bids.

Joint Director (WPC), MPCB informed that as Maharashtra was again badly hit by COVID-19, the progress is slow for the ongoing projects since February 2021. The number of ongoing STPs has increased from 21 to 29. Similarly, number of STPs in tendering stage have increased from 12 to 14 of 472 MLD capacity. DPRs for 16 STPs are yet to be approved. Large number of STPs are reported to non-complying with the new standards of BOD 10 mg/l. State has directed to upgrade the existing STPs to achieve the new norms. With regard to action plan for coastal areas in the State, it was informed that District Environment Plan for 21 coastal towns were submitted to CPCB in December, 2019 and the plan is being implemented and being monitored. The State Government was directed to provide update status in the MPRs.

Joint Secretary, Urban Development Department, Maharashtra informed that State had planned implementation of works for bridging the gap of 2000 MLD in sewage treatment. However, due to COVID-19 pandemic and the subsequent financial constraints, the same could not be taken up. Further, projects for additional capacity are being proposed to be sanctioned either under Jal Jeevan Mission or under State scheme within 2022 and they shall be commissioned in 2 years thereafter. State Government is constantly reviewing the on-going projects and 50 STPs of around 900 MLD shall be completed within a year.

On a query from DG, NMCG, the Joint Adviser, CPHEEO informed that guidelines are under consideration for Jal Jeevan Mission (Urban) and are expected to be finalized in the near future.

12. <u>Odisha</u>

Director, NRCD informed that as per CPCB report, sewage generation in the State is estimated at 1273 MLD, whereas the same is reported to be 4200 MLD in the State dossier

forwarded to this Ministry earlier. In case of six major towns in the State (Bhubaneswar, Cuttack, Puri, Sambalpur, Rourkela and Talcher), it was earlier informed as 367 MLD, but now it is reported to be 298.55 MLD. The State Government was requested to reconcile and firm up the data for further discussions. It was further informed that against total sewage generation of 367 MLD from six major towns, sewage treatment capacity created so far is 266.5 MLD with 10 STPs installed in these towns. Meanwhile, with more sewage treatment of 104 MLD and the FSTPs planned for these towns, there would be no gap between sewage generation and treatment. However, the same would not hold good for the State as a whole. Three STPs of total capacity 104 MLD were under construction from the resources mobilized by the State. One STP of 48 MLD at Rokat is scheduled for completion by June, 2021. STPs of 40 MLD at Dhanupalli, Sambalpur and 16 MLD at Mattagajpur, Cuttack were reported to be 93% & 82% complete. The State Government to expedite networking and/or house service connections to ensure adequate inflow to these STPs for their optimal utilization. In case of industrial effluent management, it was informed that the no CETP exists in the State. There are 1030 water polluting industries in the State generating 803 MLD of effluent, and all these units are equipped with ETPs. The State Government needs to ensure compliance of industrial units with the environmental norms and not contribute to pollution load to any of polluted river stretches and/or the recipient water bodies. Regarding municipal solid waste management, it was informed that out of total municipal waste generation of 1772 TPD in the State, waste processing facility (Open dumping, Micro-composting) is available and operational for 853 TPD. For Bhubaneswar and Cuttack, agreement has been signed for setting up 550 TPD centralized Waste to Energy Plant. The State Government was asked to expedite the same in order to ensure compliance to the Solid Waste Management Rules, 2018. Regarding action plans for coastal areas/towns (4 nos) and rejuvenation of Kathajodi river (in its Cuttack stretch) to serve as a model, the State Government was asked to provide/update status in the MPRs.

Member Secretary, Odisha Water Supply & Sewerage Board informed that 5 new STPs are partially commissioned and their related I&D and household connections work is still in progress. STP at Rokat is to be completed by December 2021, STP at Mattagajpur by December 2021 (partially by August 2021) and STP at Dhanupalli by March 2022 (partially by September 2021). It was informed that 53 Septage Treatment Plants have been completed and 65 Septage Treatment Plants are in construction stage.

Secretary, Ministry of Jal Shakti highlighted that from next meeting onwards, in absence of Chief Secretary, the State should be represented by Principal Secretaries of respective State Departments.

13. <u>Goa</u>

Director, NRCD informed that 9 STPs of 78.35 MLD are existing in the State against total sewage generation of 112.53 MLD (based on actual assessment of waste water generation mainly in urban areas, including census towns). Remaining areas including the rural ones, are covered through septic/soak pit arrangement, and thus not requiring designed treatment facilities/plants. Utilization capacity of the STPs remains only 29 MLD and the State needs to expedite house connections. 5 STPs of 35.5 MLD are under construction. 3 STPs of 43 MLD are proposed, but works related to STPs have not yet started due to local issues and only sewer networking is in progress. The State Government was directed to expedite implementation of the ongoing and proposed STPs to meet the timelines set by NGT.

Secretary (Science, Technology & Environment), Goa informed that low capacity utilization (29 MLD) of the existing 78.35 MLD is partly due to 30 years' design period of the STPs and full capacity utilization would be achieved at a later stage only. However, almost all the sewage inflow received at the STPs is being treated fully. STPs under construction at Colva (7.5 MLD), Calangute (5.6 MLD) and Kavlem (15 MLD) were reported to be nearing completion in terms of civil works along with installation of electrical and mechanical equipments. However, their commissioning is delayed for want of house service connections, electrical connections, pumping arrangements and these are expected to be complete by December, 2021 only. With regard to proposed STPs, locals are being persuaded by the State in order to overcome the local issues and to initiate the STP works. In compliance of the directions of NGT, polluted stretch of Sal river (Priority-III) has been identified to be developed as a model to showcase for other identified river stretches. Different conservation works on the said river stretch have been taken up for implementation with the target date of completion as March, 2022. With regard to solid waste management, integrated processing facilities exist only for 150 TPD at Saligao out of total 766 TPD municipal waste generated in the State. The same is proposed to be increased by 200 TPD (100 TPD at Saligao & 100 TPD at Cacora) by December, 2021. State has engaged TERI for further strengthening of EPR policy and has also enacted Plastic Waste Management Act to reduce plastic pollution.

Secretary, Ministry of Jal Shakti stressed that the facilities for integrated solid waste management proposed at Bainguinim (250 TPD) and Verna (250 TPD) need to be expedited to meet the respective timelines.

14. <u>Andhra Pradesh</u>

Scientist E, NRCD informed that there are 43 STPs of 515.85 MLD capacity existing in State. All are reported to be operational and complying with norms. However, 20 MLD STP at Kadapa and 6.5 MLD STP at Pulivendula have been reported to be partially operational**.** There exists a gap of 987 MLD in sewage treatment capacity and 474.07 MLD capacity STPs are under construction, however no significant progress is observed in the ongoing projects. Many of the projects in which works is yet to begin are being reported to be completed by December 2021, which may be verified and realistic timelines may be provided in the MPRs. Details of on-going/ proposed ETPs such as capacity, progress, expected date of completion, etc., need to be reported. Utilization capacity of the existing solid waste management facilities is very low (39%). Tenders have been called for 10 integrated solid waste management plants under PPP Model. Details on other action plans such as ground water regulation, RHW, floodplain & e-flow management, plantation, biodiversity, mining activity regulation, adoption of Model River and action against defaulters have not been provided in the MPRs.

Commissioner cum Director of Municipal Administration informed that for bridging the gap of 987 MLD in sewage treatment, work is under progress for 32 STPs of 474 MLD, which were expected to be completed by December 2021. However, due to financial constraints, work got delayed at few locations. 51.4 MLD STPs are under tendering and for remaining proposals, funding avenues are being explored. Further, it was informed that 64 FSTPs are proposed. Except for 11 FSTPs which are in re-tendering, works are under progress for remaining 53 FSTPs and are expected to be completed by December, 2021. It was informed that 6850 TPD of solid waste is generated in the State and 49 Compost plants are effectively functioning. State is considering adopting the Indore solid waste management model and is proposing to initiate 100% door to door solid waste collection from all households from August, 2021 onwards and is in the process of establishment of garbage transfer stations. 2 Waste to Energy plants have been completed, one at Guntur shall be functional in July 2021 and another one also at Guntur to be made operational within 2-3 months. 72 Integrated

SWM plants are under tendering. It was assured that information from remaining points shall be made part of the MPRs from next submission onwards.

Director General, NMCG pointed out that the State needs to expedite the ongoing projects as the completion timeline of June, 2021 for ongoing STP works has already been exhausted. The delay in commissioning the plants would result in the State being a defaulter for which fines may be levied on the State by NGT.

15. <u>Kerala</u>

Scientist E, NRCD highlighted about the delay in completion of the ongoing projects and that a large number of the projects in the State are also either at proposal/ tendering/ DPR stage and are yet to be grounded. State generates 3472 TPD of waste and there is a gap of 970 TPD in solid waste treatment. To address this issue, 10 Waste to Energy Plants have been proposed by the State, of which 2 plants are under construction, 3 plants are in DPR stage, 3 plants are in tendering stage and 2 plants are in initial stage. State needs to expedite the works of on-going and proposed projects.

Additional Chief Secretary (Environment), Kerala informed that delay in implementation of the STP projects is due to rise in COVID-19 cases. The matter of solid and liquid waste management is being reviewed regularly by Chief Secretary, Kerala.

Additional Chief Secretary (LSG), Kerala informed that delays in project were attributed to local government elections held in December 2020, then assembly elections held in April, 2021 and imposition of lockdown in the State during May-June 2021 due to rise in number of COVID-19 cases. However, during this period, the State Town and Country Planning Department has completed an assessment of the municipalities to identify the scope of requirement of FSTPs/ STPs. Technical assistance was provided by Sanitation Mission to the Local Governments. The assessment was done on the basis of groundwater table, land availability, distance of source from the proposed land, taking up projects and estimation of fund requirements. During this period, initiatives were taken to fast track the projects by bringing in the urban agglomerations and CFC funds into play. It was informed that there would not be any issue of funds, as the Local Governments have fairly good amount of funds and also funds are being covered under World Bank Project for Re-Build Kerala initiative. With regard to the solid waste management projects, it was informed that clearances,

including from coastal zone, are being taken due to which progress seems to be slow. Further, identification of suitable land is an issue, which is being taken up with different State Government Departments. However, a lot of progress has been achieved in segregation of waste and a systematic mechanism has been developed. Around 20,000 decentralized entrepreneur collections units have been engaged for the work. Material collection facilities have also come up in each Local Government. Clean Kerala Company has been engaged and a calendar of action has been prepared, on the basis of which the segregated waste is collected and the recyclables are being recycled through tying up with the recyclers. Result of this systematization will be visible within a month's time. Waste management is a top priority of the State at present.

Member Secretary, Kerala State Pollution Control Board (KSPCB) informed that Board along with State Urban Development Department is preparing updated dossier with regard to sewage management in the State, which shall help in addressing the issue of gap in sewage treatment capacity. As per the water quality monitoring data of the year 2020 (Jan-Dec), 8 rivers seem to have achieved the bathing quality standards and water quality has also improved in other rivers, including River Karamana, which is identified as Priority I river. It was reported that the under construction STP at Medical College, Thiruvananthapuram has been completed. Kerala Water Authority is proposing additional STPs in 28 ULBs and DPRs for the same have been prepared. Regular meetings of RRC are being held to monitor the progress of implementation of the Action Plans. KSPCB is regularly inspecting the industries and appropriate action is being taken against the defaulters. Similarly, other departments of the State are taking necessary actions as per the Action Plans and the direction of Hon'ble NGT.

16. Puducherry

Director General, NMCG directed the UT to provide details on the issue of non- compliance of the existing oxidation pond of 12.5 MLD and status of DPRs with regard to the 2 new proposed STPs of 3 MLD each at Puducherry and Karaikal.

Scientist E, NRCD informed that as reported by UT officials, the oxidation pond is non-complying with respect to the new standards of BOD 10 mg/l but is complying with the earlier norm of BOD of 30 mg/l.

Secretary (Science, Technology & Environment), Puducherry informed that due to increase in household connections the gap in sewage treatment has been reduced. PWD has initiated tenders for installation of online monitoring systems for the existing STPs.

Tenders have been finalized for treatment of legacy waste in the UT and, therefore, the issue of solid waste management in the UT shall be resolved in the near future. UT has submitted Action Plan for Coastal Pollution Management to CPCB. It was informed that out of 98 water polluting industries, 10 industries are found to be non-complying, PCC is regularly following up with them and most of the industries are on the verge of closing down. Steps are being taken for management of floodplain and e-flow and to prevent illegal sand mining in the UT.

Secretary (PWD), Puducherry informed that the oxidation ponds were commissioned in 1980 and were designed as per the old discharge standards (BOD of 30 mg/l). Efforts shall be put in to complying with the new norms of BOD 10 mg/l. Work order for preparation of DPRs for 2 STPs of 3 MLD each have been awarded to WAPCOS, site inspection has been conducted by the team, and efforts are being put in to comply with the timelines.

17. Telangana

Scientist E, NRCD informed that as per State MPR, 17 STPs with a total capacity of 210.4 MLD are under different stages of implementation, of which work is yet to start at 2 locations. Of the 17 STPs, 13 STPs of 80.41 MLD are proposed to be completed before December 2021 and remaining 4 STPs of 130 MLD are expected to be complete by March, 2022. Further, 111 STPs with total capacity of 1915 MLD are proposed.

Director General, NMCG highlighted that there exists a huge gap in sewage treatment capacity of 1861.45 MLD in the State. As informed by the State, the Action Plan for pollution management in Hyderabad is already available, while management of untreated sewage in other ULBs need to be addressed. The non-complying industries need to be closely monitored for ensuring compliance and State Pollution Control Board needs to take strict action against the defaulters. State Government needs to have a plan for monitoring the e-flow in the rivers. E-flow assessment may also be carried out by engaging experienced institutions. It was suggested that a separate session may be organized wherein experts in the field may be engaged, wherein methods for assessment of e-flows in perennial and non-perennial rivers may be discussed upon.

Chairman, HWSSB informed that out of 2750 MLD of sewage generated in the State, 2229 MLD sewage alone is generated in Hyderabad. STPs of 770 MLD are operational and are complying with the norms. Online continuous monitoring systems are in place in all STPs. With regard to the proposed 31 STPs of 1215 MLD (under HAM), it was informed that one package has been successfully tendered and works for 17 STPs have started. This shall address the Hussain Sagar Catchment area and is expected to be completed within 2 years.

With regard to the other 2 packages under HAM, it was informed that a meeting was held in the morning with Minister of Urban Development, wherein it was agreed to sanction projects for 14 STPs of approx. 800 MLD. This shall take care of the River Musi stretch-I. Co-treatment of septage with STP is being taken up and in places not having STPs and sewer network, State is planning to construct FSTPs.

Director General, NMCG appreciated the State's efforts in adopting HAM model for developing sewerage infrastructure and directed the State to document the information and share it with Ministry of Jal Shakti, so that the best practices can be circulated to all the States across India.

With regard to other parts of Telangana, Member Secretary, Telangana State Pollution Control Board (TSPCB) informed that 72 STPs of 315 MLD capacity are proposed, of which DPRs have been prepared for 42 STPs and DPRs are under preparation for 30 STPs. Due to paucity of funds, not much progress has been made. It was also informed that Chief Secretary, Telangana has also requested State Departments to sanction some projects, but due to rise in COVID-19 cases not much progress could be made. Utilization of 6 existing STPs of 116 MLD (along PRS of III, IV & V) is only 36 MLD. There is huge gap in sewage treatment at Dubba Nizamabad, for which funds are being arranged. It was informed that considerable progress has been made in the ongoing 17 STPs, including initiation of works in a number of projects. Further, 374 industries are being monitored online and 84 industries are on ZLD. 47 industries are found to be non-compliant, of which 9 industries were closed and directions were issued to 38 industries. It was informed that sites have been inspected and maps have been prepared for management of flood plains. With regard to e-flow management, State Irrigation Department had informed that due to non-perennial nature of the rivers, assessment could not be taken up. However as suggested by DG, NMCG the State shall look into the technical aspects of the issue. With regard to solid waste management, it was informed that processing facilities shall be established in all 141 municipalities: Works

have been completed in 52 municipalities and works are going on in 75 municipalities. Further, solid waste is being managed in all 12,700 gram-panchayats in the State by creation of compost shed, 100% door to door collections, deployment of tractors for collection of waste and installation of recyclers for management of plastic waste. It was also informed that 71 municipalities are adopting FSSM of total 1565 KLD, out of which works have been completed in 18 ULBs and work in 17 ULBs is in progress.

Director General, NMCG directed the State to go through the document "Urban River Development Plan" prepared by NMCG in collaboration with MoHUA and another document regarding 'Strategic Guidelines for Mainstreaming Urban River-sensitive Master Plans", which are available on the NMCG website.

18. <u>Lakshadweep</u>

Scientist E, NRCD highlighted that the UT should submit Monthly Progress Reports in a timely manner, and Action Plan for Coastal Pollution Management is yet to be submitted to CPCB.

Secretary (Environment & Forest), Lakshadweep informed that MPRs shall be submitted on time by the UT. Draft Action Plan for Coastal Pollution Management has been prepared, but considering the proposed expansion of tourism services in the UT, after consultation with scientific institutions such as NCSCM & NIO, the final Action Plan shall be submitted accordingly within the next 15-20 days. At present, there is only one STP of 24 KLD in the UT. It is now proposed that all commercial tourist establishment in the islands should mandatory install STPs. With regard to marine conservation, UT has already declared 685 sq.km area of lagoons as marine conservation reserves to protect marine biodiversity such as corals. 7 more similar conservation reserves shall be notified and are under approval process. This shall lead to 35-37% of the lagoon area under protected area management. 100% door to door collection and segregation of municipal solid waste is being done and the non-biodegradable waste is sent to mainland for treatment. As of July 2021, this year 358 metric tonnes of waste has been transported for treatment.

19. Gujarat

Joint Director, NRCD highlighted that in the past 6 months, construction of 7 STPs have been completed and 3 news STPs of 98 MLD are proposed to be taken up in addition to the 60 already proposed STPs. Pilot project for treatment through insitu bio- remediation have been taken up at 3 municipalities, and after successful results the same shall be replicated at other locations. Out of 73 existing STPs in the State, 27 STPs are reported to be non-complying and out of 34 operational CETPs, 18 CETPs are reported to be non-complying. State needs to provide status with regard to the action taken to resolve the land acquisition issues for Tapi rejuvenation project. State also needs to expedite the deep sea disposal project, as while the Jetpur tender has been finalized, but for Ahmedabad region decision is still pending. Completion timelines of the under construction STPs need to re-looked and revised timelines are to be provided. State is yet to submit Action Plan for Coastal Pollution Management to CPCB.

Commissioner, Municipalities Administration & Additional Chief Executive Officer-GUDM; Commissioner, Surat Municipal Corporation; Additional Secretary, Forest & Environment Department, senior officers from Ahmedabad Municipal Corporation, Vadodara Municipal Corporation, Gujarat Water Supply & Sewerage Board (GWSSB) as well as other concerned Departments attended the meeting along with Member Secretary, Gujarat Pollution Control Board.

Member Secretary, Gujarat Pollution Control Board informed that out of 27 STPs found to be non-complying, action have been taken against 13 units and show-cause notices have been issued to 14 STPs. With regard to the 18 non-complying CETPs, 2 CETPs are now found to be complying. Show-cause notices have been issued to 13 CETPs. 5 CETPs of the State are under trial run after closure order of the Board. It was also informed that Environmental Compensation of Rs. 21.87 crores has been imposed on the non-complying CETPs and Rs. 13.72 crores has been recovered so far. With regard to Deep Sea Effluent Disposal Pipeline, tender is finalized in case of Jetpur region & work order has been issued. In case of Ahmedabad region, as the final disposal point falls on the upstream of the proposed Kalpsar Reservoir, the matter is under active consideration of Government of Gujarat. Two meetings convened under the Chairmanship of Chief Secretary, Gujarat to find an alternative for disposal of effluent and to discuss the issues in implementation of deep sea effluent disposal pipeline project for industrial areas of Ahmedabad region.

Commissioner, Municipalities Administration & Additional Chief Executive Officer-GUDM informed that some land acquisition issues are pending at Collector office & Revenue Department levels in case of STPs of rural area under Tapi Shuddhikaran project. Same will be taken on priority basis and GWSSB shall start work as soon as the land acquisition issues are resolved. He further added that the STPs are planned in such a way that each & every Municipality will have its own STP to cater to its sewage generation. To improve the sustenance of these STPs, State is implementing solar power provisions in these STPs. In big cities such as Ahmedabad, Vadodara, Rajkot and Surat, considering the future expansion, upgradation of existing STPs and commissioning of new STPs are being taken up.

Commissioner, Surat Municipal Corporation submitted that out of 15 STPs planned in Surat under Tapi Shuddhikaran, 3 STPs have been made operational, work is in progress for 4 STPs and land has been taken possession of and soil investigation is in progress for 6 STPs. Land possession in case of 1st STP is pending and for 2nd STP final approval is pending.

Director General, NMCG appreciated that the Gujarat is a leading State as far as reuse of treated sewage is concerned. He suggested that priority should be given to the Tapi Shuddhikaran which is a project of concern and to sort out the issues as early as possible. Further, it was suggested that State can adopt combination of FSTP + STP models for treatment of sewage.

20. <u>Karnataka</u>

Joint Director, NRCD highlighted the issue of low capacity utilization of the existing STPs (69%). In the past 6 months, slow physical progress has been observed in the ongoing STP projects and progress of almost 23 STPs appears to be stagnant. Out of 141 STPs, 13 STPs have been reported to be non-operational in the State. 251 ETPs have been reported as non-compliant. Physical progress of 55 under construction STPs have not been provided. State needs to provide details of action taken with regard to e-flow management of the rivers and floodplain management.

Principal Secretary (Environment), Karnataka cum Chairman, KPCB responded that legal notices have been issued as per Water Act to the non-complying industries. With regard to the 2 under construction CETPs of 7.2 MLD, it was informed that marginal progress has been achieved, 1.2 MLD CETP at Bidar is nearly 100 % complete and 5 MLD CETP at Yadgir has

achieved 80% progress and shall be made operational in the next few months. With regard to Expression of Interest of 3 proposed CETPs, land and capital issues are yet to be resolved. There is an increase in processing of solid waste in the State from 5800 TPD to 6200 TPD. State has submitted Action Plan for Coastal Pollution Management to CPCB in the first week of July, 2021. With regard to the low utilization capacity of the existing STPs, it was informed that houses are not connected to the main sewer line and sufficient tools are not available to take coercive action against the defaulting houses. Out of the 13 STPs which were reported to non-operational, 3 STPs have been made operational. With regard to the 251 non-complying ETPs, an expenditure of Rs. 5.6 crore has been made to resolve the issues and improvement in compliance status are expected to be reported soon. Out of 55 under construction STPs, physical progress has improved in 40 STPs.

ED (Tech) NMCG pointed out that completion timeline for the ongoing projects needs to be reviewed as many of the STPs in progress still shows completion timeline of February/ March 2021.

Director General, NMCG directed State to provide adequate information in the MPRs and re-iterated that completion timeline of NGT has been exhausted, State may request NGT for any relaxation in timeline.

21. <u>Tamil Nadu</u>

Joint Director, NRCD highlighted that data for sewage generation increased from 3729.16 MLD to 3786.16 MLD as per the latest MPR. 4 CETPs are reported to be non-complying. 37 STPs in the proposal stage are observed to be progressing very slowly despite the gap in treatment capacity of 1400 MLD. Out of 45 under construction STPs, incremental progress of 17 STPs is held up from past 6 months and work for 1 STP has yet not started. State needs to ensure timely submissions of MPRs and compliance status with regard to the decisions taken in the meeting. 28 STPs are still in DPR stage along PRS, which need to be expedited. Action Plan for Coastal Pollution Management is yet not submitted by the State to CPCB.

Principal Secretary (Environment, Climate Change and Forests), Tamil Nadu stated that due to rise in COVID-19 cases and recent lockdown imposed in the State, slow progress of under-construction STPs have been reported. Further, it was informed that Action Plan for Coastal

Pollution Management has been already submitted to CPCB and approval on the same has been received from CPCB.

Representative from Municipal Corporation, Chennai informed that due to Covid-19 pandemic, there is delay in progress of the ongoing STPs. In case of Solid Waste Management, out of total 135 TPD of solid waste generated in Chennai, 28 TPD of waste is processed and by October 2021, remaining waste shall also be processed.

ED (Tech), NMCG highlighted that industries happen to be the major concern for the State. 10 CETPs of 41 MLD are proposed and DPRs for these have been forwarded to GoI for funding. In absence of these CETPs, regulation and compliance of the industries is questionable, hence this issue needs to be looked into at the State level and status may be reported.

Director General, NMCG raised serious concern over little progress with regard to the 10 proposed CETPs and the major challenge of compliance of the industrial units.

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22. <u>Andaman & Nicobar</u>

Joint Director, NRCD highlighted that MPRs are not being received regularly and incremental progress of the under construction STPs is not provided. UT needs to take necessary action against 27 non-complying STPs and 15 non-complying ETPs. UT is yet to submit Action Plan for Coastal Pollution Management to CPCB.

Secretary (Department of Science & Technology), Andaman & Nicobar informed that number of operational STPs has increased by 8 in last few months and number of complying STPs has also increased to 32 and number of non-compliance STPs has reduced from 51 to 25. With regards the remaining 24 STPs, notices have been issued to 9 STPs and these are expected to comply within 10 to 15 days, and notices will be issued to rest of the 15 STPs within 7 days. Inspections have been completed and by end of July/August captive STPs will be complying. FSTP in Port Blair is 90% complete and only installation of machinery is required, which got delayed due to rise in Covid-19 cases. In case of decentralized STPs, tendering process has been completed and will be awarded soon. These STPs shall be completed within next two years. With regard to the industrial pollution management, it was informed that there are around 700 industrial units of which only 36 units require ETPs. 21

units have ETPs installed, 6 units have closed down and show cause notices have been issued to the remaining 9 units. It was informed that there is little confusion with regard to solid waste management data. It is estimated that 121 TPD of solid waste is generated and around 50 TPD of waste processed. However, as per the Municipal Corporation, 90 TPD of waste is generated and the entire waste generated is being treated. Action Plan for Coastal Pollution Management will be submitted by mid-July 2021. National Institute of Ocean Technology has already conducted survey and study in and around Port Blair. The remedial measures will be decided in the meeting to finalize the coastal rejuvenation plan in July itself.

DG, NMCG appreciated the efforts being put in by the UT Administration and suggested that proposed and on-going projects should be closely monitored to avoid any delay in the works. It was suggested that details of the marine parks can be shared along with the MPRs so that the same can be made part of the quarterly submissions to NGT.

23. Bihar

Senior Environmental Specialist, NMCG informed that 2 mission visits have been done in December 2020 and March 2021. It was informed that along polluted river stretches other than river Ganga, DPRs for towns of Raxaul, Jogbani, Harinagar & Nakatiaganj are yet to be sanctioned and funds to be tied up by the State Government. Along river Ganga, revised DPRs for Manihari, Teghra, Dighwara & Jamalpur are awaited. With regard to network projects, permissions from RCD, PMC, NHAI & Railways are pending. For removal of pipes from Beur & Saidpur, permission from PMC is also pending for a long time. Land NOC is pending for IPSs at Maner, Sultanganj & Digha. It was further informed that land NOC for Bakhtiyarpur has been received. For under tendering projects, it was informed that 6 projects were under tendering out of which work has been awarded for Hajipur, financial bids have been opened for Kahalgaon project. For Khagaria project, necessary guidance has been given by NMCG and financial bid is expected to be opened soon.

Managing Director, BUIDCO informed that DPRs for Dighwara, Manihari, Teghra, Dehri & Arval towns have been submitted to NMCG. DPRs for Narkatiaganj, Jogbani & Ramnagar have been received from NEERI, which is under examination at BUIDCO and shall be sent to NMCG within a week. The DPR for Harinagar shall also be sent to NMCG by next week. The DPR for Raxaul has not been prepared by NEERI as field survey could not be done due to COVID restrictions. The land NOC for Maner & Fatuah is under progress. However, land

NOC for Digha has been received and work has commenced. With respect to land issue for Sultanganj, it was informed that site visit was carried out along with officials of NMCG and it was observed that the project can be completed without construction of IPS.

Director General, NMCG requested State officials that after site verification, the component of IPS may be removed and the Sultanganj project should be completed early. State was directed to expedite the ongoing projects sanctioned under Namami Gange and was directed to avoid delays in completion of the projects. State was also suggested to look for alternate funding options for newly proposed projects and to go for FSTPs for smaller towns rather than constructing STPs. The issue of utilization of assets created under RFD, Patna was also raised and State was requested to develop the same.

ED (Projects), NMCG indicated that critical issues pertaining to ongoing projects needs to resolved for timely completion of projects.

ED (Tech), NMCG highlighted that State had informed that floodplain demarcation is not possible along rivers. Engineer-in-chief, WR Department informed that a scientific study has been initiated and a report shall be submitted soon to NMCG.

24. <u>Jharkhand</u>

Senior Environmental Specialist, NMCG highlighted that 452 MLD sewage is generated in the State for which 15 STPs of 103.55 MLD exist. Further projects of 92.5 MLD capacity are under construction. Slow progress has been observed in the ongoing STP project of 36 MLD at Aditypur. With respect to Rajmahal project, it was informed that the STP works have been completed, but the last mile sewer connections are in progress. Trial run for the STP has commenced by connecting 1 SPS. With regard to proposed projects, Phusro project is under tendering and bids have been received. Dhanbad, Ramgarh & Mango are yet to be awarded.

Director (SUDA), Jharkhand informed that due to land disputes not much progress has been made at Adityapur STP and 37 MLD STP at Ranchi has been re-awarded. Rajmahal STP is under trial run. It was further informed that 10 bids have been received for Phusro and works will be awarded within a week. Regarding Dhanbad & Ramgarh project, it was informed that CSR funding is sought from DVC & BCCL but response is awaited. With regard to bioremediation/ in-situ remediation proposed at Chas, Ranchi and Mango, DPRs are yet to be received from NEERI. State has developed Integrated Liquid Waste Management Plan, as a

part of which FSTPs are being installed in 26 ULBs having population less than 50,000. Works are in progress for 4 FSTPs, 4 FSTPs are under tendering and DPRs are being prepared for 15 FSTPs as per the guidelines of Jal Jeevan Mission and Swach Bharat Mission 2. With regard to solid waste management, it was informed that out of 36 MSW processing plants proposed, works for 31 plants have been sanctioned and 5 plants are yet to be sanctioned. Floodplain maps for River Ganga has been prepared by State Water Resources Department and for remaining stretches, Consultants have been hired. Feasibility Report has been prepared for development of a Bio-diversity park at Sahibganj.

Director General, NMCG directed State to operationalize the Rajmahal STP at the earliest and requested State to share copy of Integrated Liquid Waste Management Plan.

25. <u>Chhattisgarh</u>

Senior Environmental Specialist, NMCG informed that total sewage generation in the State is 600 MLD. 3 STPs of 73 MLD capacity have been completed, but the capacity utilization is around 6 MLD only. 6 STPs of 238 MLD capacity are under construction. However, very less progress has been achieved since last review meeting due to pandemic. It was further informed that for better capacity utilization, focus should be on house service connections. Work has been awarded for Kanker, Dhamtiri, Simga, Nawapara & Rajim. However, further details has not been provided with regard to these STPs. With regard to the 35 MLD STP proposed at Korba, the issue of treated water by NTPC is pending since 1.5 years and needs to be resolved urgently by State. It was further indicated that all FSTPs in the State have been constructed and working.

Chief Secretary, Chhattisgarh informed that all efforts are being made for improving capacity utilization and ensuring timely completion of ongoing projects. It was further clarified that for the proposed 6 projects, the works have been awarded to the contractors. Delay in these projects is mainly due to recent lockdown that was imposed in State and owing to heavy rainfalls during monsoon. However, some progress in these 6 STP projects have been achieved.

Additional Chief Secretary (Housing & Environment) informed that NTPC is agreeing to reuse the treated water, but the issue with regard to cost of purchase of treated water is yet to be resolved and requested NMCG to intervene for resolving the issue at the earliest.

Director General, NMCG informed that the matter shall be pursued with Ministry of Power and further requested the State to formulate a policy for reuse of treated waste water.

ED (Technical), NMCG raised the issue of recent fly ash breach incident reported from the NTPC Power Plant and ACB India power plant in Korba causing environmental damages. As the site is in the catchment of Priority IV River Hasedo, State Government was requested to submit a report in the matter. Member Secretary, Chhattisgarh Environment Conservation Board informed that action was taken by the Board immediately after the incident was reported and agreed to provide the report.

26. <u>Uttar Pradesh</u>

Senior Waste Management Specialist, NMCG informed that out of 106 existing STPs, 3 are non-operational. 37 STPs are under construction out of which 3 STPs (Ramana, Ramnagar & Chunar) have been completed and are under trial run. In addition, 25 STPs are proposed out of which (i) concession agreement has been signed for STPs at Ghazipur & Mirzapur and (ii) the financial bids for Bareily STP have been opened & likely to be awarded soon followed by execution of concession agreement. The gap in sewage treatment of about 677 MLD is proposed to be met by construction of FSTPs. No DPR has yet been finalized/ proposed by the State on one of the major town on Ganga main stem (Pandit Deen Dayal Upadhyay Nagar). With respect to progress of on-going STPs, it was informed that all projects are progressing and progress needs to be expedited. 2 projects at Moradabad & Lucknow are still sub-judice. The DPR for GH Canal project at Lucknow is pending for approval from AMRUT. The contracts for 2 on-going projects at Balia & Pratapgarh were terminated. For Balia project, the State is yet to take further follow up action, while for Pratapgarh project NMCG has communicated its observations to State for DPR revision. In addition, NMCG has provided its NOC for Farrukhabad project, but the State has not yet awarded the work.

With respect to industrial pollution, there has not been any significant change. Out of 7 existing CETPs, 5 are complying whereas 2 CETPs of Mathura & Jajmau are still non-complying. 2 CETPs at Unnao & Banther are under rehabilitation whereas another CETP at Jajmau is under construction.

In respect of Municipal solid waste, there has been very minimal improvement. The deadline for operationalization of plant at Fatehpur has been shifted to March 2022 from June 2021. In

addition, the deadline for operationalization of 7 plants at Sambhal, Badaun, Mirzapur, Ballia, Rampur, Jhansi & Rampur have also been revised to March 2022 from October 2021. The land issues for 8 SWM plants at Bareily, Firozabad, Loni, Nazibabad, Bhadoi, Basti, Gorakhpur & Akbarpur are still unresolved. 37 new proposed plants are expected to be operational by March 2022.

It was further informed that State Govt. has notified Ground Water (Management & Regulation) Act. Further, State has taken up rejuvenation of small rivers & ponds. Work is in progress for 20 small rivers. Work related to flood plain notification for Hindon, Yamuna, Varuna & Gomti rivers is in progress. Sites have been identified for Bio-diversity parks and project proposals are under preparation. E-flow for Kannauj-Unnao stretch is being maintained as per CWC directions. E-flow for Ghagra, Rapti, Ramganga & Saryu rivers have been decided, however the requisite notifications are yet to be issued. E-flow for Yamuna, Ganga (Unnao- UP border) & Betwa is yet to be decided.

Managing Director, UPJN informed that out of 6 non-complying STPs, 3 projects at Mathura are under rehabilitation and 2 projects are expected to be completed by August 2021. The permission from Railway for Banda project has been received in June 2021 and the project is expected to completed by December 2021. The capacity of non-functional STP at Sultanpur is augmented to 10 MLD (existing 5 MLD) and work is expected to be completed by November 2021. Regarding excess flow in Ramana STP, it was informed that flow from storm water drain and newly developed areas is reaching the STP which is under audit and a report shall be shared at the earliest. For Moradabad project, the matter is pending in High Court. It was informed that the matter is being followed up by Senior advocate and at local level also it is being pursued. Regarding Lucknow project, the next date for hearing has been scheduled in 3rd week of July.

DG, NMCG requested to involve a senior advocate and get the matter resolved.

Regarding GH Canal project at Lucknow, it was informed that the project has been awarded and work has commenced. For Balia project, the comments of UPJN has been communicated to SMCG on 6th July 2021. The LoA for Bareily project is expected to be issued within next 15 days. The technical evaluation for Kairana project is under process. It was further informed that the land for Pandit Deen Dayal Upadhyay Nagar has been made available and DPR shall be prepared/ submitted shortly.

Director General, NMCG requested to ensure timely completion of 7 STP projects which are in advanced stages of construction.

ED (Tech), NMCG raised the issue of waiver of penalty imposed by UPSIDC for development of park in Farrukhabad textile CETP and requested State to look in to the matter for early resolution.

27. <u>Rajasthan</u>

Senior Waste Management Specialist, NMCG informed that since the last review meeting, 3 additional STPs have become operational taking the total to 94 functional STPs. However, the capacity utilization has not changed significantly and remains at approximately 65%. There has been significant improvement in performance compliance of STPs. Previously, 45 STPs were reported non-complying, but now only 17 STPs are non-complying, out of which 7 are under upgradation. 11 CETPs out of 14 are still non-complying. No progress had been reported on 31 STPs under construction since last review meeting. Municipal solid waste processing remains at 41% and no progress has been reported on under construction/ tendering projects. Land issues for 2 STPs in Jaipur and Bhiwadi were indicated and no progress for 2 STPs at Hanumangarh has been reported. STP at Nokha has been completed, but it has not been made operational. The progress of Nawalgarh STP has not been indicated in the MPR. It was further informed that there are large number of STPs which have achieved a progress of more than 90% and the completion timelines are being increased by 2-3 months. State was requested to look in to the matter for early and timely completion of these projects.

Chief Engineer, Rajasthan informed that since last review meeting, 4 new STPs (Fategarh, Sanwar, Jhunjhunu & Suratgarh) have been made operational. Out of 65 ongoing projects, 16 projects are expected to be completed by September 2021, another 16 projects by March 2022 and remaining projects are scheduled for completion in a phased manner by 2025. The capacity utilization has reduced from 69% to 65% due to dismantling of existing STP at Delawas and it is under upgradation. Regarding non-complying STPs, it was informed that out of 39 non-complying STPs, 15 STPs are now complying and out of remaining 24 STPs, 7 are under upgradation under various schemes which will be completed by December 2022. 8 STPs at Salawa, Jaisalmer, Jhalor, Churu, Jhalawar, Pali, Rajsamand & Bikaner are on old technology and need upgradation. The funding for these STPs is yet to finalized either under

SBM II, any new scheme of 15th Finance Commission or any other scheme. The Consent to Operate for 8 non-complying STPs at Ajmer, Bhalotra, Didwana, Fatehpur, Jaysinghpore, Makwana, Nimbada & Kushalgarh has been applied. The STP at Nokha, which is not functional, is proposed for refurbishment under RUIDP Phase IV by adding 2 STPs of 4 MLD and 7 MLD capacity to cover the complete town. Regarding monitoring mechanism of STPs, the work has been awarded to the consultants and it is expected that the portal & application will be developed for trial run by 15th August 2021. Regarding legal issues of Hanumangarh STP, it was informed that it has gone into arbitration and any further decision shall be taken after conclusion of arbitration. Regarding Bhiwadi STP, it was informed that the project is held up due to public agitation and next date for hearing has been sought. Regarding house service connections, it was informed that a progress of 1.22% has been achieved since last meeting. Municipal SW processing has increased from 38.5% to 41.36% as 2 new processing plants and 6 new MRF have been commissioned.

ED (Tech), NMCG raised the issue of non-complying CETPs and requested State to make them compliant. Chief Engineer, RSPCB informed that presently there are 15 CETPs. 3 CETPs do only primary treatment and feed to Pali CETP, hence there are only 12 CETPs operational. Out of these, 6 are complying whereas 5 are non-complying. 6 complying CETPs are working on ZLD and remaining 5 CETPs are being upgraded to ZLD. State was requested to furnish details of monthly progress of CETPs.

28. <u>Uttarakhand</u>

Member Secretary, Uttarakhand Pollution Control Board informed that with completion of 2 new STPs, the number of existing STPs in the State has increased to 66. All the STPs are found to be complying with the norms. For 5 under-construction STPs, the agency has been directed to complete the construction works by December 2021 and upon completion of these additional 52 MLD will be added to the existing capacity. 3 CETPs existing in the State are complying. 24 industries are yet to be connected to CETP at Pantnagar and shall be connected by December, 2021. These 24 industries are found to be complying with the norms. Stricter norms are being finalized for 3 CETPs in designing phase. DPR has been prepared and submitted for co-treatment of septage in STPs at Haridwar, Rishikesh, Devprayag and Srinagar. State is preparing Byelaws for Septate Management. With regard to solid waste management, it was informed that out of 91 ULBs in State, DPRs have been

approved for 88 ULBs and sent to Government of India. 550 tonnes of SLF is operational at Haridwar and Dehradun. State is exploring possibilities of establishing Waste to Energy plants. It was informed that in 400 kms along the Ganga river stretch in floodplain zone has been notified. Some encroachment in floodplain has already been removed and some more is being removed. Afforestation works and wetland conservation along the floodplain is being taken up. Further, it was informed that out of 52 hydro projects in the State, in most of the projects e-flows are being maintained.

Director General, NMCG highlighted that NMCG receives a number of representations on solid waste being dumped in Uttarkashi, which is an eco-sensitive zone. Therefore, State may develop solid waste management facilities in consultation with experts in the field.

29. <u>Delhi</u>

Director (Technical), NMCG informed that the estimated sewage generation in the Delhi is 3,273 MLD, for which 35 STPs of 2715 MLD are in operation. The utilization capacity is reported to be 2,444 MLD (90%). The status of sewage generation and existing STPs remains the same. No samples have been taken from STPs due to lockdown, but earlier only 9 STPs out of 35 STPs were reported to be complying. For CETPs, no samples could be taken for monitoring due to lockdown, but earlier all 13 CETPs were reported to be non-complying.

Director General, NMCG directed the State to provide information on the status of ongoing projects such as Coronation Pillar, STP Projects under YAP-III, issue of tree cutting, non-compliance of CETPs, other bottlenecks in implementation of the on-going projects. It was highlighted that benefits of the completed projects cannot be achieved without completing the entire project. Further, it was suggested that works at STP sites should continue during the monsoon period in order to avoid delay in execution of the project.

CEO, Delhi Jal Board informed that the obstacles with regard to the on-going projects are being overcome, every month detailed review is being taken by Delhi Government, which has resulted in considerable progress in the projects. 9 STPs are meeting the new parameters of BOD-10mg/l and TSS -10 mg/l. 21 STPs are complying with the design parameters of the respective STPs (BOD-20mg/l, TSS- 30mg/l) and (BOD-30mg/l, TSS- 50mg/l). DJB has planned for upgradation of these STPs at design parameters of BOD-10 mg/l and TSS -10 mg/l by adding chemical dosing, more aeration and addition of filters, etc. Earlier 5 STPs

were not meeting the design parameters due to poor O&M. Now in these STPs, works such as repairs of aerators, disc filters etc are being completed and these plants (Keshopur, Kondli etc) will be rectified through dosing and enhanced aeration to meet the design parameters by December 2021. Further, it was informed that a significant progress has been achieved in the on-going STP projects despite tough conditions due to rise in Covid-19 cases and efforts are being made to complete the projects as per the committed timelines. Presently, there are no issues remaining with regard to tree cutting permission, and the permission only for Kondli Phase II is under process and is expected by next month. However, Phase II project at Kondli will be commence after October 2021. The physical progress in Kondli, Rithala and Okhla are 62%, 47% and 34%. With regard to 318 MLD Coronation Pillar STP, 50% capacity has been made operational in March 2021 and 50 MGD flow has been taken in for optimization of different parameters and the STP is scheduled to be 100% complete by September, 2021. It was ensured that there is no hindrance regarding any type of statutory permissions in construction of STP projects and all committed timelines will be achieved. All payments have been done to all vendors on weekly basis and separate accounts for separate projects have been set up. Further, efforts are being put in to complete the 3 STP projects at Kondli, Rithala and Okhla by December, 2022.

Special Commissioner (Industries), Delhi informed that there is no plan for closure of CETPs and NEERI has been engaged for improvement of performance of CETPs. NEERI has proposed two types of plans - Short term plan and Long term plan. Short term plan is for removal of large amounts of sludge deposited. The TSDF site for hazardous waste is going to start soon and accordingly all sludge will be moved to TSDF site and performance of CETPs will improve. Long term plan is for upgradation of CETPs. Recently NEERI has given options for upgradation of 3 CETPs, which is under examination. Accordingly, instructions will be given to the all CETP societies for upgradation of CETPs at the earliest. It is also suggested that DPCC has to notify the outlet parameters for industries which are permissible as per inlet norms for CETP. Further, as some of the effluents are being discharged into the storm water drains, therefore on pilot basis it was proposed to treat wastewater in a drain from Wazirabad in the CETP. However, NOC from DJB is awaited in this regard.

ED (Tech), NMCG stated that NEERI has taken too much time in technical appraisal for upgradation of CETPs. Recently DPCC has given directions to all 13 CETPs for ensuring compliance to the norms, else these CETPs need to be closed down.

Director General, NMCG highlighted that since the beginning of monitoring by CMC in January 2020, same status has been reported with regard to upgradation of the CETPs. Industries have to follow the norms. Unless the closing down of the member industrial units of the CETPs takes place, no improvement of CETP performance is possible. It was suggested that NEERI should complete the study in a time bound manner.

ED (Tech), NMCG further highlighted that the flow of approx. 1000 MLD of untreated sewage from Maharani Bagh Pumping station through Kalindi Biodiversity park is being discharged into Yamuna River. DJB needs to review and take action in this matter and submit report to NMCG.

CEO, DJB informed that 13 out of 18 drains have been trapped. The discharge may have been reaching the river through un-sewered areas. DJB has plan to lay the sewer lines in un-sewered areas. However, to address the issue of pollution, STPs at the mouth of drains were proposed for Barapullah Drain as well. But due to unavailability of land, the project could not be taken up. DJB has made a plan to pump the flow of Barapullah drain to Okhla STP. ISP is also commissioned which will take care of Najafgarh, Supplementary and Sahadara drains after completion of STP projects in Dec 2022.

Due to connectivity issues, response from Member Secretary, DPCC could not be properly heard and he was directed to submit written information. As per the information submitted by DPCC, following Action has been taken by DPCC against the CETPs and water polluting industries/ units in the 17 Industrial Areas connected to 13 CETPs:

(i) Action against CETPs

DPCC had issued Show Cause Notices on 05.04.2021 to 10 CETP Societies and 2 Operators of CETPs at Narela & Bawana for Imposition of Environmental Compensation (Total EC amount is Rs. 12.05 Crores) for not meeting the prescribed standards in the period February, 2019 to February, 2021. Replies were received w.r.t said Show Cause Notices and after considering the replies, Environmental Compensations (Total EC amount of Rs. 12.05 Crores) has been imposed by DPCC on the 10 CETP Societies and 2 Operators of CETPs at Narela & Bawana on 07.07.2021.

(ii) Action against Water Polluting Industries/ units

DPCC has issued directions for closure to 1065 water polluting industries/ units in the 17 industrial areas connected to the 13 CETPs in first week of July, 2021.

30. Haryana

Director (Technical), NMCG informed that the State generates approximately 1,375 MLD of sewage, against which 152 STPs of 1803 MLD exist, which are being utilized at 1081.9 MLD capacity. Out of these 18 STPs are reported to be non-complying (9 in Yamuna catchment and 9 in others).

ED (Tech), NMCG highlighted that even though Haryana has adequate sewage treatment capacity, even then the drains in the State have high BOD. There is deficiency in sewage treatment capacity in Faridabad and STPs are under-construction. Two big drains - Gauchi and Buddia carry large quantity of sewage and discharge into River Yamuna. Further it has been reported that all CETPs are compliant, but based on site visit by NMCG team, CETPs were found to be non-complying. There have been repeatedly large number of cases related to unauthorized sand-mining in Yamuna Nagar.

Member Secretary, Haryana State Pollution Control Board (HSPCB) informed that with completion of 3 STPs, Haryana now has 155 STPs of 1823 MLD. There is deficiency in sewage treatment capacity in Faridabad but construction of new STPs is under progress and there is no issue of fund availability for these projects. All STPs in Ghaggar are complying and 18 STPs are non-complying in Yamuna and other areas. HSPCB has issued directions to all STPs to adopt new norms of BOD 10mg/l. HSPCB will take the action against the non-complying STPs. Centralized online monitoring systems have been installed in STPs, CETPs and industries for compliance monitoring. Most of non-complying STPs are defaulters as they are not meeting Fecal coliform norms. Chief Secretary, Haryana recently directed to upgrade all STPs to meet FC norms. Most of the ongoing STP projects are scheduled to be completed by Dec 2022. It is confirmed that performance of CETPs is a serious problem. Integrated Drain Monitoring Committee (IDMC) is monitoring CETPs independently. Ground Water Authority in Haryana has been constituted for groundwater regulation. Treated Waste Water Policy has been notified by the State, wherein it is proposed that 50% of the treated water shall be reused by 2025 and 100% reutilization by 2030. Septage Management Policy is being implemented by the ULBs and through tankers the septage is being treated in nearby STPs. Further, it was informed that the matters are being seriously

looked in by the State Government and Chief Secretary, Haryana is closely monitoring the issues. Sonepat STP is under- utilized due to non-completion of household connections, which are under-progress.

31. <u>Himachal Pradesh</u>

Director (Technical), NMCG informed that as per the data submitted by the State, water quality in 7 polluted river stretches is seen to be improved. Out of 65 existing STPs, 7 are reported to be non-compliant. Baddi CETP is now reported to be compliant. Kala Amb CETP was to be completed by December 2020, and the progress of the same is to be reported. Timeline of the 2 MLD CETP at Paonta Sahib is to be provided. Further, it was highlighted that River Kanan, after confluence with River Sirisa, reaches River Satluj and is carrying pollution load downstream to other States. Therefore, the State needs to have a rejuvenation plan for this river.

Member Secretary, Himachal Pradesh Pollution Control Board (HPPCB) informed that Kala Amb CETP is expected to be completed by August, 2021. With regard to gap in sewage treatment, 29 STPs are under-construction and 31 STPs are proposed, which are expected to be completed by 2022. With regard to CETP at Paonta Sahib, funding arrangement is yet to be tied up. It was also informed that the stretch with regard to river Sirsia is being addressed by CETP Baddi and HPPCB is closely monitoring the industries and the CETP in order to prevent pollution of river.

32. <u>West Bengal</u>

Director (Technical), NMCG informed that there are 17 polluted river stretches, of which 12 rivers stretches falls on priority IV (Damodar, Kansi, Jalangi & Mathabhanga) & V (river Barakar, Silabati, Rupnarayan, Dwarkeswar, Mayurakshi, Kaljani, Karola & Teesta). State has informed that 70%-80% pollution abatement work of these rivers (Kansi, Jalangi, Silabati, Rupnarayan, Dwarkeswar & Kaljani) have been completed and in the subsequent months 100% work will be completed. Due to these interventions, quality of water will be improved in particular stretches. In the ongoing projects, State has made significant progress except in Ghusighata STP work wherein 170 MLD STP is proposed. Work for Churni project was awarded, but it is yet to start. With regard to industrial pollution, CETP Module no. 5 has

been stabilised and operation started in Jun 2021. Module no. 6 is in the stage of stabilisation and is expected to start functioning by Aug. 2021. Civil construction of Module no. 7 & 8 is complete and trial run will be started within Aug. 2021. Thus all the CETPs will be completed in Aug 2021 and after completion of these CETPs, water quality of River Vidyadhari which is in priority –I is expected to improve.

Principal Secretary (Urban Development), West Bengal informed that it was proposed to install a 170 MLD STP at Ghusighata earlier. However, State Environment Department did a study on low cost treatment technology which is being used in the East Kolkata Wetland (EKW), wherein around 910 MLD of sewage is naturally treated. Ghusighata is in the downstream of EKW and simultaneously UDD engaged IIT, Kharagpur for condition assessment. IIT prepared a feasibility study report and suggested that improvement in water quality of the proposed STP in Ghusighata shall be insignificant and instead suggested to control the pollution at the source itself. With regard to River Vidyadhari, which is surrounding to Kolkata, it was informed that the river comprises of 3 small rivers basically - Kestopur Khal, Noyai Khal & Bagjola Khal. IIT suggested to install STPs in the ULBs that are polluting the river. Therefore, State has planned one 41 MLD STP for Kestopur Khal amounting to Rs. 247 crore. Apart from this, second major source of pollution in Vidyadhari river is from Bagjola Khal and to intercept the flow of Bagjola Khal, 10 STPs of total capacity 246 MLD are at DPR stage. The funding of the project is planned under State sector. For Noai Khal, Feasibility Study is being done by IIT-Kharagpur and the preliminary report has been submitted. STPs are proposed at Barasat, Dumdum, Madhyamgram, North Dumdum, Rajarhat –Gopalpur, New Barrackpore. Land identification is going on to address the discharge to Vidyadhari through Noai Khal from above mentioned ULBs. Similarly, the part of Vidyadhari chain is New town of Kolkata, wherein another 24 MLD STP capacity has already operationalized. State is also constructing solid waste collection facility on all the major drains and outfalls falling into Kestopur, Bagjola & Noai Khals. So rather than making one STP at Ghusighat, State now plans to make 18 STPs in different localities so as to catch the pollution at the source. Further, it was informed that State has operationalized 3 new Electric Crematoriums and 7 Ghats during the month of April 2021 and May 2021. State also has started constructing 24 new crematoriums and another 6 are in pipe line. CPCB has developed a Mobile App namely 'STP Monitoring App,' where the static and dynamic data of all the STPs are getting digitized. So far, 12 STPs of West Bengal have been digitized

through this App and rest will be connected in next 3 months. West Bengal has taken up Karola river as a Model river having 47 number of outfalls and 100% works completed. The proposed works with regard to the river Kansi and Jalangi have been completed and works are proposed to be completed soon in 3 rivers. Further, State shall be sending documents to CPCB for de-listing of rivers from the polluted river categorization. With regard to low cost treatment technology, State plans to install one FSTP in each district of West Bengal by next one year. Works related to Solid Waste Management in 12 model towns are to be completed within one year. No legacy waste is found dumped within 1 kms of rivers. Scientific solid waste processing has started in 21 ULBs. Massive planation of trees started in 7 non-attainment cities by State Forest Department. With regard to issues in projects proposed at Asanol and Durgapur, DPRs have been submitted and land acquisition is also being pursued. NMCG was also requested to provide assistance in obtaining land from ECL and DBC. With regard to issues in Bardwan project, a meeting was held with District Magistrate and local district authorities for resolving the issues and a comprehensive study is being carried out to understand if the project can be completed with minimum cost. With regard to Tolly Nallah, it was informed that all documents have been submitted. With regard to Churni river, it was informed that bio-remediation works have started and the work of STP is yet to start as there have been some queries by the Finance Department. This is expected to be resolved within 10 days. Further, it was informed that DPRs for Garden Reach-Keorapukur were submitted in April 2021 to NMCG and response is awaited.

Director (Technical), NMCG informed that Final Technical Bid Evaluation Report for Tolly's Nullah Project has been submitted to the World Bank along with the observation of NMCG on 23.06.2021 for approval. Bid validity has been extended up to 31.08.2021 by World Bank. It was requested that State may replicate the mechanism adopted by the State to rejuvenate the model river - Karola, in other rivers as well. With regard to the DPRs for Garden Reach-Keorapukur, it was informed that certain observations with regard to upgradation of recently upgraded STPs were highlighted to the State officials in the previous review meeting of the State.

Director General, NMCG informed that a separate review meeting shall be held with the State to review the progress of the projects and for discussion on the issues in the proposed projects.

33. <u>Madhya Pradesh</u>

Director (Technical), NMCG informed that State has made good progress and 11 new STPs (including big STP at Gwalior, Bhopal) have been completed and now there are 37 STPs of 1030 MLD existing in the State. There is increase in capacity utilization of STPs (629.16 MLD). As the projects are sewer network with STP projects, State may also report about the status and progress made in house-sewers connections in the MPR. River Khan has been adopted as Model River and recently a lot of appreciations has been received in media with regard to improvement in ecology and biodiversity of the river. As per the data provided in the MPR, water quality in rivers, except at Nagda, appears to be good. Compliance status of STPs and CETPs may also be provided by the State.

Director General, NMCG appreciated the progress made by the State and enquired about the household connections.

Deputy Secretary (Urban Development Department), Madhya Pradesh informed that out of 16 lakh house hold connections proposed for all the STPs, 6.5 lakh household connections have been made. The household connections are part of the contracts with the contractor and later on residents shall be charged accordingly.

Director General, NMCG concluded the meeting and suggested NMCG to organize a Webinar before the next meeting of CMC, wherein best practices can be shared with the States.

The meeting ended with thanks to the Chair.

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Annexure-I

List of participants:

1. Shri Pankaj Kumar, Secretary, Ministry of Jal Shakti – *in Chair*
2. Shri Rajiv Ranjan Mishra, Director General, NMCG cum Project Director, NRCD
3. Shri Ashok Kumar Singh, Executive Director (Projects), NMCG
4. Shri D.P.Mathuria, Executive Director (Technical), NMCG
5. Shri Brijesh Sikka, Senior Consultant, NMCG
6. Dr. Pravin Kumar, Director Technical, NMCG
7. Shri A.Sudhakar, Additional Director, CPCB
8. Shri J.C. Babu, Additional Director, CPCB
9. Shri V.K.Chaurasia, Joint Adviser, MoHUA
10. Shri J.B.Ravinder, Deputy Adviser, MoHUA
11. Shri Ishwer Singh, Consultant (Legal) NMCG
12. Shri S.K. Srivastava, Director, NRCD
13. Shri A.P. Singh, Scientist E, NRCD
14. Dr. Sabita Madhvi Singh, Joint Director, NRCD
15. Shri Rajat Gupta, Senior Waste Management Specialist, NMCG
16. Shri Saumya Mukhopadhyay, Senior Environmental Specialist, NMCG
17. Dr. P.N.Rymbai, Scientist B, NRCD
18. Shri Vijay Kumar, Assistant Civil Engineer, NMCG
19. Shri Rachit Andley, Project Manager, NMCG
20. Shri Avshesh Chauhan, Assistant System Analyst, NMCG
21. Shri Kumar Ajitabh, Project Officer Legal, NMCG
22. Mrs. Ruby Raju, Project Engineer, NMCG
23. Shri Abhiyantesh Verma, Support Engineer, NMCG
24. Ms. Preeti, Research Associate, NRCD
25. Shri Debarshi, Research Associate, NRCD

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Annexure-III

Status as on 31st October 2021

Table-II					
Summary of the Sewerage Projects (Haridwar (d/s) to Unnao d/s)					
Projects	**No. of Projects**	**Completed**	**Ongoing**	**Under Tendering**	**Remarks**
NMCG	27	9	13	5	Annexure: III.1
AMRUT	4	2	2	0	
TOTAL	**31**	**11**	**15**	**5**	

Table-III							
Status of Sewerage Infrastructure projects in Ganga Basin (d/s of Unnao to Ganga Sagar)							
S.no	**State**	**Total**	**Completed**	**Ongoing**	**Under Tendering/ Tender under Evaluation**	**Tender To be Floated**	**Remarks**
1	Uttar Pradesh	25	18	06	0	1	Annexure- III.2
2	Bihar	29	4	21	4	0	Annexure- III.3
3	Jharkhand	3	1	1	1	0	Annexure- III.4
4	West Bengal	23	3	14	2	4	Annexure- III.5
	Total	**80**	**26**	**42**	**7**	**5**	

Change of Category

S.No.	New Projects Sanctioned	From Ongoing to Completed	From Tendering to Ongoing
1.	1	9	6

Table - IV			
Statement showing State-wise Sewerage Infrastructure Projects			
State	**No. of Sewerage Projects prior to 2014**	**No. of Sewerage Projects after 2014 up to Oct 2021**	**Total**
Uttarakhand	10	26	36
Uttar Pradesh	10	42	52
Bihar	1	28	29
Jharkhand	1	2	3
West Bengal	4	19	23
Delhi	0	10	10
Himanchal Pradesh	0	1	1
Haryana	2	0	2
Rajasthan	0	1	1
Total	**28**	**129**	**157**

Annexure - III.1

Status of Sewerage Infrastructure Projects in Ganga Basin - Haridwar D/s to Unnao D/s (Excluding Yamuna) - NMCG

S.no.	State	Project Name	Town	Main/Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	STP Capacity Total (MLD)	Status	Likely date of completion (As on Oct' 21)
1	UP	Sewerage System & STP works at Garhmuhteshwar	Garhmukteshwar	Main	Ganga	46.51	9	Completed	Completed
2	UP	Sewerage System & STP works (Phase II) at Kannauj (Kali)	Kannauj	Main	Ganga	43.66	1	Completed	Completed
3	UP	Sewerage Scheme at Narora, Bulanshahr	Narora	Main	Ganga	48.45	4	Completed	Completed
4	UP	Sewerage works in Anupshahr, Bulandshahr	Anupshahr	Main	Ganga	75.79	2.5	Completed	Completed
5	UP	Farrukhabad I&D and STP works (HAM)	Farrukhabad	Main	Ganga	261.12	47.7	Awarded	Mar/24
6	UP	Interception/ Diversion of Sisamau Nala of Kanpur city	Kanpur	Main	Ganga	63.8	0	Completed	Completed
7	UP	Sewerage works in Sewerage District I Kanpur	Kanpur	Main	Ganga	430.49	0	Completed	Completed
8	UP	Sewerage Scheme & STP at Bithoor, Kanpur Nagar	Bithoor	Main	Ganga	13.4	2	Completed	Completed

S.no.	State	Project Name	Town	Main/Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	STP Capacity Total (MLD)	Status	Likely date of completion (As on Oct' 21)
9	UP	STP at Pankha, Kanpur and integration with existing STPs	Kanpur	Main	Ganga	967.23	160	Ongoing	Mar/22
10	UP	Interception, Diversion of drains & Sewage Treatment works at Shuklaganj, Dist. Unnao (HAM)	Shuklaganj	Main	Ganga	65.18	5	Ongoing	Dec/22
11	UP	Interception, Diversion of drains & Sewage Treatment works at Unnao (HAM)	Unnao	Main	Ganga	102.2	15	Ongoing	Mar/22
12	UP	Interception and Diversion (I&D) works with STP at Bareilly, Uttar Pradesh	Bareilly	Tributary	Ramganga	271.39	63	UT (Retendering)	Mar/24
13	UP	Interception and Diversion (I&D) works and STP at Budhana, Uttar Pradesh.	Budhana	Tributary	Kali (Hindon)	48.76	10	Ongoing	Dec/22
14	UP	I&D and STP works at Kasganj, Uttar Pradesh	Kasganj	Tributary	Kali (East)	76.73	15	Ongoing	Dec/21
15	UP	Sewerage System & STP works (Phase I) at Moradabad (Ramganga)	Moradabad	Tributary	Ramganga	330.05	58	Ongoing	Dec/21

S.no.	State	Project Name	Town	Main/Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	STP Capacity Total (MLD)	Status	Likely date of completion (As on Oct' 21)
16	UP	I&D works with STP at Moradabad	Moradabad	Tributary	Ramganga	118.69	25	Ongoing	March/24
17	UP	I&D works and STP at Muzaffarnagar	Muzaffarnagar	Tributary	Kali (Hindon)	234.03	54.5	Ongoing	Dec/22
18	UP	Sewerage Scheme (I&D) with STP works at Meerut, Uttar Pradesh	Meerut	Tributary	Kali (East)	690.71	220	UT (Retendering)	Apr/24
19	UP	I&D works for Kairana Town, Distt- Shamli,	Kairana	Tributary	Yamuna	78.42	15	UT	March/24
20	UP	Faecal Sludge Management (Co-treatment) for abatement of pollution in River Ganga at Bijnor	Bijnor	Main	Ganga	0.29	0	Ongoing	Dec 21
21	UP	Rehabilitation of sewerage Infrastructure & Augmentation/ Upgradation of STP	Vrindavan	Tributary	Yamuna	42.82	4	Completed	Completed
22	UP	Rehabilitation/Renovation of Mathura sewerage scheme: construction of 30 MLD STP at Masani	Mathura	Tributary	Yamuna	460.45	67.3	Ongoing	De/21
23	UP	I&D with rehabilitation of sewerage scheme	Agra	Tributary	Yamuna	842.25	177.60	UT (Retendering)	Apr/24
24	UP	I&D and STP works of Baghpat	Baghpat	Tributary	Yamuna	77.36	14	Ongoing	March/22

S.no.	State	Project Name	Town	Main/Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	STP Capacity Total (MLD)	Status	Likely date of completion (As on Oct' 21)
25	UP	I&D works	Firozabad	Tributary	Yamuna	51.08		Completed	Completed
26	UP	I&D works	Etawah	Tributary		140.60	44.95	Ongoing	Dec/21
27	UP	I&D works	Lucknow	Tributary	Gomti	213.91	82	Ongoing	Mar/24
					TOTAL	**5795.37**	**1096.55**		

Status of Sewerage Infrastructure Projects in Ganga Basin - Haridwar D/s to Unnao D/s (Excluding Yamuna) - AMRUT									
S.no.	**State**	**Project Name**	**Town**	**Main/Tr**	**Name of the River**	**Sanctioned Cost (Rs. In Cr.)**	**STP Capacity Total (MLD)**	**Status**	**Likely date of completion (As on Oct '21)**
1	UP	Rampur Sewerage Project - Amrut	Rampur	Tributary	Ramganga			Completed	Completed
2	UP	Bijnor Sewerage Project - Amrut	Bijnor	Main	Ganga		24	Completed	Completed
3	UP	Hapur Sewerage Project - Amrut	Hapur	Tributary	Kali East		30	Ongoing	Dec-21
4	UP	Bulandshahar Sewerage Project - Amrut	Bulandshahar	Tributary	Kali East		40	Ongoing	Dec-21
					TOTAL		**94.0**		

Annexure-III.2

Status of Sewerage Infrastructure projects in Ganga Basin (d/s of Unnao to Ganga Sagar) – Uttar Pradesh – NMCG

S. no.	State	Project Name	Town	Main/ Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	Existing Capacity in MLD	STP Capacity New + Rehab (MLD)	Sewer Network (Km)	Sewage Generation in MLD 2020	Sewage Generation in MLD 2035	Gap in MLD 2020	Gap in MLD 2035	Status	Likely date of completion (As on Oct '21)
1	UP	Sewage treatment Plant for Assi-BHU Sewerage District at Ramana	Varanasi	Main	Ganga	161.31	222	50	-	194.78	235.76	(-)	(-)	Completed	Completed (under trial)
2	UP	Rehabilitation of old trunk sewer **in Varanasi**	Varanasi	Main	Ganga	89.95		0	0					Ongoing	Dec/21
3	UP	Rehabilitation of 5 Ghat pumping stations and STPs at Dinapur & Bhagwanpur **in Varanasi**	Varanasi	Main	Ganga	20.52		0	0					Completed	Completed
4	UP	Non-Sewerage, Institutional Development & Other works for Pollution Abatement works in Varanasi	Varanasi	Main	Ganga	126.2		0	0					Completed	Completed
5	UP	Construction of interceptor sewers, relieving trunk sewer & rising mains in Varanasi	Varanasi	Main	Ganga	165.76		0	28					Completed	Completed
6	UP	Construction of 3 pumping stations (Chaukaghat, Phulwariya & Sariya) in Varanasi	Varanasi	Main	Ganga	39.57		0	0					Completed	Completed

S. no.	State	Project Name	Town	Main/ Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	Existing Capacity in MLD	STP Capacity New + Rehab (MLD)	Sewer Network (Km)	Sewage Generation in MLD 2020	Sewage Generation in MLD 2035	Gap in MLD 2020	Gap in MLD 2035	Status	Likely date of completion (As on Oct '21)
7	UP	Construction of 140 MLD STP at Dinapur, Varanasi	Varanasi	Main	Ganga	199.19		140	0					Completed	Completed
8	UP	I&D works for Ayodhya	Ayodhya	Tributary	Saryu (Ghaghra)	37.67	12	0		6.80	8.00	(-)	(-)	Completed	Completed
9	UP	I&D and STP works at Sultanpur, Uttar Pradesh	Sultanpur	Tributary	Gomti	70.18		17	8	13.07	15.43	(-)	(-)	Ongoing	June/22
10	UP	Interception & Diversion works (I&D) and Sewage Treatment Plant at Jaunpur, Uttar Pradesh	Jaunpur	Tributary	Gomti	206.05		30	0	21.51	24.90	(-)	(-)	Ongoing	Mar/22
11	UP	Faecal Sludge management for Pollution abatement at Chunar, Uttar Pradesh	Chunar	Main	Ganga	2.7		0.01	0	4.37	4.96	Septage management Project		Completed	Completed
12	UP	Sewerage & Non sewerage Schemes for pollution abatement of river ganga at District 'B' & 'E' of Prayagraj	Prayagraj	Main	Ganga	199.26		85	10.88	213.46	253.62	(-)	(-)	Completed	Completed
13	UP	Sewerage &Non-sewerage Schemes for pollution abatement of river ganga at District 'A' of Prayagraj	Prayagraj	Main	Ganga	106.08		20	9.24					Completed	Completed
14	UP	Sewerage work in Sewerage District 'E'	Prayagraj	Main	Ganga	142		0	109.2					Completed	Completed

S. no.	State	Project Name	Town	Main/ Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	Existing Capacity in MLD	STP Capacity New + Rehab (MLD)	Sewer Network (Km)	Sewage Generation in MLD 2020	Sewage Generation in MLD 2035	Gap in MLD 2020	Gap in MLD 2035	Status	Likely date of completion (As on Oct '21)
15	UP	Sewage Treatment Plant (STP) at Salori (14 MLD)	Prayagraj	Main	Ganga	42.4		14	0					Completed	Completed
16	UP	Sewer network in District E of Prayagraj - Part 2 (Additional Work) under Component "A"	Prayagraj	Main	Ganga	52.78		0	42.66					Completed	Completed
17	UP	Sewerage System in Sewerage District 'C' & Allahapur, Prayagraj	Prayagraj	Main	Ganga	146.87		0	134.19					Completed	Completed
18	UP	Sewerage works in Sewerage District 'A' of Prayagraj	Prayagraj	Main	Ganga	288.94		0	241.63					Completed	Completed
19	UP	Sewerage System with Sewer network in Sewerage District 'B' of Prayagraj	Prayagraj	Main	Ganga	265.86		0	214.88					Completed	Completed
20	UP	Interception, Diversion & Treatment works for Naini (District G), Phaphamau (District F) & Jhusi area District in Prayagraj (HAM)	Prayagraj	Main	Ganga	767.59		72	13.21					Ongoing	Mar 22
21	UP	Integrated project for development of STPs in Prayagraj along with existing Assets	Prayagraj	Main	Ganga	904		80	-					Completed	Completed

S. no.	State	Project Name	Town	Main/ Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	Existing Capacity in MLD	STP Capacity New + Rehab (MLD)	Sewer Network (Km)	Sewage Generation in MLD 2020	Sewage Generation in MLD 2035	Gap in MLD 2020	Gap in MLD 2035	Status	Likely date of completion (As on Oct '21)
22	UP	I&D works and STP, Gazipur (HAM)	Gazipur	Main	Ganga	152.83		21	1.3	14.75	18.09	(-)	(-)	Ongoing	Nov 23
23	UP	I&D works and STP, Mirzapur (HAM)	Mirzapur	Main	Ganga	129.08	14	18	2.07	28.07	33.21	(-)	2.21	Ongoing	Nov 23
24	UP	I&D of drains & sewage treatment works at Ramnagar	Varanasi	Main	Ganga	72.91		10	0.44	194.78	235.76			Completed	Completed
25	UP	Pollution Abatement Works for River Saryu/Ghaghara at Faizabad town, District Ayodhya (Interception & Diversion with STP)	Faizabad	Tributary	Saryu (Ghaghra)	221.66		33						TF	

Annexure-III.3

Status of Sewerage Infrastructure projects in Ganga Basin (d/s of Unnao to Ganga Sagar) - Bihar – NMCG

S. no.	State	Project Name	Town	Main/Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	STP Capacity New + Rehab (MLD)	Sewer Network (Km)	Sewage Generation in MLD 2020	Sewage Generation in MLD 2035	Gap in MLD 2020	Gap in MLD 2035	Status	Likely date of completion (As on Oct '21)
1	BH	I&D and STP for Barh town	Barh	Main	Ganga	58.26	11	-	7.55	9.28	(-)	(-)	Ongoing (Trial Run started)	Jan 22
2	BH	Sewer Network, SPS and STP, Begusarai	Begusarai	Main	Ganga	230.06	17	114	13.94	19.66	(-)	2.66	Ongoing	Dec 22
3	BH	I&D and STP works for Bhagalpur **(HAM)**	Bhagalpur	Main	Ganga	413.29	45	0.05	Part of the area draining towards nalla - 45 MLD STP capacity available till year 2035. Rest of area not draining to nala - Septage collection and Treatment proposed.				Ongoing	Mar 24
4	BH	Sewer Networks, SPS and STP at Buxar	Buxar	Main	Ganga	164.23	16	106.06	12.75	16.07	(-)	0.07	UT	Apr 24
5	BH	I&D and STP at Chappra	Chappra	Main	Ganga	236.15	32	18.95	24.31	28.87	(-)	(-)	Ongoing	Jul 22
6	BH	I&D and STP at Fatuha	Fatuha	Main	Ganga	35.49	7	0	5.06	7.35	(-)	0.35	Ongoing	June 22
7	BH	Sewer Networks, SPS and STP, Hajipur	Hajipur	Main	Ganga	305.19	22	189.3	19.0	24.1	(-)	2.13	Ongoing	Mar 24
8	BH	Interception and Diversion (I&D) with STP at Maner, Bihar	Maner	Main	Ganga	41.36	6.5	3	5.4	6.6	(-)	0.06	Ongoing	Aug-2022
9	BH	Mokama I&D and STP works	Mokama	Main	Ganga	60.91	8	-	7.18	8.12	(-)	0.12	Ongoing	Jan-2021

S. no.	State	Project Name	Town	Main/Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	STP Capacity New + Rehab (MLD)	Sewer Network (Km)	Sewage Generation in MLD 2020	Sewage Generation in MLD 2035	Gap in MLD 2020	Gap in MLD 2035	Status	Likely date of completion (As on Oct '21)
10	BH	Sewer Networks, SPS and STP, Munger	Munger	Main	Ganga	294.02	30	174.75	25.52	29.66	(-)	(-)	UT	Mar 24
11	BH	Sewage Treatment Plant - Beur for Patna, Bihar	Patna	Main	Ganga	68.16	43	0	230.84	286.15	(-)	(-)	Completed	Completed
12	BH	Sewerage system with Sewer network, Patna Beur	Patna	Main	Ganga	225.77	0	179.74					Ongoing	Feb 22
13	BH	Sewage Treatment Plant - Karmalichak for Patna, Bihar	Patna	Main	Ganga	77.04	37	0					Completed	Completed
14	BH	Saidpur STP and adjoining Network for Patna, Bihar	Patna	Main	Ganga	184.93	60	55.1					Completed	Ready for inauguration
15	BH	Saidpur Sewer Network, Patna, Bihar	Patna	Main	Ganga	268.63	0	172.5					Ongoing	Mar 22
16	BH	Sewerage scheme at Pahari Zone V, Patna, Bihar	Patna	Main	Ganga	356.37	0	115.93					Ongoing	Apr-2022
17	BH	Sewerage scheme at Pahari (Zone IVA (S)), Patna	Patna	Main	Ganga	184.86	0	87.69					Completed	Ready for inauguration
18	BH	Sewerage Treatment Plant at Pahari - Patna	Patna	Main	Ganga	191.62	60	-					Ongoing	Jan 22
19	BH	Sewerage system with Sewer network, Patna Karmalichak	Patna	Main	Ganga	277.42	0	96.54					Ongoing	Jan 22

S. no.	State	Project Name	Town	Main/Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	STP Capacity New + Rehab (MLD)	Sewer Network (Km)	Sewage Generation in MLD 2020	Sewage Generation in MLD 2035	Gap in MLD 2020	Gap in MLD 2035	Status	Likely date of completion (As on Oct '21)
20	BH	Sewerage System and STP for Digha zone, Patna **(HAM)**	Patna	Main	Ganga	824	100	288					Ongoing	Jun 23
21	BH	Sewerage System and STP for Kankarbag zone, Patna **(HAM)**	Patna	Main	Ganga	578.89	50	150					Ongoing	Jun 23
22	BH	I&D works with STP at Sonepur	Sonepur	Main	Ganga	30.93	3.5	-	2.80	3.50	(-)	0.00	Ongoing	Dec-2021
23	BH	Sultanganj I&D and STP works	Sultanganj	Main	Ganga	60.22	10	-	7.28	9.78	(-)	(-)	Ongoing (Trial Run)	Ready for inauguration
24	BH	I&D and STP at Bakhtiyarpur	Bakhtiyarpur	Main	Ganga	35.88	10	0	6.78	9.93	(-)	(-)	Ongoing	Jul 22
25	BH	I&D and STP works for Naugachia	Naugachia	Tributary	Kharkari	60.79	9	-	6.37	8.30	(-)	(-)	Ongoing	Dec 21
26	BH	Danapur I & D and STP project	Danapur	Main	Ganga	103.27	25	6.9	15.50	25.00	(-)	0.0	Ongoing	Jun 22
27	BH	I&D and STP works in Phulwarishariff	Phulwarishariff	Main	Ganga	46.25	13	-	7.00	13.00	(-)	0.00	Ongoing	Jun 22
28	BH	Interception and Diversion and STP works in Barahiya	Barahiya	Main	Ganga	27	6	0	4.90	5.90	(-)	(-)	UT (Tender Evaluation)	Mar 24
29	BH	Interception and Diversion and STP works in Kahalgaon	Kahalgaon	Main	Ganga	25.77	6	0	4.20	6.60	(-)	0.60	UT (Financial bid evaluation)	Oct 23

Annexure-III.4

Status of Sewerage Infrastructure projects in Ganga Basin (d/s of Unnao to Ganga Sagar) - Jharkhand– NMCG

S. no.	State	Project Name	Town	Main/Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	STP Capacity Total (MLD)	Sewage Generation in MLD 2020	Sewage Generation in MLD 2035	Gap in MLD 2020	Gap in MLD 2035	Status	Likely date of completion (As on Oct'21)
1	JH	Sewerage Scheme & STP works at Rajmahal	Rajmahal	Main	Ganga	56.76	3.5	2.93	3.75	(-)	0.25	Ongoing	Ready for inauguration
2	JH	Sewerage Scheme & STP works at Sahibganj	Sahibganj	Main	Ganga	99.36	12	10.54	12.23	(-)	0.23	Completed	Completed
3	JH	I&D and STP project, Phusro	Phusro	Tributary	Damodar	61.05	15					UT (Technical evaluation)	May-2023

Annexure-III.5

Status of Sewerage Infrastructure projects in Ganga Basin (d/s of Unnao to Ganga Sagar)- West Bengal– NMCG

S. no.	State	Project Name	Town	Main/Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	STP Capacity New + Rehab (MLD)	Existing Capacity in MLD	Sewer Network (Km)	Sewage Generation in MLD 2020	Sewage Generation in MLD 2035	Gap in MLD 2020	Gap in MLD 2035	Status	Likely date of completion (As on Oct'21)
1	WB	Sewerage Scheme & STP works at Gayeshpur	Gayeshpur	Main	Ganga	168.67	8.23		61	7.17	8.51	(-)	0.28	Completed	Completed
2	WB	Sewerage Scheme & STP works at Kalyani	Kalyani	Main	Ganga	57.87	21		46.33	12.76	15.99	(-)	(-)	Completed	Completed
3	WB	Sewerage Scheme & STP works at Bhatpara	Bhatpara	Main	Ganga	228.52	31	30	125	45.76	52.54	(-)	(-)	Completed	Completed
4	WB	Interception & Diversion with STP at Bally **(HAM)**	Bally	Main	Ganga	164.93	40	22		35.31	41.14	(-)	(-)	Ongoing	Sep 23
5	WB	Interception, Diversion & treatment works at Baranagar & Kamarahati **(HAM)**	Baranagar	Main	Ganga	172.1	60	45	9	67.49	72.85	(-)	(-)	Ongoing	Sep 23
6	WB	Sewerage System with sewer network at Barrackpore	Barrackpore	Main	Ganga	272.32	24		247.14	18.05	20.14	(-)	(-)	Ongoing (STP operational)	May 22
7	WB	Interception, Diversion & treatment works at Behrampore	Behrampore	Main	Ganga	51.21	3.5	3.7	5.25			Part of town drains towards River, STP capacity available for 2035 for part of the town.		Ongoing	May 22

S. no.	State	Project Name	Town	Main/Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	STP Capacity New + Rehab (MLD)	Existing Capacity in MLD	Sewer Network (Km)	Sewage Generation in MLD 2020	Sewage Generation in MLD 2035	Gap in MLD 2020	Gap in MLD 2035	Status	Likely date of completion (As on Oct'21)
8	WB	Sewerage System & STP works at Budge-Budge	Budge-Budge	Main	Ganga	145.98	9.3		131.59	9.02	10.23	(-)	0.93	Ongoing (STP Operational)	May 22
9	WB	Sewerage System & STP works at Halishahr	Halishahr	Main	Ganga	274.76	16		226.99	14.54	15.42	(-)	(-)	Ongoing (STP Operational)	May 22
10	WB	Interception, Diversion & treatment works at Howrah **(HAM)**	Howrah	Main	Ganga	185.22	65			Sewered area - 65 MLD STP capacity available till year 2030. Unsewered area - Septage collection and Treatment proposed.				Ongoing	Sep 23
11	WB	Interception & Diversion with STP at Hughly-Chinsurah **(HAM)**	Hughly-Chinsurah	Main	Ganga	154.73	26.5		20	21.06	23.03	(-)	(-)	UT (Technical Evaluation)	Mar 24
12	WB	I&D works with STP at Jangipur	Jangipur	Main	Ganga	68.47	13		11.38	10.86	13.09	(-)	0.09	Ongoing	May 22
13	WB	I&D and STP works at Kanchrapara, West Bengal	Kanchrapara	Main	Ganga	48.77	18		2.5	14.03	15.75	(-)	(-)	Ongoing	Feb-22
14	WB	Interception, Diversion & treatment Works at Tolly's Nullah (Adi Ganga) **(HAM)**	Kolkata	Main	Ganga	307.12	26.1	179	114	555	614	Ex. Treatment capacity 179 MLD, Proposed Capacity - 26 MLD = 205 MLD and about		UT (Financial evaluation)	Apr 23

S. no.	State	Project Name	Town	Main/Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	STP Capacity New + Rehab (MLD)	Existing Capacity in MLD	Sewer Network (Km)	Sewage Generation in MLD 2020	Sewage Generation in MLD 2035	Gap in MLD 2020	Gap in MLD 2035	Status	Likely date of completion (As on Oct'21)
15	WB	Integration of STPs with rehabilitation and O&M of existing Assets, Garden Reach	Kolkata	Main	Ganga	165.16	102		-			410 MLD is draining towards ex. Eastern Kolkata Wetland.		TF (Retender)	Mar 24
16	WB	Interception & Diversion with STP at Maheshtala **(HAM)**	Maheshtala	Main	Ganga	224.69	35	47.5		31.58	39.60	(-)	(-)	Ongoing	Mar 24
17	WB	Interception, Diversion & treatment works at Nabadwip	Nabadwip	Main	Ganga	61.23	20		4	14.68	16.55	(-)	(-)	Trial run	Dec 21
18	WB	I&D and STP works at Burdwan, West Bengal	Burdwan	Tributary	Banka	234.31	50		19	37.73	43.89	(-)	(-)	TF (Retender – revised DPR)	Apr 24
19	WB	Interception and Diversion (I&D) works with STP, for drains falling in River Damodar, at Durgapur, West Bengal	Durgapur	Tributary	Damodar	287.53	80		11.39	69.27	78.27	(-)	(-)	TF (Retender – revised DPR)	Apr 24
20	WB	Detailed Project Report for I&D sewerage system & STP for Asansol & Kulti towns, West Bengal	Asansol	Tributary	Damodar	384.96	95		4.5	68.77	82.45	(-)	(-)	TF (Retender – revised DPR)	Apr 24

S. no.	State	Project Name	Town	Main/Tr	Name of the River	Sanctioned Cost (Rs. In Cr.)	STP Capacity New + Rehab (MLD)	Existing Capacity in MLD	Sewer Network (Km)	Sewage Generation in MLD 2020	Sewage Generation in MLD 2035	Gap in MLD 2020	Gap in MLD 2035	Status	Likely date of completion (As on Oct'21)
21	WB	Rejuvenation of Existing STPs along with lifting station & pumping station including sewerage network at North 24 Parganas Dist., West Bengal	North -24 Parganas	Main	Ganga	65.54	46.24							Ongoing	Dec 21
22	WB	Rejuvenation of exiting STPs along with lifting station & pumping station including sewerage network at Hooghly Dist., West Bengal	Hooghly	Main	Ganga	86.61	78.9							Ongoing	Feb-22
23	WB	Design and build of I&D structure including lock gate and it's all structures as well as allied works at Barrackpore municipality,	North 24 Parganas	Main	Ganga	0.93								Ongoing	May 22

राजीव रंजन मिश्रा, भा.प्र.से.
महानिदेशक
राष्ट्रीय स्वच्छ गंगा मिशन

Rajiv Ranjan Mishra, IAS
DIRECTOR GENERAL
NATIONAL MISSION FOR CLEAN GANGA

सत्यमेव जयते

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION

Annexure IV

D.O. No. T-13/2013-14/278/NMCG **Dated -01st July, 2021**

Dear Sir,

As you might be aware, in Bihar, 405 km Ganga River stretch is covered under Namami Gange programme, being implemented by the National Mission for Clean Ganga (NMCG). Till date, **54 projects** have been sanctioned in the field of Sewerage Infrastructure, Ghats and Crematoria and River Front Development, Afforestation, Bio-remediation, Rural Sanitation and River Surface cleaning works at a total cost of **Rs. 6245.02 Cr** which are at different stages of implementation. A total 30 sewerage infrastructure projects are sanctioned in 20 towns which will create 632 MLD of Sewage Treatment Plant capacity and laying of 1753 km of sewerage network at a sanctioned cost of **Rs 5420.73 Cr.**

2. The status of these projects is monitored by NMCG through review meetings taken by me and also ED(Project), NMCG at regular intervals. A Technical Review Mission, led by me, also visited the State from 5 – 11 March 2021, to review the ongoing projects in Bihar (RFD and wastewater investments). In addition, the team also discussed various site-specific issues, permission aspects, bottlenecks, future progress and completion schedule and its feasibility. Necessary suggestion and advice were given to speed up the works. The delegation also met with Hon'ble Deputy Chief Minister of Bihar, Shri Tarkishore Prasad and briefed him about the progress in Namami Gange Projects and requested his support in specific issues.

3. In spite of all the efforts from our side, the progress of the projects is not very encouraging. Out of 30 sewerage projects only 4 have been completed and 24 is under various stages of construction and 4 are still under tendering. Most of the projects have been held up due to non-issue of permissions from different authorities like RCD, NHAI, Railways and PMC. A complete list of the projects and their completion status is given in **Annexure-I**.

4. In view of the above, I shall be grateful, if a review meeting, with all concerned departments and agencies, could be convened at your level, so that all the issues/ clearances etc., could be discussed and sorted out, and the pending projects could be completed without much delay.

Best Regards

Yours sincerely,

(Rajiv Ranjan Mishra)

Shri Tripurari Sharan, IAS
Chief Secretary
Government of Bihar
Old Secretariat,
Patna-800015
Email: cs-bihar@nic.in

Annexure-I

S.No	Project Name	Cost (Rs in Crore)	Current Status (June 2021)
Completed Projects			
Patna			
1	Beur STP-43 MLD	77.85	Completed
2	Karmalichak STP-37 MLD	73.61	Completed
3	Saidpur STP (60 MLD) and adjoining network-55.1 km	184.93	Completed
4	Pahari Sewerage Network –Zone IVA-87.7 km	184.86	Completed
5	Beur Sewerage Network-179.4 km	225.77	81.5% complete
6	Saidpur Sewerage Network (Zone III)-172.50 km	268.63	75% complete
7	Pahari Sewerage Network (–Zone V)-116km	356.37	54% completed
8	Pahari STP (60 MLD)	191.62	92% complete
9	Karmalichak Sewerage Network-96.54 km	277.42	88% complete
10	Digha Sewerage Network and STP scheme; 100 MLD STP and 303 km network	824	Work in Progress
11	Kankarbagh Sewerage Network and STP scheme; 50 MLD STP and 150 km network	578.89	
Other Ongoing Sewerage Projects			
12	Barh I&D and STP scheme (11MLD)	58.26	84% complete (STP complete)
13	Naugachia I&D and STP scheme (9 MLD)	60.79	85% complete (STP complete)
14	Sultanganj I&D and STP scheme (10 MLD)	60.22	85% complete (STP& 2 SPS ready, ready for trial run)
15	Mokama I&D and STP scheme (8 MLD)	60.91	76 % complete (STP complete)
16	Sonepur I&D and STP scheme (3.5 MLD)	30.93	83% complete
17	Begusarai sewerage network and STP scheme;17 MLD STP and 114km of Network	230.06	52% complete
18	Chhapra I&D and STP scheme (32 MLD)	236.15	58% complete
19	Maner I&D and STP scheme (6.5 MLD)	41.36	Land issue
20	Bakhtiyarpur I&D and STP scheme (10 MLD)	35.88	19%
21	Danapur I&D and STP scheme (25 MLD)	103.27	3%
22	Phulwarishariff I&D and STP scheme (13 MLD)	46.25	Land Issue

S.No	Project Name	Cost (Rs in Crore)	Current Status (June 2021)
23	Fatuha I&D and STP scheme (7 MLD)	35.49	Land Issue
24	Bhagalpur I&D and STP scheme (45 MLD)	413	Work Awarded
25	Hajipur Sewerage Network and STP scheme; 22 MLD STP and 189km network	305.19	Work awarded on 29.06.2021
Projects Under Tender Evaluation			
26	Munger Sewerage Network and STP scheme; 30 MLD STP and 174.75 km of network	294.02	Tender Under evaluation 4 bids received. World Bank NOC received on 18.06.2021 to open financial bid.
27	Khagaria I&D and STP scheme (4.5 MLD)	21	Tender Under evaluation 3bids received. Clarification provided by NMCG.
28	Barahiya I&D and STP scheme (6 MLD)	27	Tender Under evaluation May need retendering
29	Kahalgaon I&D and STP scheme (6 MLD)	25.77	Tender Under evaluation 3 bids received. Financial bids opened. L-1 price is 55% higher.
30	Buxar Sewerage Network and STP scheme; 16 MLD STP and 95.21 km network	164.23	Tender Under Evaluation 4 bids received. TBER will be received soon.
Total	632MLD STP and 1753km Network	**5420.73**	

S.No	Name of Projects	Permission from PMC	Permission from RCD	Permission from NHAI	Permission from Railways	Land NOC	IOCL	Total
1	Beur Network (km)	32	1	-	-	-	0.65	33.65 km
2	Saidpur Network		13					13 km
3	Pahari Zone V network		8.45	2.6, 2 crossings				11.05 km
4	Karmalichak Network		5.55km (NOC needed) +2.54km (NOC recvd but work stopped)	1km	1.77 km (6 crossings)			10.81 km
5	Barh I&D STP							11 KV power supply permission
6	Naugachia I&D STP		2 km	2.5 km	1 km & 2 crossings			5.5 km, 2 rly crossing, local hindrances
7	Sultaganj I&D STP						2 IPS	2 IPS land permission
8	Begusarai STP + Network		14.5 km	4-5 crossings, 3 km permission	0.7km, 1 crossing (0.25km)			18.45 km
9	Sonepur I&D and STP	-	-	-	0.27km, 1 crossing	-	-	0.27km, 1 rly crossings
10	Chhapra I&D and STP	-	5.3 km	0.5 km (work done 0.4km) no work being done for the rest 100m.	-	-	-	5.8 km

S.No	Name of Projects	Permission from PMC	Permission from RCD	Permission from NHAI	Permission from Railways	Land NOC	IOCL	Total
11	Bakhtiyarpur				70m, 1 crossing			70m
12	Mokama		2.2km		90m, 1 crossing	-	-	2.29 km
13	Maner					1STp, 3 IPS		1 STP and 3 IPS land permission
14	Danapur				-	2 IPS		2 IPS Land Permission,
15	Fatuha	-	-	-	-	1 STP, 5 IPS		1, STP, 5 IPS land permission
16	Phulwarishariff	-	-	-	-	1 STP (Khagaul) 1 IPS		1 STP and 1 IPS land permission
17	Digha and Kankarbagh		96.51	-	-	1 IPS for the I&D works		96.51 km , 1 IPS
	Total	32km	151.5 km	9.6, 7 crossings	3.9 km, 12 crossings	3 STP, 12 IPS lands		196.51 km , 19 crossing permission (NHAI+Railways), 3 STP and 12 IPS land permission.

#The details of Pahari STP and Bhagalpur project is not included

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सत्यमेव जयते

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन,
नदी विकास और गंगा संरक्षण विभाग
GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION

D.O. No. J-13011/1/2009-NRCD-II **Dated:9th July 2021**

Dear Sir,

In my previous communication dated 1st July, I have informed you about the status of ongoing sewerage projects in Bihar and bottlenecks which are stopping the progress of some of the projects. It is really heartening to know that you have already taken one review meeting and we are very hopeful that within a short period these bottlenecks will be removed.

2. As informed earlier, out of the 30 sanctioned sewerage projects, we have been struggling long to settle the tender for 6 sewerage project. Even with necessary guidance from NMCG many times, these bids could not been settled. The list of the projects and their current status of tendering is enclosed in **Annexure-I.**

3. Among these 6 projects, 2 projects, Namely the (i) sewerage and STP scheme of **Munger** and (ii) Sewerage and STP scheme of **Buxar** are funded by External Funding Agency i.e. World Bank. I wish to mention that these 2 projects were earlier sanctioned by NRCD in 2010-2011 but the work could not be completed due various issues including land availability and later the contractor was terminated and work was retendered for the balance work with almost 3 times of the previous sanctioned cost. For the sake of the importance of cleaning Ganga, NMCG have accepted to share even the revised cost. However, even with such a flexibility for these 2 projects, no urgency/sincerity has been seen at the state level to settle these tenders.

4. As you must be aware, for the World Bank funded projects the bidding process and finalization of bids are to be done as per the procurement guidelines of World Bank as depicted in the NGRBA framework. The central government (NMCG) and concerned departments of 5 basin states. namely, **Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal** are the signatories of this framework with World Bank. A copy of the minutes of negotiation signed by Govt. of India and all the 5 basin states with World Bank is enclosed in **Annexure-2** for your kind reference.

5. In case of World Bank funded projects, if and only if a contractor is blacklisted by World Bank (anywhere in the World), only in such case the contractor will be debarred from taking part in a bid. However, having known this fact, the officials in the concerned Department of the State Government have ignored this. In spite of all the efforts from our side by providing necessary guidance through numerous communications, the concerned officials have not followed the guidelines of World Bank and blacklisted 2 participating bidders among the 4 as per state rule.

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6. Both these bidders challenged the decision of Government of Bihar in the High Court of Patna and blacklisting of one party (M/s LC Infra) has already got quashed and the other party (M/s EMS) is also contesting in the court.

7. Meanwhile on 18.06.2021, World Bank have provided their NOC for opening the financial bids of the 4 bidders with a clear instruction to submit the bid evaluation within 7th July 2021. They have also indicated to withdraw their loan for the projects, if their guidelines are not adhered to and no further extension of bid validity will be given beyond 31st July 2021. They have also expressed their concern for the leakage of valuable procurement related information at the state level. A copy of the e-mail is enclosed for your kind reference in **Annexure-3.**

8. Kindly note that if the loan is withdrawn then NMCG would also not be in a position to fund the Munger project. Moreover, if the loan is withdrawn it will be a huge embarrassment for the central as well as for the state government.

9. As far as the Buxar Network and STP project is concerned, no NOC was sought by state authorities before issuing the pre-bid minutes and addendum. This is a serious issue and is generally treated as mis-procurement as per World Bank guideline. However, we have managed to convince the World Bank this time and based on good faith they have provided their NOC to complete the bid evaluation process. However, even with these efforts the bid evaluation is still not completed.

10. In view of the above, I shall be grateful if you could personally monitor and provide necessary directions to settle these bids especially the opening of financial bids of Munger sewerage network and STP scheme.

With Best Regards

Yours sincerely,

Encl: As above

(Rajiv Ranjan Mishra)

Shri Tripurari Sharan, IAS
Chief Secretary
Government of Bihar
Old Secretariat
Patna-800015
Email:cs-bihar@nic.in

Annexure-I

S.No	Project Name	Date of Sanction	Cost (Rs in Crore)	Current Status (June 2021)
1	Munger Sewerage Network and STP scheme; 30 MLD STP and 174.75 km of network	05.03.2018	294.02	Tender Under evaluation 4 bids received. World Bank's NOC received on 18.06.2021 to open financial bid. Not yet opened.
2	Buxar Sewerage Network and STP scheme; 16 MLD STP and 95.21 km network	31.12.2019	164.23	4 bids received on 1st Feb 2021. Tender Under Evaluation. The TBER is still awaited.
3	Khagaria I&D and STP scheme (4.5 MLD)	24.12.2018	21	Only after 6th Call, tender seems to be settled. Yet the financial bids not opened. NMCG's suggestion ignored during the 4th call.
4	Barahiya I&D and STP scheme (6 MLD)	30.12.2019	27	Tender has been called and cancelled many times. The 5th call has been published on 28.06.2021. No information given to NMCG why the previous attempts were cancelled.
5	Kahalgaon I&D and STP scheme (6 MLD)	30.12.2019	25.77	Tender Under evaluation 3 bids received. Financial bids opened on 11.06.2021. Decision of recommendation is yet to receive.
6	Hajipur Sewerage Network and STP, 22 MLD STP and 189km Network	05.03.2018	305.19	Work Awarded on 29.06.2021 after 4th call.
Total	**84.5 MLD and 459 km network**		**837.21**	

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MINUTES OF NEGOTIATIONS
BETWEEN

INDIA
AND THE
INTERNATIONAL DEVELOPMENT ASSOCIATION
AND THE
INTERNATIONAL BANK FOR RECONSTRUCTION & DEVELOPMENT

REGARDING THE PROPOSED
NATIONAL GANGA RIVER BASIN PROJECT

May 2, 2011

GENERAL

1. Negotiations for the proposed National Ganga River Basin Project ("the Project") were held in New Delhi on 2 May 2011, at the office of the Department of Economic Affairs (DEA) of the Ministry of Finance, Government of India. The negotiations were attended by the representatives of the Department of Economic Affairs, and of the Ministry of Environment and Forests (MoEF) of the Government of India, and the representatives of the states of Bihar, Jharkhand, Uttar Pradesh, Uttarakhand, and West Bengal ("the Indian delegation"), and the representatives of the International Development Association and the International Bank for Reconstruction and Development (hereafter "IDA/IBRD team"). The list of participants from the Indian delegation and IDA/IBRD team is attached to these minutes (Attachment 1).

2. **Purpose of Minutes.** During Negotiations, the two delegations reviewed and discussed the draft Project Appraisal Document (PAD) dated 30 April 2011, the draft Financing Agreement (FA) dated 30 April 2011, and the draft Loan Agreement (LA) dated 17 April 2011 (collectively "Project Documents"). The agreed/negotiated PAD, FA, and LA, all dated 2 May 2011, are attached to these minutes as Attachments 2, 3 and 4 respectively.

3. These minutes are not a complete record of negotiations. They are intended to record and clarify certain understandings and agreements reached during the Negotiations, with respect to the Project Documents.

4. **Credit and Loan Amounts.** The proposed financing for the Project includes a Credit in the amount of 123,020,000 Special Drawing Rights (SDR), equivalent to USD 199,000,000 (based on an exchange rate of SDR 1 = US$ 1.62, in effect on April 30, 2011); and a Loan in amount of USD 801,000,000.

5. The draft **Disbursement Letter** (DL) for the Credit and Loan has been discussed and agreed during negotiations. A copy of the negotiated disbursement letter is enclosed as Attachment 5.

UNDERSTANDINGS REACHED

PROJECT APPRAISAL DOCUMENT (PAD)

6. The Indian delegation and the IDA/IBRD team discussed and agreed changes to the PAD which are reflected in the revised negotiated PAD provided in Attachment 2.

7. The Indian delegation proposed, and the IDA/IBRD team agreed, that the consolidated quarterly IUFRs for the Project will be submitted to the World Bank within 60 days from the end of the quarter. This is in line with the due date for submission of the quarterly progress reports of the Project.

8. The teams have agreed that the indicators and targets included in the Results Framework, may be discussed and reviewed at the end of the first year, and, in light of the experience with implementation, may be replaced with more appropriate indicators and targets if needed.

9. The teams have agreed that the percentage of expenditures to be financed (inclusive of taxes) shall remain 89% of the central share of eligible expenditures for both Component 1 and Component 2 of the Project, and that this percentage shall be discussed and reviewed during the Mid Term Review (MTR).

10. The teams have also agreed that the salaries of government officers on long-term and exclusive deputation to the Project are eligible as incremental operating costs.

11. The IBRD/IDA team clarified that all the safeguard documents associated with sub-projects financed by the Project will be shared with the World Bank for review and no objection, prior to submission by the PMG to the Empowered Steering Committee for approval.

12. Regarding procurement management, the teams have agreed that the following business standards will be maintained for procurement review by Bank where submissions are in complete form as per the agreed documents (Standard Bid Documents, Evaluation formats, Contracts, etc.) and without any deviations from the agreed procurement procedures. In case clarifications are sought due to incompleteness in documentation or deviations in procurement processes followed from the agreed procedures, maintenance of the business standard for further review and/or processing of No Objections will be contingent on reciprocation of similar business standards for responses and clarifications by the client:

Type of Procurement	7 Business Days for Values (in Million US$)	10 Business Days for Values (in Million US$)	17 Business Days for Values (in Million US$)
Works, Turnkey, Supply & Install. Plant & Equipment.	<25	±25 and <50	-≥50
Goods	<10	±10 and <30	-≥30
IT Systems; Non-Consulting Services.	<5	±5 and <20	-≥20
Consulting Services	<3	±3 and <15	-≥15
Single-Source Contracts with Consulting Firms & Direct Contracting for all types of procurement	<0.5	±0.5 and <5	-≥5
Single-Source contracts with Individual Consultants	<0.25	±0.25 and <1	-≥1

NGRBA PROGRAM FRAMEWORK

13. The Indian delegation and the IDA/IBRD team agreed that the NGRBA Program Framework and Related Manuals, as prepared by the PMG and dated 2 May 2011, is the final version for the purposes of the Financing Agreement.

14. In view of substantial revisions in the ESMF, the ESMF dated May 2, 2011 will be disclosed on the website of MOEF and the project states by May 16, 2011, indicating its context and applicability, replacing the version of the ESMF already disclosed.

LEGAL AGREEMENTS

15. The parties reviewed and agreed upon the final text of the draft FA and LA dated 2 May 2011. In addition, the following matters arising in connection with the FA and LA were also discussed, and understandings reached as follows:

16. **Article II, Section 2/03 of the FA (Commitment Charge).** The IDA/IBRD team explained that Section 2.03 provides for a Maximum Commitment Charge of one-half of one percent (0.05%) per annum, charged on the undisbursed amount. At the end of each of IDA's fiscal years, as part of its review of the World Bank Group's net income, the IDA Board of Executive Directors (the "Board") decides on the commitment charge rate to be applied for the upcoming fiscal year, always within the agreed cap fixed in the aforementioned Section. Currently, the commitment charge for IDA credits for FY11 is zero percent. The Commitment Charge is applied to all IDA credits globally.

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17. The Indian delegation requested that the following clause "as such framework may be amended from time to time by the Recipient to achieve the objectives of the NGRBA Program" from the definition of the NGRBA Program Framework be moved to the main body of the Financing Agreement, and the IDA/IBRD team agreed to place the sentence in Schedule 2, Section B.1.

ADDITIONAL ISSUES

18. The Indian delegation requested, and the IDA/IBRD team agreed that, should any additional IDA15 funds become available prior to the submission of project Documents to the World Bank Board, these would be made available for the Project.

19. **Disclosure of Information:** Pursuant to the World Bank Policy on Access to Information, the Bank will disclose the PAD, the related legal agreements and other information related to the legal agreements, including any supplemental letters. The Indian delegation confirms that the Bank may publicly release these documents only after approval of this project by the Bank's Board of Executive Directors.

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Ms. Kavita Prasad
Director (FB),
Department of Economic Affairs
Ministry of Finance
Government of India

Mr. Rajiv Gauba
Joint Secretary
Ministry of Environment and Forests
Government of India

Ms. Genevieve Connors
Co-Task Team Leader
South Asia Region
The World Bank

2/5/2011

Mr. Debashis Sen
Principal Secretary
Department of Urban Development,
Government of West Bengal

2/5/11

Mr. Chandra Nath Jha
Special Secretary
Department of Urban Development and Housing,
Government of Bihar

Mr. Navneet Sehgal
Secretary
Department of Urban Development,
Government of Uttar Pradesh

2/5/11

Mr. S.P Singh
Program Director, SPMG
Government of Uttarakhand

2/5/11

Mr. Anjani Kumar
Officer on Special Duty
Government of Jharkhand

2/5/11

Mr. A.S.P. Sinha
Senior Joint Commissioner
Ministry of Water Resources

New Delhi, India
May 2, 2011

Attachments:
Attachment 1: Participants to the Negotiations
Attachment 2: Project Appraisal Document dated 2 May 2011
Attachment 3: Financing Agreement dated 2 May 2011
Attachment 4: Loan Agreement dated 2 May 2011
Attachment 5: Disbursement Letter (draft dated 1 May 2011)

Attachment 1

GOVERNMENT OF INDIA

Mr. Rajiv Gauba, Joint Secretary, Ministry of Environment and Forests (MoEF).
Ms. Kavita Prasad, Director (FB), Ministry of Finance, (Department of Economic Affairs).
Mr. Aniruddhe Mukerjee, Director, Ministry of Environment & Forests & Additional Mission Director, National Mission Clean Ganga.
Mr. Brijesh Sikka, Director, NRCD, Ministry of Environment & Forests.
Mr. B. B. Burman, Director, NRCD, Ministry of Environment & Forests.
Mr. Ajay Raghava, Deputy Director, NRCD, Ministry of Environment & Forests.
Mr. A. S. P. Sinha, Sr. Joint Commissioner (Ganga), Ministry of Water Resources.
Mr. Virendra Singh, Sr. Accounts Officer, CAA&A.

STATE GOVERNMENTS

Mr. Debashis Sen, Principal Secretary, Urban Development Department, Government of West Bengal.
Mr. Chandra Nath Jha, Special Secretary, Department of Urban Development and Housing, Government of Bihar.
Mr. Navneet Sehgal, Secretary, Department of Urban Development, Government of Uttar Pradesh.
Mr. Ravi Rastogi, Chief Engineer, UP Jal Nigam.
Mr. Anjani Kumar, Officer on Special Duty, Government of Jharkhand.
Mr. S. P. Singh, Program Director, SPMG, Government of Uttarakhand
Mr. Prabhat Raj, Executive Engineer, Uttarakhand Peya Jal Nigam.

INTERNATIONAL DEVELOPMENT ASSOCIATION (THE WORLD BANK)

Mr. Sanjay Pahuja, Senior Water Resources Specialist and Task Team Leader (by audio from Washington DC)
Ms. Genevieve Connors, Water Specialist and Co-Task Team Leader
Mr. Juan Carlos Alvarez, Senior Counsel
Mr. Tapas Paul, Senior Environmental Specialist
Mr. A.S. Harinath, Environmental Specialist
Mr. Parthapriya Ghosh, Social Development Specialist
Mr. Junxue Chu, Senior Finance Officer (by audio from Washington DC)
Ms. Sona Thakur, Communications Officer
Mr. Kalesh Kumar, Senior Procurement Specialist
Ms. Papia Bhatachaarji, Senior Finance Management Specialist

Fwd: No Objection to Evaluation of Technical Proposals submitted by NMCG for India - P119085 - IN National Ganga River Basin Project - IN-NMCG-102757-CW-RFB - Munger STP and Sewer

From : Jagan Mohan <tl.procurement@nmcg.nic.in> Fri, Jun 18, 2021 06:31 PM

Subject : Fwd: No Objection to Evaluation of Technical Proposals submitted by NMCG for India - P119085 - IN National Ganga River Basin Project - IN-NMCG-102757-CW-RFB - Munger STP and Sewer

To : mdbuidco@gmail.com, spmgbihar@gmail.com

Cc : UDHD <urbansec-bih@nic.in>, cebuidco@gmail.com, headquarter buidco <headquarter.buidco@gmail.com>, r deo123 <r.deo123@yahoo.com>, Sh Ashok Kumar Singh <ed.projects@nmcg.nic.in>, Saumyasib Mukhopadhyay <saumyasibm@nmcg.nic.in>, Senthilkumar <d.senthil@nmcg.nic.in>, Mr.Madhava Kumar R Sr.Eco.F.Analysis Expert <madhavakumar@nmcg.nic.in>

Dear Sir,

Please refer self-explanatory trailing mail received from the World Bank regarding NOC for TBER on Munger project.

In view of above, we look forward to receiving the Combined Technical and Financial Evaluation Report and Recommendation to Award the contract by June 30 2021 for onward submission to the World Bank before July 07, 2021.

Regards,

Jagan Mohan Patnaik,
Team Leader
Procurement Management Support Services,

National Mission for Clean Ganga

Ministry of Jal Shakti,
Department of Water Resources, River Development & Ganga Rejuvenation
1st Floor, Major Dhyan Chand National Stadium
India Gate, New Delhi - 110002
☎ Telephone:+91-011-23072900-901

From: noreply@worldbankgroup.org
To: "Senthilkumar" <d.senthil@nmcg.nic.in>

Cc: xchauvot@worldbank.org, usingh@worldbank.org, "Senthilkumar" <d.senthil@nmcg.nic.in>, asuman@worldbank.org, rjohn@worldbank.org, "Jagan Mohan" <tl.procurement@nmcg.nic.in>, rjoseph1@worldbank.org, "Mr.Madhava Kumar R Sr.Eco.F.Analysis Expert" <madhavakumar@nmcg.nic.in>, isiddique@worldbank.org
Sent: Friday, June 18, 2021 1:10:53 PM
Subject: No Objection to Evaluation of Technical Proposals submitted by NMCG for India - P119085 - IN National Ganga River Basin Project - IN-NMCG-102757-CW-RFB - Munger STP and Sewer

Dear Mr. Senthil Kumar,

India-P119085:IN National Ganga River Basin Project, Ln./Cr # IBRD-80650; No-Objection to Technical Evaluation Report for Munger STP and Sewerage Scheme – Activity No. IN-NMCG-102757-CW-RFB

We have received NMCG's letter submitted to the Bank on June 15, 2021 through STEP conveying recommendation to technically qualify all four participating bidders and open their financial parts of the bids. Based on the information provided and subject to addressing the following comments, the Bank has no objection to NMCG's recommendation to technically qualify all four bidders and to open their financial parts of the bids in public (virtually given COVID 19).

Please ensure to -

1. check the bid validities of the bidders before issuing the notice for financial opening and only open the financial bids of those bidders whose bids are valid on the date of the financial opening.
2. open the financial parts of the bids virtually. The representatives of the bidders will attend the opening session virtually, should they wish to attend. Please give 5 days' time in between issuance of the notice for financial opening and the date of financial opening. Considering the current bid validity till June 30, 2021, the financial opening must be completed by June 30, 2021.
3. reflect and address all complaints received on this procurement (including evaluation committee's comments) and reconcile the recommendations of BUIDCO and NMCG in the Combined Technical and Financial Evaluation Report and Recommendation to Award.

We would like to draw NMCG, SMCG and BUIDCO's attention to the following:

a. The Financing/Loan Agreement for the National Ganga River Basin Project ("the Project") signed between the Government of India and the World Bank states that all procurements under the Project to be financed out of the proceeds of the Loan/Credit shall follow the World Bank's Procurement Guidelines, January 2011 and Consultant Guidelines, January 2011. Financing/Loan Agreement being an international treaty supersedes any National or State level Act/Rule/Orders. This has also been reinforced by DEA (e.g. OM dated October 19, 2020).

b. Therefore, the Bank reiterates what it already mentioned in previous exchanges that only debarment/suspension by the Bank is valid in this Bank funded procurement.

c. The Bank is extremely concerned with abnormal delays in evaluation of bids in this package without any justifiable reason, as communicated to you from time to time. As you are aware, Paragraph 1.14 (Misprocurement) of the World Bank's Procurement Guidelines states -

> "The Bank does not finance expenditures under a contract for goods, works, or non-consulting services if the Bank concludes that such contract: (a) has not been awarded in accordance with the agreed provisions of the Loan Agreement and as further elaborated in the Procurement Plan to which the Bank provided no objection; (b) could not be awarded to the bidder otherwise determined successful due to willful dilatory conduct or other actions of the Borrower resulting in unjustifiable delays, the successful bid being no longer available, or the wrongful rejection of any bid……..In such cases, whether under prior or post review, the Bank will declare misprocurement, and it is the Bank's policy to cancel that portion of the loan allocated to the goods, works, or non-consulting services that have been misprocured."

he Bank is paying particular attention to the need for timely completion of procurement processes for ensuring compliance with the Efficiency principle of the Bank's Procurement Policy to avoid inordinate delays which result in ineffective use of funds and impede development objectives. We noted that the bid submission deadline for this procurement was on January 7, 2020 and the technical evaluation of the bids has been delayed inordinately. Considering the current status of the procurement, the Bank strongly recommends that the Combined Technical and Financial Evaluation Report and Recommendation to Award be submitted to the Bank for review no later than July 7, 2021, which would mark 18 months since bid opening.

Accordingly, the Bank requires that the financial bid evaluation, including the Bank's prior review and Government's internal approvals, to be completed and the contract awarded within July 31, 2021, and would only agree to extend the bid validity one last time until July 31, 2021, to give sufficient time for the Bank to review and issue its no objection and for the Letter of Award to be issued. We would like to highlight upfront that the Bank may not favorably consider requests for extension of bid validity period beyond July 31, 2021 and may take remedies for inordinate delays, should the process exceeds that date.

In light of the above, we look forward to receiving the Combined Technical and Financial Evaluation Report and Recommendation to Award the Contract through STEP for our review by **July 7, 2021**.

Best Regards,

Xavier Chauvot De Beauchene

STEP System Users - Click here

Bank Users - Click here

From : Jagan Mohan <tl.procurement@nmcg.nic.in> Fri, Jun 18, 2021 01:56 PM

Subject : Fwd: No Objection to Evaluation of Technical Proposals submitted by NMCG for India - P119085 - IN National Ganga River Basin Project - IN-NMCG-102757-CW-RFB - Munger STP and Sewer

To : Saumyasib Mukhopadhyay <saumyasibm@nmcg.nic.in>

Cc : Senthilkumar <d.senthil@nmcg.nic.in>

Dear Sir,

Please refer trailing mail received from the World Bank on Munger assignment. This is for your information and necessary direction pls.

Regards,

Jagan Mohan Patnaik
TL-PMSS, NMCG

From: noreply@worldbankgroup.org
To: "Senthilkumar" <d.senthil@nmcg.nic.in>
Cc: xchauvot@worldbank.org, usingh@worldbank.org, "Senthilkumar" <d.senthil@nmcg.nic.in>, asuman@worldbank.org, rjohn@worldbank.org, "Jagan Mohan" <tl.procurement@nmcg.nic.in>, rjoseph1@worldbank.org, "Mr.Madhava Kumar R Sr.Eco.F.Analysis Expert" <madhavakumar@nmcg.nic.in>, isiddique@worldbank.org
Sent: Friday, June 18, 2021 1:10:53 PM
Subject: No Objection to Evaluation of Technical Proposals submitted by NMCG for India - P119085 - IN National Ganga River Basin Project - IN-NMCG-102757-CW-RFB - Munger STP and Sewer

Dear Mr. Senthil Kumar,

India-P119085:IN National Ganga River Basin Project, Ln./Cr # IBRD-80650; No-Objection to Technical Evaluation Report for Munger STP and Sewerage Scheme – Activity No. IN-NMCG-102757-CW-RFB

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b. Therefore, the Bank reiterates what it already mentioned in previous exchanges that only debarment/suspension by the Bank is valid in this Bank funded procurement.

c. The Bank is extremely concerned with abnormal delays in evaluation of bids in this package without any justifiable reason, as communicated to you from time to time. As you are aware, Paragraph 1.14 (Misprocurement) of the World Bank's Procurement Guidelines states -

> "The Bank does not finance expenditures under a contract for goods, works, or non-consulting services if the Bank concludes that such contract: (a) has not been awarded in accordance with the agreed provisions of the Loan Agreement and as further elaborated in the Procurement Plan to which the Bank provided no objection; (b) could not be awarded to the bidder otherwise determined successful due to willful dilatory conduct or other actions of the Borrower resulting in unjustifiable delays, the successful bid being no longer available, or the wrongful rejection of any bid……..In such cases, whether under prior or post review, the Bank will declare misprocurement, and it is the Bank's policy to cancel that portion of the loan allocated to the goods, works, or non-consulting services that have been misprocured."

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Best Regards,

Xavier Chauvot De Beauchene

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Bank Users - Click here

Letter No.YoMo–04(Vividh) 07–372/2020– 296

Government of Bihar

Water Resources Department

From,

Arun Kumar Dwivedi
Joint Secretary (Engg.)

O/o ED (T), NMCG
Dy. No...2615.....
Date....10/08/2021.

To,

The Executive Director (Technical),
National Mission for Clean Ganga
Dept of Water Resources, RD & GR
Ministry of Jal Shakti, GoI
1st Floor, Major Dhyanchand National Stadium
India Gate, New Delhi-110002
E-mail:- ed-technical@nmcg.nic.in

Patna, dated :- 02/08/2021

Sub:- Reoprt on Scientific Study of Flood Plain Zoning in the State of Bihar regarding.

Ref:- NMCG letter no. TF-16019/3/2020/NMCG Part (I)/765 dated-29.07.2021.

Sir,

In reference to the above mentioned subject, I am directed to convey that the report on Scientific Study of Flood Plain Zoning in the State of Bihar is hereby enclosed for your kind information and necessary action.

Encl: As above

Your faithfully

02/08/2021

(Arun Kumar Dwivedi)
Joint Secretary (Engg.)

Memo No. 296 /Patna, dated 02/08/2021

Copy to Member Secretary, Bihar State Pollution Control Board, Bihar, Patna/Principal Secretary, Urban Development and Housing Department, Bihar for information and necessary action.

02/08/2021

(Arun Kumar Dwivedi)
Joint Secretary (Engg.)

Report

on

Scientific study on the feasibility of Flood Plain Zoning in the State of Bihar

Prepared By:

Flood Management Improvement Support Centre (FMISC), WRD

Patna-800002

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Acronyms:

DEM:	Digital Elevation Model
DMSP:	Disaster Management Support Program
ESA:	European Space Agency
FMISC:	Flood Management Improvement Support Centre
LANDSAT:	Land Satellite
NRSC:	National Remote Sensing Centre
RADAR:	Radio Detection and Ranging
SRTM:	Shuttle Radar Topography Mission
USGS:	United State Geological Survey
WRD:	Water Resources Department

A REPORT ON SCIENTIFIC STUDY ON THE FEASIBILITY OF FLOOD PLAIN ZONING IN THE STATE OF BIHAR

1. OBJECTIVE

Flood Management Improvement Support Centre (FMISC) under Water Resources Department (WRD), Government of Bihar is a pioneer organization having a Mathematical Modelling Centre (Research & Development wing) is entrusted to carry out a scientific study on Flood Plain Zoning in the state of Bihar vide letter no-यो0मो0-4 (विविध)7-372/2020-528 Patna, dated 30/12/2020 of Engineer-in-Chief (Headquarter), Water Resources Department, Patna. The main objective of this scientific study is to find out whether the Flood Plain Zoning in the state of Bihar is feasible or not.

2. INTRODUCTION

Floods have caused devastation and acute human sufferings too frequently since the dawn of civilization and the man has had to live with floods since his existence. The impact of flood was not perhaps felt to the same extent in the past as is felt now. This was due to the fact that much small number of people were living and pressure of industrial activities and other development works in the flood plains was far less compared to the present day.

Bihar is India's most flood-prone State, with 76 percent of the population, in the North Bihar living under the recurring threat of flood devastation. About 68,800 Sq. Km. out of total geographical area of 94,163 Sq. Km. comprising 73.06 percent is flooding prone. Bihar is also one of the States having lowest per capita income in India. It has shown signs of improvement in recent years. Recurrent floods are proving to be stumbling block in the resource generation/improvement efforts. Floods not only affect lives, livelihoods, productivity and security of existing investments, but are also a disincentive for additional investments in Bihar.

Bihar accounts for about 17% of the flood-prone area and 22% of the flood-prone population in India. 28 out of 38 districts of Bihar are flood prone. Bihar's vulnerability to floods is due to its very flat topography just downstream of the steep Himalayas, intense monsoonal rains (more than 2,500mm/year in the upstream catchment in Nepal and about 1,200 mm/year in the State; 80% rainfall occurs during the months of June to September), high sediment loads due to fragmented rocks of Himalayas, high population density (1102 per Sq.km., Census 2011), low-socio-economic development, inadequate water infrastructure to regulate flow (e.g., storage in Nepal or designated detention areas in upper catchments).

The plains of North Bihar, adjoining Nepal, are drained by a number of rivers that have their catchments in the steep and geologically recent Himalayas. About 65% of catchments area of these rivers falls in Nepal/Tibet and only 35% of catchments area lies in Bihar (*Figure-2.1*). The rivers that cause much of the flooding include the Ganges and its tributaries (BurhiGandak, Gandak, Bagmati-Adhwara Group, Kamla, Kosi and Mahananda from the Himalayas on its left bank and the lower reaches of the Sone, Punpun, Chandan and Badua rivers on its right bank). It is important to point out that only BurhiGandak originates from low hills of outer Himalaya or Shivalik in West-Champaran.

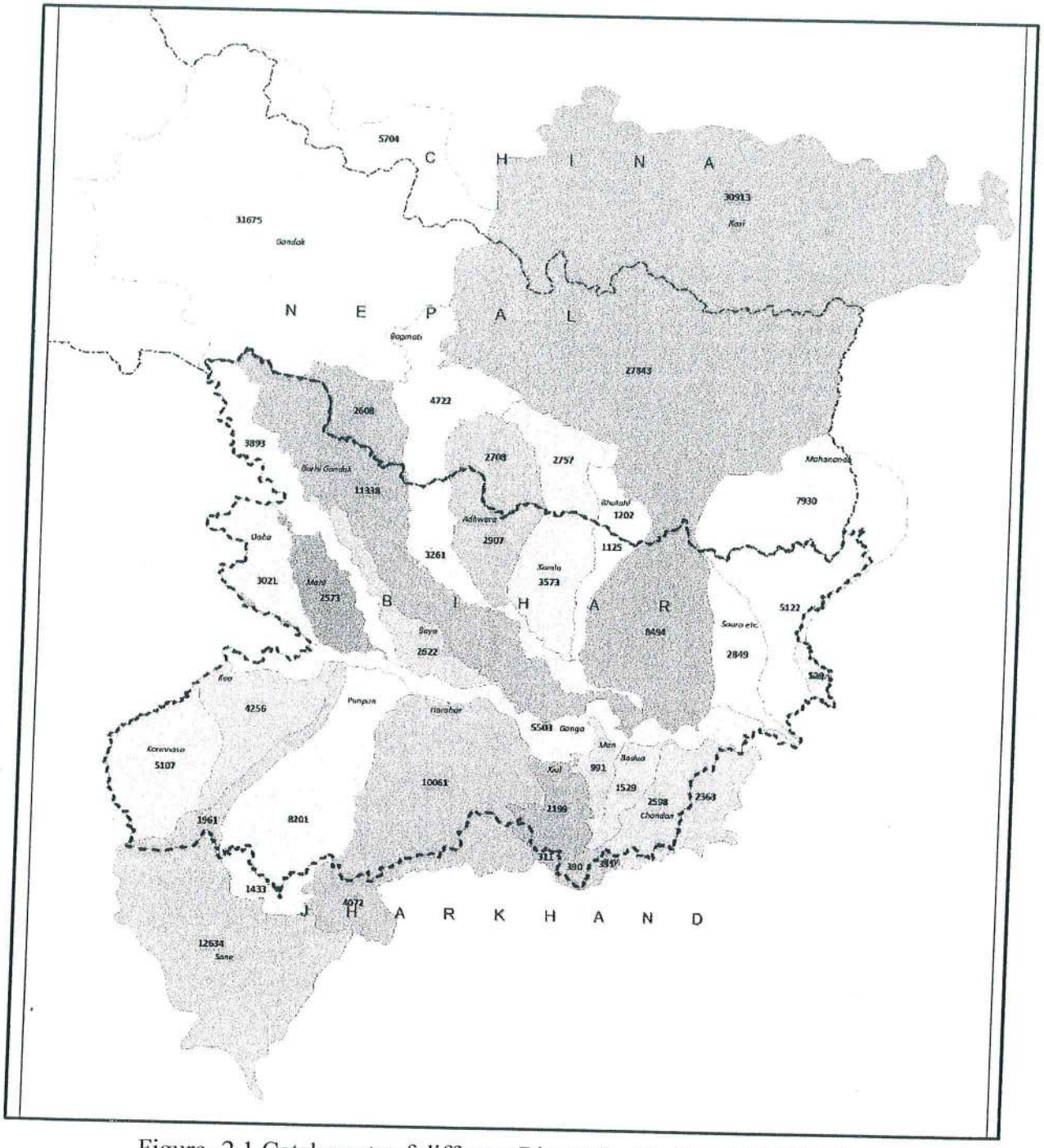


Figure- 2.1 Catchments of different Rivers (inside & outside Bihar)

The flood problem was accentuated due to ever increasing encroachments on the flood plains by the growing population to meet its requirements of shelter, food and fibre. The destruction of forests, reclaiming areas for occupation and fuel for their domestic requirements had also caused changes in river regime. All these have resulted in an anomalous situation where, in spite of protection measures carried out so far in the State with a substantial investment on flood management works, flood damages have gone on increasing instead of decreasing.

The plains of North Bihar are some of the most susceptible areas in India, prone to flooding. A review by Kale (1997) indicated that the plains of North Bihar have recorded the highest number of floods during the last 30 years. The total area affected by floods has also increased during these years. Drained by the two major rivers like the Kosi and Gandak and several smaller systems, such as Burhi Gandak, Baghmati and Kamla Balan, the plains of North Bihar have experienced extensive and frequent loss of life and property over the last several decades (Sinha and Jain,1998). The Kosi River (The Sorrow of Bihar) is well known in India for rapid and frequent avulsions of its course and the extensive flood damages it causes almost every year.

The Kosi is one of the major tributaries of the Ganga river, and rises in the Nepal Himalayas. After traversing through the Nepal Himalayas, it enters India near Bhimnagar. Thereafter, it flows through the plains of North Bihar and joins the Ganga River near Kursela, after traversing for 320 Km from Chatra. The river has been causing a lot of destruction by lateral movement and extensive flooding. As its waters carry heavy silt load and the river has a steep gradient, the river has a tendency to move sideways. Thus, in about 200 years the river has moved laterally by about 150 Km (Gole and Chitale, 1966; Wells and Dorr, 1987). To check the lateral movement as well as for flood control, embankments on both sides of the river were constructed, five to sixteen Km apart. Although this has confined the lateral shift of the river within the embankments, but the problem of flooding is still a challenge in this area. The problem of river flooding is getting more and more acute due to human intervention in the flood plain at an ever-increasing scale. Total length of embankment (flood protection works) till the end of ninth five-year plan (1997-02) was 3435 Km & now it is 3780 km (*Figure-2.2*).

River Kosi remains at the central stage as far as history of floods in Bihar is concerned. The oscillation of the river Kosi bed below Chatra (Nepal) can well be compared with that of a pendulum of a clock having a fixed point at Chatra and oscillating between the district of Purnia on the east and district of Darbhanga on the west. Dr. B. Hamilton about 165 years ago formed an impression that the Kosi during the remote past possibly flowed more towards the south east than towards the east and joined the Brahmaputra.

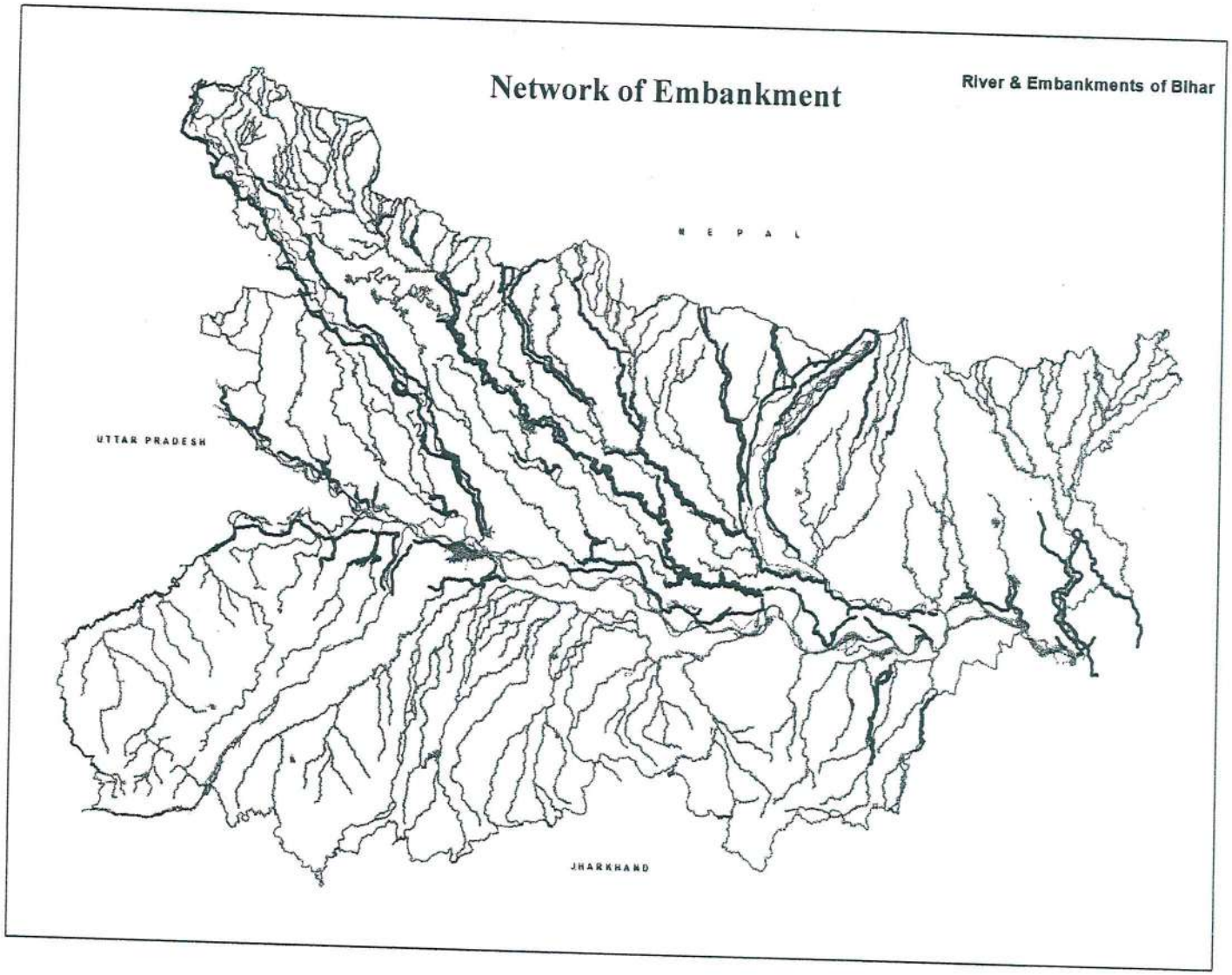


Figure –2.2 Embankment Networks of Bihar

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The views of M/S Leopold and Maddocks Jr. of United States Technical Co-operation Mission was sought by Govt. of India and the state of Bihar in connection with the finalization of the 1953 Kosi project. Dr. Kanwar Sain &Dr.Chitale gave reports about Kosi and its possible remedies which are based on sound logic. The history of past floods as available from the records of the district gazetteers of Saharsa and Purnia summarized by 2nd Bihar State Irrigation Commission.

Kamla Balan river basin is bounded by the Adhwara group of rivers on the west, the Kosi basin on the east, the Kareh river on the south and Mahabharat range of hills in Nepal on the north. The River Kamla and its tributaries used to cause flooding mainly in the districts of Madhubani and Darbhanga. The construction of embankment on its both banks from Jainagar to Jhanjharpur in 1958, Jhanjharpur to Darjia in 1962 and its subsequent extension up to Kotharam (1980) has checked flooding to a great extent in the middle reach of the river.

3. FLOOD MAPPING USING SATELLITE IMAGES

For the past 35 years satellite imaging has been used to map various earth resources as well as geographical features for better understanding of human nature interaction and its bearing on future of humanity. Natural disasters have been an integral part of our life and mankind has been trying to overpower natural forces wherever they find a chance to win.Flood seems to be the most damaging one as human settlement and their activities are found close to water bodies and rivers. Rivers which receive more water in the form of rain support more population density but have a greater risk in the event of a flood.

3.1 ADVANTAGES OF REMOTE SENSING AND ITS LIMITATIONS

In the beginning optical imaging cameras mounted on satellites used to capture astonishing pictures of the surface of the earth along with patterns of cloud. But the limitation of optical imaging during cloudy days; which is usual scenario during monsoon; hampered capturing most of the events. The advent of Radio Detection And ranging (RADAR) imaging during late 80's helped us in capturing a greater number of events as cloudiness was no limitation. These images, however were quite expensive and limited by availability due to orbit cycle design. Still, better and more numbers of RADAR imaging platforms were continuously providing pictures of flood events all over the world.

3.2 DATA SOURCE

For flood mapping of Bihar State, we are depending on processed extracts of RADARSAT images provided by NRSC under DMSP (Disaster Management Support Program). Besides we also purchase optical images from NRSC. Freely available sources like USGS (U.S. Geological Survey) and ESA (European Space Agency) also provide various images through their portal.

4. MAPPING METHODOLOGY

FMISC has procured and generated various thematic GIS datasets such as Administrative layer, Road, Rail, River systems, embankments and Canal. These layers are used to prepare a framework of study area under consideration. Satellite image or its extract is place in the background to generate a user-friendly map for use in field for decision making. Area of flood is generated on classified layer and is geo-processed to aggregate on District or Block level. It is to be noted that these images are available for a small area at a time. Satellite revisit period varies from 7 to 26 days. Since RADAR imaging satellites are steerable, their view can be changed on instructions from the operator. These advance multipurpose satellites are deployed for various missions from time to time hence their availability is not guaranteed. However, by employing a combination of various sensors and platforms a large number of flood events can be captured.

We have an archive of flood layers provided by NRSC. Every year's layers are put together on the state map to generate a mosaic, which sufficiently depicts maximum flood extent covered by satellites during that monsoon season. A composite map of Bihar based on satellite images from year 2007 to 2020 is prepared at FMISC *(Figure 4.0)*.

Here this also must be kept in mind that all the flood events and all flooded areas have not been covered on a particular date. ***The maximum flood extent may miss some major flood event due to non-availability of any satellite over that region. The image of the region might have been captured on a later date; but by that time flood water may have receded from a large area.***

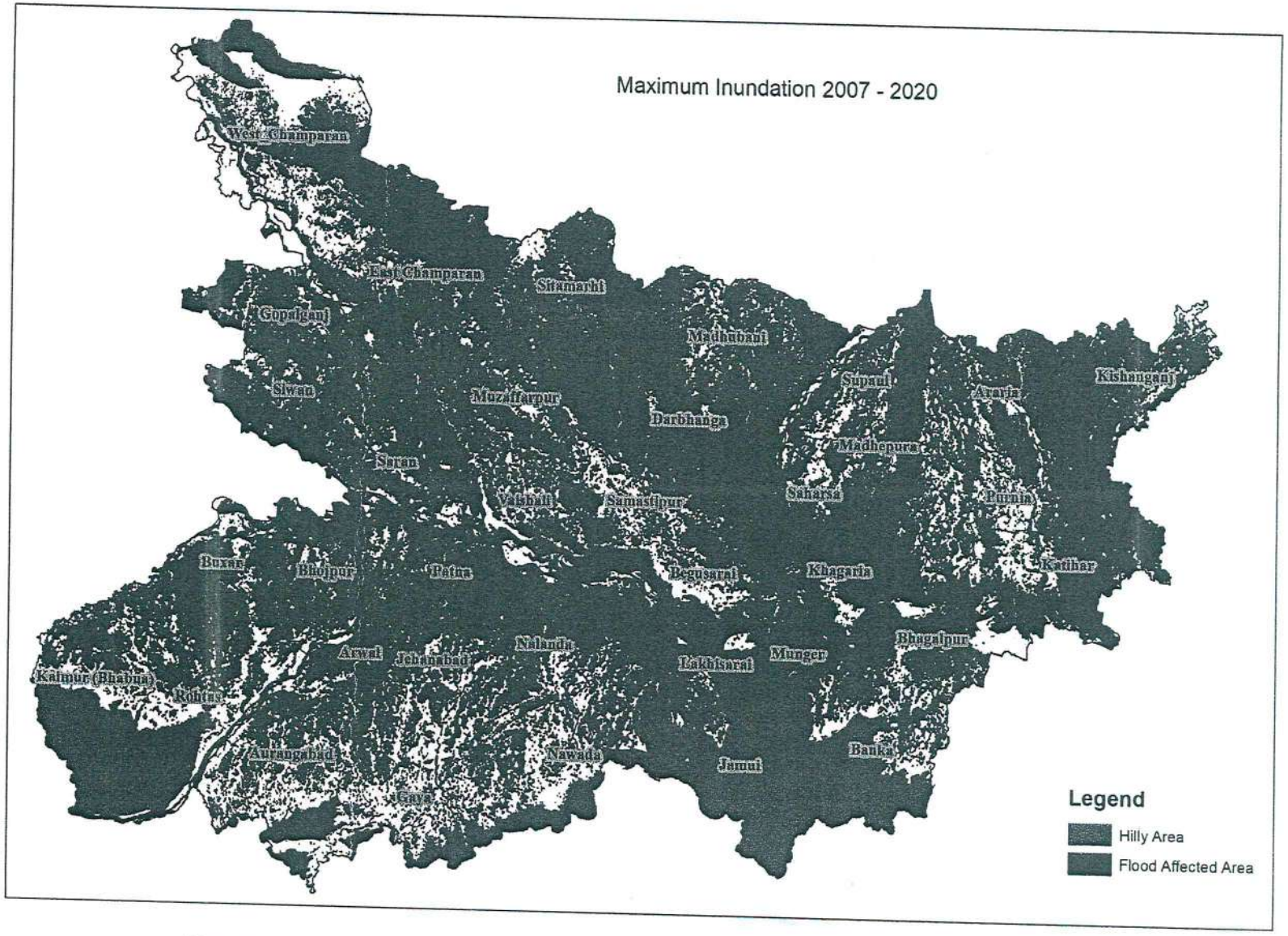


Figure-4.0 Composite Inundation Map of Bihar based on satellite images of 2007-2020

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5. HYDRO-METEOROLOGICAL FACTORS AND THE FLUVIAL PROCESS

Much has been said about the ferocity of Rivers of Bihar and the resultant flood devastation and economic miseries caused to State. Blame has always been placed on the rivers of North Bihar, mainly Kosi, Bagmati, Kamla and Mahananda. It is always said that these rivers carry a lot of water and sediment from Himalayan region and spread across plains of North Bihar. Pattern of rain during monsoon is such that rivers themselves find insufficient time and space to accommodate such a vast quantity of water in such a short time that too at close intervals. Due to insufficient capacity of the river to carry the discharge hence the surplus must find its way on its own causing either spill-over or breaches of embankment which ultimately causes loss of life and property. We must not forget that this insufficiency of capacity of river has resulted in formation of vast alluvial plains which has supported civilization since time immemorial.

The problem is further aggregated by the fact that Bihar plain lies near the lower end of the great Indo-Gangetic plains hence every bit of water received in upper and middle catchment must pass through this State with rivers having very gentle slope. It is wrong to consider flood and plain as separate contexts; rather treat it as ***flood plain*** with benefit of fertile land and miseries of flood.

Kosi has been considered as "Sorrow of Bihar" but in fact this river has created the biggest deposit of alluvium which forms a large part of Indo-Gangetic plain. The fan shaped convex dump created by this single river system is still undergoing development with the help of shifting channels from East to West and from West to East, spreading vast amount of sediment obtained from destruction of massive Himalayan mountains. Notably this fan is known as "Maize bowl" of Bihar.

6. FACTORS AFFECTING PATTERN AND INTENSITY OF FLOODS IN BIHAR

6.1 TOPOGRAPHICAL FACTORS – *LOCATION IN CATCHMENT*

While dealing with flood problem of Bihar we talk about rivers of Bihar and somehow ignore other big and small river systems of upper part of the great Indo-Gangetic plain. A catchment is an area over which rainwater is collected and directed towards downstream i.e., lower elevation in the form of river network, which merge together to form an axial drainage leading to final outlet i.e., Ocean. This means that the areas at lower elevation keep receiving water from upper part of the catchment even if there is no direct input in the form of rain. This causes a pile-up of water to be transported to sea. Notably the upper part of the catchment also has greater gradient hence rainwater moves faster on the land as well as in the channel. The velocity slows down as we move downstream in the catchment (*Figure- 6.1*). Moreover, sediments coming from upper catchment settles down in the channel itself due to drop in velocity as well as nears the sea. This seemingly slow process; over the years; has contributed a lot to upheaval of river beds resulting in increased submergence of Ganga Khadar even if the intensity of monsoon remains the same.

6.2 TOPOGRAPHICAL FACTORS – *LOCAL RELIEF FEATURES*

Flood plains are formed due to predominantly aggradation action of river systems. In course of transporting water and sediment the river tries to establish equilibrium between energy it has at its disposal and load it has to carry down to the sea. When energy is surplus the river etches out its edges to create more waterways and when load exceeds carrying capacity, it is deposited on the way. This action creates many shapes on the surface it has created, hardly perceptible to an untrained eye but visible during floods.

The SRTM Digital Elevation model clearly shows that the flood plain is entrenched in the plains and interfluvial areas are raised much above the flood plain (*Figure-6.2.1*). Thus, River flood prone areas lie at lower elevation in the form of a relatively narrow river play zone. The picture is just reversed in case of Bihar, it shows raised strip all along the River while areas lying away from Rivers are flooded. These raised strips are Natural Levees (*Figure-6.2.2*).

This low relief feature is created in rivers carrying huge sediment load and episodic large volume of water; causing spill over. The heaviest material is deposited soon after the spill, on the edges while finer material is carried further from the river. This repeated action raises edges of rivers creating a raised bank all along. A satellite image acquired during monsoon months shows these features clearly in a part of North Bihar plains (*Figure – 6.2.3*).

Natural levee is one such feature which is hardly visible due to its subtlety (low relief) but these low ridges along the rivers are high enough that many ancient settlements have thrived on it, being protected from frequent floods. Many towns and cities serve as examples in our study area which are proven to be of great antiquity and find place in oldest Hindu scriptures. Many important cities and towns such as Buxar, Chapra Patna, Munger, Hajipur, Begusarai, Bhagalpur and Kahalgaon are situated on the bank of Ganga which is treated as Holy River from ancient times. ***This settlement pattern is strictly guided by topography (Figure- 6.2.4)***.



Figure – 6.1 The Northern plains shown by MODIS satellite

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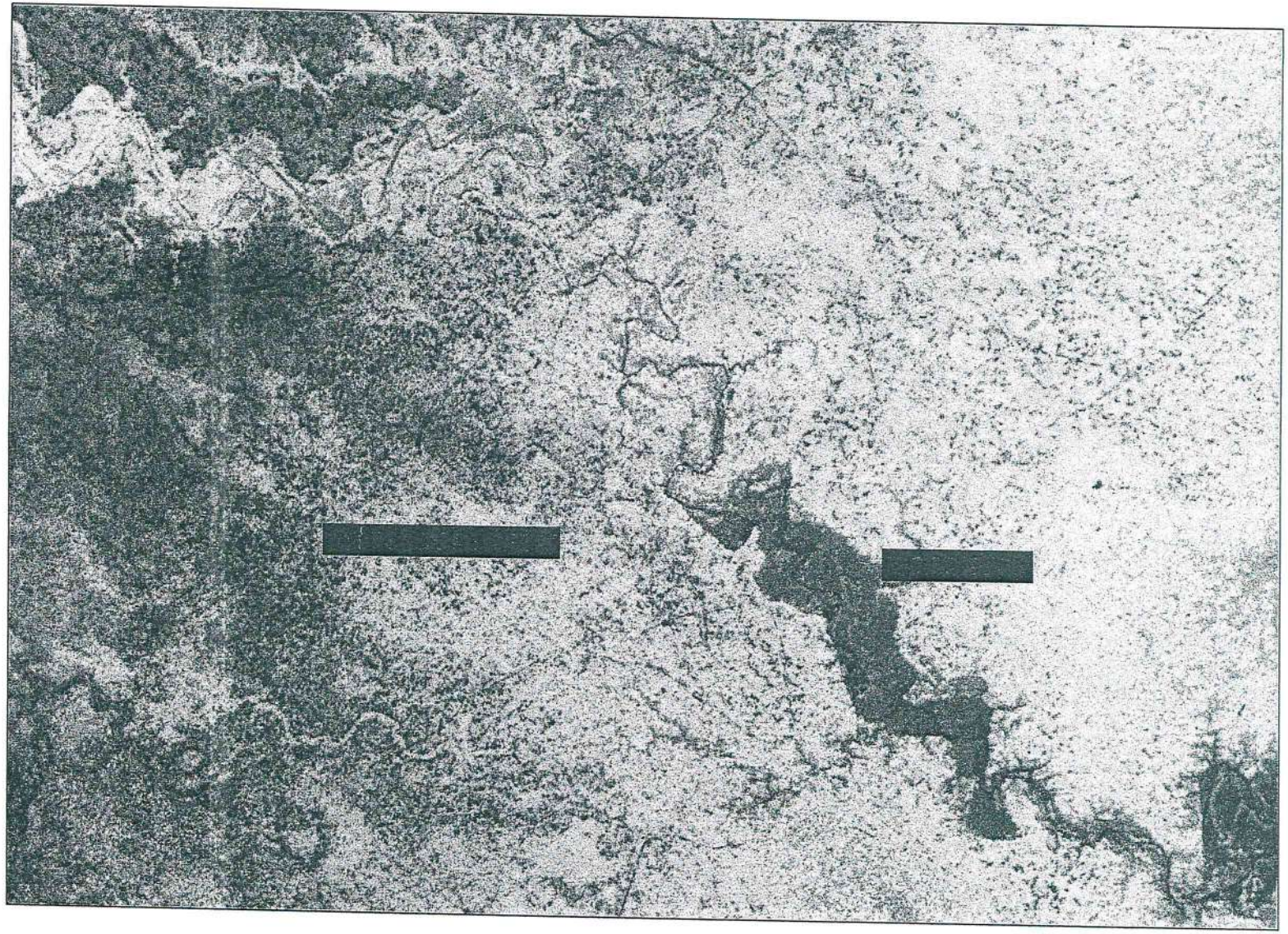


Figure- 6.2.1 Topography of U.P Plains*(Source SRTM, DEM)*

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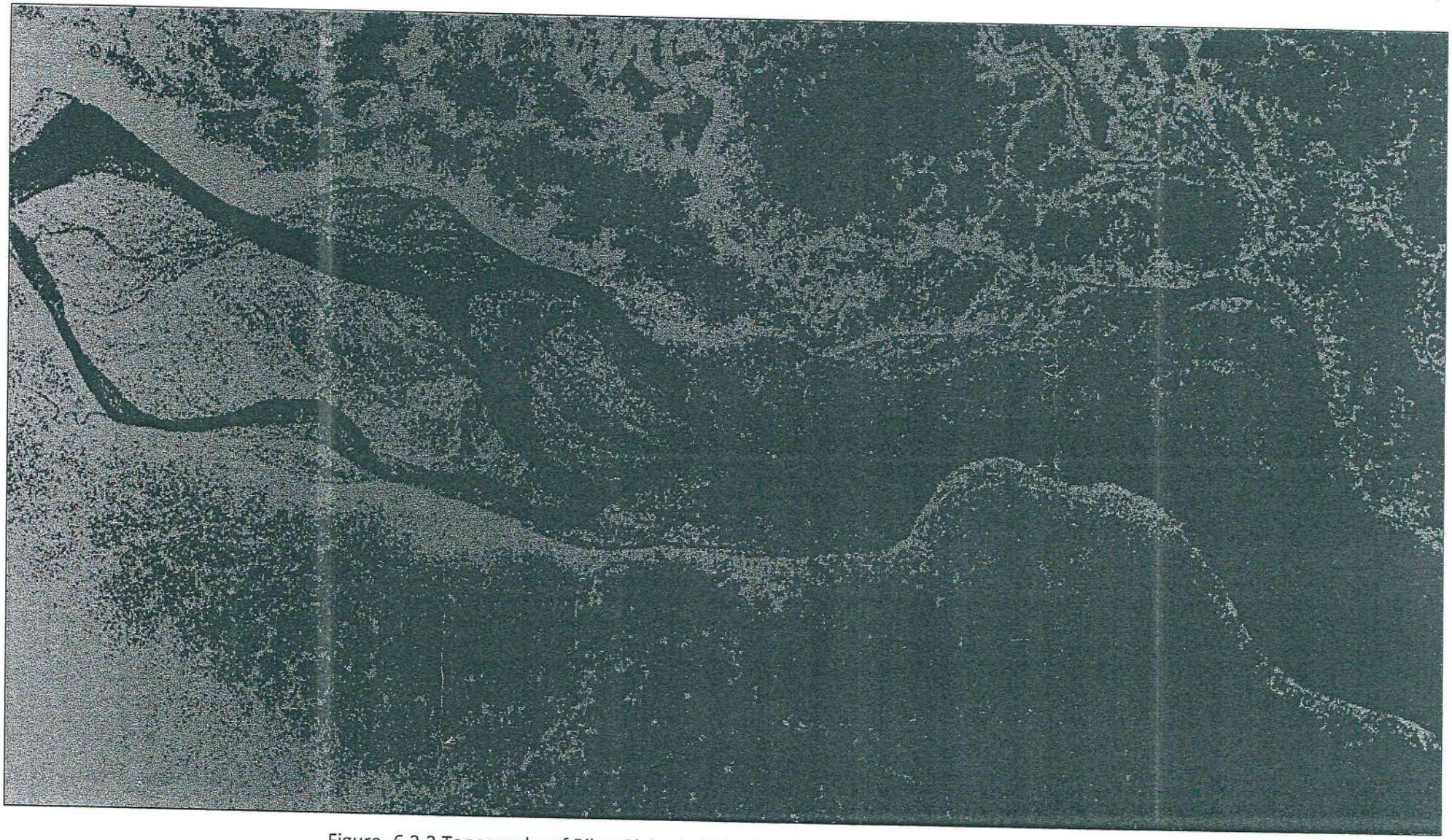


Figure- 6.2.2 Topography of Bihar Plains in Rainy Season *(Source: SRTM, DEM, USGS)*

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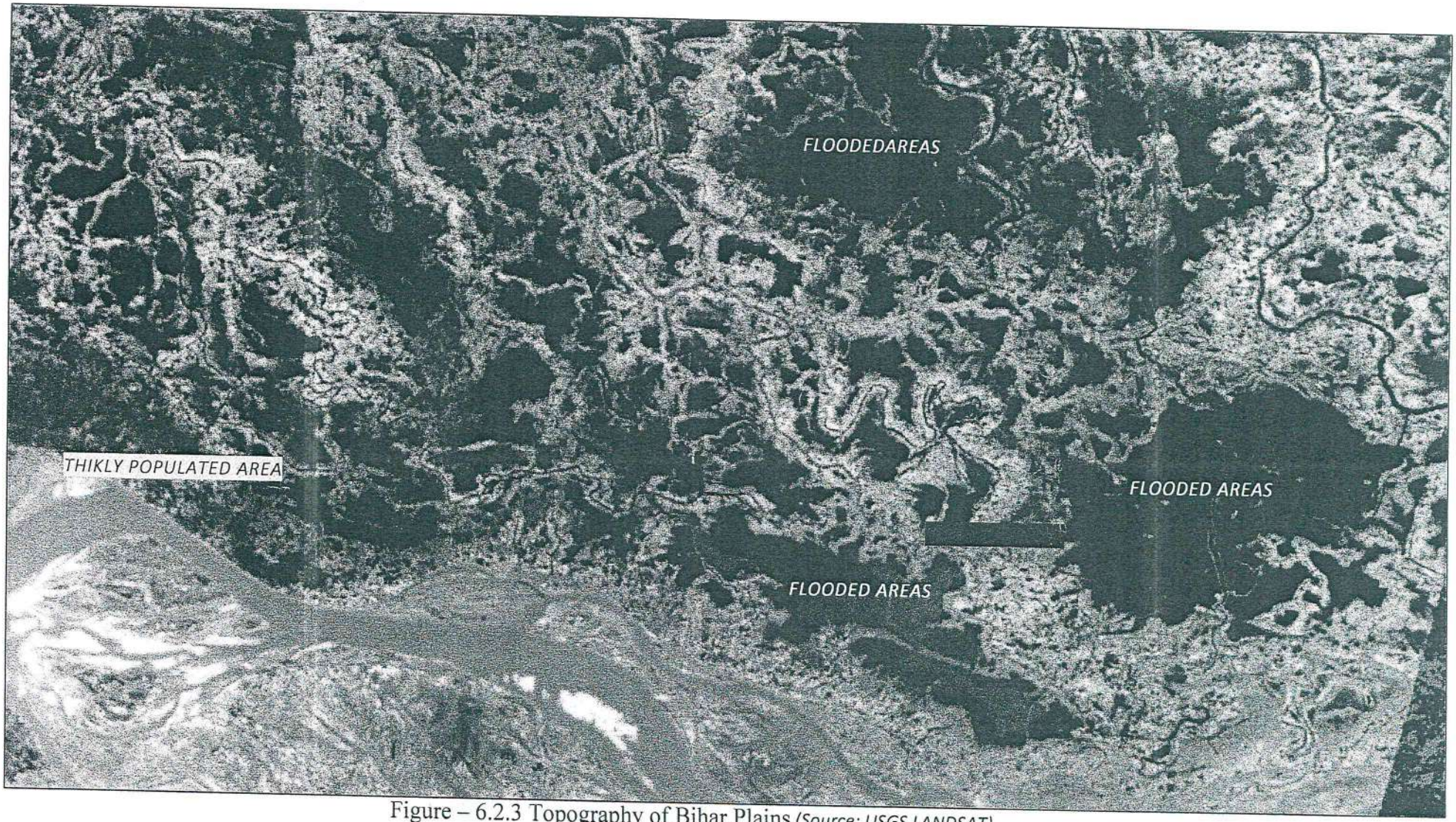


Figure – 6.2.3 Topography of Bihar Plains *(Source: USGS LANDSAT)*

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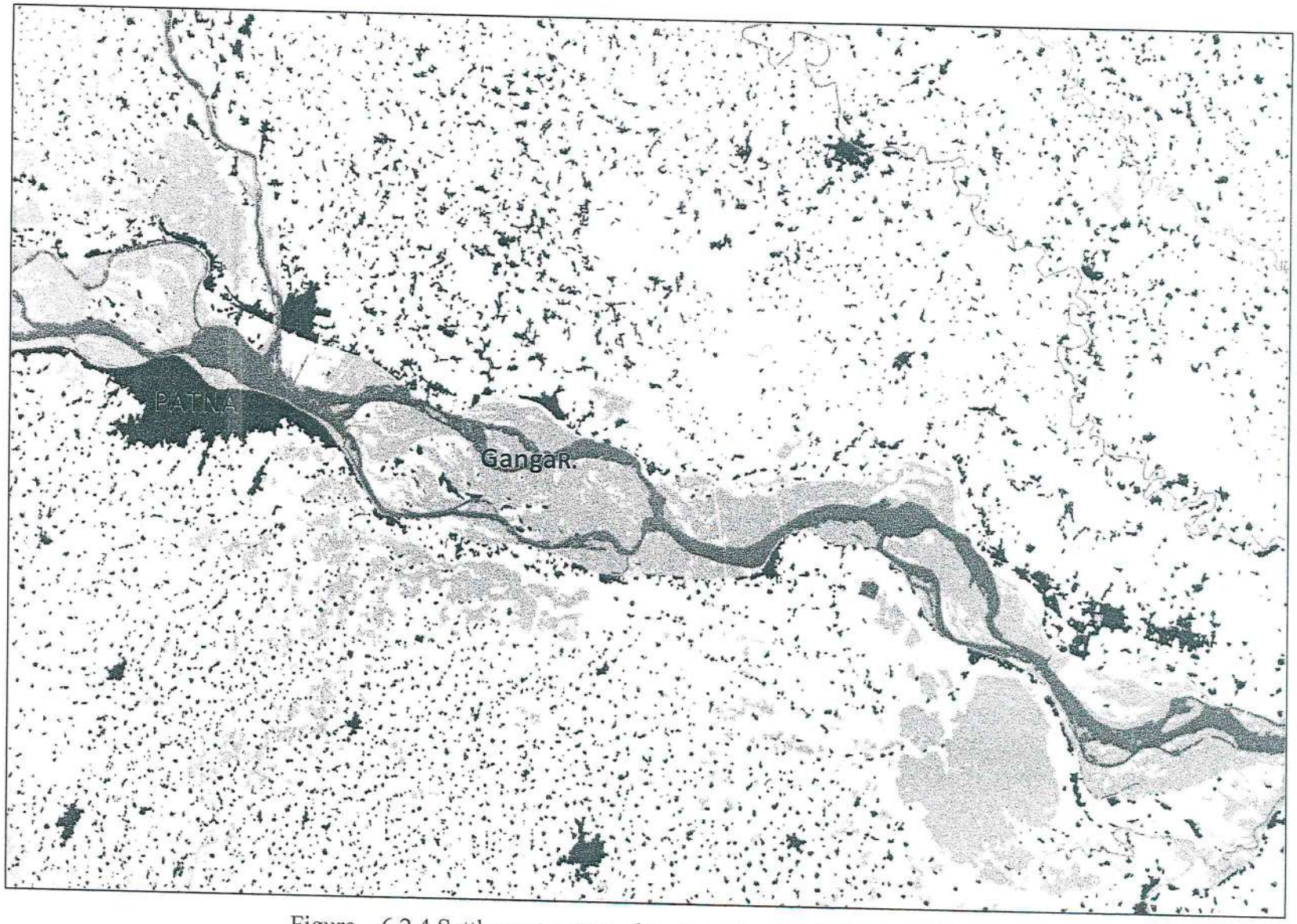


Figure – 6.2.4 Settlement pattern showingmajor habitation near River

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7.0 LAYOUT OF MAJOR CIVIL INFRASTRUCTURES

A look at drainage pattern of Bihar plains clearly shows a southerly slope in the North Bihar plain and a northerly slope in South Bihar plains, both leading to Ganga; the axial drainage of Bihar plains. While south Bihar rivers have a South to North orientation; North Bihar rivers show a tilt towards South East e.g., Gandaki, Bagmati, BurhiGandak etc. Kosi is an exception to this pattern as it has its own self-built terrain over which it has been wandering. The westerly bulge is due to a convex surface of the great alluvial fan formed just below Chatra in Nepal Himalaya. The river flows along the western edge of this massive alluvial fan. Supaul, Saharsa, Madhepura, Araria, Purnea, part of Kishanganj and Katihar districts lies over this alluvial fan.

Despite a well-defined natural topography favouring faster removal of flood water and lesser damage to life and property, the state suffers a lot of losses frequently on a routine basis. Fertile nature of soil and a favourable weather system has supported civilization since known long history. The region has witnessed rise and fall of many kingdoms and dynasties, all adding to infrastructural development across the plain. Ever increasing population and economic activities to support their livelihood has resulted in construction of Roads, Canals, Bridges and railway lines.

As the area is flood prone, most of these infrastructures have been developedconsidering flood hazards. This has resulted in a network of criss-crossing raised lines of "bunds", dividing a gently sloping plain in compartments of various sizes and "depth". Flood water, now has to negotiate through these ***compartments*** on its way down the plain. In most of the cases outlets provided in these "barriers" fall far short of requirement resulting in impeded drainage. Therefore, the flood has to wait longer to find passage, leading to longer duration of inundation. Many towns and cities are exposed to this problem and have constructed *Town Protection Bunds* to stay protected from flood water ingress in town areas.

Construction of a large number of bridges across the rivers has also affected transportation of sediment in traction (along River beds especially during non-monsoon months). Due to construction of these bridges, clear waterway gets obstructed impeding the free flow of water. All our efforts and engineering endeavours have given boost to our standard of living but now the adverse effects are being felt with more imposing vigour. Facing challenging nature head-on has taught us many lessons in the form of large-scale damage to life and property whenever nature sets its course right. For a short duration we have relished the feeling of *winning over* power of nature, now is the time to learn to live within the space provided by nature.

Rivers have always been lifeline of human as well as animal kingdom, hence we must begin to share only legitimate part of natural wealth, be it land, water or air.

Bihar is predominantly an agrarian economy, depending on its land and water. Long-time experience has supported agriculture till date and pleasantly we have not damaged our soil to the extent "progressive farmers" of the west have done. But the flip side is that we have failed to reduce pressure on land due to high population growth rate. Majority of farmers have small to very small holding which falls far less than sufficient to support livelihood. They are now

turning to intensive cultivation which require more of artificial irrigation, generating high demand of water from underground reserves. Farmland away from Rivers are more dependent on Ground Water for irrigation compared to those living close by Rivers.

It is pertinent to notice that civilization has begun from rivers. Large inhabitations lie onnearby the rivers or its tributaries because of large availability of alluvial plains and water suitable for agricultural food crops. Almost all-important towns of Bihar lie on the bank of either Ganga, Gandak, BurhiGandak, Bagmati,Kamla, Kosi, Mahananda and Sone. So, it is very difficult to demarcate flood zone on these rivers as this will affect the present scenario even though these towns are frequently affected by recurring floods.

Since the most towns of the State of Bihar are situated on/ near by the banks of rivers/ tributaries, a large population inhabit in the river adjoining area called flood plain. As population is also increasing very fast so the displacement of such large inhabitation/ population from these areas is not possible. On the other hand, the land available in non-flood plain are highly productive and the cost of land is high so practically not possible to do resettlement of these large population which are inhabiting since long period of time in the flood plain.

Almost all inhabitants of the State of Bihar are dependent on groundwater rather than surface water. The groundwater availability nearby river is higher and as we move away from rivers the ground water level lowers, which results in scarcity of drinking water. Therefore, in case of resettlement from flood plain will also create a great problem of drinking water availability. This will result in ecological imbalance.

8.0 YEARWISE FLOODING PATTERN MAPPED FROM 2007-2020

Year wise flooding pattern as captured by satellites on various dates during monsoon season have been assembled to generate year wise composite maps. These images have been provided by NRSC Hyderabad under Disaster Management Support Programme (DMSP) of Govt. of India. These maps can be seen from *Figure- 8.1 to 8.14.*

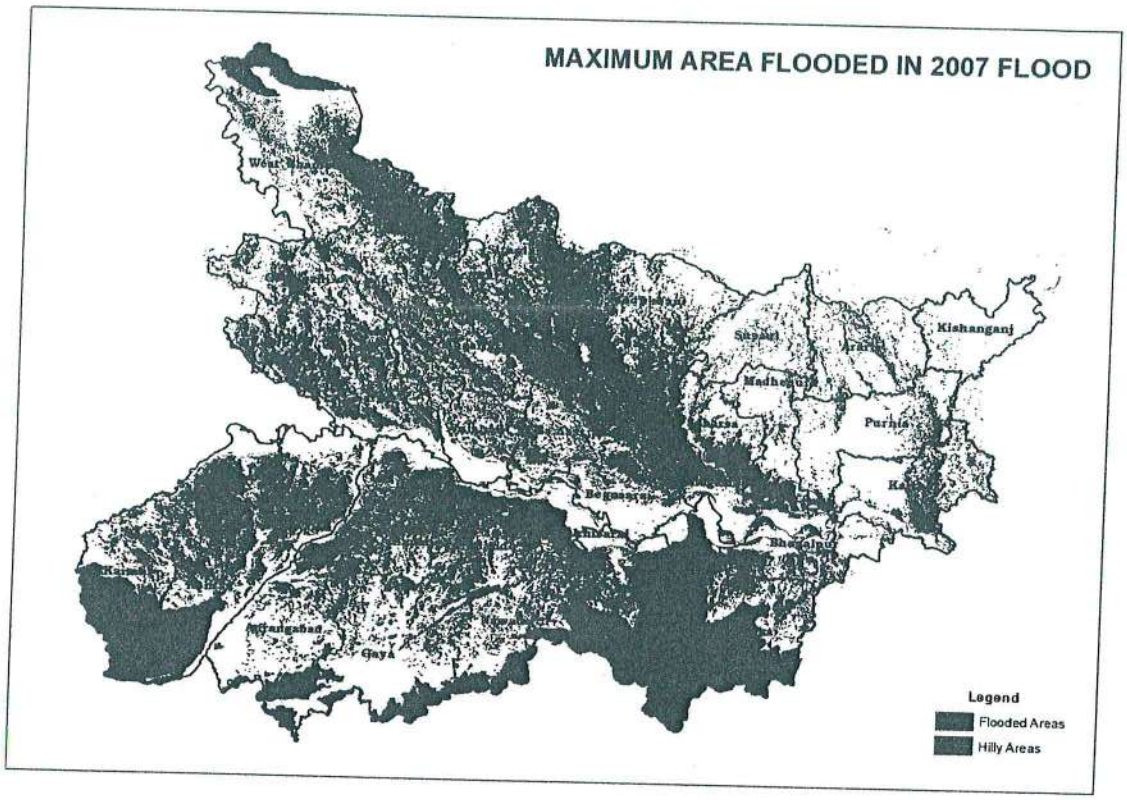


Figure - 8.1 Composite Inundation Map for 2007

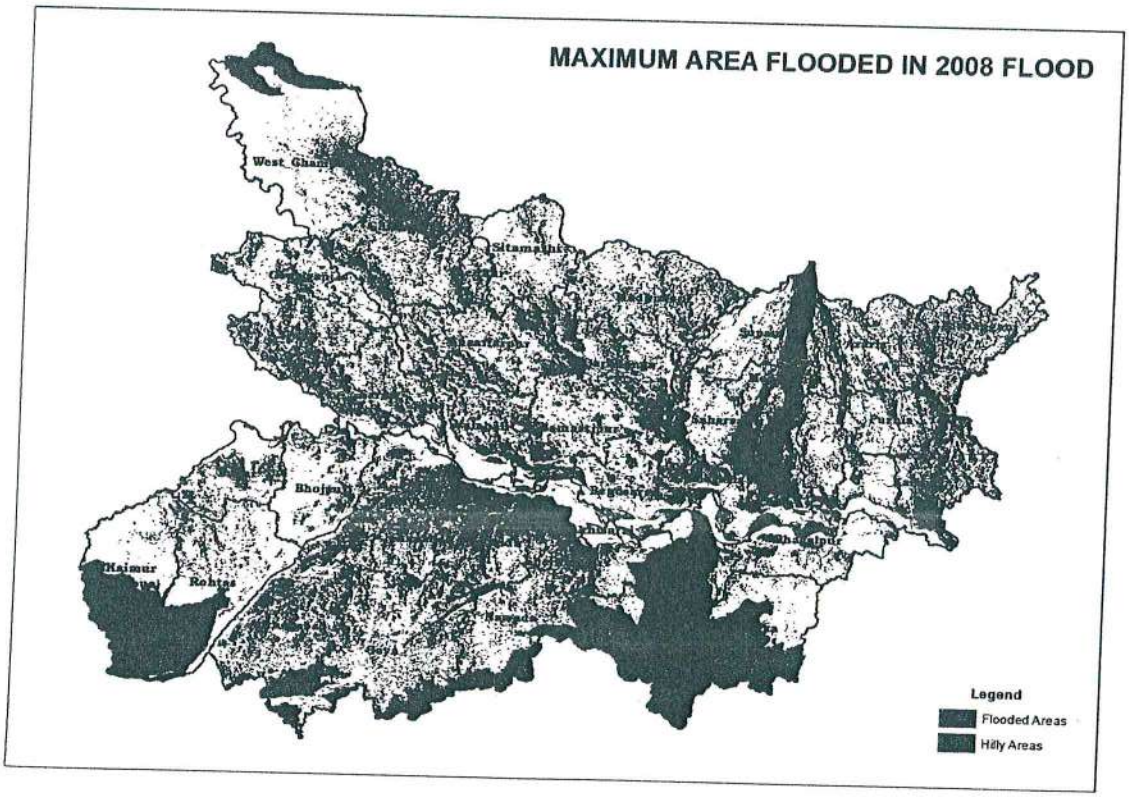


Figure - 8.2Composite Inundation Map for 2008

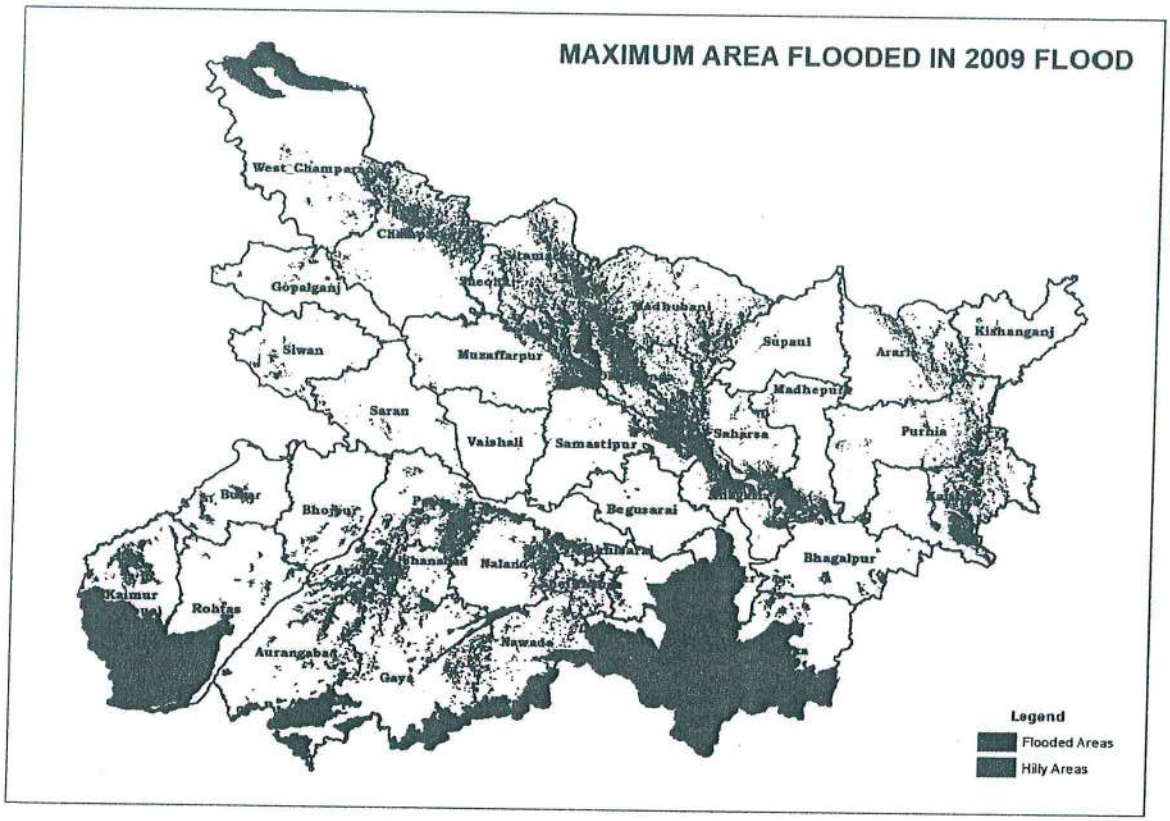


Figure- 8.3Composite Inundation Map for 2009

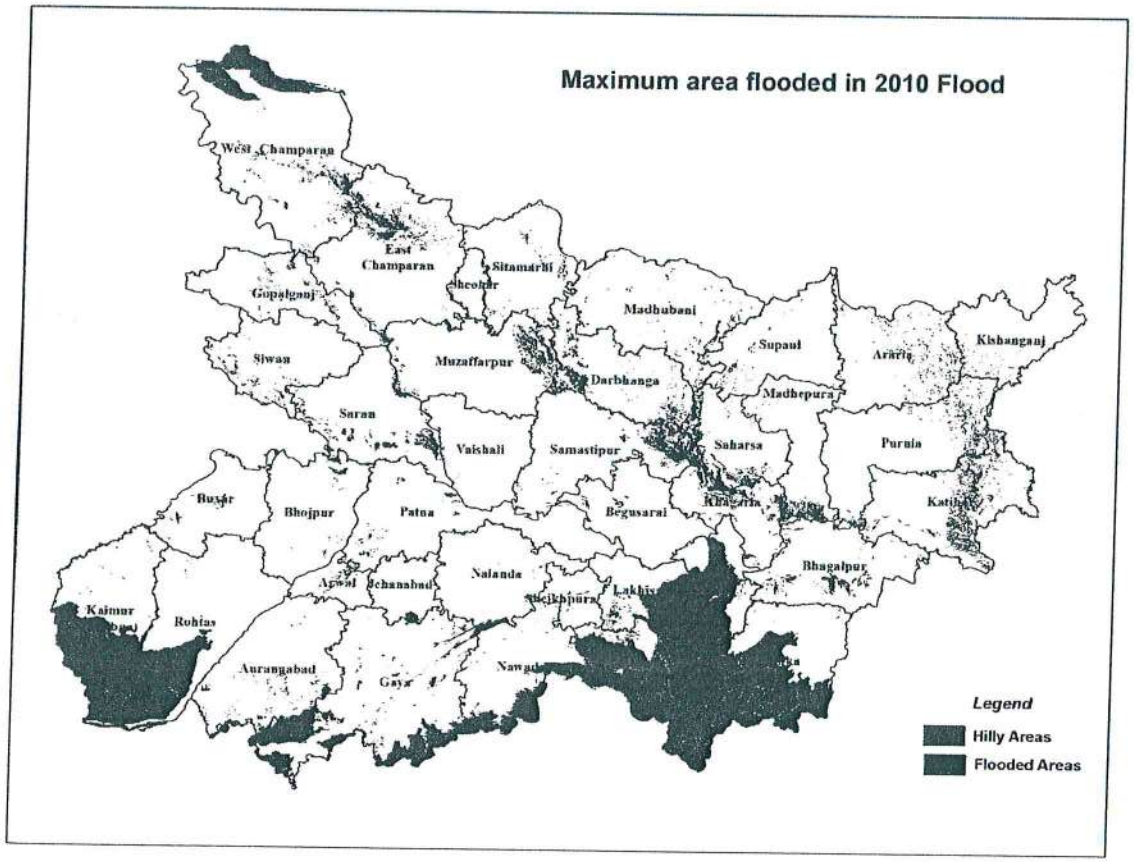


Figure - 8.4Composite Inundation Map for 2010

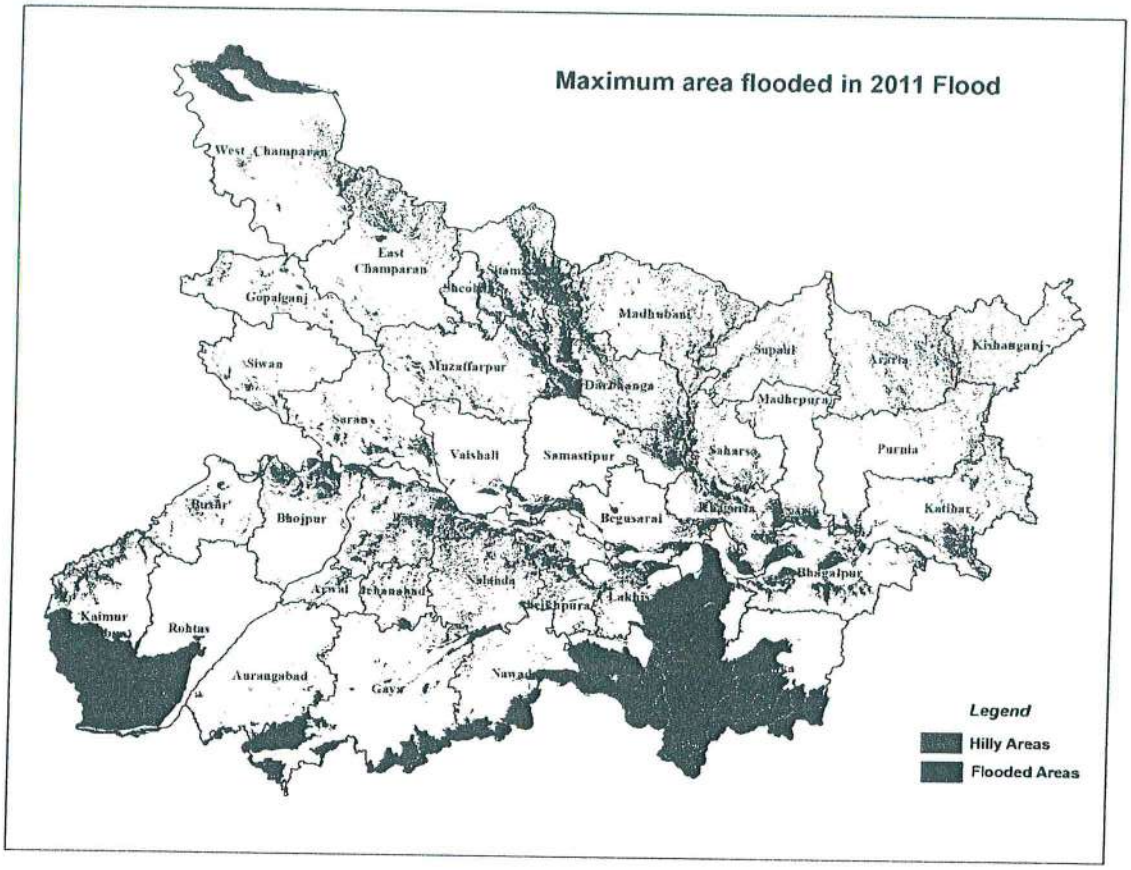


Figure - 8.5Composite Inundation Map for 2011

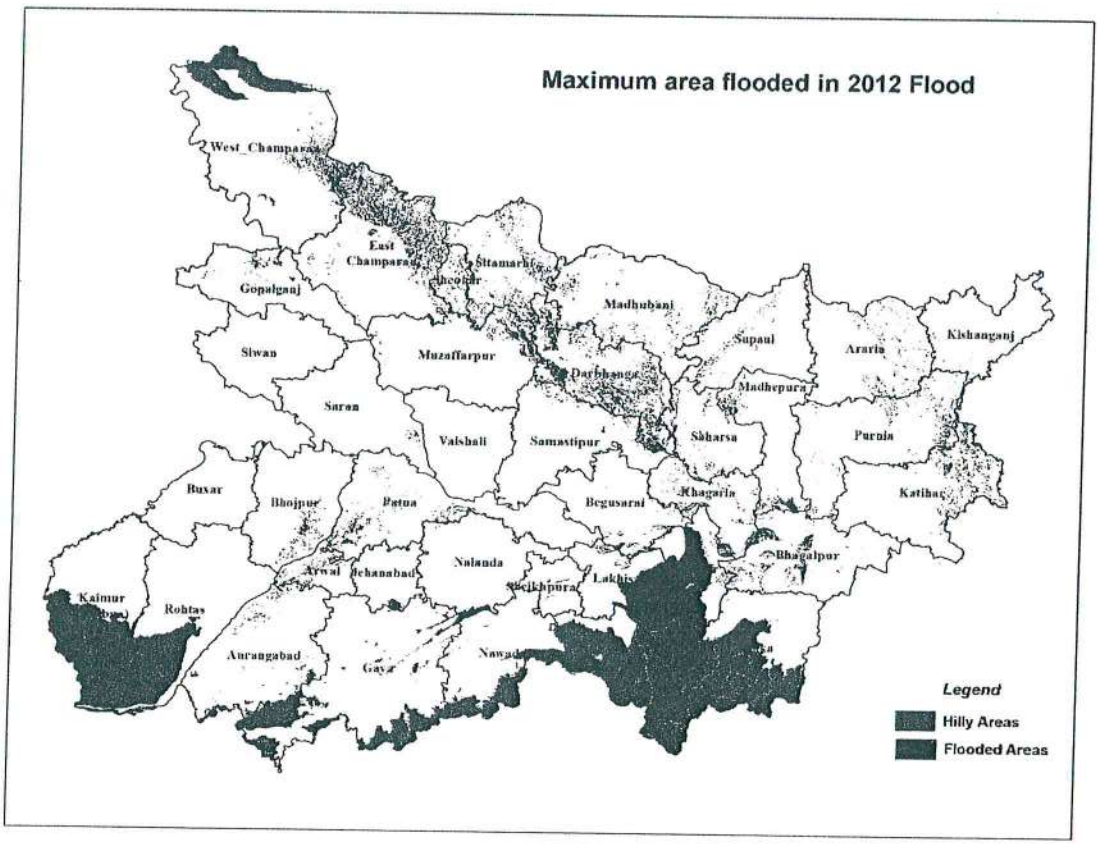


Figure - 8.6Composite Inundation Map for 2012

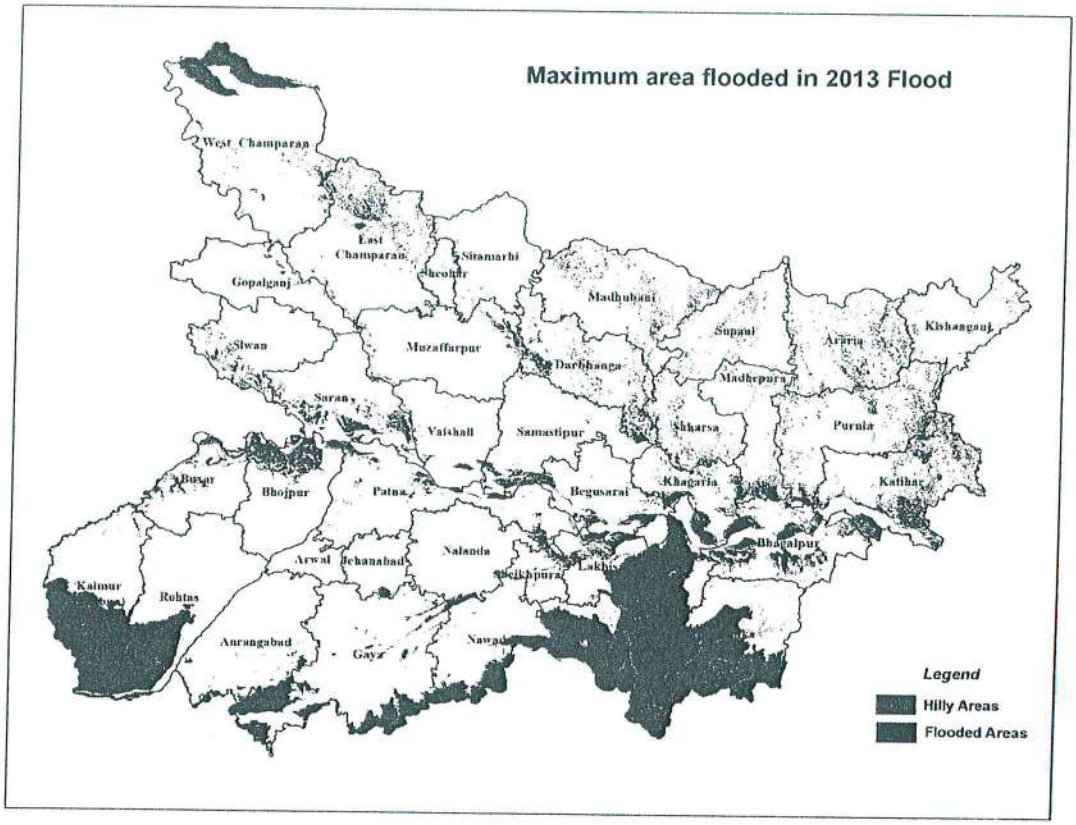


Figure - 8.7Composite Inundation Map for 2013

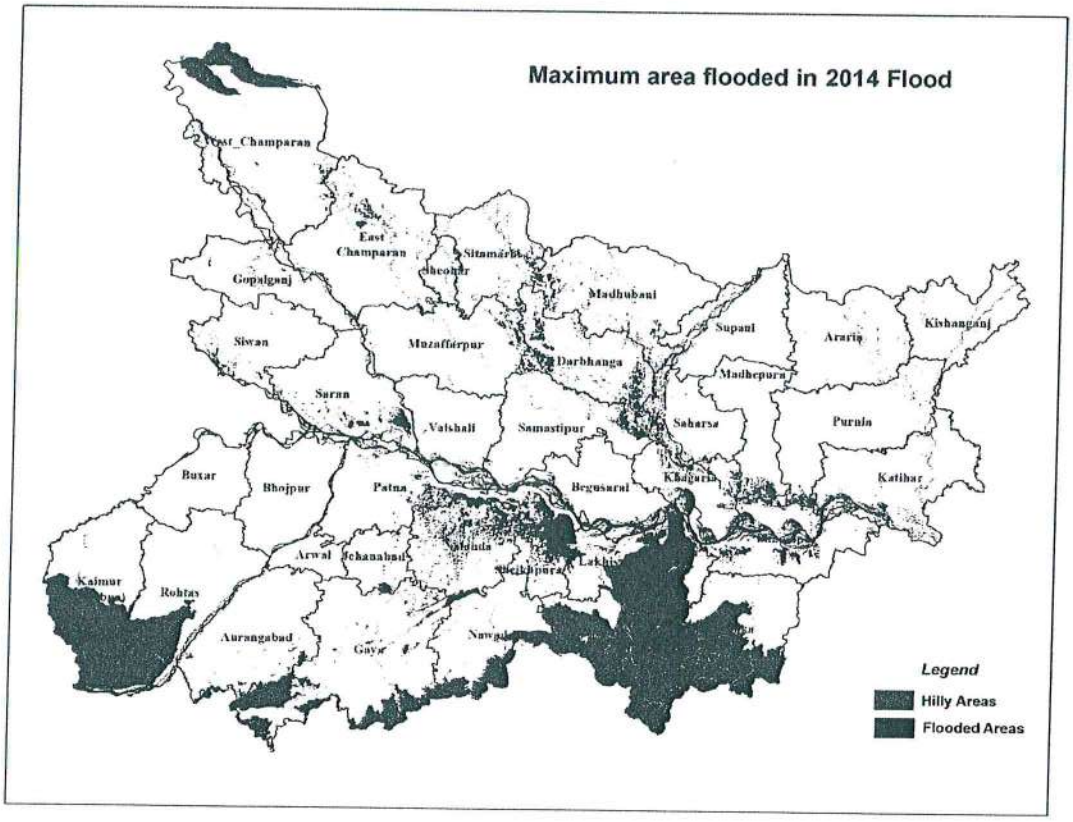


Figure- 8.8Composite Inundation Map for 2014

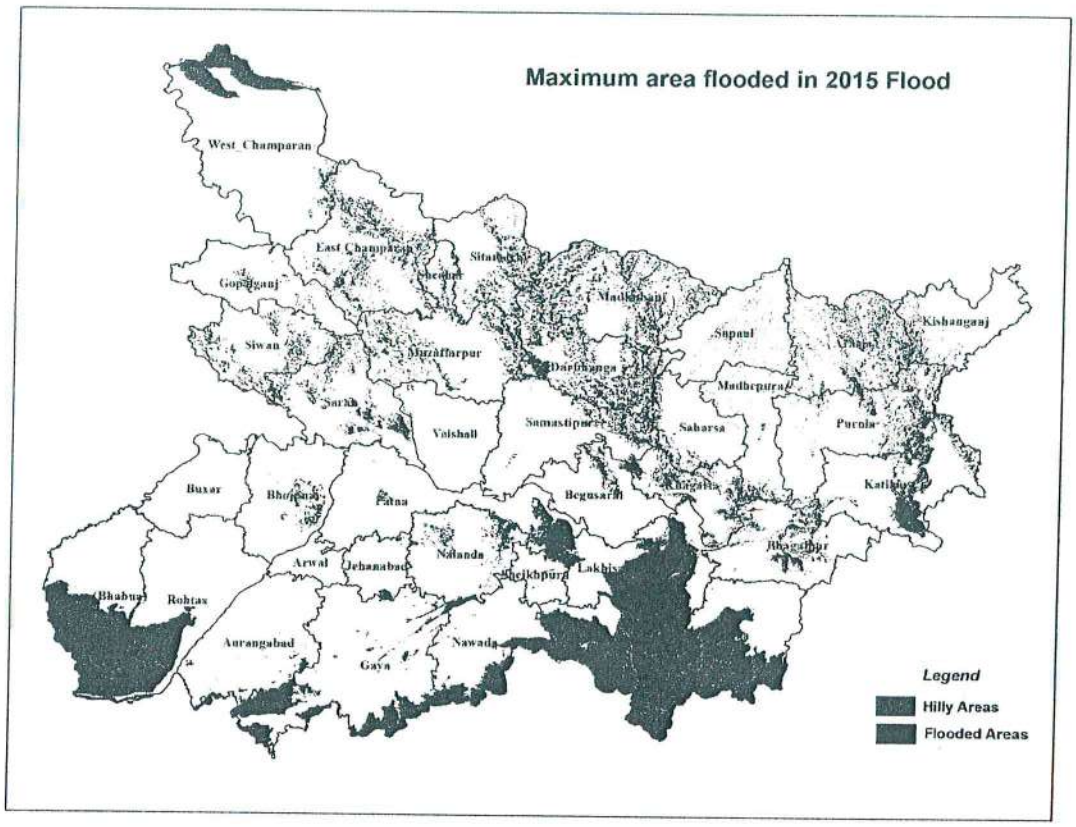


Figure - 8.9Composite Inundation Map for 2015

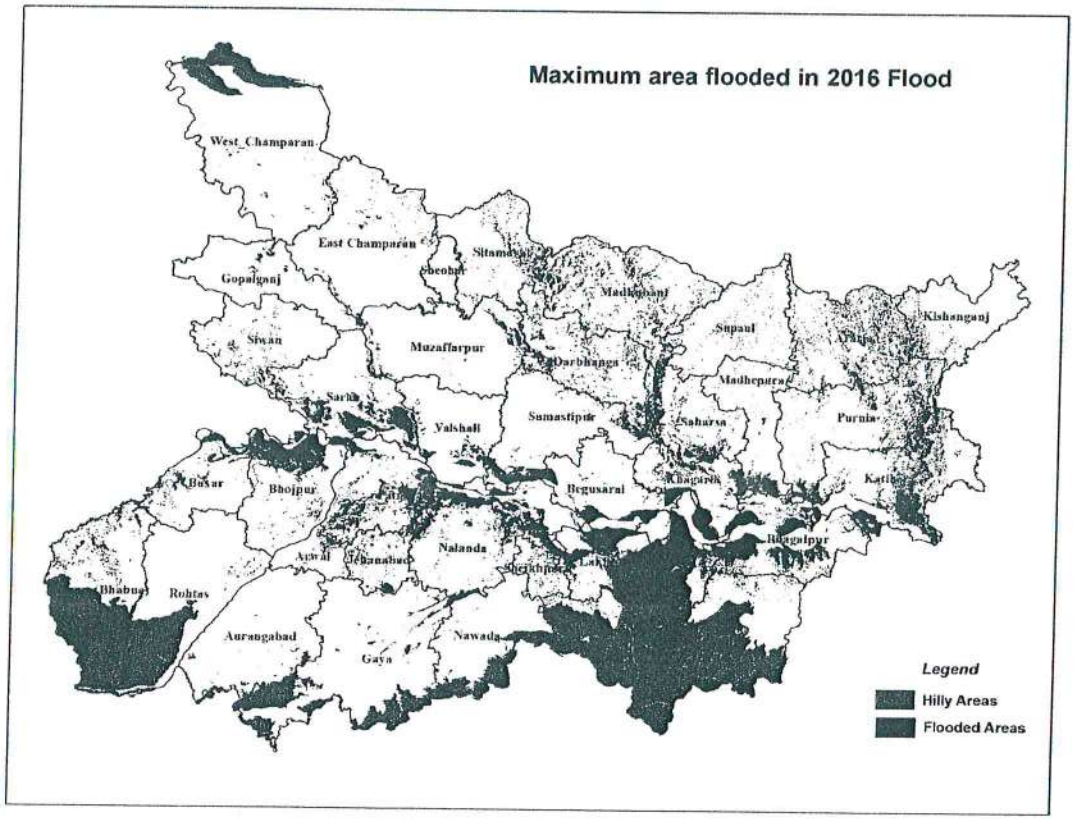


Figure - 8.10Composite Inundation Map for 2016

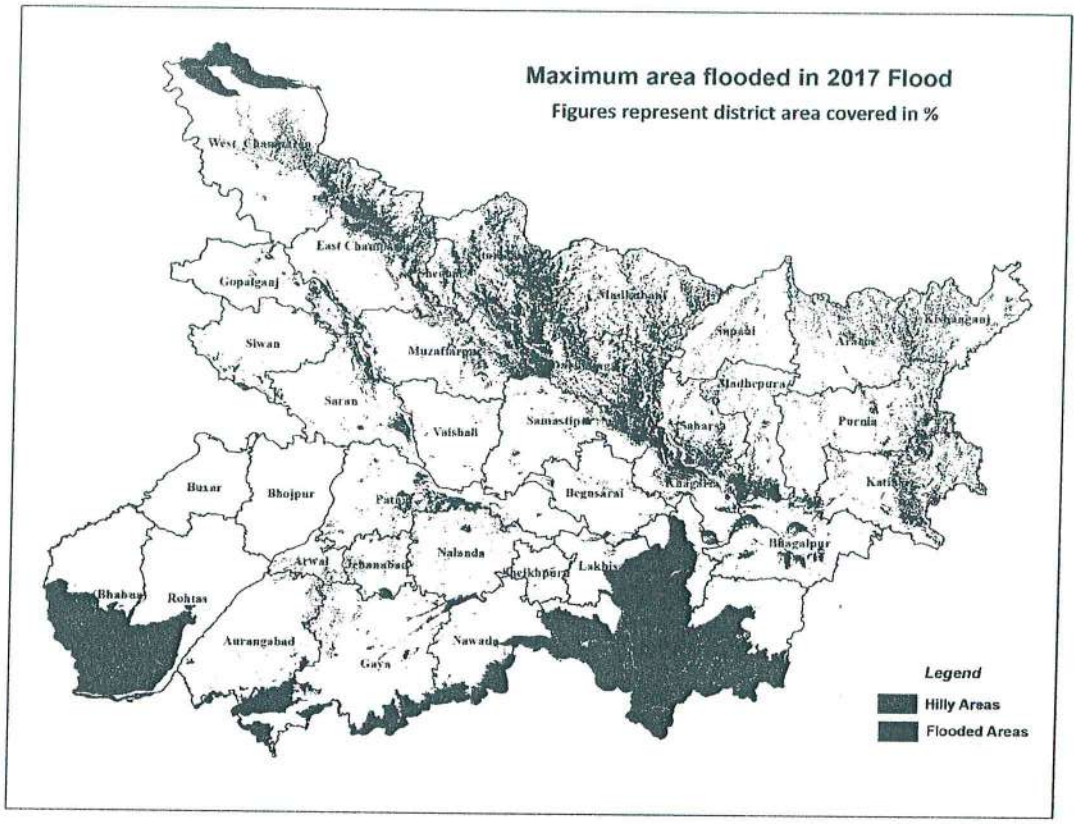


Figure - 8.11Composite Inundation Map for 2017

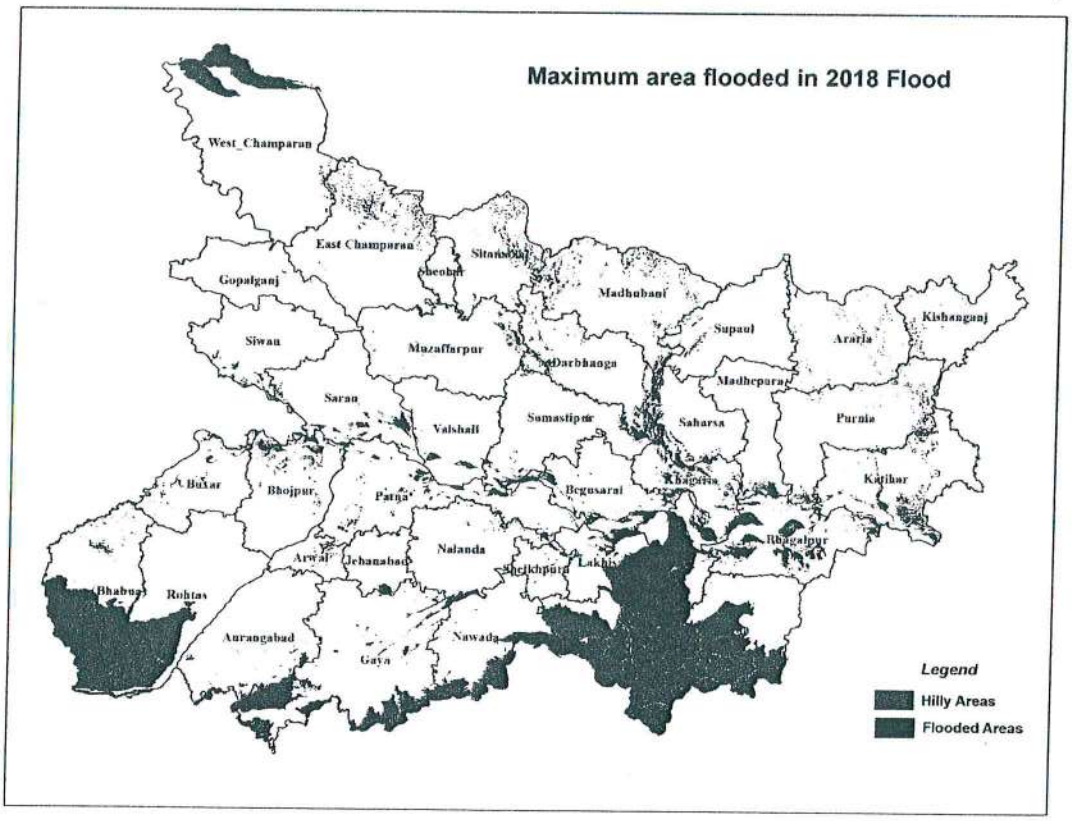


Figure- 8.12Composite Inundation Map for 2018

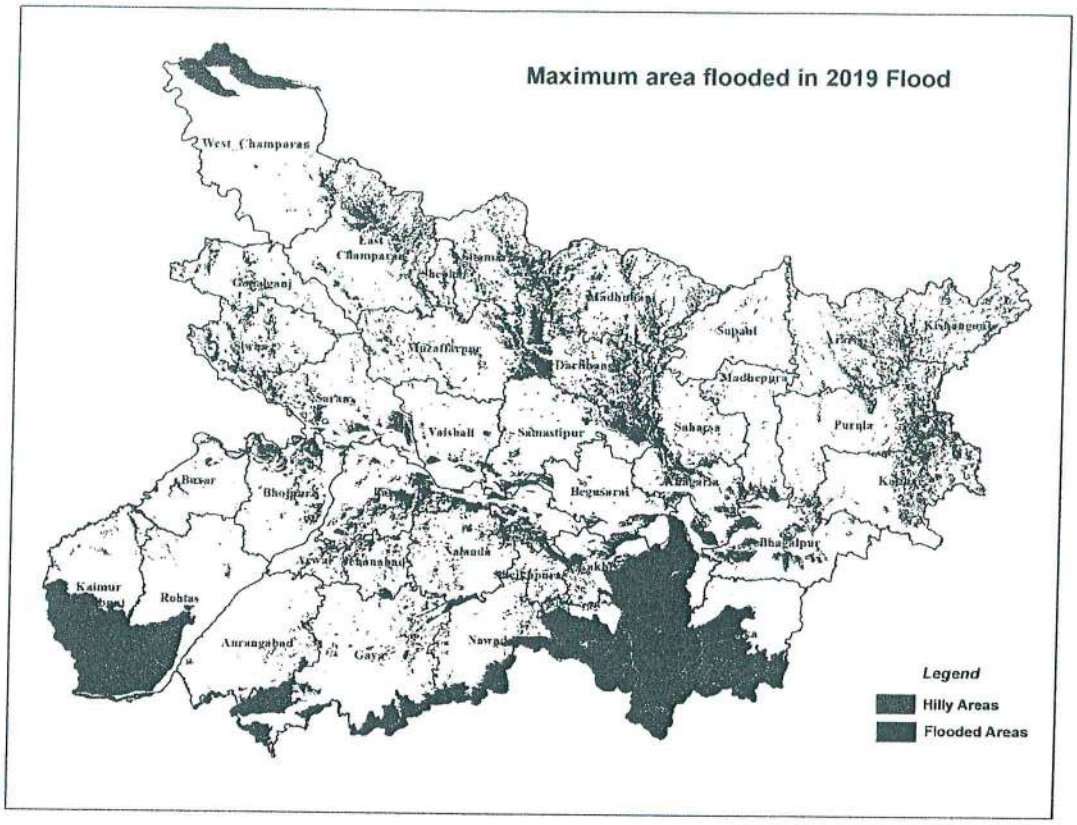


Figure- 8.13Composite Inundation Map for 2019

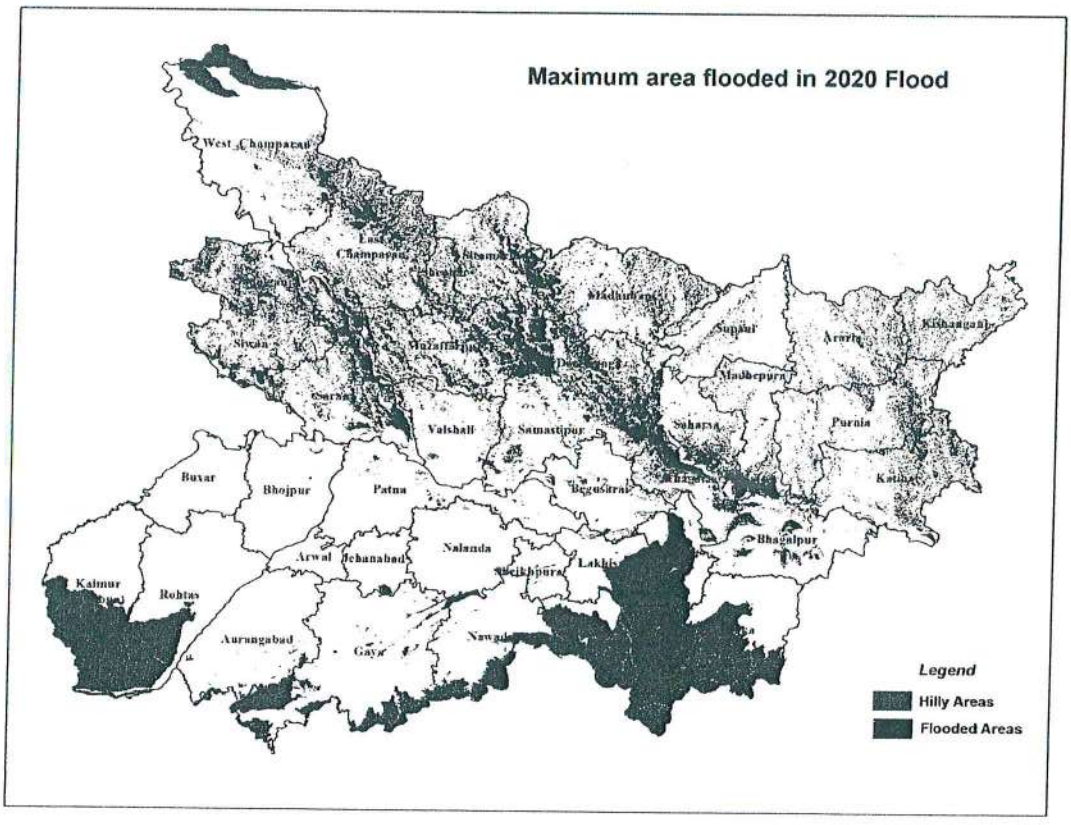


Figure - 8.14Composite Inundation Map for 2020

9.0 CONCLUSION

Land and water form the basis of human civilization. Since time immemorial man has been living close to rivers as availability of water is guaranteed. Even when cultivation was not organized as an activity to support survival, living close to water bodies was a necessity. Later on, cultivation practices developed and land from rivers were occupied for this purpose. In a climatic region where water pours down in plenty there were dangers of being washed away hence men learned to choose safer places for living and farming. Despite all efforts many civilizations have been partly or wholly obliterated by force of water. These experiences taught us first lesson of flood management, where staying away from furious water was the core theme. Later on; as men acquired assets in the form of permanent shelter and farmlands; they started making protective arrangements to minimize losses.

Fight between life giving river and a more arrogant human begun!

We have now come to a phase where we are losing more battle than winning. Tremendous growth of population coupled with huge infrastructure development in all kinds of Geographies has pushed modern civilization in to an ever-continuing war with nature. Despite all kinds of technological development, water is prime need for our survival. So, we still try to live near water bodies causing problem of further accommodation. Any further encroachment will prove detrimental to society.

According to the draft River Conservation Zone (Regulation of Harmful Activities) Rules, 2012, an active floodplain is defined by high flood line (HFL), which in entrenched /embanked stretches of a river is the available space (including the river channel/s) in the valley of entrenched stretch, or between two embankments, or between existing roads on either side along a river acting as an embankment. In other stretches of the river HFL, active floodplain shall be the 100-year flood line.

Flood plain zoning regulations are becoming stricter and execution of other large projects for drinking water availability gets priority. Fortunately, we have realized importance of availability of clean water and started planning for ensuring its availability for future generations. Still there are regions where we can still survive and develop by establishing a balance with nature. Almost every part of the globe is thickly populated but all of them do not have advantage of water availability. Food is required by them as well, hence someone has to produce enough to ensure food for all. Bihar has the advantage of water availability so it can produce more food for future generations. We have left open agricultural land for cultivation while infrastructure and living space has been kept to a minimum. Flood protection and revival of time-tested old irrigation practices are being taken up keeping in mind the growing responsibility of ensuring food availability for the country and those in need.

Hence it is cleared that on account of existing topography near river banks, availability of fertile land, people's dependability on domestic use of water and the high cost of land in non-flood plain area; dense population in northern plain terrain are bound to settle within embanked river areas (Embankment length of 3780Km), which indicate the non-feasibility of flood plain zoning in the state of Bihar.

Annexure- VI

Water Quality assessment at Inter State Borders

Comparative assessment of median data of BOD and DO of year 2014 and 2021 at 7 identified water quality locations at the Inter-State Borders.

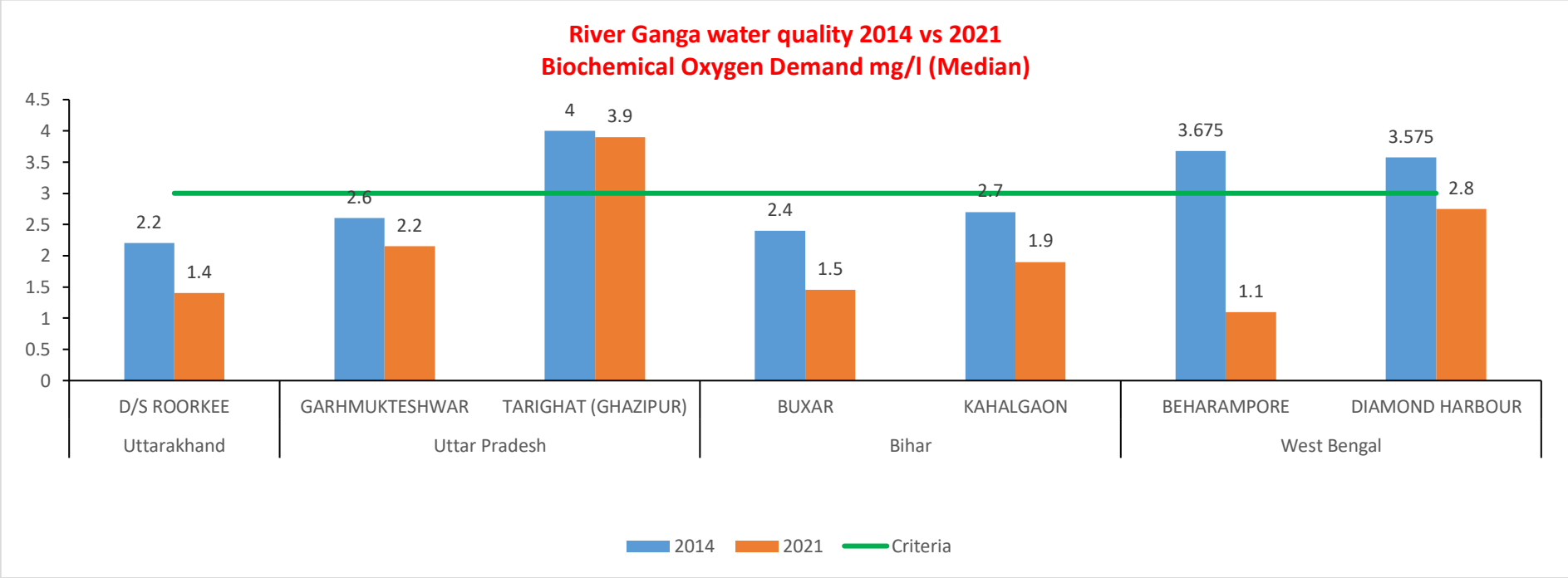


Fig. 1. 2014 vs 2021 Comparative assessment of BOD in mg/l of River Ganga water quality at 7 Inter- State border locations

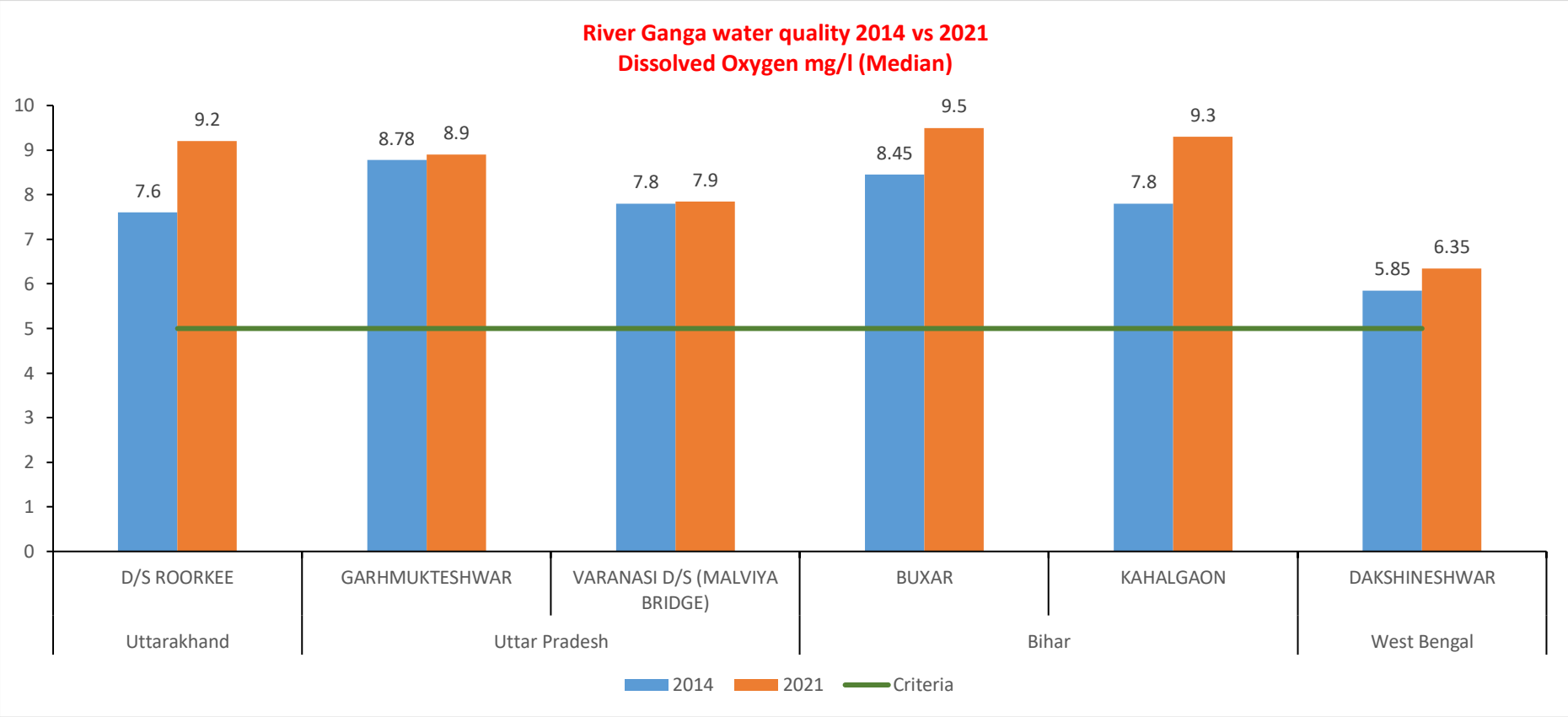


Fig. 2. 2014 vs 2021 Comparative assessment of DO in mg/l of River Ganga water quality at 6 Inter- State border locations

Annexure- VII

Comparison of median data of water quality parameters viz., DO, BOD and FC of year 2014 and 2021

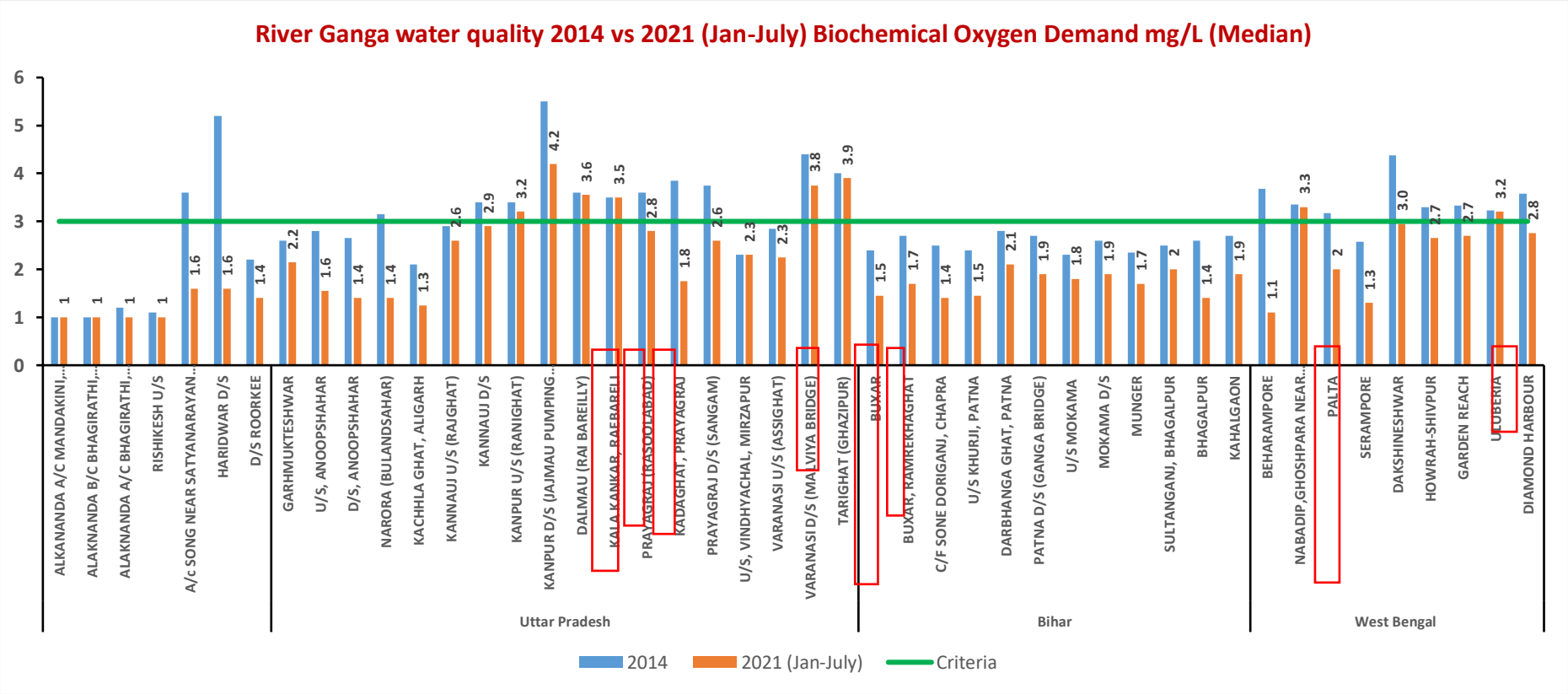


Fig. 3: Comparison in DO of water sample of River Ganga among the States of Uttarakhand, Uttar Pradesh Bihar and West Bengal

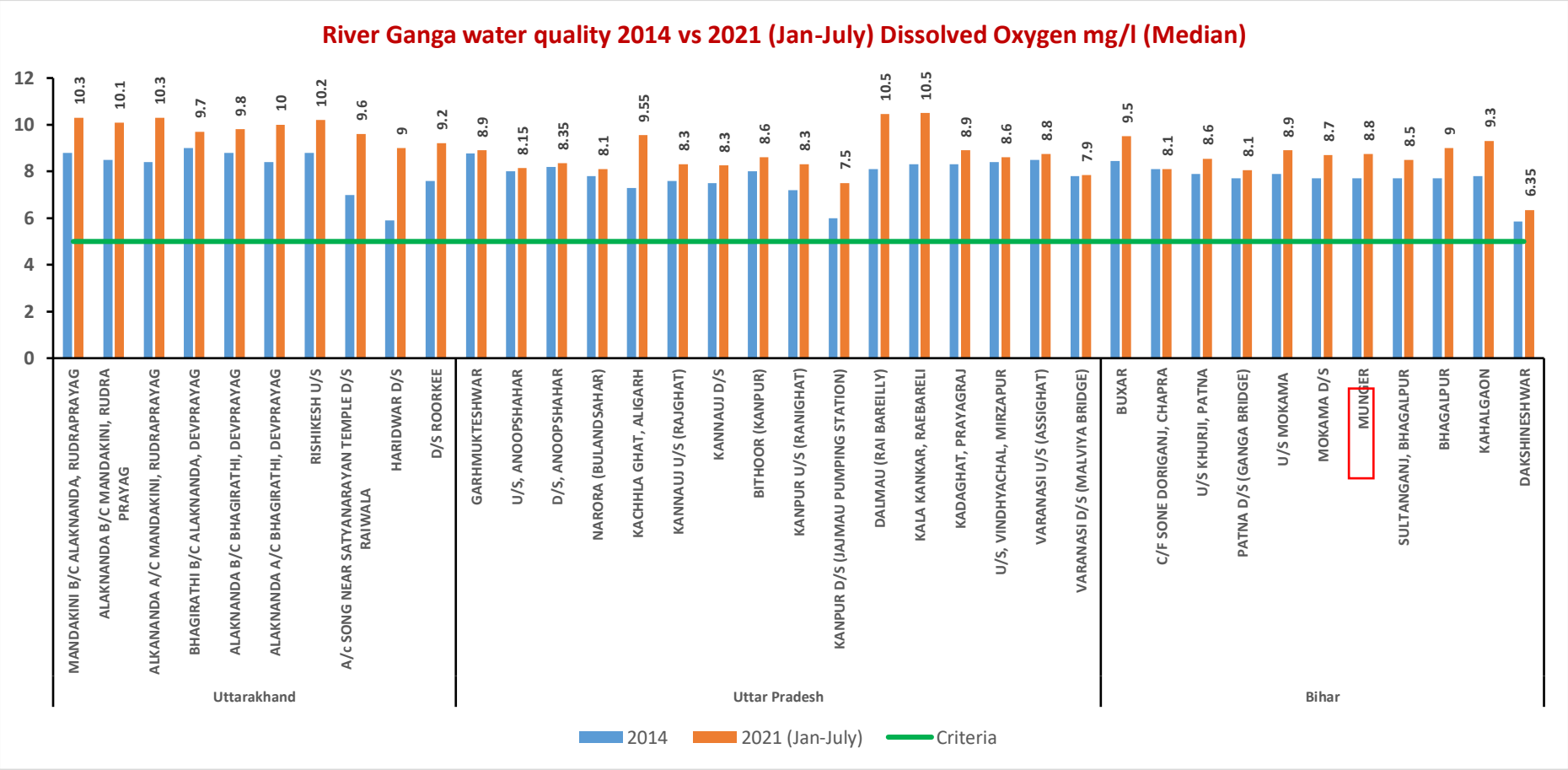


Fig. 4: Comparison in BOD and of water sample of River Ganga among the States of Uttarakhand, Uttar Pradesh, Bihar and West Bengal

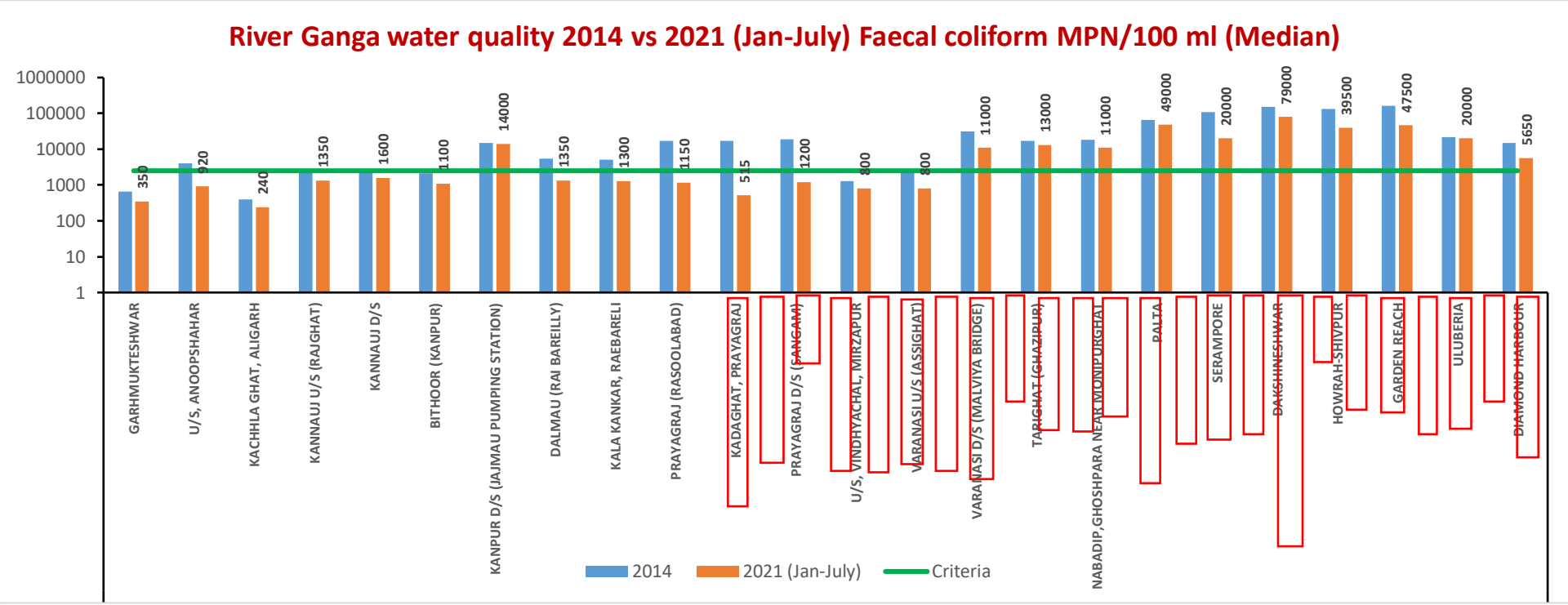


Fig. 5: Comparison in FC of water sample of River Ganga among the States of Uttarakhand, Uttar Pradesh, Bihar and West Bengal

उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड
UTTAR PRADESH POLLUTION CONTROL BOARD

Ref. No H63220 /सा- 630/OA- 128/2021 /C-6 *Dated* 08/7/2021

Hon'ble NGT Matter

To,

Executive Director (Technical),
National Mission for Clean Ganga (NMCG),
First Floor, Major Dhyan Chand National Stadium,
New Delhi- 110002.

Subject: **To engaged Experts/Institutions suggested by the committee constituted by Hon'ble NGT vide it's Order dated: 17.06.2021 in OA No-128/2021 Saurabh Tiwari Vs Union of India & Ors.**

Dear Sir,

Kindly refer to Hon'ble NGT, New Delhi order dated: 17.06.2021 in OA No-128/2021 Saurabh Tiwari Vs Union of India & Ors. The relevant portion of the order is as under-

"....We also constitute an independent Monitoring Committee for the purpose comprising CPCB, State PCB, National Mission for Clean Ganga (NMCG) and District Magistrate, Varanasi. The State PCB will be the nodal agency for coordination and compliance. The Committee may meet within two weeks and review the action plan on the subject in the light of the pre-existing action plans, if any, with such modifications as may be necessary. The Committee will be at liberty to take assistance of any other expert/institution, including an Agency dealing in rejuvenating works. It may undertake field visit, including sample collection and analysis as required...."

The committee consitituted in compliance of the above order comprises of the following members-

1. Dr AK Vidhyarti, Additional Director & DH WQM-II, CPCB.
2. Shri Gulab Chand, ADM City, Varanasi.
3. Shri Kalika Singh, Regional Officer, UPPCB, Varanasi **(Nodal Officer).**
4. Shri Rachit Andley, Project Manager, NMCG.

The committee held it's meeting on 03.07.2021, the minutes of the said meeting is attached herewith. In the above said meeting the following decision was taken by the committee-

".....The expert from Centre for Environmental Management of Degraded Ecosystems (CEMDE) may be engaged for guidance and preparing action plan for Revival of River Ecosystem activity and the expert Civil Engineering Department, IIT-Roorkee may be engaged on consultancy mode for review of existing sewage master plan and to suggest further action points on Sewage Management, Industrial Waste Management, Solid Waste & Flood Prone Zone Management, Ecological Flow & Ground Water Management and E-Monitoring & Evaluation with short & long term action plan (s)....."

Therefore you are requested to kindly engage **one expert from Centre for Environmental Management of Degraded Ecosystems (CEMDE)** for guidance and preparing action plan for Revival of River Ecosystem activity and **one expert from Civil Engineering Department, IIT-Roorkee** to review of existing sewage master plan and to suggest further action points on Sewage Management, Industrial Waste Management, Solid Waste & Flood Prone Zone Management, Ecological Flow & Ground Water Management and E-Monitoring & Evaluation with short & long term action plan (s).

Enclosure- As Above.

Your Sincerely,

(Ashish Tiwari)
Member Secretary

Copy to: Shri Kalika Singh, Regional Officer, UPPCB, Varanasi **(Nodal Officer).**

Member Secretary

T.C/12V, Vibhuti Khand Gomti Nagar, Lucknow – 226010
Phone: 2720831, 2720828, 2720691 & 2720681 - Fax: 0522 – 2720764
Emil: info@uppcb.com - Web Site: www.uppcb.com

Minutes of meeting of the Monitoring Committee, constituted in the matter of NGT order dated 17.06.2021 in O.A. No. - 128/2021 regarding pollution of rivers Varuna and Assi in Varanasi by discharge of untreated sewage and unauthorized constructions, held on 03.07.2021*via* video-conferencing

Meeting of the Monitoring Committee was held on 03.07.2021 at 04:00PM *via* video-conferencing for discussing the matter regarding NGT order dated 17.06.2021 in O.A. No. - 128/2021 regarding pollution of rivers Varuna and Assi in Varanasi by discharge of untreated sewage and unauthorized constructions. The participatory members of the meeting were:

1. Dr. A. K. Vidyarthi, Additional Director & DH, WQM-II, CPCB
2. Sh. Gulab Chand, ADM-City, Varanasi
3. Sh. Kalika Singh, Regional Officer, UPPCB, Varanasi
4. Sh. Rachit Andley, Project Manager, NMCG

Outcomes of the consultative meeting organized on 30.06.2021 at 11:00 am via video-conferencing with representatives of District administration, Varanasi; UP Jal Nigam; Municipal Corporation of Varanasi; Irrigation Department of UP; and subject/local experts for seeking their view/ suggestion for preparation of action plan for restoration/ rejuvenation of River Varuna and Assi was discussed. Following issues/areas were identified during discussion held on 30/06/2021 for addressing by the proposed action plan for river Varuna and Assi:

1) Encroachment
2) River Water Pollution
3) Revival of River Ecosystem
4) Interception, Diversion and Treatment of Sewage

It was agreed that action plan prepared by UPPCB in O.A. No. 673/2018 will be taken as basis. However, since the plan is generic and regulatory in nature it therefore needs further upgradation and modification. For preparation of action plan, teams of officials from CPCB, UPPCB and NMCG and different agencies (Municipal Corporation-Varanasi, Varanasi Development Authority, District Administration, UPPCB, irrigation department of UP, Forest department of UP, UPJN and NMCG) may be constituted/deputed for carrying out monitoring/survey for generation of data/information and preparation of action plan on four major issues as mentioned above. The details are as follows:

1) **Encroachment**

Teams: CPCB, UPPCB, District Administration, Municipal Corporation of Varanasi; Irrigation Department of UP and Varanasi Development Authority

Objectives:

a. Identification of encroached stretches

b. Change in river morphology and river bed due to encroachment with time

2) River Water Pollution

Teams: CPCB, UPPCB and NMCG

Objectives:

a. Pollution source mapping and assessment of river Varuna water quality from origin point (Prayagraj) to confluence to river Ganga.
b. Pollution source mapping and assessment of water quality of tributary Morwa river.
c. Pollution source mapping and assessment of Assi river

3) Revival of River Ecosystem

Teams: CPCB, UPPCB, Irrigation Department of UP, Forest department of UP, Ganga Pradushan Niyantran Unit (U P Jal Nigam), CGWB & subject expert.

Objectives:

a. Survey of river Varuna and Assi from origin and its adjoining drains/tributaries and identification of existing wetland in catchment of river Varuna & Assi and scope of their revival and channelization.
b. Identification of sites for implementation of remedial measures such as development of bio-diversity park/constructed wetland in catchment of river Assi and Varuna and their adjoining drains/tributaries.
c. Study of the topographic feature of rivers, including depth and width, gradient etc. as well as river ecosystems and ecology of adjacent lands and adjacent landscapes.
d. Restoration of groundwater
e. Hydrological and drainage mapping of river Varuna and Assi.
f. Collection of primary and secondary data.

4) Interception, Diversion and Treatment of Sewage

Teams: CPCB, UPPCB, Municipal Corporation-Varanasi, Irrigation Department of UP, UPJN and subject expert

Objectives:

a. Explore reasons for high discharge in Assi River in context to the high migratory population scenario.
b. Evaluation and gap analysis of existing sewerage master plan I&D schemes under present population growth and city expansion scenario.

c. Suggestions for managing the excess flow of Assi River by additional I&D and pumping schemes or construction of multi-storeyed or underground STP at the mouth of Assi River.
d. Evaluation of existing interceptor and pumping system for Varuna River and suggestions for modification.
e. Evaluation of existing STP and modifications.

It is proposed that experts from Civil Engineering Department, IIT-Roorkee and Centre for Environmental Management of Degraded Ecosystems (CEMDE), Delhi University may be engaged for guidance and preparation of action plan on sewage management and river ecosystem restoration.

The committee agreed that the expert from Civil Engineering Department, IIT-Roorkee (Prof. A.A. Kazmi), who happens to be one of the members of NGT committee in O.A. No. 200/2014 and is a leading expert in sewage management and expert from Centre for Environmental Management of Degraded Ecosystems (CEMDE) (Prof. Emeritus C.R. Babu) who has carried a lot of work in rejuvenation of degraded water ecosystem, biodiversity parks development such as Yamuna Biodiversity Park, Kalindi Biodiversity Park etc. may be engaged for providing guidance and help in preparation of action plan.

Upon deliberations, following decisions were made:

1. All members agreed that teams may be constituted to carry out survey and monitoring for generation of data/ information related to the four identified areas/ issues.
2. The proposed monitoring/survey by the above constituted teams shall commence from 06.07.2021 onwards.
3. The expert from Centre for Environmental Management of Degraded Ecosystems (CEMDE) may be engaged for guidance and preparing action plan for Revival of River Ecosystem activity and the expert from Civil Engineering Department, IIT-Roorkee may be engaged on consultancy mode for review of existing sewage master plan and to suggest further action points on Sewage Management, Industrial Waste Management, Solid Waste & Flood Prone Zone Management, Ecological Flow & Ground Water Management and E-monitoring & Evaluation with short & long term action plan(s).
4. NMCG may be requested to engage experts/institutions for preparation of action plans.

(Kalika Singh)	(Rachit Andley)	(Gulab Chandra)	(Dr. A.K. Vidyarthi)
Regional Officer	Project Manager	ADM-City	Additional Director & DH,
UPPCB, Varanasi	NMCG	Varanasi	WQM-II Division, CPCB

राष्ट्रीय स्वच्छ गंगा मिशन
National Mission for Clean Ganga

F. No. TE-16015/7/2021-TECH4 NMCG

Date: July 20th, 2021

To,

Prof. A.A. Kazmi
Department of Civil Engineering,
Indian Institute of Technology, Roorkee
Roorkee-247667, Distt:Haridwar
Uttarakhand

Sub: Review of existing sewage master plan and suggestion of further action points on Sewage Management, Industrial Waste Management, Solid Waste & Flood Prone Zone Management. Ecological flow & Ground Water Management and E-monitoring and Evaluation with short and long terms action plan (s) regarding restoration and rejuvenation of Varuna and Assi Rivers at Varanasi

Ref: Hon'ble NGT order dated 17.06.2021 in O.A No. 128/21 regarding pollution of river in Varuna and Assi in Varanasi by discharge of untreated sewage and unauthorised constructions

Sir,

This has reference to the Hon'ble NGT order dated 17.06.2021 in O.A No. 128/21 regarding pollution of river in Varuna and Assi in Varanasi by discharge of untreated sewage and unauthorised constructions, wherein a Monitoring Committee was constituted having members from Central Pollution Control Board (CPCB), National Mission for Clean Ganga (NMCG), UPPCB and District Magistrate, Varanasi with the main objective of preparation of action plan for rejuvenation and restoration of Varuna and Assi Rivers in Varanasi. The Monitoring Committee may also engage experts/ institutions/ agencies dealing in rejuvenation works.

The UPPCB vide letter dated 08.07.2021 requested NMCG to engage expert from *Civil Engineering Department, IIT-Roorkee* for review of existing sewage master plan and suggestion of further action points on Sewage Management, Industrial Waste Management, Solid Waste & Flood Prone Zone Management, Ecological Flow & Ground Water Management and E-monitoring and Evaluation with short and long terms action plan (s). The scope of the study is enclosed for your kind reference. You are requested to submit the project proposal on the study to NMCG. The overall coordination for the said project study will be done by RO-Varanasi, UPPCB.

Since the matter is urgent, you are requested to start the visit of the study area in consultation with Committee as soon as possible. The study report shall be submitted to the Committee by 30.07.2021 positively. An email of confirmation along with details of your visits may be forwarded to NMCG and RO-Varanasi, UPPCB. In due course of time, the project proposal may be submitted to NMCG separately for sanctioning.

Yours faithfully,

(D. P. Mathuria)
Executive Director (Technical)

Copy to:

(i) PS to Director General, National Mission for Clean Ganga, New Delhi

(ii)PS to Chairman, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi-110032

(iii)PS to Chairman, Uttar Pradesh Pollution Control Board, Building No. TC-12 V, Vibhuti Khand, Gomti Nagar, Lucknow, Uttar Pradesh-226010

(iv)PS to Member Secretary, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi-110032

(v) PS to Member Secretary, Uttar Pradesh Pollution Control Board, Building No. TC-12 V, Vibhuti Khand, Gomti Nagar, Lucknow, Uttar Pradesh-226010

(vi) Dr A.K. Vidyarthi, Additional Director and Divisional Head, WQM-II, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi-110032

(vii)Sh. Gulab Chand, ADM City, Varanasi.

(viii) Sh. Kalika Singh, Regional Officer, Uttar Pradesh Pollution Control board, Varanasi

(ix) Sh. Rachit Andley, Project Manager, National Mission for Clean Ganga, New Delhi

Scope of work for Civil Engineering Department, IIT-Roorkee (restoration and rejuvenation of Varuna and Assi Rivers at Varanasi).

It has been observed that due to the implementation of several large scale infrastructure project, rapid increase in migratory population is observed in the Varanasi city in last 3-5 years. It causes the increase in wastewater flow in several drains of the city. It is observed by CPCB that the flows in Assi River is showing significant increase from the earlier values of 42.810 MLD (CPCB Action Plan) and 44.5 MLD (JICA Masterplan). Based on earlier flow measurement, a new STP of 50 MLD was constituted at Ramanna. But under present scenario, it seems that I&D and pumping of 50 MLD flow from the mouth of Assi River is inadequate. Therefore it is suggested to:

1. Explore reasons for high discharge in Assi River and suggestions for reducing the same including modification in existing sewerage infrastructure, if any.
2. Assessment of adequacy of existing sewerage treatment infrastructure and suggestions for closure of gaps, if any.
3. Assessment of existing sewage network, interception and diversion arrangements and suggestions for additional infrastructure for ensuring conveyance of additional flows/ sewage, if any.

20.7.2021

राष्ट्रीय स्वच्छ गंगा मिशन
National Mission for Clean Ganga

F. No. TE-16015/7/2021-TECH4 NMCG

Date: July 20th, 2021

To,

Prof. C.R. Babu,
Centre for Environment Management of
Degraded Ecosystems (CEMDE),
Department of Environmental Studies,
University of Delhi- 110007

Sub: Providing guidance for the preparation of Action Plan for Revival of River Ecosystem activity regarding restoration and rejuvenation of Varuna and Assi Rivers at Varanasi

Ref: Hon'ble NGT order dated 17.06.2021 in O.A No. 128/21 regarding pollution of river in Varuna and Assi in Varanasi by discharge of untreated sewage and unauthorised constructions.

Sir,

This has reference to the Hon'ble NGT order dated 17.06.2021 in O.A No. 128/21 regarding pollution of river in Varuna and Assi in Varanasi by discharge of untreated sewage and unauthorised constructions, wherein a Monitoring Committee was constituted having members from Central Pollution Control Board (CPCB), National Mission for Clean Ganga (NMCG), UPPCB and District Magistrate, Varanasi with the main objective of preparation of action plan for rejuvenation and restoration of Varuna and Assi Rivers in Varanasi. The Monitoring Committee may also engage experts/ institutions/ agencies dealing in rejuvenation works.

The UPPCB vide letter dated 08.07.2021 requested NMCG to engage experts from *Centre for Environment Management of Degraded Ecosystems (CEMDE)* to guide Committee and preparing action plan for revival of River Ecosystem activity. The scope of the study is enclosed for your kind reference. You are requested to submit the project proposal on the study to NMCG. The overall coordination for the said project study will be done by RO-Varanasi, UPPCB.

Since the matter is urgent, you are requested to start the visit of the study area in consultation with Committee as soon as possible. The study report shall be submitted to the Committee by 30.07.2021 positively. An email of confirmation along with details of your visits may be forwarded to NMCG and RO-Varanasi, UPPCB. In due course of time, the project proposal may be submitted to NMCG separately for sanctioning.

Yours faithfully,

(D. P. Mathuria)
Executive Director (Technical)
20.7.2021

Copy to:

(i) PS to Director General, National Mission for Clean Ganga, Delhi
(ii) PS to Chairman, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi-110032
(iii) PS to Chairman, Uttar Pradesh Pollution Control Board, Building No. TC-12 V, Vibhuti Khand, Gomti Nagar, Lucknow, Uttar Pradesh-226010
(iv) PS to Member Secretary, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi-110032
(v) PS to Member Secretary, Uttar Pradesh Pollution Control Board, Building No. TC-12 V, Vibhuti Khand, Gomti Nagar, Lucknow, Uttar Pradesh-226010
(vi) Dr A.K. Vidyarthi, Additional Director and Divisional Head, WQM-II, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi-110032
(vii)Sh. Gulab Chand, ADM City, Varanasi.
(viii) Sh. Kalika Singh, Regional Officer, Uttar Pradesh Pollution Control Board, Varanasi
(ix) Sh. Rachit Andley, Project Manager, National Mission for Clean Ganga, New Delhi

Scope of work for CEMDE (restoration and rejuvenation of Varuna and Assi Rivers at Varanasi).

1. Assessment of status of both the rivers from the origin upto point of confluence with river Ganga for identification of polluted stretches.
2. Study of the topographic feature of rivers, including depth and width, gradient etc. as well as river ecosystems and ecology of adjacent lands and adjacent landscapes.
3. Number of inlets and the quality of sewage/ industrial effluents discharging into the rivers and their topographic features and ecology.
4. Location of natural wetland(s) and their status and their connectivity to rivers.
5. Appropriate sites for the development of constructed wetlands, their design including feasibility of their development for secondary and tertiary treatments of industrial effluents for removal of heavy metals etc.
6. Action Plan for catchment and treatment wetlands and their restoration and utilization for groundwater recharging through rain water/ flood water (catchment wetlands) or their use for treatment of polluted water (treatment wetland).
7. Assessment of status of floodplain and existing flood plain wetlands.
8. Possibilities of channelizing the river water to pass through the floodplain wetlands for removal of pollutants.
9. Feasibility study for development of floodplain wetlands including existing wetlands.
10. Development of floodplain forests & grasslands.
11. Status of embankment and development of greenways along the embankments.
12. Assessment of the suitability of river bed and of their inlets for in-situ bioremediation to treat sewage and industrial effluents.
13. Preparation of Action Plan incorporating above items.

Note: All the expenditures including travel and other logistics along with the charges for taking colour/black & white print out of maps, photographs and report etc. will be reimbursed to NMCG/UPPCB against the bills.

1834
20.7.21

Annexure X

Action Plan for the Rejuvenation and Restoration of River Varuna and Assi

NGT, Principal Bench, New Delhi,
in order dated 17.06.2021
O.A. no. 128/2021
in the matter of
Saurabh Tiwari vs. Union of India & Ors

Chapter 1. Background

1.1 National Green Tribunal (NGT) order

NGT, Principal Bench, New Delhi, in order dated 17.06.2021 in O.A. no. 128/2021 in the matter of Saurabh Tiwari *vs*. Union of India & Ors related to pollution of rivers Varuna and Assi in Varanasi by discharge of untreated sewage and unauthorized constructions stated the following requisites:

- Remedial measures to be taken for restoration and rejuvenation of River Varuna and River Assi in the Varanasi stretch, Uttar Pradesh.
- Statutory authorities in the State of UP to perform their responsibility in accordance with judgments of the Hon'ble Supreme Court in Paryavaran Suraksha case that stated *industry requiring "consent to operate", can be permitted to run, only if its primary effluent treatment plant, is functional* and other relevant cases as mentioned is O.A. No. 593/2017, *Paryavaran Suraksha Samiti & Anr. vs. Union of India & Ors*., O.A. No. 673/2018, and O.A. No. 200/2014, *M.C. Mehta vs. UOI & Ors* (relating to river Ganga).
- Constitution of an independent Monitoring Committee for the purpose comprising CPCB, State PCB, National Mission for Clean Ganga (NMCG) and District Magistrate, Varanasi. The State PCB will be the nodal agency for coordination and compliance. The Committee may meet within two weeks and review the action plan on the subject in the light of the pre-existing action plans, if any, with such modifications as may be necessary. The Committee will be at liberty to take assistance of any other expert/institution, including an agency dealing in rejuvenating works. It may undertake field visit, including sample collection and analysis as required.
- Preparation of report that may cover status on water quality of Assi, Varuna, action taken on diversion and treatment of sewage, water quality of upstream and downstream of confluence of Assi and Varuna to River Ganga, demarcation of Flood Plain Zones of Assi, Varuna and Ganga (in the said area), in accordance with the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016.

Constitution of an independent Monitoring Committee

A consultative meeting among the representatives of the Monitoring Committee and other experts was held on 30.06.2021 at CPCB *via* vedio-conferencing for discussing the above-mentioned NGT matter. Dr. A. K. Vidyarthi, Additional Director & DH, WQM-II represented CPCB, Sh. Kalika Singh, RO, UPPCB, Varanasi represented State PCB, Sh. Rajat Gupta,

SWM Specialist represented National Mission for Clean Ganga (NMCG) and Sh. Gulab Chand, ADM represented District Magistrate, Varanasi. Also, experts and eminent professors from Delhi University and IIT, Roorkee having expertise on subject matter and from IIT-BHU, Varanasi having knowledge of local issues participated in the consultative meeting.

During the meeting, the **existing action plan by UPPCB for River Varuna** was discussed that was prepared for identified polluted stretch of River Varuna from Rameshwar d/s to confluence with River Ganga. This action plan was prepared in compliance of Hon'ble NGT order in O.A. No. 673/2018 and has been categorized into 5 sections namely Sewage Management, Industrial Waste Management, Solid Waste & Flood Prone Zone Management, Ecological Flow & Ground Water Management and E-monitoring & Evaluation with short/ long-term action plan(s). However, it was apparent that the Action Plan for River Varuna has limitations being exhaustive as well as theoretical in nature and it may not be feasible to implement all short or long-term objectives in timely manner mentioned in the same. Also, it was lacking primary data and ground truthing facts. Also, an immediate action plan is required rather than the present regulatory action plan. Further, for River Assi, there is no action plan or intervention measures present. Therefore, it was concluded that the existing plan could be appropriately modified for feasibility of implementation for both the rivers i.e. River Varuna and Assi.

Issues identified and recommendations made during the meeting of Monitoring Committee /Present status

After thorough discussions, the committee identified the following inevitable issues and possible gap areas to be addressed in the modified action plan:

i. **Prevention of river water pollution**: Problem of pollution in River Varuna and Assi seemingly pertains more due to sewage rather than industrial pollution. For understanding state-of-the art pollution situation of entire stretch of both the rivers, pollution mapping may be conducted to identify polluting sources such as small-scale industry cluster(s), additional drains as well as help to identify sites for non-conventional treatment (such as constructed wetlands, waste stabilization pond, bio and phytoremediation) that can substitute STPs. Sample collection of the river water, drains and effluents to be done for analysis of selected parameter(s). In this context, analysis of water quality of upstream and downstream of confluence of Assi and Varuna to River Ganga as well as confluence of drains in River Varuna and River Assi be carried out.

ii. **River ecosystem study and groundwater recharge issue**: For identification, Inventorization & geo-referencing of appropriate sites for development of constructed wetlands/in-situ remediation/connecting river channels/water bodies, biodiversity parks, ddemarcation of floodplain zones be performed. Study of topographic feature of rivers, including depth and width, gradient as well as river ecosystems and ecology of adjacent lands and adjacent landscapes may be done along with identifying number of inlets and the quality of sewage / industrial effluents discharging into the rivers and their topographic features and ecology. Further, identification of natural wetlands and their status as well as connectivity to rivers could be done. Possibilities of channelizing the river water to pass through such floodplain wetlands for removal of pollutants should be explored. Massive plantation drive should be undertaken for development of floodplain forests & grasslands. Proposal for catchment and treatment wetlands and their restoration and utilization for recharging rain water / flood water (catchment wetlands) or their use for treatment of polluted water (treatment wetland) be made.

iii. **Sewage and surface runoff management:** The present flow of River Assi is estimated to be about 100 MLD. The recently constructed STP at Ramanna has a 50 MLD treatment capacity that was based mostly on earlier flow measurements of the Assi River. In the present scenario, this treatment capacity is inadequate. Therefore, proper measures have to be undertaken to deal problem of under-treatment. This may include exploring reasons for high discharge in River Assi and managing excess flows, evaluation and gap analysis of existing sewerage masterplan as well as intersection and diversion schemes under present population growth and city expansion scenario. Overall, for both the rivers, evaluation of existing STPs and possible upgradations along with modifications in the existing interceptor and diversion as well as pumping system may be done.

iv. **Encroachment issue:** Encroachment is a pertinent issue especially for River Assi due to unauthorized constructions and such constructions should be removed/demolished before laying interceptor sewers or putting any kind of interventions in effect. It is a matter of long-term workout by the District Administration and Municipal Corporation with likely legal/administrative interventions. However, it was recommended that survey could be conducted to understand the level of existing encroachments in the catchment of both the rivers.

Methodology

A. Pollution source identification and mapping: For the purpose of pollution mapping, joint monitoring and sampling of River Assi, Varuna as well as Basuhi and Morwa (tributaries of Varuna) was carried out by teams of CPCB and UPPCB during July 12 - 15' 2021. Additionally, officials from Uttar Pradesh Jal Nigam also participated for the survey of River Assi at few locations. The objectives of the pollution mapping were:

a. Tracing and mapping the course of the rivers and identifying major adjoining drains/small streams discharging their content into the mentioned rivers.
b. Characterization of water quality of rivers at various locations (River Varuna, Assi, Basuhi and Morwa).
c. Identification, quantification and characterization of major drains joining the rivers.
d. Quantification and characterization of volume of untreated wastewater discharging to River Ganga through River Assi and River Varuna.
e. Water quality of River Ganga b/c and a/c with River Assi and River Varuna.

Note: The monitoring was done during monsoon period. However, Water quality during non-monsoon period could be slightly different.

Common methodology adopted to study the above-mentioned objectives for River Assi, Varuna, Basuhi and Morwa rivers are:

i. ***Preliminary work*:** The trajectory of the river was mapped for identification of the origin of the rivers and to find out the entire stretch. Major towns and cities along the river, industries, and number of drains discharging into River Varuna, River Assi and River Morwa were identified.
ii. ***Field work***: Each sampling point was chosen on the basis of locational importance, proximity to industrial areas, if any, and discharge points of drains, proximity to major towns and cities, and the ease of access for sampling. River water samples were collected along the River Varuna, River Morwa and River Assi and also at locations representing the water quality before and after confluence of any major drain or tributary into the river. Also, wastewater samples of identified drains discharging into the mentioned rivers were collected. Samples were brought to the CPCB Regional Directorate, Lucknow laboratory for analysis.
iii. ***Laboratory work***: General/Specific parameters (Colour, pH, TSS, TDS, DO, BOD, COD, NO_3-N, NO_2-N, Total Nitrogen, PO_4-P, Total Phosphorus, Cl^-, Phenol, Sulphate),

bacteriological parameters (Total coliforms (TC), Faecal coliforms (FC), and trace/heavy metals (Total Chromium, Pb, As, Zn, Fe) were analyzed in the laboratory.

B. River ecosystem study: For the purpose of river ecosystem study and identification of possible sites for in-situ remediation using Constructed Wetlands, Biodiversity parks, officials from Centre for Environmental Management of Degraded Ecosystem (CEMDE)-University of Delhi, CPCB, UPPCB and UP Irrigation & Water Resource Department, and Local Administration surveyed the riverscapes and landscapes of River Varuna and River Assi from the origin to their confluence with River Ganga from 17th - 19th July 2021.

C. Sewage Management: For the purpose of identification of status and capacity of existing STPs, the issues related to under-utilization of their actual capacities, status of drains tapping as well as sewage generation in and around adjoining areas of River Varuna and River Assi, officials from IIT-Roorkee, CPCB, UPPCB and UP Jal Nigam conducted an intensive survey from the origin of River Assi as well as River Varuna to their confluence with River Ganga from 28th July – 1st August 2021.

Concept/Objective of the present Action Plan

The concept of river rejuvenation in our country is often considered as achieving the water quality levels that could permit use of such waters for bathing purpose. Traditionally, it's been limited to pollution control, sewage and solid waste management. In view of sewage management, the aspect of sewage generation is equated with the sewage treatment capacity to control pollution. Further, it is believed that controlling industrial pollution discharge into the river is same as restoring the river water quality. However, from the time when the concept of sewage management facility for any river catchment is conceived and DPR is prepared for sewerage network, interception and diversion facilities till the commissioning of STP actually happen, a time-lapse for 4-5 years occur. By then, many demographics as well as land-use factors including infrastructure that affect sewage generation for which the actual facility was planned, undergo surge. This even attracts other economic activities that has a rippling effect thereby, leading further surge in demographics which in turn lead to further sewage generation. Therefore, there is a never-ending gap in sewage generation and the planned or functional

treatment facilities that mostly lead to continuous discharge in public sewers and over-flow of untreated/partially treated sewage into the river system.

Another facet of river pollution mentioned previously is the industrial pollution control that aim to stop discharge of wastewater generated from industrial processes into the river system. Indian industries characterize themselves with low scale of operation, archaic technology, lack of cleaner technology, high freshwater consumption, high effluent generation and inadequate effluent treatment systems, in addition to unskilled personals that lack technical knowhow. Despite of existing regulatory measures, these outmoded systems have resulted in high effluent generation along-with discharge of partially treated or untreated effluent into the river system.

In last few decades, the concept of ecological flow has been popularized for river rejuvenation. It is believed that the river water quality will not improve unless the flow is maintained or increased. However, it must be noted that the rivers of our country may be divided into two broad categories. Some rivers originate in the Himalayas. In addition to rainfall, these rivers also benefit from the melting of the accumulated ice-cap/glaciers of the mountains. The other set of rivers are entirely rain-fed, receiving water from the annual rainfall alone; in non-rainy seasons, their flow is limited to the extent of inflow of water from seepage through the soil mass of its catchment. If the rain fails, the area remains ‘thirsty’; rivers remain dry or have less water. Keeping this in mind, the concept of e-flow has limitations for such non-perennial and thirsty, land locked rivers. These rivers have an entirely different ecosystem such as river channel, riparian zone, flood plains and embankments. They receive water during monsoon that is stored for a longer duration and helps in recharging of nearby ground water aquifers, connected channels and wetlands, which in-turn helps in maintaining water availability in river during non-monsoon period. Therefore, for such rivers, the concept of maintenance of different component of their eco-system is more important than the concept for ecological flows.

Keeping in view the above aspects, the present concept of river restoration encompasses 2 prolonged approaches. First priority in water-quality assessment and management is to maintain and restore “the desirable level of general environmental quality or wholesomeness” and thereafter, comes the fulfillment of “requirement for the best designated use” that has to be taken up at the second stage. It is to be realized that merely meeting bathing water quality, doesn’t equate with rejuvenation of polluted river or any of its stretch. The rejuvenated river should have functional as well as self-purification systems *i.e.* biological communities that

have trophic cascades. The waters of such rejuvenated rivers have high DO level, low BOD, COD, TDS, SS and coliform density. The rejuvenation of polluted rivers can be easily achieved by: (i) restoration of river ecosystem which includes the channel water ecosystem, the riparian ecosystem, floodplain wetlands, floodplain forests and grasslands and (ii) development of vegetation on embankment. All these can be achieved by establishing a Biodiversity Park covering the polluted stretch of rivers. Another significant component of river rejuvenation is restoration/conservation of wetlands. Wetlands are distinct ecosystems which are flooded with water either permanently or seasonally. Wetlands are neither completely land-based habitats nor completely aquatic habitats but somewhere in-between. They are important for flood management, ecological improvement of urban areas and potential tourism sites. They are natural water purifiers as they act as micro sponges and remove impurities like heavy metal, plastic fibers and in-organic dirt before releasing the water in bigger water bodies. They can be constructed as separate water body or within Biodiversity parks (as constructed wetlands).

Ecological integrity of river ecosystem via interaction leading to ecological processes among five elements of river systems (namely structure, quality and quantity of water, biodiversity and floodplains) is key to the health of whole river system and sustenance of water quality and quantity. Treatment of wastewater and bringing the polluted water to the level of bathing quality is just one among many remediations and/or restoration required for rejuvenation of river systems. Therefore, it is be believed that rejuvenation of polluted rivers cannot be achieved by treating wastewater using STP alone. Anthropogenic-mediated activities on the riverscape have been increasingly disrupting the ecological processes leading to further degradation of riverscapes resulting in loss/degradation in terms of function of river health and deterioration of water quality despite of treating waste water through STPs by spending millions of rupees annually.

One needs an integrated approach for the rejuvenation of polluted rivers as mentioned above that should involve Nature Based Solution. To conclude, bathing quality of water is not true representative of wholesomeness of river ecosystem and should not be equated with rejuvenation of polluted rivers. It may be just considered as one of the indicators, at best. Rejuvenation of polluted rivers requires as integrated approach involving restoration of river ecosystems i.e. bringing back the self-purification system of rivers so that the rivers can sustain the quality of water and start providing ecosystem services, they are destined to provide

workable, cost effective, nature-based solution for restoration and rejuvenation of degraded/polluted rivers of India.

Water quality parameters requirements

Setting high quality objective such as classes A, B for rivers like Varuna and Assi for whole river or significant part may be too ambitious and is not only difficult but practically impossible also. Wholesomeness should take an overall integrated view of water ecosystem and also take into consideration long term impacts and cultural-social perceptions of water quality. It is proposed that with the present action plan following water quality parameters should be achieved:

Sr. No.	Parameters	Water quality
i.	Sanitary Survey	Generally clean neighbor hoods and u/s
ii.	General Appearance	No floating matter
iii.	Colour	No colour of anthropogenic origin
iv.	Smell	No unpleasant odour
v.	Transparency	>0.2 m to 0.5 m depth
vi.	Ecological (presence of Animals)	Fish and insects
vii.	pH	6.5 to 9.0
viii.	DO	Above 3
ix.	BOD mg/l	Below 8
x.	EC, mhos/cm	<500
xi.	NO2+NO3)-N mg/l	Below 1
xii.	Suspended Solid, mg/l	<100
xiii.	Fecal Coliform, MPN/100 ml	<2500 per 100 ml
xiv.	Bio-Assay (Zebra Fish)	No death in 2 days

Chapter 2. River Varuna

Potamological features and the present state

The River Varuna is a small tributary of the Ganga River system and originates from **Mailhan Jheel** of Phoolpur tahsil of Prayagraj District (25.599873 and 82.107220). After flowing through a length of about 200 km it meets river Ganga just northeast of Varanasi city of Uttar Pradesh. In its entire stretch, it passes through districts of Prayagraj, Bhadohi and Varanasi of Uttar Pradesh. The entire area of the Varuna river basin is composed of unconsolidated flood alluvium of recent age. Although the plain appears as rather a flat alluvial plain, it shows up sandy surfaces at relatively higher elevations (higher level floodplain) and clayey surfaces at lower elevations.

Water Quality status and stretch characterization

During the pollution mapping and exploratory survey, the course of Varuna river was mapped from present presumed origin till confluence into the River Ganga (**Table 2.1**). River Varuna traverses through the districts of Prayagraj, Bhadohi, and Varanasi in Uttar Pradesh. The River joins River Ganga at Sarai Mohan (Adikeshwar Ghat) in Varanasi (25.329446; 83.044002). The main industrial areas in the catchment of River Varuna are in Bhadohi (Textile cluster), Sidhwan (Jaunpur) and Varanasi (Textile Cluster). Bhadohi textile cluster area falls into the catchment of River Morwa a tributary of R. Varuna. The river Varuna receives wastewater from the industries and sewage from a part of municipal area of Varanasi which contributes to the deterioration of its water quality.

Polluted Stretch of Varuna river originates from district Bhadohi (UP) and flows East-to-Southeast and confluences at Adikeshwar Ghat in Varanasi with River Ganga in the downstream of Varanasi. There are 118 water polluting industries located in the catchment area of river Varuna. Out of these 118 units only 60 units are operational however 29 units are self-closed and 29 are closed by the UP-Pollution Control Board (UPPCB). These operational industrial units have their own effluent treatment plants and treated effluent is being discharged through recipient drains reaching to R. Ganga through R. Varuna.

A total 20 Drains in the catchment of R. Varuna found directly discharging into River. Out of these 20 drains, 02 are in Bhadohi district and rest 18 are found in Varanasi City. Out of these 18 drains, 07 drains are found tapped and 11 found untapped on the day of visit. Waste water coming through these tapped drains are diverted to sewage treatment plant at Dinapur

and Goithaha. The discharge from these untapped drains approximately 88 MLD is directly being discharged in to River Varuna however discharge of three (03) drains namely Orderly, Azadnagar and Khajury colony drain could not be measured because of un approachable path. List of the drains with their flow is tabulated at **Table 2.2.**

Summary of the stretch(s) identified along-with major observations

For the present study, River Varuna is divided into three stretches that have been classified on the basis of comparable values of water quality parameters. They are:

A. Stretch – I: Origin to before confluence with River Basuhi

B. Stretch – II: After confluence Basuhi to U/s Daniyalpur drain/U/s of Varanasi city

C. Stretch – III: D/s of Daniyalpur to River Varuna before confluence with River Ganga

Table 2.1. Sampling Location on River Varuna and stretch identified

S. N.	Stretch	Sample Location	Name of Sampling Location of R. Varuna	Lat. (In Decimal)	Long. (In Decimal)	Description
1	STRETCH - I	R-1	R. Varuna at Varaneshwar Mahadev Mandir, Phulpur, Prayagraj	25.587	82.132	Ponding was observed in R. Varuna
2		--	R. Varuna at Tarhati Bridge (Jaunpur)-Sultanpur Bridge (Prayagraj)	25.579075	82.182999	River water was stagnant therefore sample was not collected
3		R-2	R. Varuna at Sherpur (Prayagraj)-Mobideenpur Bridge, (Bhadohi)	25.497656	82.329900	Mansoon water was found collected the River stretch at this location
4		R-3	R. Varuna at Kusha ghat- Godma Bridge (Bhadohi)	25.494039	82.458646	Mansoon water was found collected the River stretch at this location
5		R-4	R. Varuna U/s of Dhaurahra Drain at Bhadohi-Junpur bypass, Bhadohi	25.417476	82.569282	Lean flow observed at this location
6		R-5	R. Varuna D/s of Nai Bazar Drain at Bhadohi	25.416	82.573	Lean flow observed at this location
7		R-6	R. Basuhi b/c to R. Varuna at Jaunpur	25.394157	82.693641	Observable flow was there at this location. Quantity of water was more than River Varuna
8		R-7	R. Varuna b/c to R. Basuhi at Bhadohi	25.394178	82.692920	Lean flow observed

9	STRETCH - II	R-8	R. Varuna a/c of R. Basuhi at Varanasi	25.392259	82.697942	R. Basuhi contributes more water to R. Varuna at this location
10		R-9	R. Varuna at Rameswaram Mandir, Varanasi	25.387393	82.854172	Some submerged plants were observed floating at this location.
11		R-10	R. Varuna at Koirajpur Bridge, Varanasi	25.361256	82.912625	Lean flow observed
12		R-11	R. Varuna at Pishaura Bridge u/s of Daniyalpur Drain	25.330484	82.940254	Upstream of Varanasi city
13	STRETCH - III	R-12	R. Varuna at Kutchehari Bridge d/s of Central jail Drain	25.341	82.982	Slightly blackish green water observed with slight flow
14		R-13	R. Varuna D/s of Nakhi Drain & U/s of Narokhar Drain	25.341	83.009	-
15		R-14	R. Varuna d/s of Orderly Drain	25.341	82.990	Waste water containing slaughtering activity observed
16		--	R. Varuna d/s of Nai Basti (Bhagawa) Drain	25.343	83.001	Sampled not collected as Barrage at D/s
17		R-15	R. Varuna at Adikeswar ghat	25.329	83.044	R. Varuna b/c to R. Ganga

Table 2.2. Drains existing in the catchment of River Varuna

Stretch		Drains existing in the catchment of River Varuna						
	Drain S. N.	**Name of Drain**	**Latitude (In Decimal)**	**Longitude (In Decimal)**	**Flow in MLD**	**Status**	**Drain meeting River Varuna**	**Description**
Stretch - I	**D1**	Dhaurahara Drain at Dhaurahara, Bhadohi	25.398	82.557	3.2	Untapped	Right Bank	Mix Drain directly meeting in R.Varuna
	D2	Nai Bazar drain at Billaula, Bhadohi	25.416	82.573	28.16	Untapped	Right Bank	Mix Drain directly meeting in R.Varuna
Stretch - II	**D3**	Durga/Lohata/Daniyalpur Drain, Varanasi	25.32104	82.95544	19.99	Untapped	Right Bank	Drain directly meeting in R.Varuna
	D4	Phulwariya drain, Varanasi near 7.6 MLD Phulwariya SPS	25.33968	82.96292	2.58	Untapped	Right Bank	Partially tapped- 7.6MLD flow is diverted to STP Dinapur 140 MLD & excess flow discharging in to R.Varuna
	D5	Sadar Bazar Drain, Varanasi	25.33817	82.97555	Tapped	Tapped	Right Bank	Flow is diverted to STP Dinapur
	D9	Chamaraudha Drain, Varanasi	25.33948	82.96093	8.95	Untapped	Left Bank	Drain is directly meeting in R. Varuna
	D10	Central Jail Drain, Varanasi	25.34317	82.96697	25.66	Untapped	Left Bank	Tapping provision provided but Drain directly meeting in R. Varuna
Stretch - III	**D6**	Raja Bazar Drain, Varanasi	25.33586	82.99138	Tapped	Tapped	Right Bank	Flow is diverted to STP Dinapur
	D7	Teliabagh Drain, Varanasi	25.33481	82.99749	Tapped	Tapped	Right Bank	Flow is diverted to STP Dinapur
	D8	Drain near Chauramata Mandir, Varanasi	25.33589	82.99994	Tapped	Tapped	Right Bank	Flow is diverted to STP Dinapur

	D11	Orderly Bazar Drain, Varanasi	25.34138	82.98486	Not Measurable	Untapped	Left Bank	Tapping provision was found but damaged during inspection for this drain however drain was directly meeting to R. Varuna due to chocking of bar screen.
	D12	Azad Nagar Drain (Banaras Drain), Varanasi	25.3411	82.98626	Not Measurable	Untapped	Left Bank	Sample was not collected & flow was also not measurable as drain was not approachable but discharged into river varuna.
	D13	Khajuri colony Drain, Varanasi	25.34106	82.9894	Not Measurable	Untapped	Left Bank	Tapping provision was available for this drain however drain was directly meeting to R. Varuna due to chocking of bar screen.
	D14	Hukulganj Drain, Varanasi	35.33744	82.9998	Not Measurable	Untapped	Left Bank	Drain was directly meeting to R. Varuna as the tapping provision is in damaged condition.
	D15	Nakkhi Drain, Varanasi	25.3413	83.00858	Tapped	Tapped	Right Bank	Tapped- Flow is diverted to STP Dinapur
	D16	Unnamed Drain 1 at Amarpur/Jalalipura Area	25.340	83.020	Not Measurable	-	Right Bank	Sample was collected but flow was not measured due to closed conduit.
	D17	Narokhar Drain, Varanasi	25.34138	83.03142	Not Measurable	Partially Tapped	Left Bank	Partially Tapped- Flow is diverted to STP Goithaha STP via Intermediate pumping station (7.34 MLD)
	D18	Unnamed Drain 2 at Amarpur/Jalalipura Area	25.341	83.021	0.13	Untapped	Right Bank	Drain directly meeting in R.Varuna
	D19	Nai Basti Drain, Varanasi	25.34338	83.00138	28.35	Untapped	Left Bank	Drain directly meeting in R.Varuna due to chocking of tapping provision.
	D20	Sarang Talab Drain, Varanasi	25.34183	83.00871	Not Measurable	Partially Tapped	Left Bank	Partially Tapped- Flow is diverted to STP Goithaha but currently in damaged condition.

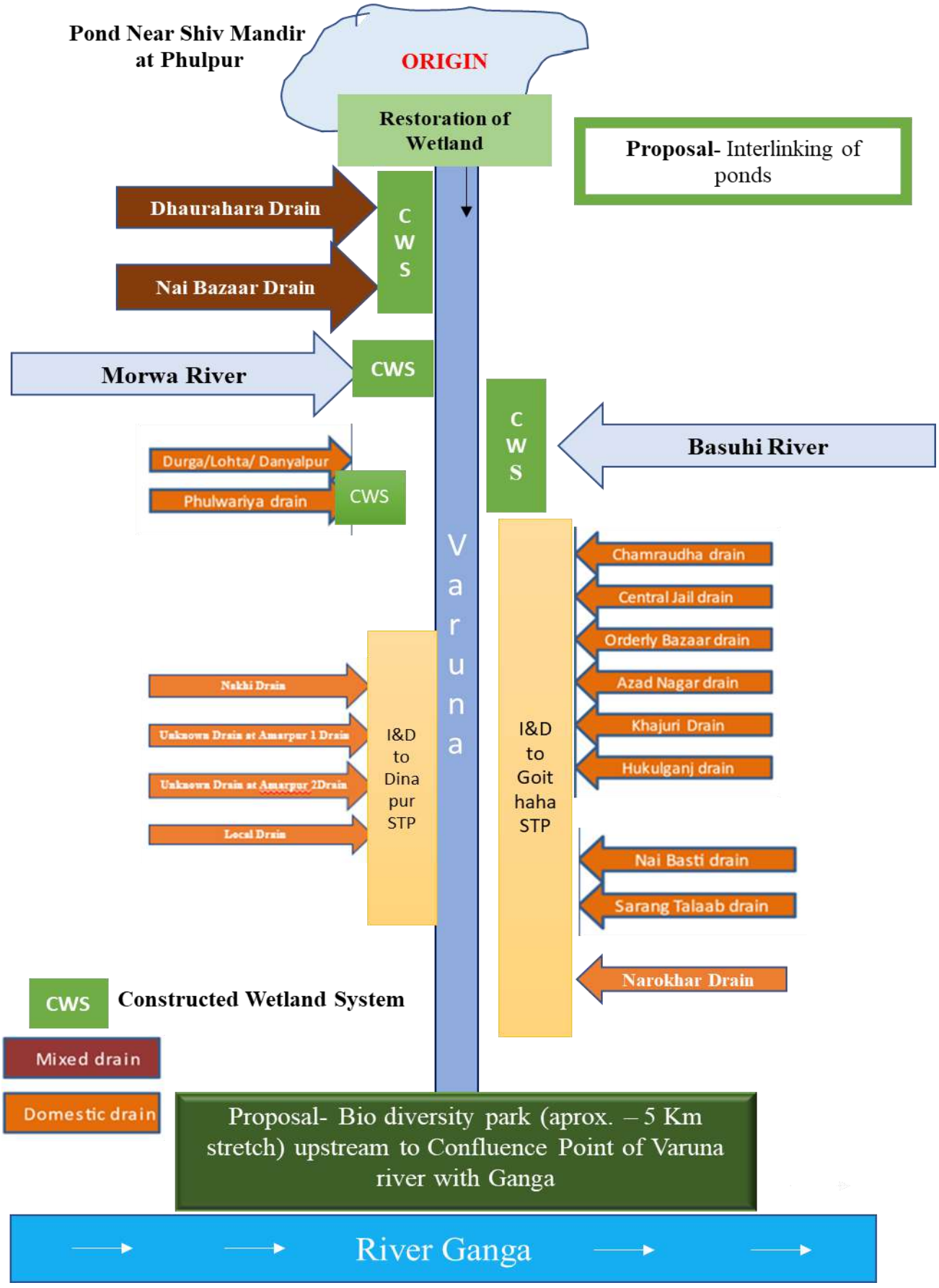


Figure 2.1. Flow diagram of River Varuna and Drains discharging into River Varuna

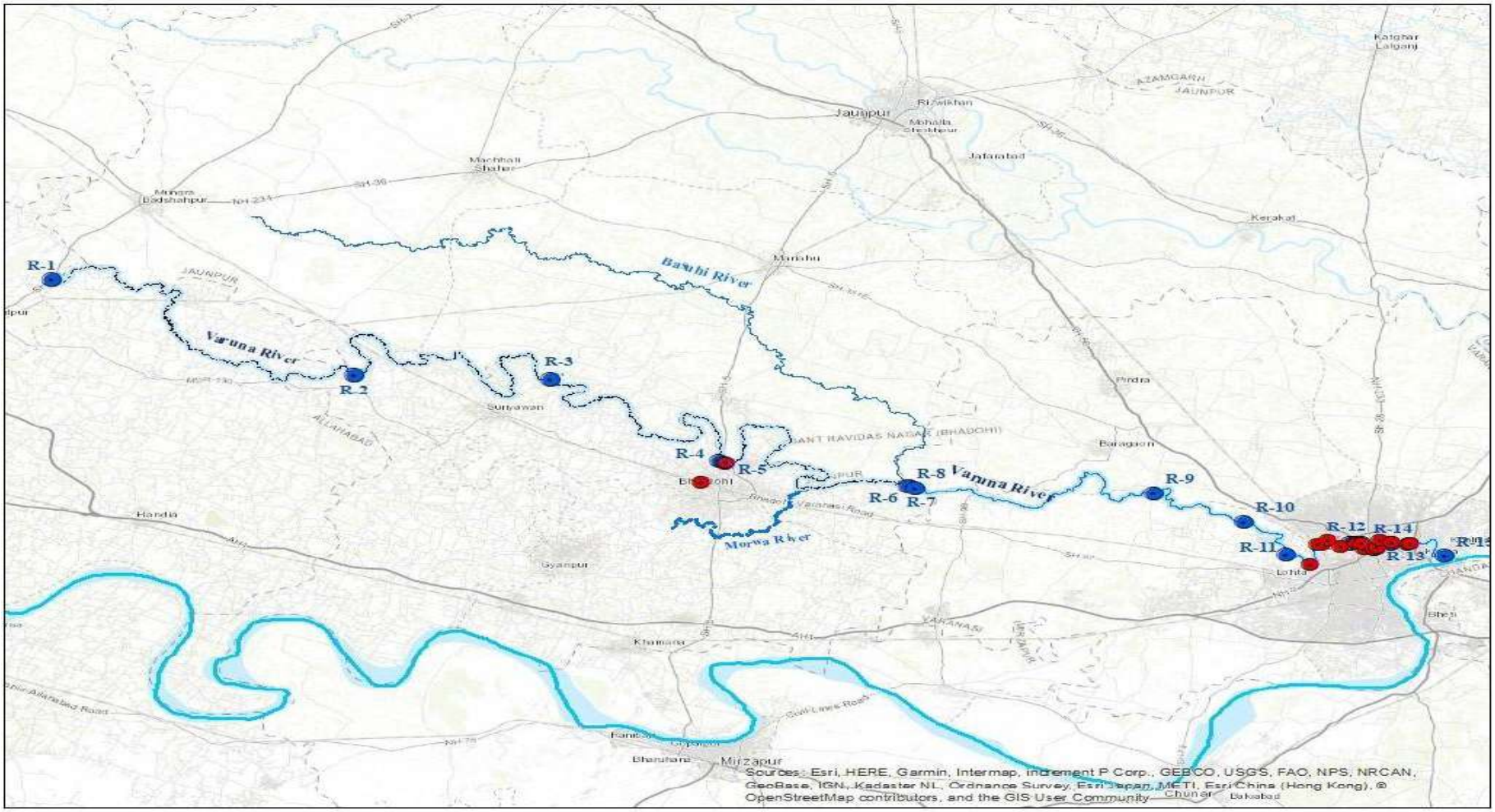


Figure 2.2. River Varuna Base Map

Table 2.3. Water Quality of River Varuna

Parameters		Sampling Locations (as per Table 5.2)														
		Stretch - I							Stretch - II				Stretch - III			
		R-1	R-2	R-3	R-4	R-5	R-6	R-7	R-8	R-9	R-10	R-11	R-12	R-13	R-14	R-15
General Parameters	Temp ^{0} C	32.0	33.5	32.0	34.5	34	36	35	35	34.5	34	34	34.8	35	34	34.0
	pH	6.72	7.02	7.23	7.58	7.66	8.56	8.01	8.24	8.26	8.12	8.03	7.53	7.45	7.48	7.51
	EC (µS/cm)	269	272	306	443	577	316	588	477	479	477	476	711	725	713	925
	Colour (Hazen)	60	50	40	30	35	15	30	25	20	25	20	35	40	40	30
	DO (mg/l)	2.8	5.8	5.6	2.6	2.6	8.9	5.9	6.3	6.0	6.2	7.2	4.1	5.8	2.8	2.5
	BOD (mg/l)	5.16	4.88	2.87	1.05	3.84	2.90	3.62	2.80	1.23	3.62	1.23	6.62	6.62	8.34	12.83
	COD (mg/l)	31.10	18.7	19.1	16.58	22.14	11.87	20.35	13.66	14.22	13.47	17.14	30.24	28.07	31.09	21.48
	TSS (mg/l)	37.1	39.4	76.7	61	37.4	21.9	28.1	32.4	26.6	34.1	27.3	20.7	22.7	16	36.5
	TDS (mg/l)	160	140	169	252	335	177	341	277	274	272	267	419	420	420	546
	Cl^- (mg/l)	3.57	4.36	7.11	19.1	27.4	20.2	29.3	18	19.3	15.6	17.2	31.2	36.6	30.5	53.4
	NH_3-N (mg/l)	.350	<0.1	<0.1	< 0.1	3.45	0.294	< 0.1	0.487	< 0.1	0.349	< 0.1	4.51	2.30	7.03	4.16

	NO_3^-N(mg/l)	<0.5	<0.5	<0.5	< 0.5	< 0.5	0.723	1.16	0.669	0.588	< 0.5	0.511	< 0.5	1.40	< 0.5	0.576
	NO_2^- N (mg/l)	<0.05	<0.05	<0.05	--	--	--	--	--	--	--	--	--	--	--	--
	Total Nitrogen				BDL	6.44	0.294	BDL	0.487	BDL	0.623	1.22	7.88	6.60	10	4.32
	PO_4-P (mg/l)	<0.06	<0.06	0.056	< 0.06	0.478	< 0.06	< 0.06	0.459	< 0.06	0.775	< 0.06	2.83	1.62	2.73	7.58
	Total Phosphorus				0.167	0.541	0.283	0.473	0.404	0.249	0.243	0.274	1.29	1.74	1.30	2.14
	TKN				< 0.5	6.40	---	--	--	< 0.5	0.623	0.712	7.82	5.20	9.82	0.820
	SO_4^{--}	10.7	9.36	12.4	18	23	28.9	31	30.2	29.0	26.7	27.2	27.6	34.0	28.3	31.6
Biological	**TC (MPN/ 100 ml)**	-	$4.9x10^4$	$1.7x10^6$	$2.0x10^3$	$2.2x10^4$	$1.3x10^5$	$7.9x10^4$	$4.9x10^4$	$7.9x10^4$	$3.5x10^6$	$3.3x10^4$	$7.9x10^4$	$4.9x10^4$	$4.9x10^4$	$3.3x10^4$
	FC (MPN/ 100 ml)	-	$2.3x10^4$	$4.9x10^5$	< 1.8	$1.7x10^4$	$1.4x10^4$	$1.1x10^4$	$2.2x10^4$	$7.8x10^3$	$1.7x10^6$	$1.1x10^4$	$4.9x10^4$	$3.3x10^4$	$2.3x10^4$	$7.8x10^3$
Heavy / trace metals	**Arsenic (As) mg/l**	-	-	-	<0.008	<0.008	0.01	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
	Zinc (Zn) mg/l	-	-	-	0.03	0.11	0.02	0.07	0.02	0.01	0.05	0.03	0.04	0.04	0.03	0.03
	Chromium (Cr) mg/l	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Lead (Pb) mg/l	-	-	-	0.11	<0.05	0.06	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.05	<0.05
	Iron (Fe) mg/l	-	-	-	2.22	0.71	0.62	0.65	0.75	0.67	0.89	0.63	0.30	0.35	0.22	0.74

Table 2.4. Characteristics of Drains joining R. Varuna

Parameters		Sampling Locations (as per Table 5.3)										
		Stretch - I		Stretch - II				Stretch - III				
		D1	D2	D3	D4	D9	D10	D11	D13	D15	D16	D18
General Parameters	pH	7.58	7.74	7.35	7.56	7.36	7.38	7.17	7.93	7.28	7.54	7.23
	Colour (Hazen)	50.0	40.0	50.0	35.0	60.0	30.0	35.0	35.0	50.0	40.0	20.0
	BOD (mg/l)	17.1	31.5	39.3	16.6	29.8	21.8	36.3	17.8	48.9	53.0	18.1
	COD (mg/l)	82.0	114	176	71.4	146	79.9	166	88.0	244	247	77.4
	TSS (mg/l)	70.2	49.6	202	89.8	64.7	68.2	183	74.2	714	815	80.4
	Cl^- (mg/l)	131	124	141	47.3	55.1	73.2	54.7	107	69.2	62.7	46.3
	NH_3-N (mg/l)	9.45	28.8	32.0	13.7	19.3	14.0	17.0	18.9	22.6	20.6	9.45
	NO_3^-N(mg/l)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	NO_2^- - N (mg/l)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Total Nitrogen (mg/l)	20.25	33.63	23.52	24.08	21.0	26.88	21.56	14.28	26.40	26.32	18.86
	PO_4-P (mg/l)	6.91	7.92	10.9	5.49	7.66	4.89	4.57	6.4	8.63	10.5	3.19

	Total Phosphorus (mg/l)	2.88	2.99	3.98	2.94	3.03	3.18	2.45	2.61	3.29	3.17	1.84
	SO_4^{--} (mg/l)	95.1	96.2	28.4	18.5	16.5	35.6	28.7	30.0	23.7	29.6	20.5
	S^{--} (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	1.63	<1.0	<1.0	1.30	1.30	<1.0
	Phenol (mg/l)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Biological	**TC (MPN/ 100 ml)**	7.9×10^6	2.4×10^7	3.5×10^7	2.2×10^5	1.6×10^8	1.1×10^7	1.6×10^8	2.2×10^7	1.7×10^7	2.2×10^7	2.4×10^7
	FC (MPN/ 100 ml)	1.4×10^6	1.3×10^7	1.7×10^7	1.4×10^5	5.4×10^7	1.3×10^6	2.8×10^7	1.4×10^7	7.9×10^6	1.1×10^7	1.3×10^7
Heavy / trace metals	**Arsenic (As) mg/l**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.018	<0.01	<0.01
	Zinc (Zn) mg/l	0.11	0.13	2.23	<0.1	0.16	<0.1	0.17	0.13	0.33	0.28	0.11
	Chromium (Cr) mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Lead (Pb) mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Iron (Fe) mg/l	1.46	1.08	2.64	2.12	0.69	0.71	1.52	0.89	8.06	12.02	0.60

Table 2.5. Major Drains joining R. Morwa

Drain SL No.	Name of Drain	Co-ordinate at Joining to R. Morwa		Observation	Type
		Latitude	Longitude		
D1	Barbaspur	25.36371	82.55382	During visit measured flow was 226.84 m^3/hr (Instantaneous)	It is a mixed type drain carrying domestic & industrial waste water.
D2	Chauri	25.36916	82.60594	During visit flow was not measurable as flow was found restricted due to blockage in drain line & pounding in upstream.	It is also a mixed type drain carrying domestic & industrial waste water.

Table 2.6. Sampling Locations of Morwa River

Location SL No.	Name of River	Co-ordinate		Sampling Location	Observations
		Latitude	Longitude		
MoR-1	Morwa	25.38836	82.29644	Origin (Present) of R. Morwa, Overflow of Pond (known as Kaitihawa Tara)	Appearance- Clear Do- 5.8 mg/l Temp- 32 ^{0}C Flow- Stagnant
MoR-2	Morwa	25.36303	82.5247	R. Morwa Bridge at Munsilaatpur Village	Appearance- Clear DO- 6.5 mg/l Temp- 33 ^{0}C Flow-Stagnant
MoR-3	Morwa	25.36371	82.55348	R. Morwa u/s of meeting point of Barbaspur Drain	Appearance- Mushy DO- 7.5 mg/l Temp- 35 ^{0}C Flow- Very less
MoR-4	Morwa	25.36353	82.55407	R. Morwa d/s of meeting point of Barbaspur Drain	Appearance- Mushy DO- 7 mg/l Temp- 35 ^{0}C Flow- Very less
MoR-5	Morwa	25.3685	82.60579	R. Morwa u/s of meeting point of Chauri Drain	Appearance- Mushy DO- 6.5 mg/l Temp- 37 ^{0}C

					Flow- Very less
MoR-6	Morwa	25.36966	82.60651	R. Morwa Sampling Point 6 d/s of meeting point of Chauri Drain	Appearance- Mushy DO- 6.4 mg/l Temp- 37 ^{0}C Flow- Very less
MoR-7	Morwa	25.3925	82.62663	R. Morwa b/c to R. Varuna	Appearance- Mushy DO- 4.7 mg/l Temp- 32 ^{0}C Flow- Stagnant
VaR-1	Varuna	25.39372	82.62634	R. Varuna b/c to R. Morwa	Appearance- Clear DO- 5.5 mg/l Temp- 35 ^{0}C Flow- Stagnant
VaR-2	Varuna	25.39466	82.63787	R. Varuna a/c of R. Morwa at Anegpur Village Bridge	Appearance- Clear DO- 3.5 mg/l Temp- 36 ^{0}C Flow- Stagnant

Table 2.7. Analysis results of Samples from River Morwa, Drains Discharging into River Morwa and Varuna before and after confluence of river Morwa

Parameters		**Sampling Locations**										
		MoR-1	**MoR -2**	**MoR -3**	**MoR -4**	**MoR -5**	**MoR -6**	**MoR -7**	**VaR-1**	**VaR-2**	**D-1**	**D-2**
General Parameters	Temp ^{0}C	32.0	33.0	35.0	35.0	37.0	37.0	32.0	35.0	36.0	-	-
	pH	7.56	7.64	7.99	7.93	8.63	8.79	7.19	8.14	7.85	7.83	8.23
	EC (µS/cm)	370	340	362	523	516	516	598	692	603	1204	2091
	Colour (Hazen)	20.0	20.0	25.0	30.0	25.0	25.0	30.0	30.0	30.0	45	125
	DO (mg/l)	5.8	6.5	7.5	7.0	6.5	6.4	4.7	5.5	3.5	-	-
	BOD (mg/l)	2.92	4.41	1.51	3.05	1.70	1.21	1.96	5.07	2.90	9.73	31.5
	COD (mg/l)	11.68	14.98	13.38	22.14	17.43	16.11	17.24	27.32	19.69	40.3	109
	TSS (mg/l)	59.4	17.9	47.4	48.2	48.9	25.9	13.7	15.6	18.5	42	44.6
	TDS (mg/l)	207	197	206	308	289	294	341	408	350	675	1150
	Cl^- (mg/l)	18.0	18.0	18.2	28.0	23.9	33.6	27.2	43.7	28.9	68.9	394
	NH_3-N (mg/l)	< 0.1	0.27	< 0.1	1.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	3.07	4.82
	NO_3^-N(mg/l)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.23	< 0.5	0.56	< 0.5	< 0.5
	PO_4-P (mg/l)	< 0.06	< 0.06	< 0.06	0.484	< 0.06	< 0.06	0.54	0.545	0.591	2.08	2.85

	SO_4^{--} (mg/l)	15.6	15.2	17.4	25.6	25.7	34.3	23.5	30.9	53.6	59.5	42.6
	Sulphide as S^{2-} (mg/l)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Phenol as C_6H_5OH (mg/l)	< 0.1	< 0.1	0.12	0.21	0.42	0.12	< 0.1	< 0.1	0.70	< 0.1	< 0.1
Biological	TC (MPN/ 100 ml)	$1.7x10^4$	$1.6x10^7$	$2.2x10^4$	$3.3x10^4$	< 1.8	< 1.8	$1.3x10^4$	< 1.8	$3.3x10^4$	$2.3x10^5$	$3.3x10^5$
	FC (MPN/ 100 ml)	$2.0x10^3$	$1.7x10^6$	$1.1x10^4$	$1.1x10^4$	< 1.8	< 1.8	$1.7x10^4$	< 1.8	$2.0x10^3$	$4.5x10^4$	$1.1x10^5$
Heavy / Trace metals	Arsenic (mg/l)	< 0.008	0.018	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.01	< 0.01
	Zinc (mg/l)	0.02	0.36	0.02	0.04	0.02	0.05	0.05	0.01	0.01	< 0.1	< 0.1
	Chromium (mg/l)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.2
	Lead (mg/l)	< 0.05	0.051	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.5	< 0.5
	Iron (mg/l)	0.34	0.12	0.28	0.27	0.33	0.43	0.16	0.26	0.18	0.63	0.61

Table 2.8. Water quality of R. Ganga at u/s and d/s of discharge point of R. Varuna

S. No.	**Parameter**	**Unit**	**Sampling location**	
			R. Ganga U/s of R. Varuna	**R. Ganga D/s of R. Varuna**
1.	pH	--	8.78	8.65
2.	Temp.	^oC	34	34
3.	Colour	Hazen	10	15
4.	Conductivity	µ S/cm	373	420
5.	TSS	mg/L	40.8	87.2
6.	TDS	mg/L	196	202
7.	Chloride	mg/L	21.1	31
8.	Sulphate	mg/L	26	27.6
9.	Phosphate	mg/L	< 0.06	0.666
10.	Nitrate as N	mg/L	< 0.5	< 0.5
11.	NH_3-N	mg/L	< 0.1	0.461
12.	DO	mg/L	9.2	8.5
13.	COD	mg/L	7.92	16.2
14.	BOD	mg/L	1.73	5.35
15.	T-Coliforms	MPN/100 ml	4.0×10^3	5.4×10^6

16.	F-Coliforms	MPN/100 ml	1.8×10^{3}	9.4×10^{5}
17.	Arsenic	mg/L	< 0.008	< 0.008
18.	Zinc (mg/l)	mg/L	0.18	0.08
19.	Chromium	mg/L	< 0.05	< 0.05
20.	Lead	mg/L	< 0.05	< 0.05
21.	Iron	mg/L	0.36	0.58

Stretch – I: Origin to before confluence with River Basuhi

1. **River Varuna at Origin** - The Mailhan Tal is believed to be the origin of this river but no water was observed at this location, however, some ponding was observed in the form of patches. Irrigation canal was observed passing close to this Tal (Mailhan). This Mailhan Tal area is about 100 acres but people have converted its most of the area in agriculture land. As there was no water at this location, sample from this location of the river could not be taken (**Photograph No. – P 1)**.
2. **River Varuna At Varuneshwar Mahadev Mandir -** Some ponding was observed in **River Varuna at Varuneshwar Mahadev Mandir** (Location Code R-1). The location is about 4-5 km from the origin of the River Varuna (Mailhan Taal). A historical temple is situated on the bank of River Varuna (Lat: 25.587 Long: 82.132). Sample was collected from this location of the river.
3. **Morwa River (A tributary of Varuna River)** - Morwa River confluence with River Varuna in this stretch. Morwa river presently originates from Kaitihawa, Tara (a small Pond) nearby Jigna Taal area in Handia, District Prayagraj (U.P). About 30-35 years ago, Morwa river originated from a big Taal/Wetland at Upardaha village in Handia of Prayagraj district. Upardaha Taal/Wetland is situated about 6.1 km away in upstream of present origin. After construction of Sharda Sahayak Canal & its network, Morwa river remained cut off from the Upardaha Taal (old origin).

This river flows through 46 villages in Handia, Prayagraj and Gyanpur, Aurai and Bhadohi blocks of District Bhadohi (U.P.) and receives water from 27 water streams (Surface Runoff/Wetland Overflow/Pond Overflow/Drains) which help the river to sustain its flow downstream. Morwa river confluences with Varuna river after flowing for about 64.68 kms (approx.) from its present origin. The confluence point of these two rivers is located near Malethu village at the boundary of two districts namely Bhadohi and Jaunpur of U.P.

Due to the shallow river depth and uneven slope of River Morwa, it swells up in the monsoon and it becomes dry in summer and winter. The upper stretch of river which is approximately 28 kilometres is generally dry for 08-09 months in a year however, during the present study the upper stretch of river was found filled with stagnant rain water. The lower stretch of the river has received water from Sharda Sahayak sub canal and some drains in Bhadohi District (U.P.).

Morwa River is flowing through textile clusters/ industrial area of Bhadohi and is adversely impacted due to the unplanned industrialization. The wastewater of textile/dyeing/carpet factories are generally discharged into Morwa river through water streams/drains. Kuda Dyeing units (unregistered) are abundant in the district. There are 2 major drains namely Barbaspur Drain & Chauri Drain in Bhadohi District (U.P.) that drains into River Morwa.

About 50 industrial/textile units are inventorized in Bhadohi district discharging their effluents into the river. Water samples were collected by team from 07 locations of R. Morwa and 02 major drains joining to R. Morwa. Beside this, R. Varuna samples were also collected b/c and a/c to R. Morwa.

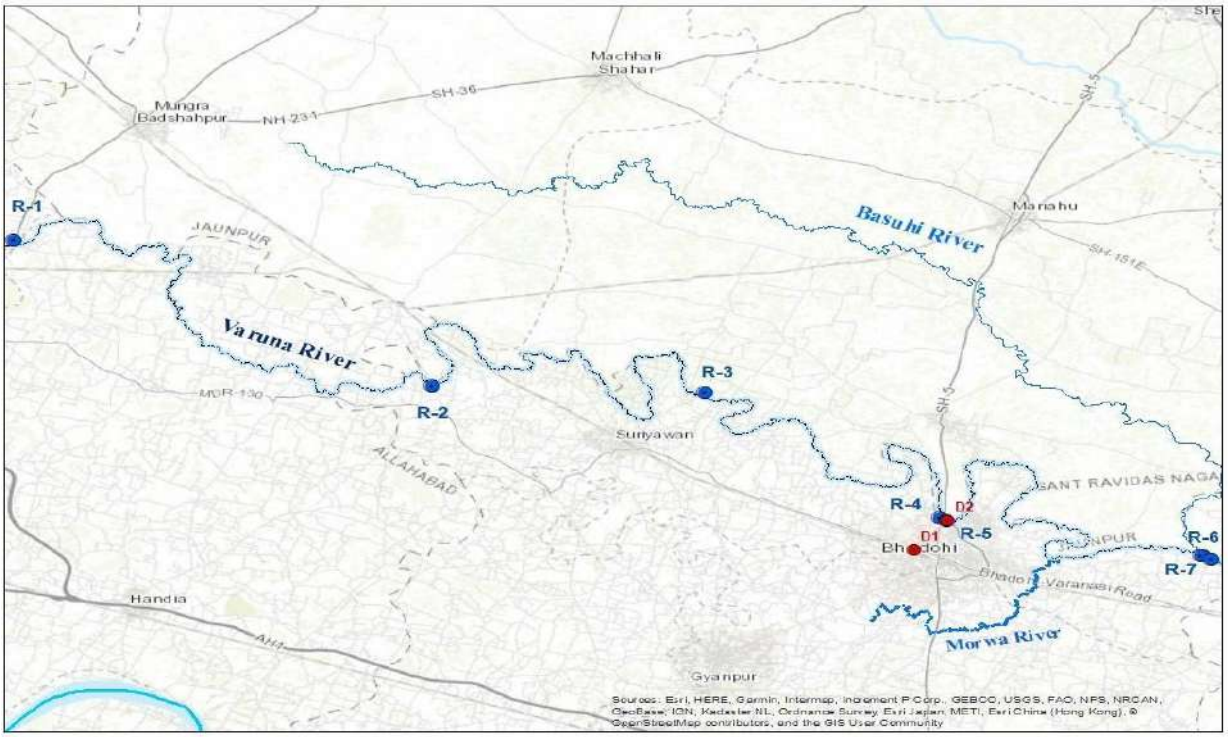


Figure 2.3. Map of Stretch - I of River Varuna

4. **River Basuhi -** Another tributary of R. Varuna is R. Basuhi that contributes significant amount of water in this river. R. Varuna gets fresh breath from this location onwards.

Water Quality of River Varuna in Stretch – I (including River Basuhi)

Water quality of river Varuna at different locations in stretch – I shows that pH, Colour, DO, BOD, COD, TSS, NH3-N and PO4-P varies from 6.72 to 8.01, 30 to 60 Hazen, 2.8 to 5.9 mg/l, 1.05 to 5.16 mg/l, 16.58 to 31.1 mg/l, 28.1 to 76.7 mg/l, <0.1 to 3.45 mg/l and <0.06 to 0.478 mg/l, respectively. The value of important parameters such as BOD, COD as well as NH3-N and PO4-P suggests that the impact of organic as well as nutrient load is insignificant in this stretch of river Varuna. Range of DO is also suggestive that water quality is supportive of certain life forms. Water quality analysis of River Basuhi also indicate similar findings. Infact, the DO of River Basuhi is 8.9 mg/l which adequate and supportive of various hydrological processes and aquatic life-forms. Like Varuna, the impact of organic as well as nutrient load is insignificant in river Basuhi.

Water Quality of River Morwa in Stretch – I

Water quality of River Morwa at different sampling locations shows pH, Colour & DO in the range of 7.19 – 8.79, 20-30 Hazen and 4.7-7.5 mg/l respectively at all the sampling locations of R. Morwa. BOD and COD are in the range of 1.21 – 4.41 mg/l and 11.68 – 17.24 mg/l. The analysis result suggests that impact of organic as well as nutrient load is insignificant in this stretch of river.

These results imply that there is no apparent pollution of this stretch. However, there is lack of flow in this stretch due to water logging and stagnancy.

Stretch – II: After confluence of Basuhi to U/s Daniyalpur drain

1. **River Varuna after confluence of River Basuhi -** Large quantity of water as compared to R. Varuna was observed in R. Basuhi (Location Code R-8). A mega project of broiler/ Egg production was observed at the bank of R. Basuhi close to the confluence to R. Varuna. (**Photograph No. – P 7).** River Varuna was observed narrow as compared to R. Basuhi at this location. Cremation shades was found prepared at the bank of the river at this location.
2. **River Varuna At Rameshwar** - Slow moving water was observed in River Varuna At Rameshwar (Location Code R-9). The historical temple, Rameshwar is situated close to the bank of R. Varuna. Some submerged plant species was also observed floating at this

location. Sample from this location of the river was collected. This location is part of the panch kosi parikrama marg. (**Photograph No. - P 8).** People take holy dip on special occasions at this location. At the downstream of this location cremation activity was observed.

3. **River Varuna At Pissaura Bridge - River Varuna At Pissaura Bridge** (Location Code R-11) may be treated as upstream of the city of Varanasi where presumably no pollution source of the city could be identified.

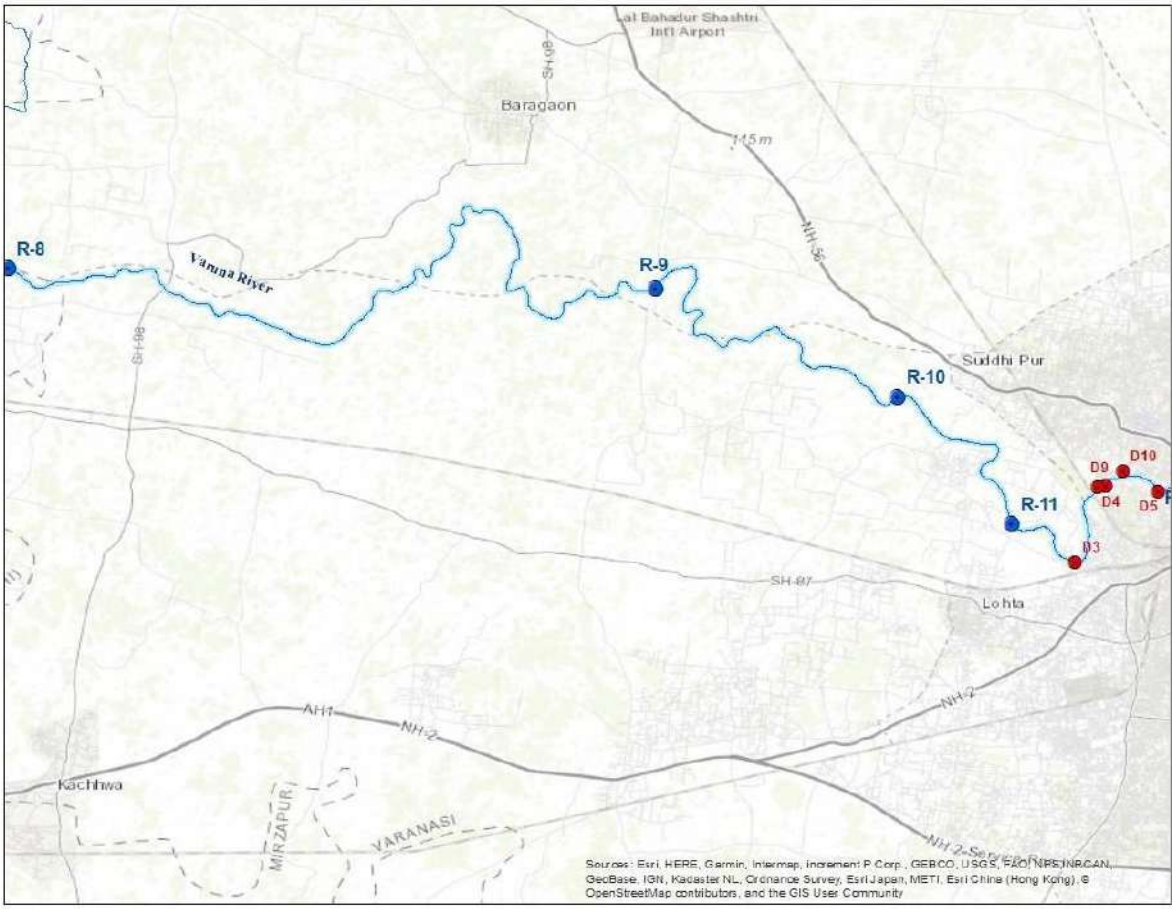


Figure 2.4. Map of stretch - II of River Varuna

Water Quality of River Varuna in Stretch – II

Water Quality of river Varuna in Stretch – II shows pH, EC, Colour, DO, BOD, COD, TSS, NH3-N and PO4-P varies from 7.53 to 8.26, 476 to 711 µS/cm, 20 to 35 Hazen, 4.1 to 7.2 mg/l, 1.23 to 6.62 mg/l, 13.47 to 30.24 mg/l, 20.7 to 34.1 mg/l, <0.1 to 4.5 mg/l and 0.459 to 2.83 mg/l respectively. DO is significantly present which is suggestive that water quality is supportive of aquatic life and biological processes. The low values of most of the parameters in the analysis result suggests impact of organic as well as nutrient load is negligible in this stretch of river Varuna. This is relatively a non-polluted stretch.

2.2.3 Stretch – III: D/s of Daniyalpur to River Varuna before confluence with River Ganga

1. **River Varuna At Kutchehry bridge, Varanasi** - In between Pissaura Bridge location and Kutchehry bridge (Location Code R-12) four drains (Durga/ Daniyalpur/ Lohta Drain, Phulwariya Drain, Chamraudha and Central Jail Drain) are contributing its discharge of about 1898.398 m^3/hr (45.56MLD) in the R. Varuna.
2. **River Varuna before confluence to R. Ganga, Varanasi** - At **River Varuna before confluence to R. Ganga, Varanasi** (Location Code R-15) a well-known Adikeshwar ghat is situated on the bank of R. Ganga at this point. R. Varuna is contributing about 10721.5 m^3/hr (257.32 MLD) to R. Ganga.

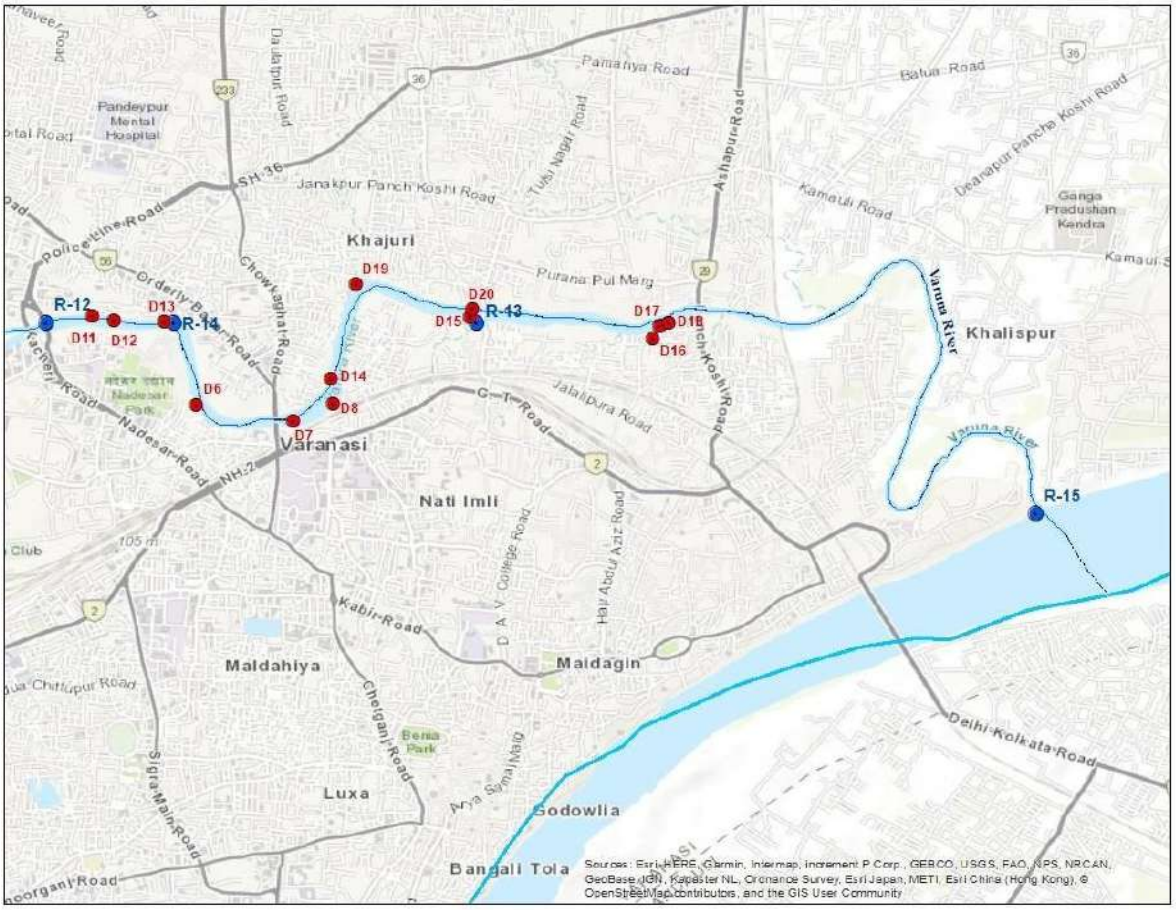


Figure 2.5. Map of Stretch - III of River Varuna

Water Quality of River Varuna in Stretch – III

Water Quality of river Varuna in Stretch – III shows pH, EC, Colour, DO, BOD, COD, TSS, NH3-N and PO4-P varies from 7.45 to 7.51, 713 to 925 µS/cm, 30 to 40 Hazen, 2.5 to 5.8 mg/l, 6.62 to 12.83 mg/l, 21.48 to 31.09 mg/l, 16 to 36.5 mg/l, 2.3 to 7.03 mg/l and 1.62 to 7.58 mg/l respectively. Based on the analyses results, it apparent that nutrient load has been detected in

water samples in this stretch. The value of ammonical nitrogen is typically indicative of presence of fresh raw domestic/organic wastewaters presumably from septic tank, a weak strength sewage. Overall, nitrates and phosphates (nutrient loading) and pesticides are also due to discharge of agricultural runoff as there are catchments having agricultural fields along the length of the river.

Similarly, the values of Bio-chemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) indicate moderate organic load of polluting sources. However, the overall water quality observed in this stretch has characteristics of partially treated or mix sewage of weak strength (Raw sewage has BOD as high as 250 mg/L; COD as 425 mg/L; Ammonical nitrogen as 32.5 mg/L; Nitrate as 5.0 mg/L; Phosphate as 7.1 mg/L) that doesn't necessarily require treatment in STP (CPHEEO Manual on Sewerage and Sewage Treatment Systems, Part A: Engineering, Chapter 5, Page 5-7), but could be treated through constructed wetland system.

Water quality of R. Ganga (upstream & downstream of discharge point of R. Varuna)

R. Varuna joins R. Ganga at the left bank at Adikeshwar Ghat at the downstream of Varanasi city. To assess the impact of R. Varuna on the water quality of R. Ganga, grab samples form u/s and d/s of confluence point of these two rivers were collected and analysed. For u/s and d/s location samples were collected from a distance of approx. 100 m before and approx. 800 m after confluence point. R. Ganga water quality at these locations is presented in Table 9. Comparison of water quality of these two locations suggests adverse impact on water quality of R. Ganga in terms parameters like BOD (3.09 times increment), COD (2.04 times increment), ammonical nitrogen (from <0.1 to 0.461 mg/L) and faecal coliform numbers (~ 522 times increment) at the downstream of discharge point of R. Varuna to R. Ganga.

Recommendation(s)

A. STRETCH I

Issue: The pollution of Varuna river water in this stretch is insignificant that doesn't require any major intervention. The only problem apparent in this stretch is that a significant portion of the origin (a wetland) is under either cultivation/agriculture land, paddy land as well as fallow land that has changed the not only the land-use but also the landcover of the area. This wetland also receives runoff from vast agricultural fields and is highly silted. This has resulted lack of flow of river from its origin.

Recommendation: The most suitable intervention is to acquire the cultivated land (once wetland at Mailhan village, Phoolpur of Prayagraj district) and convert it back into wetland as well as Biodiversity Park. Also, there are massive wetlands in the downstream (about 60 km from point of origin) and other wetlands located in the unpolluted stretches of the river, where desilting could be carried upto appropriate depth (original bed level). The desilted material can be used for making natural embankments without disrupting natural drainage pattern stream. These wetlands receive water from catchments and feed to the river. Enhanced stream flows not only remove sediments but also dilute the pollution levels in water in the downstream. Further more water will be available for the local communities. Once the origin i.e. Mailhan Taal is restored, the flow and in turn the water quality will further improve downstream this location.

B. STRETCH II

This stretch is seemingly non-polluted and requires **no** intervention.

Additionally, following could be considered for the stretch 1 and 2 with respect to drains that discharges into the river and for the industrial clusters of Morwa river:

i. Two major tributaries namely Basuhi, which joins Varuna at about 100 Km away from the point of origin and Morwa, which joins Varuna at about 150 km away from the point of origin, carry agricultural runoff, excess water from canals and catchments from agricultural fields may contain high levels of nutrients and pesticides. These can be remediated by riparian vegetation along the embankments. Both of them, do not carry any industrial pollutants. However, Morwa receives sewage from Burbuspur drain at Rampur village of Bhadoi district and Chauri drain at Kom village of Bhadohi district. The sewage of Burbuspur drain and Chauri drain should be treated by constructed wetland system at the mouth of the drain that joins Morwa or 100 m away from the confluence point or at any stretch where the width of the drain is maximum. The length and number of units of Constructed Wetland System will depend up on the volume of water and length of the drain.
ii. Setting up of one or more units of Constructed Wetlands Systems (CWS) within each of three drains (Dhoraira, Basti bazar and Durga of above stretches) for in-situ remediation of sewage as well as industrial effluents. It is not possible for in-situ remediation directly of polluted river water of this stretch using CWS because of large volume of water coming from the unpolluted stretch of the river along-with the discharges of drains and the narrow width of the river. Therefore, the best strategy is to setup CWS within each polluted drain.

iii. As a regulatory step, Charter implementation could be emphasized for Textile GPI clusters of Bhadohi based in Morwa catchment.

C. STRETCH III

This stretch is relatively polluted when compared with other two previous stretches based on the values of water quality parameters analysed.

Recommendation(s):

i. This stretch may require desilting, particularly in locations/stretches where the tributaries with polluted water join the river and the desilted material can be used for strengthening embankments.

ii. All the drains (that are presently untapped) should be tapped *via* interception/diversion to the related STPs. With respect to tapping of drains, if overflow exists even after interception/diversion system, that could be tapped into CWS for in-situ remediation. The sewage is mostly of weak strength (partially or mostly digested septic discharge/ domestic wastewater), that does not give prominence to construction of any additional STP is not essential.

iii. At present, the STPs at Dinapur (old and new) as well as STP at Goithala are underutilized given their designed capacities. They should be made fully efficient in terms of utilization. Values of high coliforms can be dealt via ensuring proper optimization of disinfection units as per the outlet flow of the STPs.

iv. There are reported wetlands in this stretch that requires restoration *via* desilting upto appropriate depth (original bed level). Thereafter, CWS could be introduced that can receive water from the catchment and treat it before feeding to the river. The riparian vegetation may help in reducing the nutrient loading.

v. The floodplains on either side of Ganga, particularly the side where Varuna joins Ganga (Adikeshwar Ghat), can be developed into floodplain Biodiversity Park (Adikeshwar Ghat Biodiversity Park). The area between the Ghat and Bridge in the downstream of Ganga from the Ghat can be developed into a Biodiversity Park. It has many ecological functions; (i) enhance water quality of Ganga in the stretch, (ii) the water from Varuna before it is discharged into Ganga can be further purified by passing through treatment wetlands developed in the Biodiversity Park, (iii) provide recreation to visitors, (iv) stabilizes embankments of the channel (v) provide habitat for many births and other fauna, and (vi) revive riparian ecosystems.

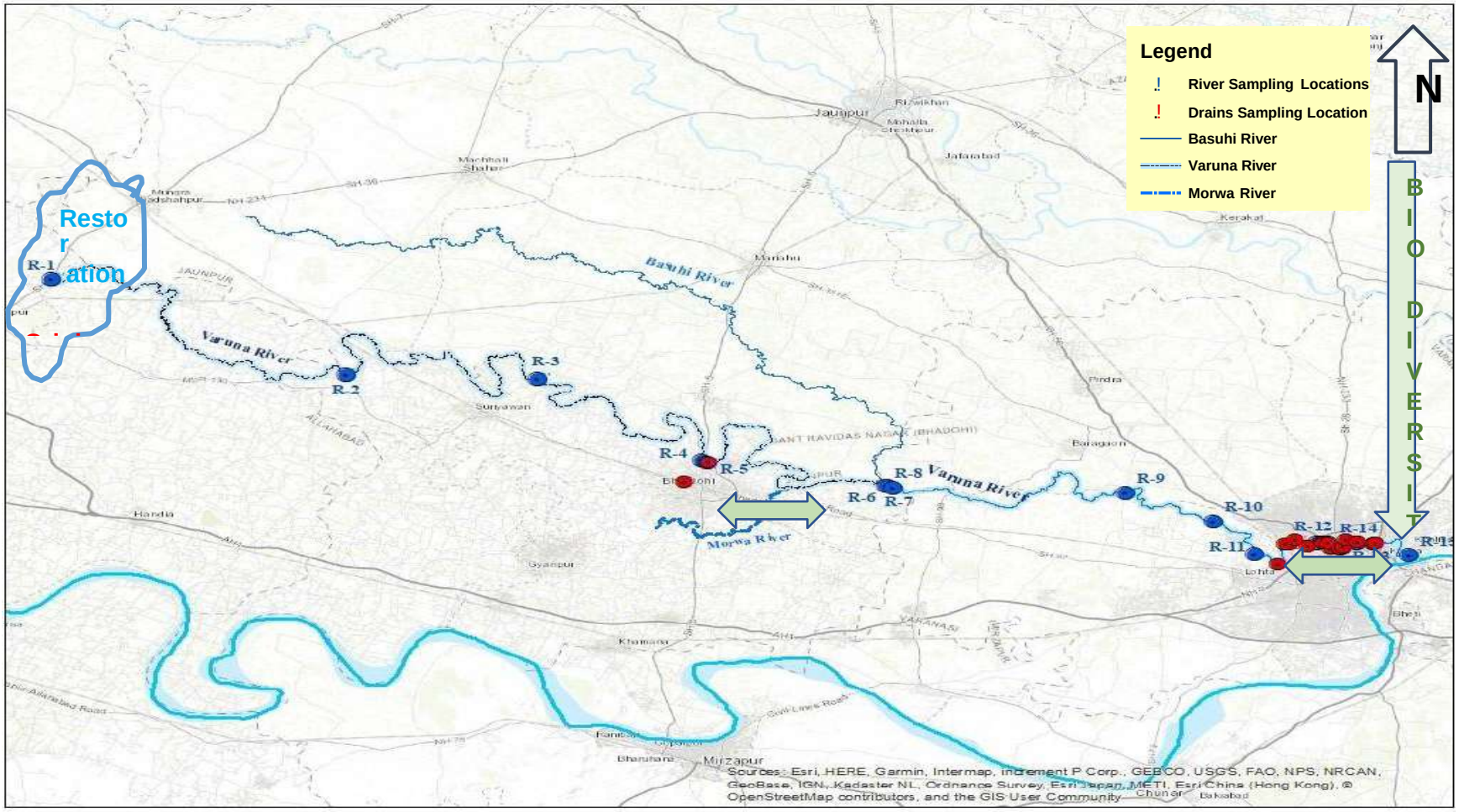


Figure 2.6. Map showing Proposed Plan for Rejuvenation and Restoration of River Varuna

Chapter 3. River Assi

Potamological features and the present state

River Assi presumably originates from Kardmeshwar Kund from surrounding areas of Kandwa in Varanasi city (situated at north of Assi river) and runs along an approximate length of 8 km through unconstructed channel before falling into River Ganga at left bank (Figure 3.1). Its width varies due to unauthorized encroachments. Previously, it used to confluence with River Ganga at Assi Ghat (the southernmost ghat in Varanasi having historical values). However, at present, River Assi is diverted and passes through Nagwa mohalla (the diversion onwards stretch is also known as Nagwa *Nala*) wherein it drains 300 meters upstream of Assi Ghat from Ravidas Park to protect Assi Ghat from direct impacts of pollution of water/wastewater of the Assi river. A bandh is constructed on the River Assi just before old confluence with Ganga around 25 years ago near the Assi Ghat with a width of around 25-30 meters.

During its overall course of flow, it passes through areas of Awaleshpur, Kanchapur, Indira nagar, Newada, Sundarpur, Saket nagar, Sankat Mochan crossing, Nagwa. Though Assi river is now a small, local, ephemeral stream compared to other major rivers, it is a cynosure of all eyes and an eye-sore as several pollutants flow through it to ultimately enter into the Ganga river. Presently, this river face serious issues such of unauthorized encroachments, degradation of floodplains, diminishing groundwater recharge, lack of ecological flow, discharge of untreated sewage, dumping and direct disposal of solid wastes into the water channel, to name a few.

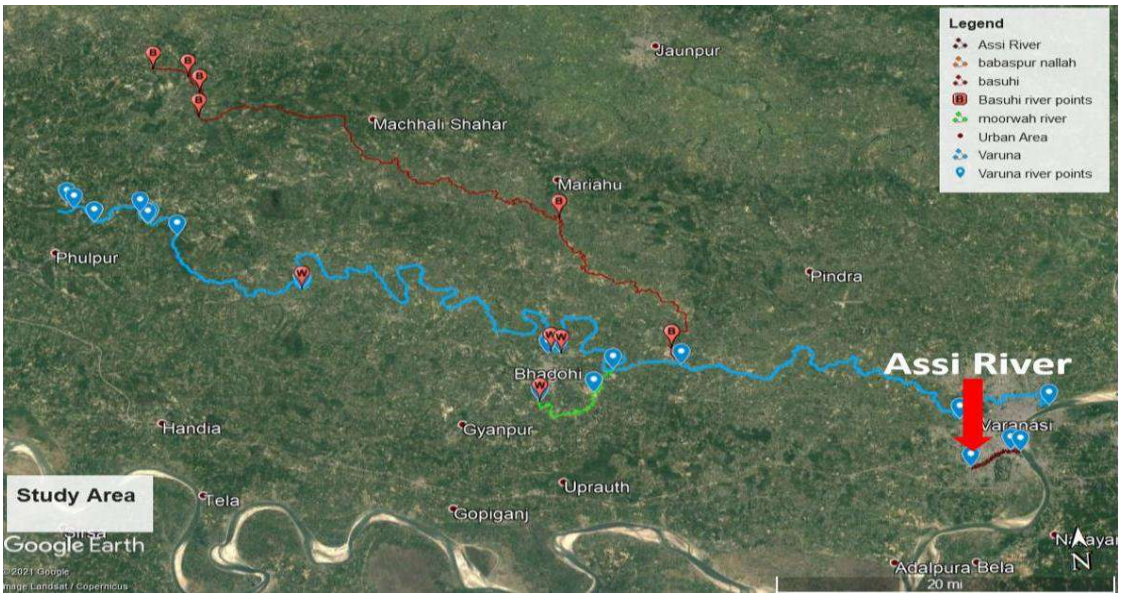


Figure 3.1: Google Map showing location of Assi River

Water Quality status and stretch characterization

During the pollution mapping and exploratory survey, the course of Assi river was mapped from present presumed origin till confluence into the River Ganga. The details of the same along-with geo-coordinates is presented in Table 3.1 and Figure 3.2. Samples were collected, wherever possible, to analyze the status of river water quality (Table 3.2) and to understand the characteristics of possible polluting sources at different locations along the course of the river.

Table 3.1. Mapped locations of River Assi from *confluence to origin* (AR: Assi River)

Location Code	Location name	Geo-coordinates	Photograph No.	Sample collection
AR-1	Confluence of R. Assi / Nagwa drain with R. Ganga	25.283039 N, 83.009778 E	39 & 40	Yes (composite)
AR-2	Diversion point of R. Assi to Nagwa stretch (near Sant Ravidas Park)	25.282949 N, 83.006714 E	41 & 42	No
AR-3	Sahodya Veer Bridge (near Sanskrit PG College, Assi-Lanka Road)	25.285133 N, 83.003534 E	43 & 44	Yes
AR-4	Ravindra Puri Bridge	25.285474 N, 83.002436 E	45 & 46	No
AR-5	Sankat Mochan, Durgakund Road	25.285141 N, 83.000475 E	47 & 48	No
AR-6	Saket Nagar	25.284126 N, 82.995829 E	49 & 50	Yes
AR-7	Sundarpur Chauraha (near sabzimandi)	25.282343 N, 82.984767 E	51 & 52	No
AR-8	Dhirendra Mahila PG College	25.280229 N, 82.982067 E	53 & 54	Yes
AR-9	Indira Nagar / DLW drain joining R. Assi in Indira Nagar Colony	25.276691 N, 82.971478 E	55 & 56	No
AR-10	Kanchanpur Pokhra	25.274167 N, 82.966970 E	57 & 58	Yes

AR-11	Khandwa Pokhri/Pond near Kardmeshwar Mahadev Inter College, Kandwa (E), Kanchanpur	25.270072 N, 82.960578 E	61 & 62	No
AR-12	Kardmeshwar *Kund*	25.267781 N, 82.958982 E	63 & 64	Yes
AR-13	Pond near Kardmeshwar *Kund*	25.267907 N, 82.957727 E	65 & 66	No

Table 3.2. Water quality status at specific sampling locations of River Assi

S. No.	Parameter	Unit	Sampling locations					
			AR 1	AR 3	AR 6	AR 8	AR 10	AR 12
1.	Flow	MLD	92	--	--	--	--	--
3.	pH	--	7.35	7.06	7.10	7.19	7.93	8.64
4.	Colour	Hazen	35.0	40.0	50.0	40.0	60.0	15
5.	Conductivity	µ S/cm	924	996	1067	980	801	525
6.	Suspended Solids	mg/L	104	177	101	151	44.2	22.8
7.	TDS	mg/L	492	512	567	518	438	273
8.	Chloride	mg/L	54.4	54.3	53.1	45.2	50.1	49.2
9.	Sulphate	mg/L	24.8	23.8	20.2	11.8	19.6	16.1
10.	Phosphate	mg/L	5.06	6.40	6.21	4.89	2.43	< 0.06
11.	Nitrate as N	mg/L	0.818	0.927	< 0.5	< 0.5	0.585	< 0.5
12.	Ammonical nitrogen	mg/L	16.8	17.7	19.8	12.6	6.62	< 0.1
13.	COD	mg/L	113	181	129	77.4	142	40.7
14.	BOD	mg/L	31.6	54.7	44.8	36.7	37.1	12.9
15.	Sulphide	mg/L	< 1.0	1.21	< 1.0	< 1.0	< 1.0	--
16.	Phenols	mg/L	0.25	0.23	0.35	0.20	< 0.1	--
17.	TKN	mg/L	23.5	31.9	35.0	30.8	24.3	--

18.	T-Coliforms	MPN/100 ml	1.3×108	7.9×107	7.9×107	1.3×108	4.5×105	2.3×103
19.	F-Coliforms	MPN/100 ml	3.5×107	3.3×107	1.1×107	1.1×107	2.0×105	1.3×103
20.	Arsenic	mg/L	0.012	< 0.01	< 0.01	< 0.01	< 0.01	-
21.	Zinc	mg/L	0.318	0.324	0.188	0.212	0.162	-
22.	Chromium	mg/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-
23.	Lead	mg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
24.	Iron	mg/L	5.026	2.068	1.81	1.92	0.848	-

***Summary of the stretch(s) identified along-with major observations*:**

STRETCH I

It was identified that the Assi river once originated through an outlet at the south-east corner from Kardmeshwar *Kund*, near Kardmeshwar Mahadev temple (AR-12). Thereafter, the water from the Kardmeshwar *kund* probably joined another pond called Khandwa Pokhri (near Kardmeshwar Mahadev Inter College, Kandwa (E), Kanchanpur, AR-11) *via* Awaleshpur area. As per local information, the depth of this *kund* is about 30 ft. It was also informed that yet another pond exists nearby west of Kardmeshwar *kund* that connects with this *kund* in the Kanchanpur area (AR-13). Continued illegal constructions along the river course and encroachment of the river path, obstructed the flow of the river especially from Kardmeshwar *kund* to pond near Kadmeshwar Inter College. This blockage of the river path led to back flow of wastewater (discharged by nearby households in to the possible river path) into the Kardmeshwar *kund* that caused pollution of the *kund*. Therefore, about 10-15 years ago, the locals with the help of administration sealed the outlet of the Kardmeshwar *kund* that led to change in the origin of River Assi and ultimately effected the flow and pollution status of the river.

***Water Quality status**:* Analysis of sample of Kardmeshwar *Kund* for water quality parameters (AR-12) indicated that there is no visible pollution of this *kund*. The phosphate, nitrate and ammonical nitrogen are undetectable indicating that there is no nutrient pollution. Similarly, the values of Bio-chemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) are significantly low (12.9 mg/L and 40.7 mg/L, respectively) that may be originating from some cattle washing and human interferences (local people were seen using the *kund* for their domestic purpose) indicating insignificant contribution of any organic or inorganic polluting sources. However, high (pseudo) Dissolved Oxygen (DO) i.e. 16.8 mg/L in the *kund* was recorded that may be due to visible algal growth and turbulence due to wind over the *kund.* Even the microbiological pollution estimated in terms of Total Coliforms (TC) and Faecal Coliforms (FC) is 2300 MPN/100 ml and 1300 MPN/100 ml, respectively is suggestively low.

Based on the water quality being reasonably well for various parameters, these locations were identified in ***Stretch 1*** *for the purpose of preparation of the Action Plan.*

STRETCH II

The present origin of River Assi has been identified as Khandwa Pokhri, a pond near Kardmeshwar Mahadev Inter College, Kandwa (E), Kanchanpur (AR-11). At present, river ceases to exist U/s of this point and becomes untraceable in areas near Kandwa road in Awleshpur area. From this pond, it traverses through Kanchanpur Pokhra, Kanchanpur (AR-10) and enters Indira Nagar after crossing Chunar Road. Here, an open storm **DLW-2** drain (Photograph No. 4.41 & 4.42) coming from DLW (formerly called Banaras Locomotive Works) area and receiving load from Indira Nagar Colony, Newada area, joins River Assi behind H. No. N6/2B-132A (AR-9). Thereafter, the river traverses through the area around Dhirendra Mahila PG College and Indira Nagar area (AR- 8). Further downstream, it crosses Sundarpur Chauraha area (AR-7) and passes through the densely populated and congested areas of Naria Road, Tagore Road, Tilak Road and Gandhi Nagar Road till it reaches Saket Nagar (AR-6). The stretch of the river between Sundarpur *Chauraha* and Saket Nagar is about 1.4 km. It is in this stretch that a major drain **DLW- 1** from DLW joins River Assi near Sundarpur *Sabzimandi* at Saraynandan (Photograph 77 & 78). Another drain discharges into River Assi near the Sundarpur Chauraha bridge. In Saket Nagar area, the width of the river is reduced to about 2-3 meters only and some houses/buildings were constructed in the path of the river itself. River path was diverted by these construction activities and the river was forced to meander at 90^{o} angles at few locations. The Assi river then flows through Durgakund Road near Sankat Mochan Crossing (AR-5) and then through Ravindra Puri Road bridge (AR-4). As informed by UP Jal Nigam, provision for storm water drainage into the River Assi is provided through a conduit pipe under the Ravindra Puri Road bridge. However, domestic wastewater is also discharged through the provided pipe. From Ravindra Puri Road, it flows towards Nagwa Road through Sahoday Veer Bridge on Assi-Lanka Road near Siyaram Dairy (AR-3). Further downstream, the River Assi is diverted through Nagwa ward where it is also known as Nagwa Drain (AR-2) near Sant Ravidas Park. Finally, this River Assi/Nagwa drain confluence with River Ganga (AR-1). The present confluence points of River Assi, behind Ravidas Ghat Park is situated at a distance of around 770 meters upstream of original confluence point at Assi Ghat. As mentioned in the introduction, a bandh is constructed on the River Assi just before the old confluence with River Ganga near the Assi Ghat. The old channel of River Assi now carries household sewage from the point of bandh onwards and is now encroached at diversion point. The original channel from diversion to confluence was of around 780 meters length till Assi Ghat which is now bypassed with short route of just 300 meters (Figure 3.3).

There is a 50 MLD sewage pumping station (SPS) of GPCU, UP Jal Nigam approximately 70-80 meter before confluence point, that has a tapping provision for pumping the sewage from River Assi/Nagwa Nala to Ramana Sewage Treatment Plant (STP). However, due to less pumping capacity, sewage overflows the tapping arrangement and directly discharges into River Ganga.

Water Quality status: Samples were collected for water quality analyses from locations namely, Kanchanpur Pokhra (AR-10), Dhirendra Mahila PG College (AR-8), Saket Nagar (AR-6), Sahodya Veer Bridge (AR-3) and Confluence of River Assi/Nagwa drain with R. Ganga (AR-1). The results suggest that the water quality parameters of River Assi at different locations has identical values with slight variations that is indicative of characteristics of typical sewage (with dilution at some locations). pH is mostly in the decimal values of 7 for all the locations. However, nutrient load has been detected in water samples from these locations. The value of ammonical nitrogen is in the range of 6.62 to 19.8 mg/L which is typically indicative of presence of fresh raw domestic/organic wastewaters presumably from septic tank, a weak strength sewage. In fact, nitrate in samples range from trace to 0.927 mg/L, again a characteristic of weak strength wastewaters. Phosphate is in the range from 2.43 to 6.40 mg/L and its presence is indicative of water discharged from household washing activities. Phenols have been found in the range of <0.1 to 0.35 mg/L indicative of absence of any industrial source in the catchment of River Assi. Similarly, the values of Bio-chemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) are in the range from 31.6 - 54.7 mg/L and 77.4 - 181 mg/L, respectively indicating moderate organic load of polluting sources. However, the microbiological pollution estimated in terms of Total Coliforms (TC) and Faecal Coliforms (FC) is observed as high as 1.3×10^8 MPN/100 ml and 3.5×10^7 MPN/100 ml, respectively, suggesting presence of sewage pollution and surface runoff from nearby land. However, the overall water quality observed in this stretch has characteristics of partially treated or mix sewage of weak strength (Raw sewage has BOD as high as 250 mg/L; COD as 425 mg/L; Ammonical nitrogen as 32.5 mg/L; Nitrate as 5.0 mg/L; Phosphate as 7.1 mg/L) that doesn't necessarily require treatment in STP (CPHEEO Manual on Sewerage and Sewage Treatment Systems, Part A: Engineering, Chapter 5, Page 5-7), and which could be treated through a series of constructed wetland systems.

Based on the values of water quality parameters, these locations were identified in ***Stretch 2*** *for the purpose of preparation of the Action Plan.*

Sub-section 1: DRAINS IN STRETCH 2

It is impertinent to mention that all along the course of River Assi from Kardmeshwar *kund* to confluence with River Ganga, numerous drains/conduit pipes have been observed discharging into the river. The photographs of the same are provided from No. 67 to 76 for reference. However, as mentioned in previous section, 2 major drains i.e. DLW-1 and DLW-2 that empty themselves into River Assi, were identified. DLW 1 drain originates from the DLW campus and carries treated sewage/effluent and other waste water from the DLW campus, ultimately meets river Assi near Sunderpur Sabji Mandi. DLW2 drain originate from Manduadih area and routes towards DLW campus and finally confluence with Assi river near Sunderpur Sabji Mandi. Grab samples were collected from these drains for estimating quantity (instantaneous) and analyses of quality of wastewater discharging from them. The results are provided in Table-

Again, the values of nutrient parameters including low values of BOD/COD indicate that these drains mostly receive sewage of weak strength with possible domestic and surface runoff sources.

Table 3.3. Major drains joining River Assi and their characteristics

S. No.	Parameter	Unit	Sampling location	
			DLW Drain - 1	**DLW Drain - 2**
1.	GPS Coordinates	--	25.2829964 N, 82.9845114 E	25.276691 N, 82.971478 E
2.	Flow (Instantaneous)	MLD	16.04	Flow not measured (unapproachable path)
3.	pH	--	7.17	7.27
4.	Colour	Hazen	30.0	30.0
5.	Conductivity	µ S/cm	938	944
6.	Suspended Solids	mg/L	57.7	114
7.	TDS	mg/L	514	503
8.	Chloride	mg/L	46.5	41.2
9.	Sulphate	mg/L	17.2	10.6
10.	Phosphate	mg/L	5.08	4.84
11.	Nitrate as N	mg/L	< 0.5	< 0.5

12.	Ammonical nitrogen	mg/L	14.7	15.4
13.	COD	mg/L	63.8	69.3
14.	BOD	mg/L	19.9	16.1
15.	Sulphide	mg/L	< 1.0	< 1.0
16.	Phenols	mg/L	0.16	0.16
17.	TKN	mg/L	37.5	35.0
18.	T-Coliforms	MPN/100 ml	1.3×10^8	4.9×10^7
19.	F-Coliforms	MPN/100 ml	4.9×10^7	3.3×10^7
20.	Arsenic	mg/L	< 0.01	0.016
21.	Zinc	mg/L	0.176	0.194
22.	Chromium	mg/L	< 0.2	< 0.2
23.	Lead	mg/L	< 0.5	< 0.5
24.	Iron	mg/L	0.624	3.108

Sub-section 2: **Water Quality of River GANGA (UPSTREAM & DOWNSTREAM of DISCHARGE POINT of River ASSI/NAGWA Drain)**

River Assi discharges into River Ganga at the left bank before the religiously important Assi Ghat. Many important ghats like Harishchandra Ghat, Dasaswamedh Ghat and Manikarnika Ghat are situated in the d/s of the Assi Ghat. Grab samples form u/s and d/s of discharge point of River Assi/Nagwa drain were collected and analysed. For u/s and d/s location samples were collected from a distance of approx. 100 m before discharge point and approx. 800 m (near Assi Ghat) after discharge point, respectively. Water quality of River Ganga at these locations is tabulated in Table 4. Comparison of water quality of these two locations indicate adverse impact on water quality of River ganga in terms of parameters like BOD (4.13 times increment), COD (1.5 times increment), Ammonical nitrogen (from <0.1 to 0.328 mg/L) and Fecal Coliform numbers (3.5 times increment) at the downstream of discharge point into River Ganga.

Table 3.4. Water quality of R. Ganga at u/s and d/s of discharge point of R. Assi / Nagwa Drain.

S. No.	Parameter	Unit	Sampling location	
			R. Ganga U/s of R. Assi/Nagwa Drain	R. Ganga D/s of R. Assi/Nagwa Drain (near Assi Ghat)
1.	pH	--	8.63	8.55
2.	Temp.	^oC	32	32
3.	Colour	Hazen	5	10
4.	Conductivity	µ S/cm	377	402
5.	TSS	mg/L	42.4	55.8
6.	TDS	mg/L	191	212
7.	Chloride	mg/L	18.5	24.1
8.	Sulphate	mg/L	21.8	27.8
9.	Phosphate	mg/L	< 0.06	< 0.06
10.	Nitrate as N	mg/L	< 0.5	< 0.5
11.	NH_3-N	mg/L	< 0.1	0.328
12.	DO	mg/L	8.5	8.8
13.	COD	mg/L	9.0	13.5
14.	BOD	mg/L	1.12	4.63
15.	T-Coliforms	MPN/100 ml	7.9×10^4	7.9×10^4
16.	F-Coliforms	MPN/100 ml	1.4×10^4	4.9×10^4
17.	Arsenic	mg/L	< 0.008	< 0.008
18.	Zinc	mg/L	0.06	0.04
19.	Chromium	mg/L	< 0.05	< 0.05
20.	Lead	mg/L	< 0.05	0.08
21.	Iron	mg/L	0.47	0.15

Issues in identified/characterized stretch and recommendations for intervention

In the previous section, the 2 stretches of River Assi have been identified and the probable issues that need immediate interventions stretch-wise have been discussed in detail in the present section. A schematic layout for the same is presented in Figure 3.4.

STRETCH I

Issue:

As observed and identified by the experts, 10-15 years back, River Assi used to emanate from two water bodies (a pond and a *kund*) at Kardmeshwar Mahadev Temple, Kandwa, Chitaipur, Varanasi near the Kandwa Panchkosi Marg. It is presumed that from the outlet of the Kardmeshwar *kund*, the river used to begin its flow through the areas around Awaleshpur, Kandwa and joined the Khandwa Pokhri near Kardmeshwar Mahadev Inter College, Kandwa. Presently as the outlet of the kund is sealed, the river downstream is untraceable and the presumed course of the river is lost. **The origin has shifted from Kardmeshwar *kund* to Khandwa Pokhri near Kardmeshwar Mahadev Inter College, Kandwa**. Also, the water quality of the Kardmeshwar *Kund* is reflective of non-polluted condition of the same. Therefore, as such pollution is not the pressing issue in this stretch, but it is restoration of the origin, identification of the lost path of the River Assi and allowing freshwater from the Kardmeshwar *kund* into the channel is a much-required intervention.

Recommendation(s):

The presumed path of the river from **Kardmeshwar *kund* to Khandwa Pokhri near Kardmeshwar Mahadev Inter College, Kandwa** is already identified. This channel is heavily encroached. Therefore, it is required that the encroachment may be removed and channel be restored by excavation/disilting or by any appropriate measure. The outlet of the Kardmeshwar *kund* be opened to allow water into that channel. Once it's done, local administration must ensure that blockage of the river channel should not happen. This will ensure flow of freshwater at the origin of the River Assi.

STRETCH II

Issue:

This stretch is from present origin of River Assi at **Khandwa Pokhri near Kardmeshwar Mahadev Inter College, Kandwa till confluence of River Assi into River Ganga.** Water quality analysis of this river stretch reflect that the river here does not have any fresh water impetus and it continues to have water with drain properties predominantly representing influx of domestic wastewater form nearby households. The river passes from sparsely inhabited areas of Kandwa and Kanchapur, and thereafter, it traverses through the highly encroached and

densely populated areas of Awleshpur / Aditya Nagar, Nagwa, Kanchanpur, Indira Nagar, Chitaipur, Sundarpur, Saket Nagar and Ravindrapuri areas. The river is trained by passing it through between RCC wall embankments in such encroached areas. All along the path of the river, untreated wastewater joins the river indiscriminately increasing the pollution load of the river, however, it is difficult to find out the exact number of inlets that discharge raw sewage and or household wastewater. Specifically, 2 major drains i.e. DLW-1 and DLW-2 empty themselves into River Assi in this stretch. Wastewater flowing into River Assi from Kanchapur Pokhra to discharge point in River Ganga is showing characteristics of typical sewage but of weak strength. Therefore, it is evident from the above that the major issues in this stretch are of pollution as well as encroachment.

Recommendation(s):

i. It is recommended that the first step, towards the rejuvenation of this stretch of Assi river, should be the removal of the encroachments (wherever required and possible) through coordinated action by State and district administrations.
ii. The **Khandwa Pokhri near Kardmeshwar Mahadev Inter College, Kandwa,** from which it originates is a wetland and it could be restored by desilting it upto its bed level and the desilted material will be used for making embankments. The embankments should be vegetated. The sewage that enters into this pond should be channelized and treated by Constructed Wetland System that will be setup at the mouth of channel that discharge sewage into wetland.
iii. A series of minimum of 5 Constructed Wetland System units should be setup at stretches where width of Assi river is maximum. If the depth of water is more than 1 meter, it should be channelized in wider stretches of the river to make the depth of water less than one meter. This will help in in-situ treatment of wastewater and will help reducing organic load in terms of BOD, Nutrients and others.
iv. The drains may require desilting all along its channel. Also, Constructed Wetland (CW) could be made at the mouth of DLW-2 drain (an open storm drain) where it empties itself into River Assi. This has a BOD of 16.1 mg/L that could be easily taken care by CW and can help reduce it further.
v. There is an operational DLW STP with designed capacity of 12 MLD and utilized capacity of only 5 MLD. It is observed that the effluent from this STP is discharged into DLW-1 drain. Since, this STP is underutilized, measures must be put in place to augment and utilize the treatment capacity of DLW STP to full extent. Even the DLW-1 drain could be

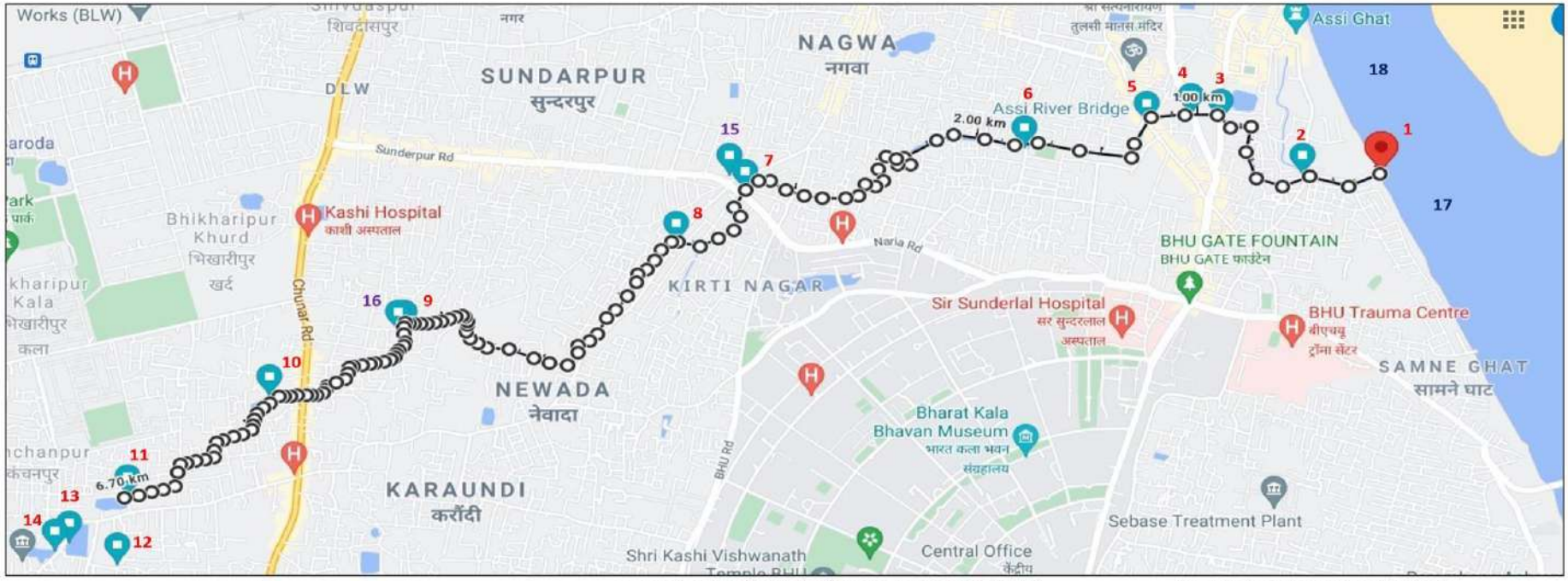
diverted to this STP for treatment. Even values of microbiological pollution could be lowered to an extent by ensuring proper disinfection in the STP.

vi. A floodplain Biodiversity Park (Assi or Ravidas Biodiversity Park) may be developed concurrently in downstream upto 5 km of the area where once River Assi used to confluence with River Ganga around Assi ghat. Once this biodiversity park is constructed having functional CWS, the channel of River Assi can be restored back by passing the river water through treatment wetlands of Biodiversity Park before it is discharged into Ganga.

vii. As mentioned before, all along the course of River Assi, numerous drains/conduit pipes have been observed discharging into the river. Tapping of all such outlets has feasibility constraints and might not be possible. Likewise, the entire channel of River Assi is predominantly narrow, therefore, laying of interceptor and diversion lines may not be possible. Such provisions are necessary requisite for conveying the sewage from nallah/drains to STPs for treatment. If sewage can't reach the treatment plants *via* proper channel, STPs will not solve the purpose. As an alternative, CWS have an advantage as they can be established within the river channel and resolve the problem *via* in-situ remediation.

viii. Also, there is the 50 MLD sewage pumping station of UP Jal Nigam that has a tapping provision for pumping the sewage from River Assi (Nagwa Nala stretch) to Ramana Sewage Treatment Plant (STP) having treatment capacity of 50 MLD (under trail run). The composite monitoring of River Assi/Nagwa Drain near the confluence with River Ganga was carried out and an average flow of 92 MLD (approx.) of untreated wastewater was found discharging directly to River Ganga. In this case scenario, if this wastewater is diverted to STP, it will only help reducing pollution load of certain area of influence i.e. towards the end of river stretch. However, most of the river stretch upstream will still remain impacted with certain extent of pollution. Implementation of CWS as a remedial measure starting from present origin and throughout the course of river, will significantly help in reducing the pollution load reaching towards the end of Assi river b/c with Ganga river in a systematic manner. Infact, the water/wastewater of River Assi/Nagwa Nala stretch (the stretch after diversion of River Assi through Nagwa mohalla is known as Nagwa drain) will have an already reduced pollution load and in turn could be fully tapped into STP Ramana. This whole process can reduce the overall pollution load along the entire stretch of Assi river. It may further lead to appearance of dissolved oxygen in due course of time that can ultimately support certain life-forms and restore the ecosystem of the river.

This approach may also reduce the burden of removal of encroachment that further legal implications as they are constructed in-situ within the river stretch.



1. Confluence of R. Assi / Nagwa drain with R. Ganga (AR 1)
2. Diversion point of R. Assi to Nagwa drain (AR 2) (near Sant Ravidas Park)
3. Sahodya Veer Bridge (near Sanskrit PG College, Assi-Lanka Road) (AR 3)
4. Ravindra Puri Bridge (AR 4)
5. Sankat Mochan, Durgakund Road (AR 5)
6. Saket Nagar (AR 6)
7. Sundarpur Chauraha (near sabzimandi) (AR 7)
8. DhirendraMahila PG College (AR 8)
9. Indira Nagar / DLW drain joining R. Assi in Indira Nagar Colony (AR 9)
10. Kanchanpur Pokhra (AR 10)
11. Pond near Kardmeshwar Mahadev Inter College, Knadwa (E), Kanchanpur (AR 11)
12. Closed/blocked path afterKardmeshwar kund outlet
13. Kardmeshwar Kund (AR 12)
14. Pond near Kardmeshwar Kund (AR 13)
15. DLW Drain – 1
16. DLW Drain – 2
17. u/s of R. Assi / Nagwa Drain
18. d/s of R. Assi / Nagwa Drain

Figure 3.2. Map showing locations of River Assi mapped during survey and sampling

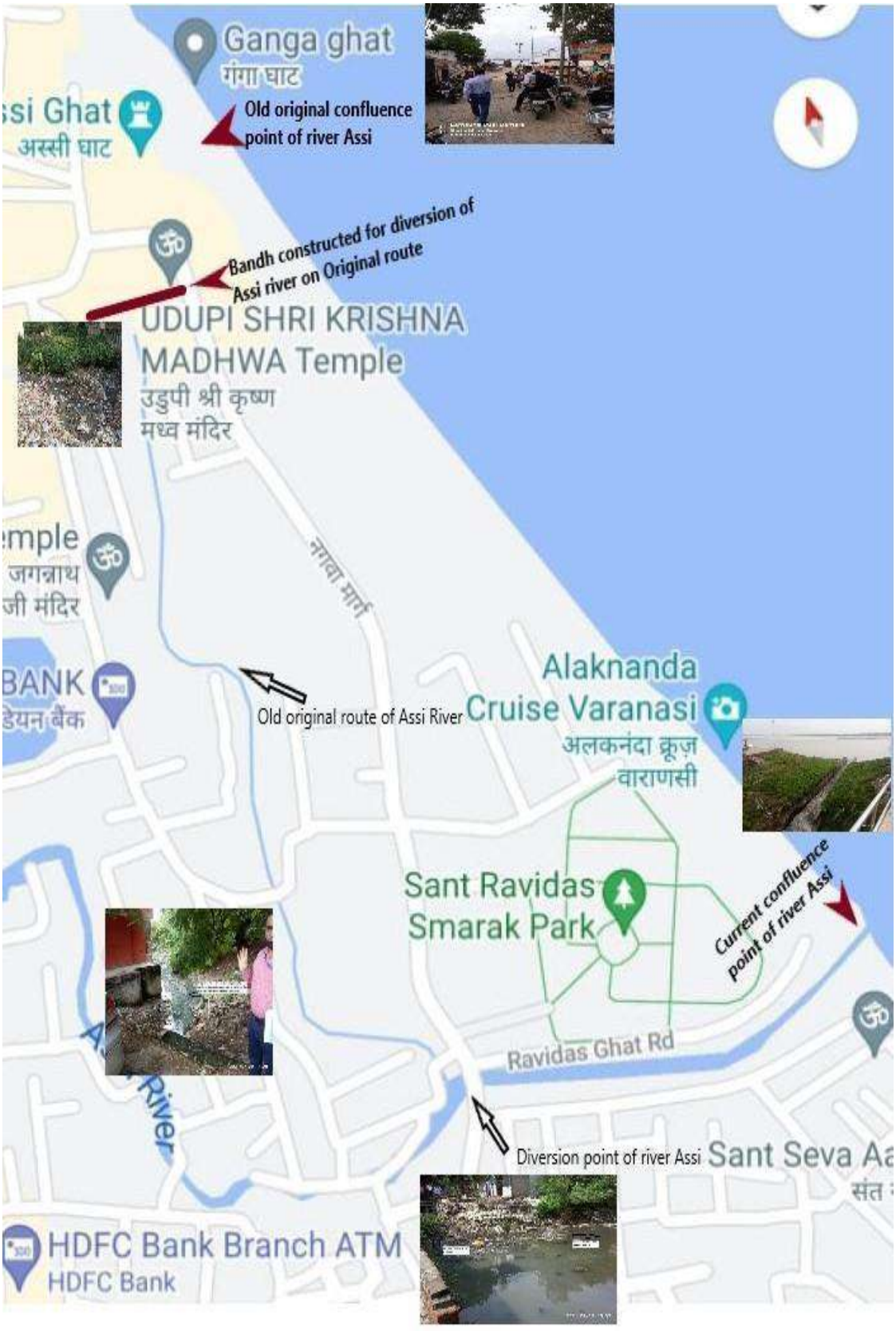


Figure 3.3. Schematic layout showing diversion of River Assi, Old channel and the present Confluence point.

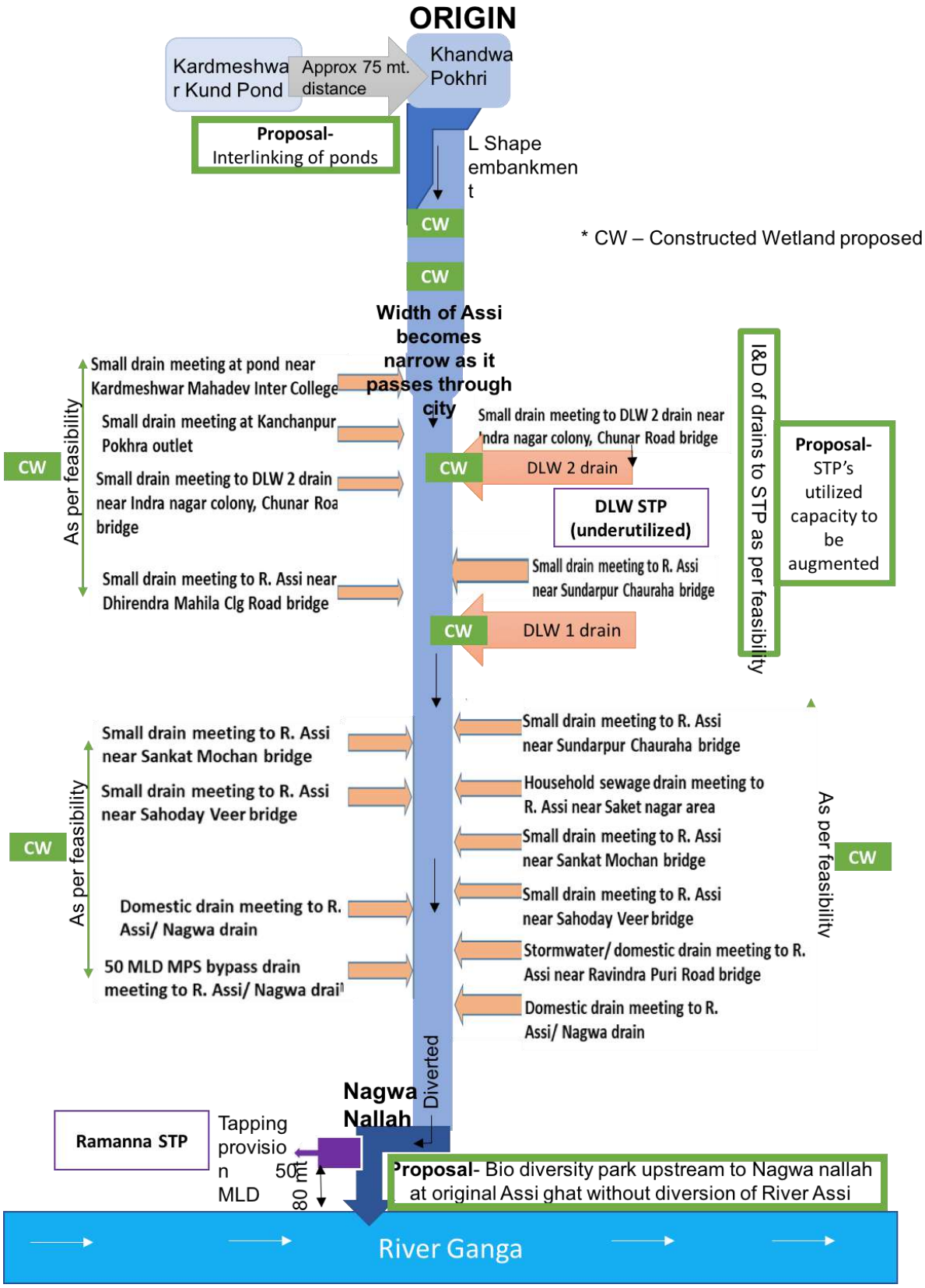


Figure 3.4. Schematic layout of River Assi from origin till confluence with River Ganga showing locations of possible interventions

Chapter 4. Action Plan

Action Plan, Work Plan, Timelines and Implementing Agencies for restoration and rejuvenation of Varuna and Assi Rivers, Varanasi

Riverscape restoration and rejuvenation of Varuna and Assi

A. Restoration and rejuvenation of Varuna River

Action Plan 1: Restoration of catchment wetlands located at the origin and downstream from the origin before joining Basuhi river (in this stretch the river is not polluted and does not have water in dry season).

Table 4.1 Action Plan for Restoration and rejuvenation of Varuna River

S. No	Work Plan	Timeline	Implementing Agency
1.	Desilting of wetlands upto the bed level and developing embankments with inlets from the catchment Location: i) Mailhan, Phulpur, Prayagraj (25.599571N, 82.107391E) ii) Near bridge at Durgaganj on the border of Bhadohi and Prayagraj (25.497886N, 82.329903E)	10 - 12 months	UP Irrigation and Water Resource Department under the guidance of CEMDE
2.	Development of Biotic Communities (at both the above locations and other sites including embankments.		CEMDE, University of Delhi

Action Plan 2: Restoration of Basuhi and Morwa tributaries. Both the tributaries have clean water. However, two drains meet Morwa having small quantity of discharge which get diluted and carry clean water from their catchments and irrigation canal water to Varuna.

Table 4.2 Action Plan for Restoration of Basuhi and Morwa tributaries

S. No	Work Plan	Timeline	Implementing Agency
i.	Desilting of channels if it is not done during last 10 year Location: I. Upardaha Taal/Wetland in Handia of Prayagraj district II. Kaitihawa, Tara (a small Pond) nearby Jigna Taal area in Handia, District Prayagraj (U.P) (25.38836 and 82.29644)	6 months	Irrigation and Water Resource Department
ii.	Vegetation development along the embankments and restoration riparian zone	2 years	CEMDE

Action Plan 3: Remediation of waste water that is discharged into Morwa (from two drains) and three major drains Dhoraira drain, Durga drain, Basti/ Naya Bazar drain that discharge sewage and industrial waste water into Varuna.

Table 4.3 Remediation of waste water that is discharged into Morwa

S. No	Work Plan	Timeline	Implementing Agency
i.	Remediation of waste water using Constructed Wetland System. A schematic Constructed Wetland System (CWS) is attached. These CWS are set up at the confluence of the drain with the tributary/river and extend upto 100 m in the upstream from the confluence point. The length of CWS and number of units depends on the flow of water, the BoD, CoD, TSS and DO levels of water and width of the drain.	1-2 years	Designed by CEMDE and Implemented by Irrigation and water Resource Department under guidance of CEMDE, water quality will be monitored by UPPCB

S. No	Work Plan	Timeline	Implementing Agency
	Locations: i) Dhoraira drain on Varuna at Bhadohi (25.417900N, 82.567600E) ii) Basti/ Naya Bazar drain on Varuna at Bhadohi (25.415251N, 82.576675E) iii)Durga drain on Varuna at Danyalpur, Varanasi (25.320033N, 82.955642E) iv) Burbuspur drain on Morwa at Rampura, Bhadohi (25.409475 N, 82.556622 E) v) Chauri Drain on Morwa at Kom, Bhadohi (25.369723N, 82.606431E)		
ii.	Desilting of drains upto bed level and strengthening of bunds with desilted material if not done during the last 5 year	1 year	Irrigation and Water Resource Department
iii.	Vegetation development on embankments of restored drain		CEMDE

Action Plan 4: Development of Floodplain Biodiversity Park at Adikeshwar Ghat where Varuna joins Ganga not only to enhance the water quality in Ganga in the stretch but also further enhance the quality of water of Varuna before discharged into Ganga by passing through treatment wetlands. The Biodiversity also help in restoring of riparian ecosystems and in stream community and also provide aesthetic and recreation value to Ganga.

Table 4.4 Development of Floodplain Biodiversity Park

S. No	Work Plan	Timeline	Implementing Agency
i.	Plan, Design and Development of Biodiversity Park. A schematic	5 years	CEMDE

S. No	Work Plan	Timeline	Implementing Agency
	layout of a typical floodplains Biodiversity Park is attached.		Irrigation and Water Resource Department (supporting structure) UPPCB (monitoring water quality)

Action Plan 5: Desilting of river Varuna in stretches where heavy sedimentation has taken place.

Table 4.5 Desilting of river Varuna

S. No	Work Plan	Timeline	Implementing Agency
i.	Desilting of river and strengthening of embankments using desilted material	2 years	Irrigation and Water Resource Department
ii.	Vegetation Development on embankments	5 years	CEMDE

Action Plan 6: Monitoring of water quality at different sampling sites to assess the health of river ecosystems.

Table 4.6 Monitoring of water quality

S. No	Work Plan	Timeline	Implementing Agency
i.	Monitoring of water quality as per CPCB norms for river water before, during and after restoration	5 years	UPPCB

B. Restoration and rejuvenation of Assi River

Action Plan 1: Restoration of catchment wetlands at the point of origin and other wetland in the downstream to enhance the flow rates of water in the river.

Table 4.7 Restoration and rejuvenation of Assi River

S. No	Work Plan	Timeline	Implementing Agency
i.	Desilting of catchment wetlands and use of desilted material for making embankments with inlets Kandwa wetland at Varanasi point of origin (25.273258 N, 82.962083 E) and other wetland located in the downstream from the point of origin.	6 months	Irrigation and Water Resource Department
ii.	Remediation of sewage water that enters into catchment wetland using CWS at the mouth of the inlets before the confluence point. The length of wetland depends upon the flow of sewage and depth of water. A schematic layout of a typical CWS is attached.	1 year	CEMDE and Irrigation and Water Resource Department
iii.	Vegetation Development on the embankment and development of aquatic communities in the wetland.	2-3 years	CEMDE

Action Plan 2: Remediation of sewage + household industrial waste water using Constructed Wetlands at stretches in the river where width is maximum with one largest CWS at 100 m away from the confluence of river with Ganga.

Table 4.8 Remediation of sewage and household industrial waste water using Constructed Wetlands

S. No	Work Plan	Timeline	Implementing Agency
i.	Setting up of CWS at 4 locations where width of river is maximum. The length of CWS depends upon the volume of water, quality of water, width of river. The riparian zones will also be restored.	2 years	CEMDE and Irrigation and Water Resource Department

Action Plan 3: Desiltation of river, if not desilted during the last 5 years and use of desilted material for strengthening of embankments wherever possible.

Table 4.9 Desiltation of river

S. No	Work Plan	Timeline	Implementing Agency
i.	Desilting of river up to the bed level and strengthening of embankment with desilted material	1 year	Irrigation and Water Resource Department
ii.	Development of vegetation on embankment wherever possible and restoration of riparian zone.	2-3 years	CEMDE

Action Plan 4: Development of Floodplain Biodiversity Parks at the Assi Ghat, from the historical confluence of Assi with Ganga, to the point where diverted. About 25 years ago the Assi River was diverted towards Ravidas Park from Nagwa road and it passes through Nagwa Colony and known as Nagwa drain before confluence with River Ganga. The old route of River Assi which is about 700 meters (from the point of interception Udupi Shri Krishna Madhav Temple to Sant Ravidas Park) carries household sewage and discharge into Nagwa drain. This may help in restoring the original Ghat where Assi used to confluence with Ganga and also enhance the quality of Ganga water.

Table 4.10 Development of Floodplain Biodiversity Parks

S. No	Work Plan	Timeline	Implementing Agency
i.	Plan, design and develop Biodiversity Park	5 years	CEMDE, Irrigation and Water Resource Department

Action Plan 5: Monitoring quality of water for sustaining the health of restored river ecosystem.

Table 4.11 Monitoring of water Quality

S. No	Work Plan	Timeline	Implementing Agency
i.	Monitoring of water quality as per CPCB norms before and after restoration	5 years	UPPCB

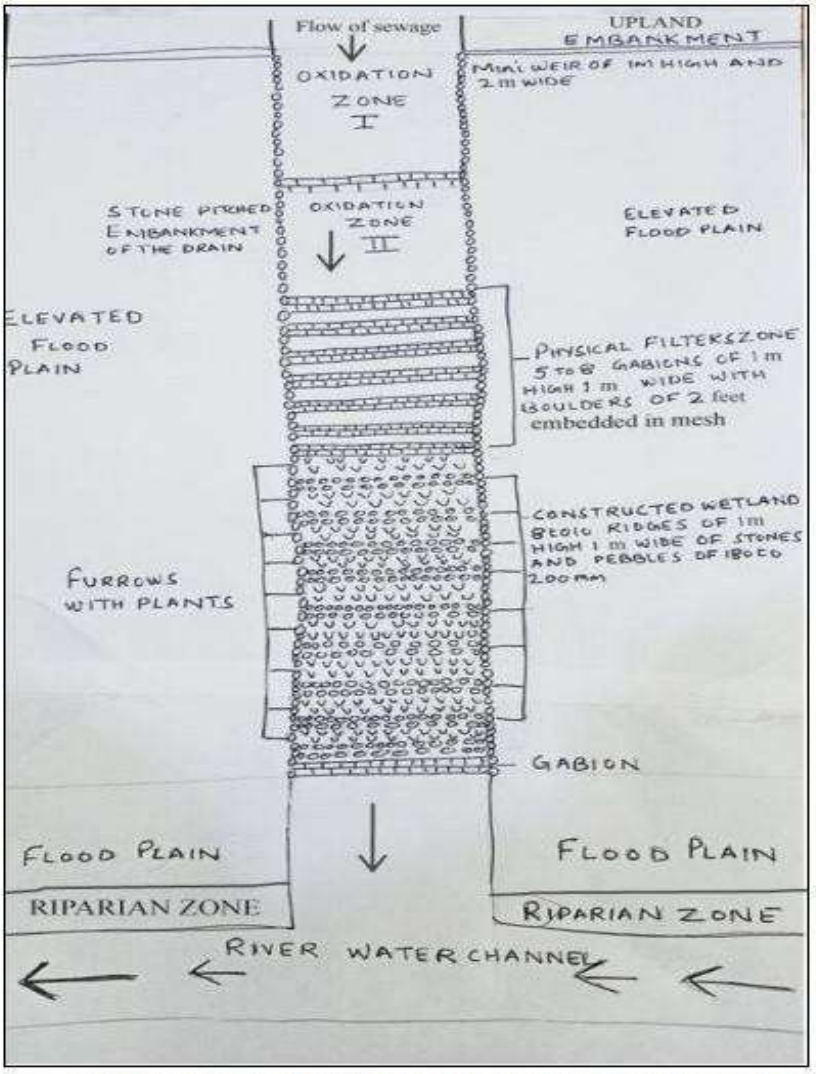


Figure : Schematic layout of a typical Constructed Wetland System for in-situ remediation of sewage/ industrial effluent of the drain that pass through Upland Elevated Floodplain of the riverscape.

Figure 4.1 Schematic Diagram of Constructed Wetland

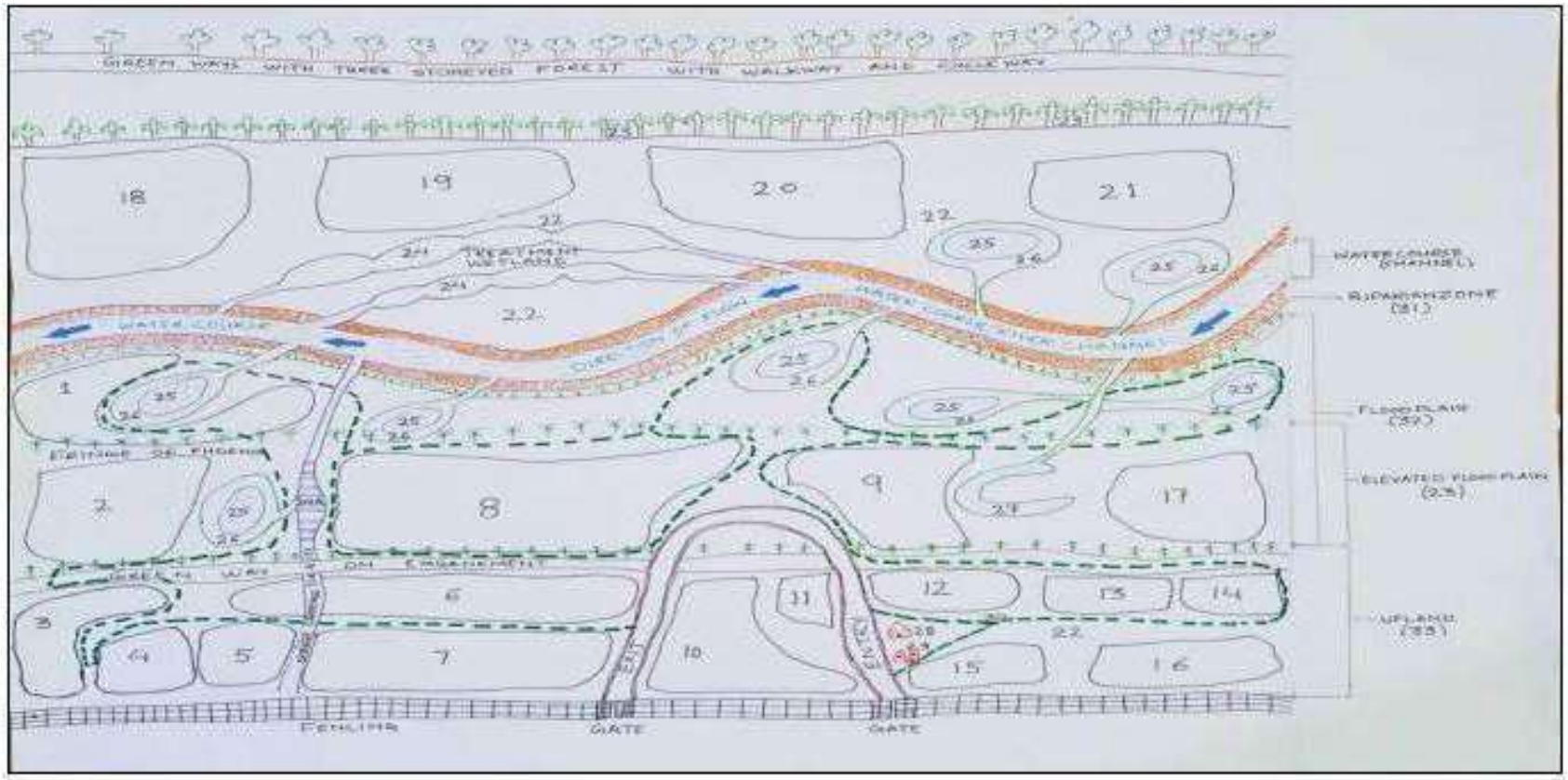


Figure : Schematic layout of a typical Biodiversity Park of the riverscape showing different structural components.

1 – Floodplain forest on the elevated ridge; 2 – Floodplain forest with *Acacia catechu*, *Bombax* and Ber, 3 – Wild fruit-bearing shrubs and trees (Birding Area), 4 – *Phoenix* groove, 5 – Shrubland, 6 – Orchard, 7 – Bamboo thickets, 8 – Grassland with scattered trees, 9 – Aquatic garden, 10 – Recreational Park, 11 – Butterfly Park, 12 – Herbal Garden, 13 – Nursery, 14 – *Sterculia* dominated community, 15 – *Butea* dominated community, 16 – *Holoptelea* dominated community, 17 – *Terminalia arjuna* dominated community, 18 to 21 – Different floodplain forest communities, 22 – Grasslands and marshes, 23 – Elevated floodplain, 24 – Treatment wetlands (natural), 24A – Constructed wetland, 25 – Catchment wetlands, 26 – Marsh, 27 – Oxbow lake, 28 – Nature Interpretation Centre, 29 – Office Campus, 30 – Dotted line (----) indicates trails, 31 – Riparian zone, 32 – Floodplain, 33 – Upland

Figure 4.2 Schematic Diagram of Biodiversity Park

Sewage Management

A. Introduction

Varanasi city is presently divided into four sewerage districts located within current municipal corporation limits. Under the present sewerage master plan the existing districts are re-aggregated into 4 Districts to correspond roughly with natural drainage catchments. These Districts are described as follows:

District 1: District 1 is the Central City Sewerage District draining to 80 MLD Dinapur STP via 6 no. sewerage pumping stations. This area includes the old city, about 1km in breadth and 5km along the Ganga river from Assi to Raj Ghat. Density in this area is very high.

District 2: District 2 is further bifurcated in 3 zones name 2A,2B,2C & Future Sewerage Area 1 (FSA1). Zone 2A is the Sub-Central District on the cis-Varuna side west of the city centre and zone 2B is a slice of the trans-Varuna district along the Varuna river up to the ridge line defined by the Jaunpur road. Wastewater in these two zones will be collected at 140 MLD Chauka ghat MPS and finally treated in 140 MLD STP at Dinapur

District 2 Zone 2C: Zone 2C is the trans-Varuna District north of the Jaunpur road. Wastewater in this area generally falls to the north and to the east. FSA1 is north of the trans-Varuna District just outside the current Municipal Corporation limit. Wastewater generated in this area tends to flow north and east towards 120 MLD STP Goithaha.

District 3: District 3 is the BHU/Assi District south of the city including FSA 4. At present this area is mainly the Banares Hindu University campus which is fully sewered. Wastewater discharged in this area follows natural drains flowing into river Assi nala and Nakkhi nala. FSA4 is outside the current Municipal Corporation limit and surrounds the area occupied by BHU campus. Wastewater in this area drains to Assi river and Nakkhi nala which discharge to Ganga river upstream of the water supply intake and Ghats.currently 2 STP namely 50 MLD Ramana STP and 8 MLD Bhagwanpur STP are in service in district 3.

District 4: District 4 include FSA-2 and FSA-3 area which is outside the current Municipal Corporation limit. FSA2 is west of the current Municipal Corporation limit, and bounded by North-eastern railway. FSA3 is west of FSA2 and bounded by the Northern railway line. Currently there is no sewage treatment facility available in district 4.

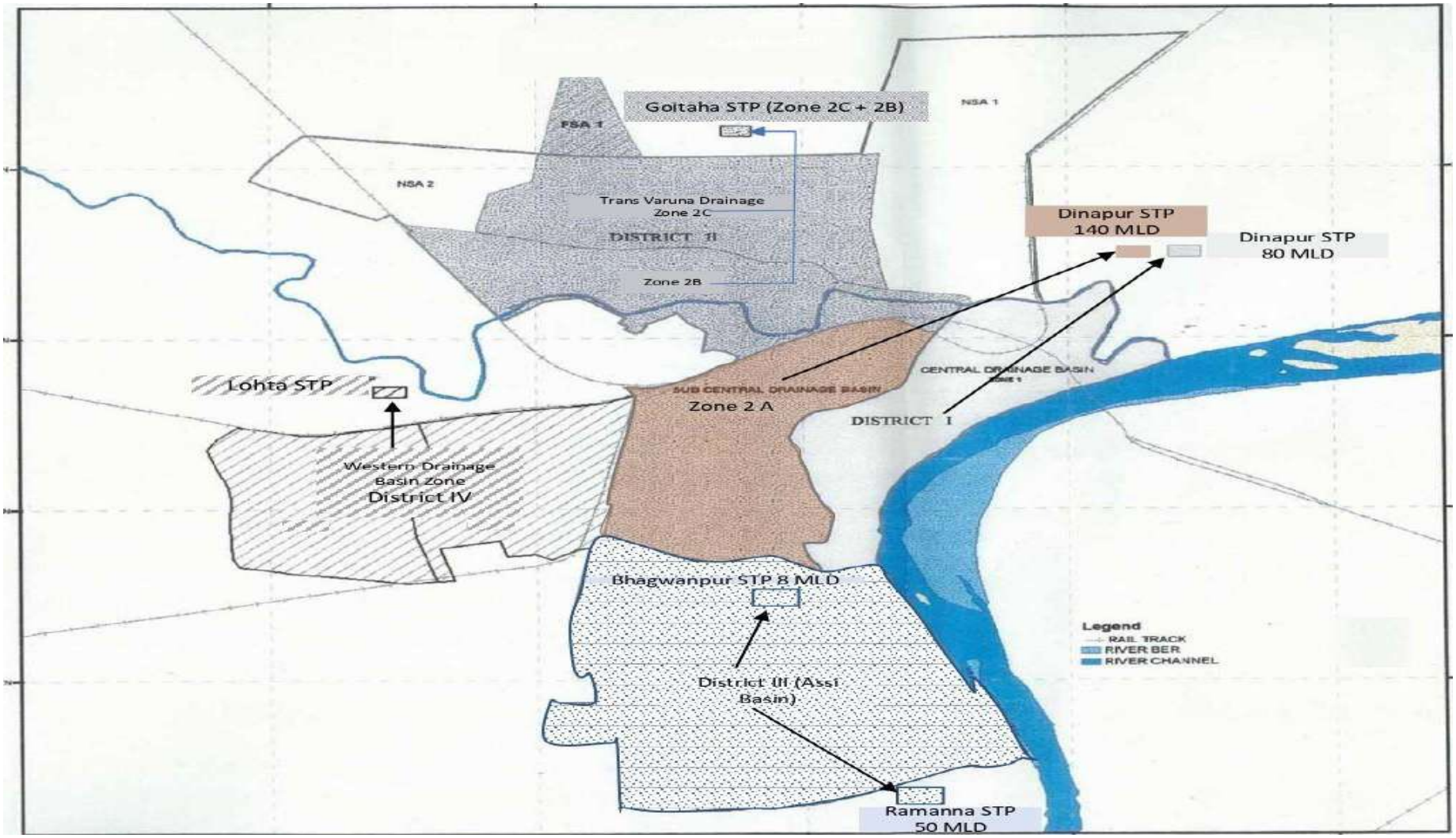


Figure 4.3 Schematic representation of sewerage district of Varanasi city

Non-Sewerage Areas (NSA)

Non-serviced areas are identified as follows:

NSA1: NSA1 is within current Municipal Corporation limits to the east of the Trans-Varuna district. It includes the local community of Sarnath. Wastewater generated in this area drains naturally into Narokar nala which is now diverted to 120 MLD Goithaha via Intermediate Pumping Station.

NSA2: NSA2 is within current Municipal Corporation limits to the extreme north west of the trans-Varuna District. Sewage generation will be diverted to 120 MLD GoithahaVaranasi

B. Sewerage master plan- 2005 (JAPAN INTERNATIONAL COOPERATION AGENCY-JICA)

JICA formulated sewerage masterplan in 2005. The plan for 2015 is explained in (Figure 1)

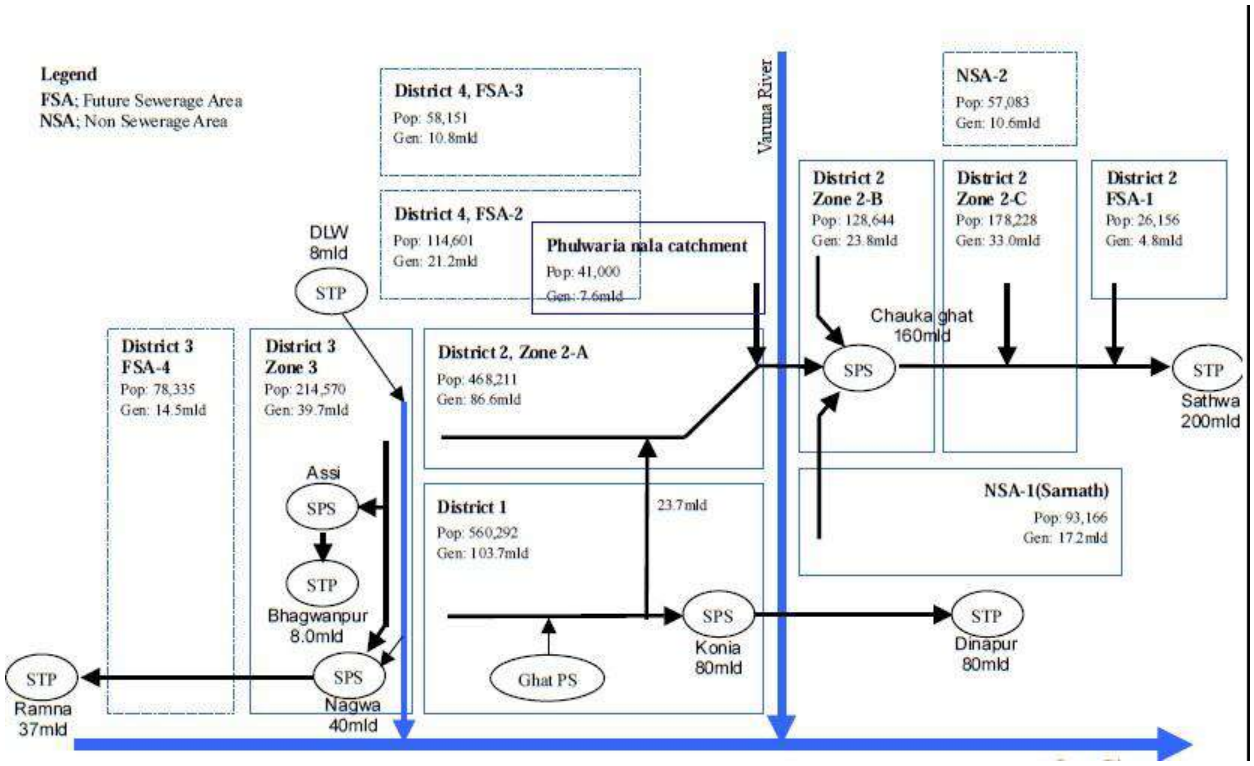


Figure 4.4: JICA Sewerage Plan for 2015

As per JICA masterplan-2005 (figure 1) the projected population in Assi catchment area for the year 2015 is 78335 + 214570 = 292,905. The projected sewage generation was 14.5 + 39.7 = 54.2 MLD. To

cater 54.2 MLD, 8.0 MLD is to be treated by 8.0 MLD existing Bhagwanpur STP and new proposed 37 MLD at Ramna.

The plan for 2030 is explained in Figure 2

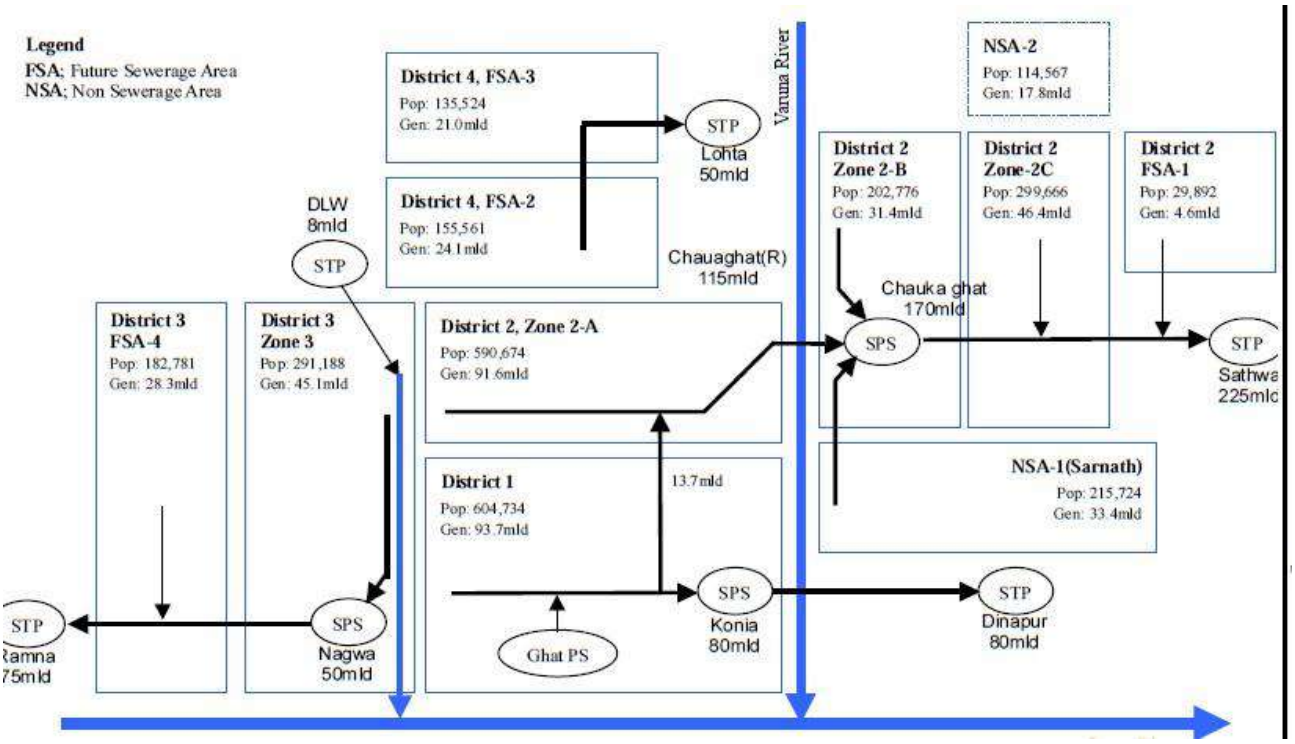


Figure 4.5: JICA Sewerage Plan for 2030

As per JICA masterplan-2005 (above) the projected population for the year 2030 is 182781 + 291188 = 476969. The projected sewage generation was 28.3 + 39.7 = 73.4 MLD. To cater 73.4 MLD, new 37 (2015) + 38 (2030) = 75 MLD was proposed.

However, in 2014 situation, JICA relooked into the sewerage masterplan and revised the capacity of 75 MLD to 59.8 MLD (50 MLD new Ramana STP + Existing 9.8 MLD Bhagwanpur).

Action plan for Varuna catchment

Trans Varuna Catchment

It consists of sewage District 2 B and 2 C**.**A new STP of 120 MLD is constructed at Goitha and working efficiently. Around 40 MLD flow is treated. The STP capacity is sufficient for next 15 years. No new STP or upgradation of existing STP is proposed.



Figure 4.6: 120 MLD STP at Goitaha for catering flow of trans Varuna Region

Cis Varuna Catchment

It consists of District 2 A. The present sewage flow from district 2 A is 80 MLD, which is being pumped from Chauka ghat pumping station and treated at Dinapur new 140 MLD STP.

In addition, new 140 MLD STP shall also treat 40 MLD flow diverted from Shahi Nala.



Figure 4.7: Chaukaghat Pumping Station

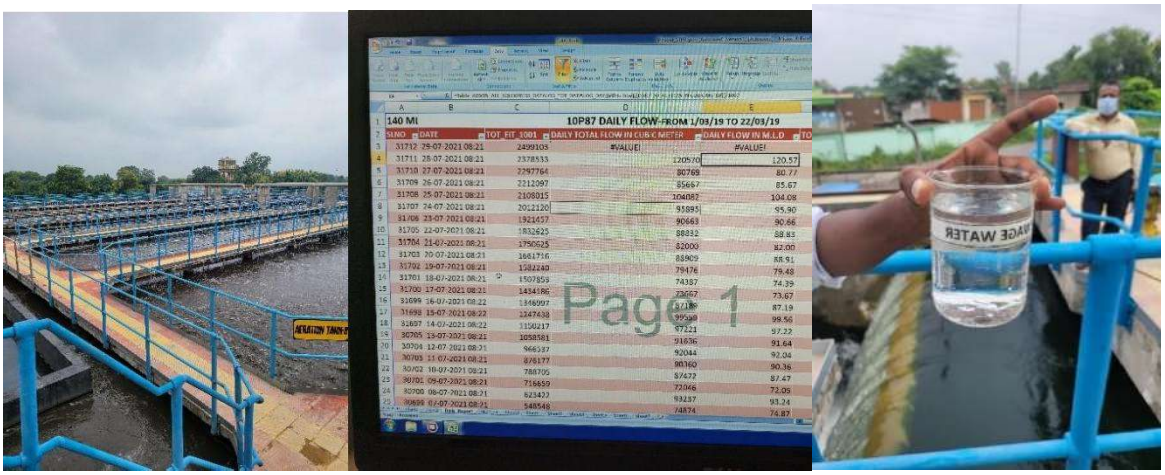


Figure 4.8: 140 MLD New Dinapur STP

Recommendations

- 140 MLD Dinapur need to be upgraded to meet discharge standard.
- A new STP is needed to cater the future population for District 2 A.
- Action plan to treat wastewater from Durga drain discharging to Varuna River should be prepared.
- Interceptor drain plan is under execution by UP Irrigation Department. All designs should be checked by expert authorities.

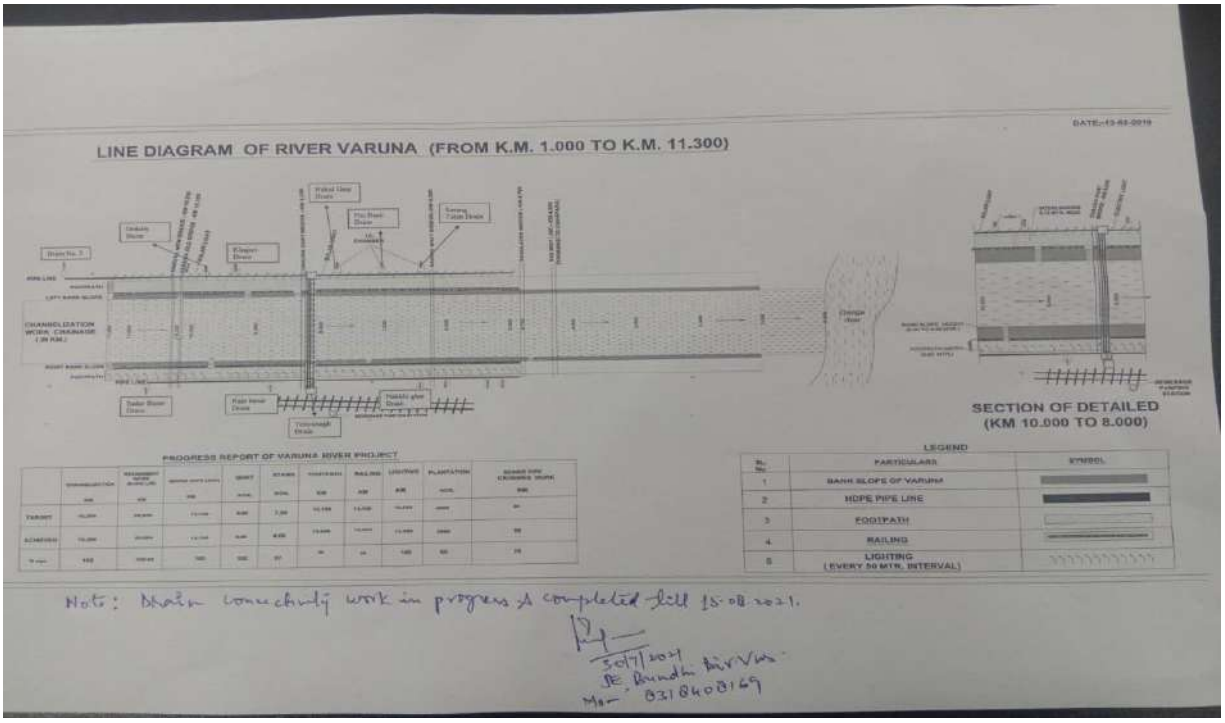


Figure 4.9: Interceptor drain plan of Varuna River

Existing condition in Assi catchment

At present, as per CPCB measurement (12-15th July 2021), the flow in Assi River is around 92 MLD. In addition, STP at Bhagwanpur also treat 8.0 MLD flow and discharges into River Ganga via Nakha drain. Hence total discharge in Assi catchment is 92 + 8 = 100 MLD. However, water supply in municipal area of Assi catchment isonly 26 MLD.

The pumping capacity at Nagwa Pumping Station to cater 50 MLD Ramana STP is only 50 MLD, 8 MLD is treated at Bhagwanpur STP and rest 92-50 = 42 MLD discharges directly into the River Ganga.



Figures 4.10 A & B: Assi River joining River Ganga and 50 MLD Nagwa Pumping Station



Figures 4.11 A & B: 50 MLD Ramana STP and Treated sewage

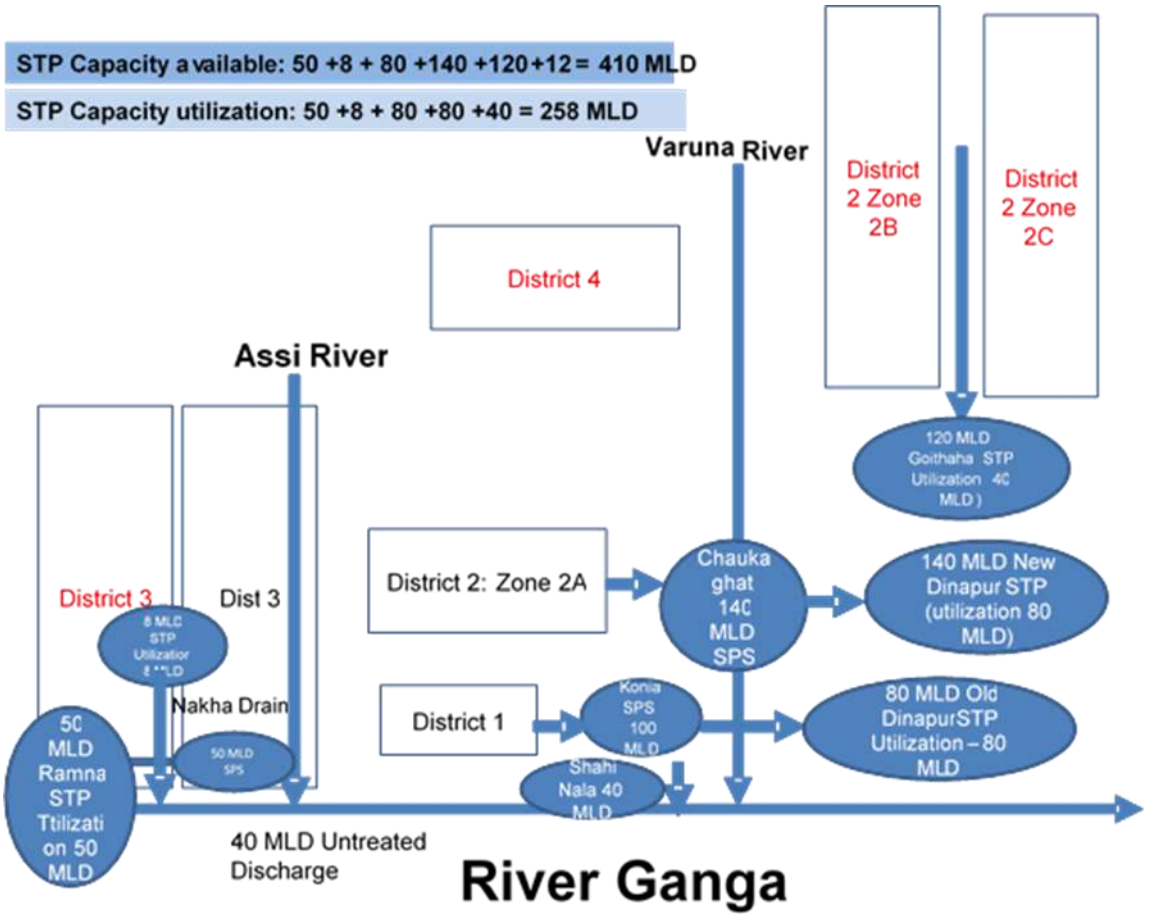


Figure 4.12 Present sewerage Situation of Varanasi City

This rapid increase in flow to Assi River is due to:

1. Unprecedented residential/commercial growth is due to large no. of developmental projects during last 4-5 years owing to VIP constituency, which seems convincing.
2. The growth within the city is limited due to constraint of land availability. Assi-BHU area and Trans Varuna area is vast open for development. Hence, increment significantly in migratory/floating population.
3. Untreated wastewater from Sewerage District 2 & 4.
4. Much higher water consumption than prescribed 135 lpcd because of unregulated water usage i.e., personnel source of water- submersible pumpsetc, which has no control of water usage.

Recommendations

A. Short Term plan

1. Presently actual discharge is mixed with rainfall. Actual dry weather flow can only be ascertained after rainy season. Detailed assessment of excess discharge is required to be done and hence future forecasting is to be done accordingly.

2. There should be 24-h proper flow measurement of Assi River by both Area velocity and V notch method after the monsoon season.
3. Controlling wastewater from other sewerage districts.
4. There should be check and control on non-revenue water (NRW). NRW is defined as loss of water through leakages and illegal usage.
5. Based on the flow measurement, water supply and population projection, a new STP need to be proposed either at Ravinder Puri Culvert (on the bank of Assi River around 1km upstream of confluence) or at Ramana existing 50 MLD STP site wherever found feasible. The DPR for additional STP is to be prepared after flow assessment and population projection.



Figure 4.13: Ravinder Puri Culvert as Possible Location for New STP at Assi

B. Long Term Plan

1. Wastewater generation is very high, hence proper 24 x 7 water supply with metering is needed to control wastewater generation and non-revenue water. A JICA project is underway to control non-revenue water
2. Laying of complete sewerage system for the entire city.
3. 9.8 MLD Bhagwanpur STP need to be decommissioned and new STP for higher capacity for future projections with new standards need to be constructed.
4. Banaras Locomotive Works STP should be upgraded to meet discharge standard.

Action plan for Ganga catchment

The sewage from District 1 (Old Varanasi) is treated in old 80 Dinapur STP. It is pumped from Konia

Pumping station.

Recommendations

Old Dinapur STP (80 MLD) need to be decommissioned and new STP for higher capacity for future projections (as well as Shahi Nala Flow) with new standards need to be constructed.



Figure 4.14: 80 MLD Old Dinapur STP

Action plan for trans- Ganga

One new 10 MLD STP is constructed and treating around 8.0 MLD flow.



Figure 4.15: 10 MLD Ramnagar STP

Recommendations

- It is recommended that due to recent infrastructural development, there shall be rapid increase in population in near future.
- It is assumed that 10 MLD full flow shall be reached within next 1-2 years. Hence, authorities should start planning for the next phase so that no untreated wastewater discharge from the trans Ganga in near future.

Table 4.12: Action Plan for sewage management in catchment of river Varuna, Assi and Ganga in Varanasi

Sl No	Sewerage District	Estimated Sewage Generation 2030 (MLD)	Pumping Station	River catchment	Existing Sewage Treatment Facility	Key issues	Proposed Action Plan	Implementing Agencies	Timeline for Action
1	District 1	93.7	Konia MPS, Saraiya P.S. 3.7 MLD	Cis Varuna	80 MLD STP Dinapur	• District 1 covers the old part of the city Varanasi including most of the markets and tourist destinations • The district has very less scope of further escalation in sewage generation in near future • Approx.80 MLD sewage generated in this district currently reaches 80 MLD Dinapur STP for treatment through Konia and Saraiya Pumping station via Old Trunk Sewer • The rest of the sewage from old trunk sewer is discharged into river Ganga through closed conduit at Shahi Nala Outfall, Rajghat • Dinpaur 80 MLD STP has completed the design life and it was designed as per old discharge standards resulting in non-compliance of STP to norms prescribed by NGT	New STP of higher capacity for future projections with new standard to be constructed after decommissioning of 80 MLD STP at Dinapur.	Uttar Pradesh Jal Nigam & National Mission for Clean Ganga	Preparation of DPR – 3 Month Approval of DPR – 3 Months Award of Work - 6 Months Completion of Work - 2 years **Total Time required – 36 months**
							Management of rest of the sewage from old trunk sewer, presently discharging at Shahi Nala outfall through pumping to 140 MLD STP Dinapur.	Uttar Pradesh Jal Nigam	**Work to be completed – 3 months**

2	District 2A	225.3(including NSA 1&2 & FSA-1	Chauka Ghat MPS (140 MLD), Phulwaria MPS (7.6 MLD)	Cis Varuna	140 MLD STP Dinapur	• Chaukaghat pumping station is currently pumping only 70-80 MLD to Dinapur 140 MLD STP. • The interception and diversion of Shahi Nala outfall at Rajghat to Chaukaghat pumping station through a new rescue trunk sewer is proposed and work is underway • The Cis-interceptor line at Varuna bank will also intercept the untapped drains on the cis Varuna bank to Chauka Ghat pumping station for pumping to Dinapur 140 MLD STP • ASP technology based 140 MLD Dinapur STP without tertiary filtration • No Biological nutrient removal (BNR) system • Under capacity utilization • I&D of drains (mainly Shahi Nala) is not completed • Damaged & non-functional I&D structure	The 140 MLD STP requires upgradation to meet the norms prescribed by Hon'ble NGT including nutrient removal	Uttar Pradesh Jal Nigam & National Mission for Clean Ganga	Preparation of DPR for upgradation – 3 months Approval of Work – 3 months Award of Work for upgradation – 3 months Completion of upgradation – 6 months **Total time required - 12-14 months**
							• Design of interceptor plan needs to be checked by expert agency and tapping shall be executed completely • I&D work of drains falling into Varuna in Cis-Varuna area shall (mainly Shahi Nala) to be completed and tapped to STPs for treatment	Irrigation Department, Uttar Pradesh Jal Nigam & subject expert	Design finalization – 1 month I&D work completion with final tapping and pumping provisions – 2 months **Total time required- 3 months**

3	District 2B		Narokhar IPS (7.6 MLD)	Trans Varuna	120 MLD STP Goitaha	• Trans Varuna area contains zone 2B & 2C sewage districts which has its sewage reaching partially for treatment at Goithaha STP through 7.6 MLD Narokhar pumping station and rest quantity by gravity. • An interceptor line is under commissioning in trans Varuna river bank for interception of 7 drains in the area discharging into Varuna currently and other small minor outfalls from lanes • The interceptor line has not been connected with pumping station currently and the interceptor system is open to flow • This interceptor line will pump the sewage to 140 MLD Dinapur STP for treatment through Chauka Ghat MPS as an interim measure • The Goithaha STP is currently functioning at around 30-40 MLD treatment (Under capacity utilization)	• Design of interceptor plan needs to be checked by expert • Interception and diversion have to be completed at the earliest by the executing agencies	Irrigation Department, Uttar Pradesh Jal Nigam & subject expert	Design finalization – 1 month I&D work completion with final tapping and pumping provisions – 2 months **Total time required- 3 months**

4	District 2C					• Currently the catchment area of Goithaha STP has less population density so the capacity utilization is less and it is targeted to achieve future utilization • I&D of the Trans Varuna area is not completed. • Damaged & non-functional I&D structure meant for intercepting the Trans Varuna bank drains.			
							A new comprehensive sewage management plan for trans Varuna needs to be developed which can cater all the drains of trans Varuna area in Varanasi.	Uttar Pradesh Jal Nigam, Varanasi Municipal Corporation, Irrigation Department and Urban Development Department	Preparation of DPR – 6 months Approval of Work – 6 months Award of work – 6 months Execution of work – 2 years **Total time required- 36-42 months**
5	District 3	73.5	Nagwa MPS (50 MLD)	Assi River	50 MLD STP Ramana, 8 MLD STP Bhagwanpur	• Estimated much higher water consumption/discharge than prescribed • Unregulated water uses and flow of freshwater from Kanchanpur talab and other water bodies in the low-lying areas joining river Assi shall	• Detailed assessment of excess discharge in dry weather • Control on NRW	Varanasi Municipal Corporation, Urban Development Department and Uttar Pradesh Jal Nigam	

						be identified and fresh water channels shall be separated from the sewerage line/drain • Estimated approximately 50% Non -revenue water (NRW) is consumed of total freshwater usags • Excess wastewater around 40-45 MLD goes directly to Ganga River from the bypass point of Nagwa 50 MLD pumping station • Bhagwanpur STP treats the sewage from Banaras Hindu University campus and treated sewage discharged through the Nakha drain which also carries untreated sewage from the Bhagwanpur local area and nearby areas of disctict 3 • The Bhagwanpur STP is designed to treat 9.8 MLD sewage (8 + 1.8) but currently only 8 MLD plant is operated and 1.8 MLD unit is non-operational • The Bhagwanpur STP treats around 10 MLD sewage working overcapacity • The Bhagwanpur STP has completed its designed life	• A new STP of adequate capacity to treat the excess approx. 50 MLD flow from the Assi river outfall.	Uttar Pradesh Jal Nigam & National Mission for Clean Ganga	Preparation of DPR – 3 Month Approval of DPR – 3 Months Award of Work - 6 Months Execution of work – 2 years
							• New STP at Bhagwanpur of requisite capacity to be constructed as per new norms & flow data to cater the needs of BHU • and nearby municipal areas.	Uttar Pradesh Jal Nigam & National Mission for Clean Ganga	Preparation of DPR – 3Months Approval of DPR – 3 Months Award of Work - 6 Months Completion of Work - 2 years **Total Time required – 32-34 months**
							• Restoration of Origin & stretches of river Assi (with land availability) through constructed wetlands • Separation of freshwater channels/storm water drains and sewerage system	Irrigation Department, Varanasi Municipal Corporation, Urban Development Department and Uttar Pradesh Jal Nigam	Within 6 months

						• Large areas in adjoining district 4 and district 4 has recently been added in Municipal area and has no sewage management system existing which contributes to excess flow from district 2 & 4 reaching river Assi.			
6	District 4	45.1	None	Cis Varuna	Not available	• Most part of the Sewerage district 4 has recently been included in the Varanasi Municpal Area and estimation and planning for the newly added areas is underway • Currently no dedicated treatment facility available • No sewerage networks • Untreated sewage directly discharges in R. Varuna. • The Durga (Lohta) drain is the major drain discharging to River Varuna from the district • Actual discharge status is unknown	In-situ treatment at Durga Drain through Constructed Wetland as interim measure	CEMDE Delhi University, Irrigation Department, Varanasi Municipal Corporation	Preparation of feasibility reports & DPR – 02 Months Approval of Work – 3 Months Award of work and implementation – 3 Months **Total Time required – 8-12 months**
							New STP of requisite capacity to be constructed as per new norms & flow data	Uttar Pradesh Jal Nigam & National Mission for Clean Ganga	Preparation of DPR – 01 Month Approval of DPR – 3 Months Award of Work - 6 Months Completion of Work - 2 years **Total Time required – 32-34 months**

						• Lohta STP (50 MLD) is proposed by 2030 (JICA report)	Detailed assessment of excess discharge in dry weather	Irrigation Department, Uttar Pradesh Jal Nigam, Urban Development department	Within 2 months
7	Banaras Locomotive Work (BLW)	50 Staff colonies		Cis Varuna	12 MLD	• The BLW campus has a STP of 12 MLD installed inside campus to treat the sewage generated in the campus • The BLW campus lies in the Assi river catchment • At least one drain originates from the campus and two drains passes near the BLW campus and ultimately discharges into river Assi • DLW-1 originates from the campus and carries treated sewage and storm water from the BLW campus • DLW-2 originates from the Manduwadih area and flows near the BLW campus • DLW-1 and DLW-2 ultimately meets river Assi near Sunderpur Chauraha	• BLW STP has outlived its designed life • BLW STP shall be upgraded/new STP to be installed to meet norms prescribed by NGT including for coliform count	BLW Engineering Department, UP Jal Nigam, National Mission for Clean Ganga	Preparation of DPR – 01 Month Approval of DPR – 3 Months Award of Work - 6 Months Completion of Work - 2 years **Total Time required – 32-34 months**
							• Reason for weak organic load characteristics of sewage at inlet of BLW STP shall be explored • Water audit of water usage and discharge from BLW campus may be done	BLW Engineering Department, UP Jal Nigam, Uttar Pradesh Pollution Control Board	Within 1-2 Month

						• DLW-3 originates from the Kanchanpur taal area and carries pond water and waste water from nearby low-lying areas • DLW 3 meets river Assi near the DLW campus trans of DLW-Chunar Road. • Around 2-3 MLD wastewater from this drain is treated at BLW STP for sometime • The 12 MLD STP at DLW operates at around 4 MLD only and the inlet raw sewage shows weak sewage characteristics with low organic load • STP has no disinfection system to control Coliform count in treated sewage	Sources of sewage and freshwater in the drains near the BLW campus ultimately discharging into Assi river shall be identified and separated for reducing the flow in Assi river at interception point	BLW Engineering Department, Irirgation Department, Urban Development Department, UP Jal Nigam, Uttar Pradesh Pollution Control Board	• Identification of sources of waste and freshwater – 1 Months • Preparation of action plan for separation of freshwater channels/storm water and waste water carrying drains– 6 Months

Table 4.13: Road map for execution of proposed action Plan for restoration of Varuna & Assi river

Sr. No.	Sewerage District /region	Existing Sewage Treatment Facility	Proposed Action/remedial measure	Project Activity		
				Work Plan	**Time line**	**Implementation Agency**
1.	District 1	80 MLD STP Dinapur	Decommissioning of existing STP and construction of new STP of higher capacity for future projections with new standard	Condition assessment & feasibility report (CAFR)	1 Month	UP Jal Nigam/ Other government organization
				Approval of CAFR	1 month	NMCG
				Submission of DPR	2 Months	UP Jal Nigam/ Other government organization
				Administrative approval & estimated sanctioned	2 months	NMCG
				Tendering & award of project	2 months	NMCG
				Basic Engineering Package (BEP) submission	3 months	UP Jal Nigam/ Other government organization /EPC contractor
				Design & Engineering approval	2 months	IIT/MNIT/Deemed university
				Construction & Commissioning	2 years	UP Jal Nigam/ EPC contractor/others
2.	District 2A	140 MLD STP Dinapur	Upgradation of STP as per new NGT norms.	Submission of DPR	2 Months	UP Jal Nigam/ Other government organization
				Approval & Tendering	3 months	NMCG
				Design & Engineering approval	2 months	IIT/MNIT/Deemed university

				Construction & Commissioning	1-2 years	UP Jal Nigam/ EPC contractor/ Other government organization
			Design of interceptor plan needs to be checked by expert	Submission of existing drawing & review proposal	1 month	UP Irrigation department
				Approval & Tendering	3 months	NMCG
				Design assessment of interceptor plan	2 months	IIT/MNIT/Deemed university
				Approval, Tendering and project award	3-4 month	NMCG
				Construction & commissioning	3-4 month	UP Irrigation department/EPC contractor
			I&D work of Shahi Nala	Tapping and diversion of Sahi nala to 140 MLD STP	1-2 months	Project is under execution by UP Jal Nigam
			I&D work of drains in cis Varuna region	I&D work of drains up to 140 MLD MPS Chaukaghat	1-2 months	Project is under execution by UP irrigation department
3.	District 2B	120 MLD STP Goitaha	I&D work of drains in trans Varuna region	I&D work of drains up to 140 MLD MPS Chaukaghat as an interim measure	1-2 months	Project is under execution by UP irrigation department
4.	District 2C		Development of new comprehensive sewage	Condition assessment & feasibility report (CAFR)	1 Month	UP Jal Nigam/ Other government organization
				Approval of CAFR	1 month	NMCG
				Submission of DPR	2 Months	UP Jal Nigam/ Other government organization

			management plan for trans Varuna	Administrative approval & estimated sanctioned	2 months	NMCG
				Tendering & award of project	2 months	NMCG
				BEP submission	3 months	UP Jal Nigam/ Other government organization /EPC contractor
				Design & Engineering approval	2 months	IIT/MNIT/Deemed university
				Construction & Commissioning	1-2 years	UP Jal Nigam/ EPC contractor/others
5.	District 3	50 MLD STP Ramana, 8 MLD STP Bhagwanpur	Assessment of excess discharge of Assi River	Detailed assessment of excess discharge of Assi River in dry weather & Control on NRW	3-4 months	UP Jal Nigam
			Design, construction and commissioning of new tapping arrangement MPS, rising main & STP of requisite capacity as per new norms & flow data.	Condition assessment & feasibility report (CAFR)	1 Month	UP Jal Nigam/ Other government organization
				Approval of CAFR	1 month	NMCG
				Submission of DPR	2 Months	UP Jal Nigam/ Other government organization
				Administrative approval & estimated sanctioned	2 months	NMCG
				Tendering & award of project	2 months	NMCG
				BEP submission	3 months	UP Jal Nigam/ Other government organization /EPC contractor
				Design & Engineering approval	2 months	IIT/MNIT/Deemed university

				Construction & Commissioning	1-2 years	UP Jal Nigam/ EPC contractor/others
			Restoration of Origin & stretches through constructed wetlands	Submission of design details & drawing of CWS	1 month	CEMDE
				Submission of DPR for desilting, civil work etc.	2 months	Irrigation and water resources department/ Other government organization
				Approval, Tendering and project award	3-4 month	NMCG
				Desilting and civil construction	3-4 months	Irrigation and water resources department/ Other government organization
				Vegetation development & commissioning	1-2 years	CEMDE
			Decommission of 8 MLD STP Bhagwanpur And Design, Construction and commission of new STP as per new norms and flow data	Condition assessment & feasibility report (CAFR)	1 Month	UP Jal Nigam/ Other government organization
				Approval of CAFR	1 month	NMCG
				Submission of DPR	2 Months	UP Jal Nigam/ Other government organization
				Administrative approval & estimated sanctioned	2 months	NMCG
				Tendering & award of project	2 months	NMCG
				BEP submission	3 months	UP Jal Nigam/ Other government organization /EPC contractor
				Design & Engineering approval	2 months	IIT/MNIT/Deemed university
				Construction & Commissioning	1-2 years	UP Jal Nigam/ EPC contractor/others

6.	District 4	Not available	In-situ development of Constructed Wetland System in Durga Drain as interim measure	Submission of design details & drawing of CWS	1 month	CEMDE
				Submission of DPR for desilting, civil work etc.	2 months	Irrigation and water resources department/ Other government organization
				Approval, Tendering and project award	3-4 month	NMCG
				Desilting and civil construction	3-4 months	Irrigation and water resources department/ Other government organization
				Vegetation development & commissioning	1-2 years	CEMDE
			Design & construction of new STP of requisite capacity as per new norms & flow data	Condition assessment & feasibility report (CAFR)	1 Month	UP Jal Nigam/ Other government organization
				Approval of CAFR	1 month	NMCG
				Submission of DPR	2 Months	UP Jal Nigam/ Other government organization
				Administrative approval & estimated sanctioned	2 months	NMCG
				Tendering & award of project	2 months	NMCG
				BEP submission	3 months	UP Jal Nigam/ Other government organization /EPC contractor
				Design & Engineering approval	2 months	IIT/MNIT/Deemed university
				Construction & Commissioning	1-2 years	UP Jal Nigam/ EPC contractor/others

7.	Varuna origin	Not available	Restoration of catchment origin of R. Varuna	Submission of design details & drawing	1 month	CEMDE
				Submission of DPR for desilting, channeling etc.	2 months	Irrigation and water resources department/ Other government organization
				Approval, Tendering and project award	3-4 month	NMCG
				Desilting, channeling and other construction work	10-12 months	Irrigation and water resources department/ Other government organization
				Biotic community development & restoration	1-2 years	CEMDE
8.	Along R. Varuna	Not available	Desilting of R Varuna & In-situ development of Constructed Wetland System in Dhoraira, Naya Bazar, Bubuspur and Chauri drains	Submission of design details & drawing of CWS	1 month	CEMDE
				Submission of DPR for desilting, civil work etc.	2 months	Irrigation and water resources department
				Approval, Tendering and project award	3-4 month	NMCG
				Desilting and civil construction	3-4 months	Irrigation and water resources department
				Vegetation development & commissioning	1-2 years	CEMDE
9.	Varuna confluence	Not available	Development of flood plain Biodiversity Park	Demarcation of flood plain of R. Vruna at confluence	3-4 months	Irrigation and water resources department
				Submission of DPR for planning, design & development of Biodiversity park	3-4 months	CEMDE
				Approval, Tendering and project award	3-4 month	NMCG
				Development of Biodiversity park	4-5 years	CEMDE

Performance assessment of STPs and requirement for upgradation/augmentation

The estimated sewage generation of Varanasi (including Ramnagar) is approximately 330 MLD (2017-18) (as per data received from UPPCB). Total 7 STPs (5 commissioned and 2 under trial) with total capacity of 421.8 MLD (361 MLD for commissioned STPs and 60 MLD for under trial STPs) have been installed for the treatment of the generated sewage. Utilized capacity of the commissioned and operational STPs is approximately 210 MLD.

Characteristics of raw sewage received at inlet of STPs located in Varanasi have BOD ranging from 10.5 mg/l to 52.4 mg/l, COD ranging from 45.7 mg/l to 193 mg/l indicating weak sewage as compared to typical municipal wastewater (BOD: 200-250 mg/l, COD: 350-500 mg/l); is received at inlet of the STPs. The weak sewage strength could be due to dilution of the sewage from septic tanks and addition of grey water from households etc.

As per inspections conducted in last 2 years, the treated sewage from STPs is found non- complying with respect to the discharge norms. As per inspection dated 23.06.2021, reduction in BOD was found in range 38% to and 85%. Similarly, reduction in the COD was found in range 39% to 81%. STPs meet the prescribed norm for Total Nitrogen (10 mg/l) only when raw sewage with low Total Nitrogen (around 10 mg/l) is received. This necessitates upgradation and augmentation of these STPs. The measure suggested for the upgradation and augmentation of STPs are mentioned in the table below.

Discharge norm for Fecal coliform (230MPN/100ml) is not achieved in all STPs. Hence to achieve the norms there is requirement of upgradation/optimization of the existing disinfection system or installation of new disinfection system (if no disinfection system is present). The inflow at STP at Bhagwanpur is ranging from 8-14 MLD which is above the designed capacity (9.8 MLD). This STP needs capacity enhancement after detailed study for capacity requirement. STPs at Dinapur and Goithaha are underutilized. The reason for less inflow into STPs should be studied and areas without sewerage network should be provided with sewerage network and connected to respective STP.

Online continuous Effluent System (OCEMS) is installed at 12 MLD STP, BLW only. OCEMS should be installed at remaining 6 (4 operational and 2 under trial) STPs and connected to CPCB/ SPCB server at the earliest for on-line monitoring of the STPs.

Table 4.14: Performance assessment of STPs of Varanasi and requirement for their upgradation and augmentation.

S. No.	STPs	Technology & process used	Designed Capacity (MLD)	Maximum Utilised Capacity (inspection date)	Inlet characteristics (mg/l)	Discharge to river	Operational / Non-operational / Non-Functional	Compliance with respect to discharge standards (2021)	Suggested upgradation and Augmentation
1	Dinapur (Old) STP	TF followed by ASP	80	70 (23.06.2021)	BOD-46.4, COD-160, TSS- 169 TN-7.02 (23.06.2021)	Ganga through open channel	Operational	Mostly found non-complying for FC	1. Installation of Anoxic treatment of adequate capacity before existing ASP. Return activated sludge flow (about 75% of inflow) may be ensured in the existing ASP 2. Optimization of existing disinfection system 3. Installation of OCEMS 4. Provision for sewerage network in uncovered areas
2	Dinapur (New) STP	ASP	140	125 (23.02.2021)	BOD-52.4 COD-161 TSS- 138 TN-16.5 (23.06.2021)	Varuna river through pipeline	Operational	Mostly found non-complying for TN and FC	1. Installation of Anoxic treatment of adequate capacity before existing ASP. Return activated sludge flow (about 75% of inflow) may be ensured in the existing ASP 2. Optimization of existing disinfection system. 3. Installation of OCEMS 4. Provision for sewerage network in uncovered areas
3	Bhagwanpur BHU STP	ASP	9.8	14 (23.06.2021)	BOD-24.9 COD-92.2 TSS- 1242 TN- 8.83 (23.06.2021)	River Ganga through Nakkhi Nala	Operational	Mostly found non-complying for TN and FC	1. Installation of Anoxic treatment of adequate capacity before existing ASP. Return activated sludge flow (about 75% of inflow) may be ensured in the existing ASP. 2. Optimization of existing disinfection system. 3. Installation of OCEMS 4. Capacity Enhancement.
4	Goithaha STP	SBR	120	55 (23.06.2021)	BOD-56.3, COD-193 TSS- 491 TN- 6.49	River Ganga via Sharda Canal	Operational	Mostly found non-complying for FC	1. Installation of Anoxic treatment of adequate capacity before existing ASP. Return activated sludge flow (about 75% of inflow) may be ensured in the existing ASP. 2. Optimization of existing disinfection system.

					(23.06.2021)				3. Installation of OCEMS 4. Provision for sewerage network in uncovered areas
5	BLW (formerly DLW) STP	ASP	12	5 (23.02.2021)	BOD-10.5, COD-45.7, TSS- 19.1 TN- 6.13 (23.06.2021)	Reused (may reach Ganga through Assi river)	Operational	Mostly found Non-Complying for FC	1. Disinfection system of adequate capacity

Note: Compliance status as per Hon'ble NGT order dated 30.04.2019. (pH: 5.5- 9.0; BOD: 10 mg/l; TSS: 20 mg/L; COD: 50 mg/L; Total Nitrogen (TN): 10 mg/L; Total Phosphorus (for discharge into ponds and lakes): 01 mg/L; Faecal Coliform: Desirable limit 100 MPN/100 ml, Permissible limit 230 MPN/100ml)

Sludge Management Plan

Treatment and disposal of sewage sludge are major factors in the design and operation of all wastewater treatment plants. Two basic goals of treating sludge before final disposal are to reduce its volume and to stabilize the organic materials. Stabilized sludge does not have an offensive odour and can be handled without causing a nuisance or health hazard. Sludge management is an issue of great concern due to its potential threat to human health and the environment with necessitated explicit regulations to organize their production and use. Currently adopted sludge management plan practices as provided by UP Jal Nigam for management of generated sludge is tabled below;

Table 4.15: Sludge management plan for generated STPs sludge

Sr No.	Name of STP	Capacity (MLD)	Approximate Generation of Sludge (Tonnes/Yr.)	Disposal of sludge	Remarks
1	Dinapur	80	8250	Being used as ingredient of Fertilizer by local farmers/manufactures	Since, removal of Nitrogen and Phosphorous is not part of the design process, hence the sludge has nutritional value and is being used as an ingredient of fertilizer.
2	Dinapur	140	6500		
3	Bhagwanpur	9.8	275	Being used in Horticulture.	
4	Goithaha	120	4350	Being used in land fill at various locations.	Process design of STPs contains provision for removal of Nitrogen and Phosphorous, hence generated sludge doesn't have nutrients.
5	Ramana	50	5200	Proposed to be used in land fill at STP site itself.	
6	Ramnagar	10	740	Proposed to be used in land fill at STP site itself.	

Industrial Pollution Control

Industrial Pollution Management

During recent survey, 118 water polluting industries located in Varanasi and Bhadohi having potential to discharge into river Ganga and its tributary Varuna were inventoried which comprised Textile/Yarn (54 units), Sari Printing (33 units), Metal surface treatment (23 units), slaughter houses & meat processing (03 units), food & beverage (03 units) and Heavy engineering & Loco (02). Out of 118, 87 units are from textile/yarn and Sari printing sector.

Action Plan for prevention of pollution from Textile Cluster

Central Pollution Control Board (CPCB) has formulated the 'Charter for Water Recycling and Pollution Prevention in Textile industries" in consultation with experts from the departments of Chemical Engineering & Technology, IIT (BHU), Textile Engineering Department, IIT Delhi, Polymer and Fiber Technology, IIT Delhi, Fibre and Textile Processing, ICT, Mumbai, UP Textile Technology Institute, Kanpur and Textile industries **(Annexure-V).**

Charter is based on participatory approach and one of the important objectives of charter is to setup a bench mark for water consumption & optimize the use of water & chemicals in processing. Charter is formulated, with a view to envisage upgradation of the status of textile industries in sustainable manner in terms of process technology upgradation, adoption of best practices, improved environmental performance, substantial reduction in the fresh water consumption and waste water generation, improvement in effluent treatment including tertiary treatment and optimize water recycling. Compliance with the prescribed standards is mandatory. There will be no compromise with regard to the industry not meeting the prescribed standards.

Charter prepared for textile industries was launched in the workshop with the textile units at Kanpur on 05.04.2019. For implementation of Textile Charter to all River Ganga Main Stem GPIs, UPPCB issued direction under section 33A of Water (Prevention and control of Pollution), 1974 on 08.05.2019.

Charter was discussed with textile mills and experts at a workshop organized by Carpet Export Promotion Council at **Bhadohi on 6th August, 2018**. A workshop was also

organized by UPPCB on implementation of "Charter for water recycling and pollution prevention in Textile industry" was held on **15th Oct, 2019 at Bhadohi**.

As per data available with CPCB, during 2020, there were 31 textile sector GPIs in Bhadohi cluster and out of 31, 22 Textile units have prepared their individual action plan which were reviewed and the suggestions has been communicated to individual unit in the month of March-April, 2020 for implementation of recommendations as per charter.

However, during recent survey 54 yarn/textile and 33 sari printing units have been inventoried in Bhadohi, Jaunpur and Varanasi region in catchment of river Ganga and Varuna. Therefore, it is suggested that charter should be implemented in textile industrial cluster located in catchment of river Ganga and its tributaries in Uttar Pradesh in effective manner which will results in reduction in the fresh water consumption and waste water generation, optimize water recycling and overall improved environmental performance of industrial unit in sustainable manner. A monitoring committee may also be constituted to monitor the implementation status of charter in textile sector in a prescribed time frame.

Solid waste management

Proper Solid waste treatment system based on Indore or Goa model need to be prepared along with Waste to Energy system








Figure 4.16: Existing Solid Waste Treatment System

The un-segregated solid waste dumped in open plots or ponds/low lying areas within 500 meter of river Varuna in Varanasi contribute air and ground water pollution. The estimated quantity of legacy waste in this dumping site is approximately 30000 MT.

Management of legacy waste having adequate capacities for collecting, transporting and disposing of the municipal solid waste produced on a day-to-day basis as well as legacy waste trapped in the dumpsites is proposed to be done.

Illegal disposal of Construction and demolition waste in floodplain zone of river Varuna and Assi shall be prohibited.

Solid waste management plan of Varanasi City

Varanasi city has an estimated population of 15, 31,458 in 2020 based on projections for population taking 2011 population as base. Owing to its rich tourism potential, the estimated daily flow of tourists and pilgrims to the city is 25,000. The total area within Varanasi Nagar Nigam (VNN) is 82.1 km square for 90 wards and 86 more Villages have been merged with VNN area of 195 Sq km. The average waste generation of Varanasi is 0.400 kg per capita per day. The city at present generates 600 MT (Approx.) of waste per day at the rate of 0.400 Kg per capita per day and decadal population growth of 2.67 per Year (as per trend of rate of population growth in last 10 year: 2001-2011)

Table 4.16: Population Projection and waste generation for Varanasi City

Year	House Hold	Population	Waste generation MT/Day (approx) @ 400 gm per capita per day
2011	**191278**	**11,98,491**	**479.39**
2021 (for 90 Wards)	**248300**	**15,31,458**	**612.58**
2021 (For 86 Newly merged villages-20 wards)	151759	4,76,779	190.71
2035 (for 110 Wards)	512012	29,64,678	1185.87

2050 (for 110 Wards)	655375	40,93,136	1637.25

The Government of India published the Solid Waste Management Rules, 2016, the Rules are now applicable beyond Municipal areas and extend to urban agglomerations, census towns, notified industrial townships, etc.

Administrative setup for MSW Management in Varanasi

The area falling under Varanasi Municipal Corporation is currently divided into 5 zones and 14 Subzone and 90 wards for administrative purposes and 86 newly merged villages. The details are annexed as Annexure VII.

Table 4.17: Manpower Engaged in Varanasi Nagar Nigam (VNN) for MSW Management

Designation	No
Municipal Commissioner	1
Additional Municipal Commissioner	1
Municipal Health officer	1
Executive Engineer's. (Transport & Processing-SWM)	2
Zonal Officers	5
Zonal Health officers	1
Sanitary & Food Inspector	14
Account Clerk	01
Account Officer	02
Safai Supervisors	93 (VNN-38 and Varanasi Waste Solution-40)
Safai Mitra's and drivers	5784 (VNN Safai Mitra's = 4171, VWSPL Safai Mitra-850, VNN drivers = 331, VWSPL Drivers-195, Rag Pickers = 237)

- Currently there are no 100% door to door collections in 90 wards of Varanasi. Most of the households, shops, and establishments throw their waste just outside their premises, on streets, in drains, in open spaces, in water bodies, and in other inappropriate places.
- These litters swept away by street sweeping and lifted by means of handcart or rickshaw trolley by Sweepers and waste collectors of VNN, this led to unsanitary condition across the city.
- Varanasi Nagar Nigam outsourced M/s Varanasi Waste solution Pvt.Ltd. For door to door collection in 90 wards, mechanized road Sweeping approx 22.1 km. daily basis (Sant. Athulananda to BHU) and toilet cleaning work of Varanasi.

- Apart from door to door collection three Ngo's named Anthill Services Pvt. Ltd; career consulting pvt. Ltd, Jan Vikas Kalyan Samiti; Engage for IEC activities for sanitation awareness in their respective wards.
- The length of roads, streets, lanes, bye-lens in the city is approximately 1200 km in the total and approx. length of drains 2400 km area within Varanasi Nagar Nigam of 82.1 km square. Street sweeping starts between 8:00 AM and continues up to 2:00 PM.

The detailed action plan for MSW management in Varanasi city is enclosed as Annexure-VII

Encroachment

Removal of encroachment from lower floodplain zone of river Varuna and Assi. Demarcation and notification of floodplain zone by introducing pillars to further prevent encroachment in River Varuna and Assi.

Monitoring Committee

a. **Supervisory Committee** – It may supervise the implementation of proposed action plan for restoration and rejuvenation of River Varuna and Assi. The committee may consist of representative from District Magistrate, Varanasi Vikash Pradhikaran, Irrigation Department, Forest Department, Municipal Corporation, UP Jal Nigam, Urban Development Department, NMCG, UPPCB and CPCB under the chairmanship of Commissioner of Varanasi division, meeting to be held on quaterly basis.

b. **Execution Committee** – The committee may responsible for execution of proposed action plan for restoration and rejuvenation of River Varuna and Assi. The committee may consist Varanasi Vikash Pradhikaran, Irrigation Department, Forest Department, Municipal Corporation, UP Jal Nigam, Urban Development Department, SMCG and SPCB under the chairmanship of District Magistrate of concerned district, meeting to be held on monthly basis.

Annexure-I: Photographs



P 1: R. Varuna at Origin (Mailhan Lake/ Taal)



P 2: R. Varuna at Varuneshwar Mahadev



P 3:R. Varuna at Tarhati, Jaunpur bridge



P 4: R. Varuna at Sherpur Momidin bridge Bhadohi



P 5: R. Varuna at Kushghat Godma Bridge



P 6: R. Varuna at Dhaurahra Bridge



P 7: Confluence of R. varuna to R. Basuhi



P 8: R. Varuna at Rameshwar, Varanasi



P 9: R. Varuna at Koirajpur, Varanasi



P 10: R. Varuna at Pissaura (u/s of Lohta drain)



P 11: R. Varuna at Kutchehry Ghat (Before confluence of Orderly bazar drain)



P 12: R. Varuna with confluence to R. Ganga (at Adikeshwar Ghat)



P 13: Dhaurahra Drain with confluence to R. Varuna



P 14: Nai Bazar Drain, Bhadohi



P 15: Lohta/ Durga drain at confluence with R. Varuna



P 16: Phulwariya Drain at confluence with R. Varuna



P 17: Chamraudha Drain at confluence with R. Varuna



P 18: Central Jail Drain at confluence with R. Varuna



P 19: Orderly Bazar Drain



P 20: Azad nagar/ Banaras Drain



P 21: Khazuri colony Drain



P 22: Nai Basti Drain



P 23: Ponding Near Nakhi Drain



P 24: Unknown Drain d/s Narokhar drain



P 25: Narokhar drain (Tapped)



P 26: Unknown Drain u/s Narokhar drain



P 27: Present Origin of R. Morwa



P 28: R. Morwa at Munsilaatpur



P 29: R. Morwa b/c to Barbaspur Drain



P 30: R. Morwa a/c to Barbaspur Drain



P 31: R. Morwa b/c to Chauri Drain



P 32: R. Morwa a/c to Chauri Drain



P 33: R. Morwa b/c to Varuna



P 34: R. Varuna b/c to Morwa



P 35: R. Varuna a/c to Morwa



P 36: Barbuspur Drain



P 37: Chauri Drain



P 38: Upardaha Taal Area





P 39 & 40: Confluence of R. Assi / Nagwa drain with R. Ganga





P 41 & 42: Diversion point of R. Assi to Nagwa drain




P 43 & 44: Sahoday Veer Bridge (Assi-Lanka road)




P 45 & 46: Ravindrapuri Bridge




P 47 & 48: Sankat Mochan (Durgakund road)




P 49 & 50: Saket Nagar




P 51 & 52: Sundarpur Chauraha Bridge




P 53 & 54: Dhirendra Mahila PG College Road




P 55 & 56: Indira Nagar DLW drain joining R. Assi in Indira Nagar




P 57 & 58: Kanchanpur Pokhra




P 59 & 60: Wastewater logged and stagnated area after Kardmeshwar kund




P 61 & 62: Pond near Kardmeshwar Mahadev Inter College




P 63 & 64: Kardmeshwar *kund* with sealed outlet




P 65 & 66: Pond near Kardmeshwar *kund* & link with *kund*



P 67



P 68



P 69



P 70



P 71



P 72



P 73



P 74



P 75



P 76

P 67 to 76: Several small drains / conduit pipes / wastewater lines from individual houses discharging into R. Assi




P 77 & 78: DLW Drain - 1




P 79 & 80: DLW Drain -2

Annexure – II: Constructed Wetlands (CWs)

CWS also uses principle of Phytoremediation techniques. It integrates microbial bioremediation, phytoremediation and root-zone treatment in addition to providing the benefits of oxidation pond and physical filters.

It is the designed and engineered natural system to treat sewage and other wastewaters. Selective aquatic plants having rich rhizospheric microbial diversity are grown in high density and sewage/wastewater is treated based on its flow by gravity. Not only cost is minimized, various pollutants (organic, inorganic, heavy metals) are remediated at various locations.

At each stage the turbulence generated in the system enriches the oxygen that makes microbial biodegradation of pollutants very efficient. The constructed wetland system can be used as *in situ* bioremediation and also as *ex situ* bioremediation.

The oxidation pond in constructed wetland systems simulates STP. The uniqueness of construed wetland system is the use of diverse aquatic plants together with their rich rhizospheric microbial communities. The diversity of these microbial communities are not found in any other remediation techniques for treatment of sewage.

Constructed wetlands (CWs) are scientifically proven and widely adopted across the world as alternative and complementary technology to conventional technologies for sewage treatment. A well-designed constructed wetland system will work on the same principle as that of STP but with greater microbial diversity associated with diverse plant species that effectively biodegrade organics and other pollutants in sewage and without energy.

A constructed wetland is highly versatile and can be designed for drains that have different topography hydraulics and physical characteristics of the drain (width, length, height). A constructed wetland system can be used as primary/ secondary/ tertiary treatment and can be used for less than 1 MLD to 1000 MLD with continuous flow. Figure 1 depicts schematic flow diagram of Constructed Wetland System.

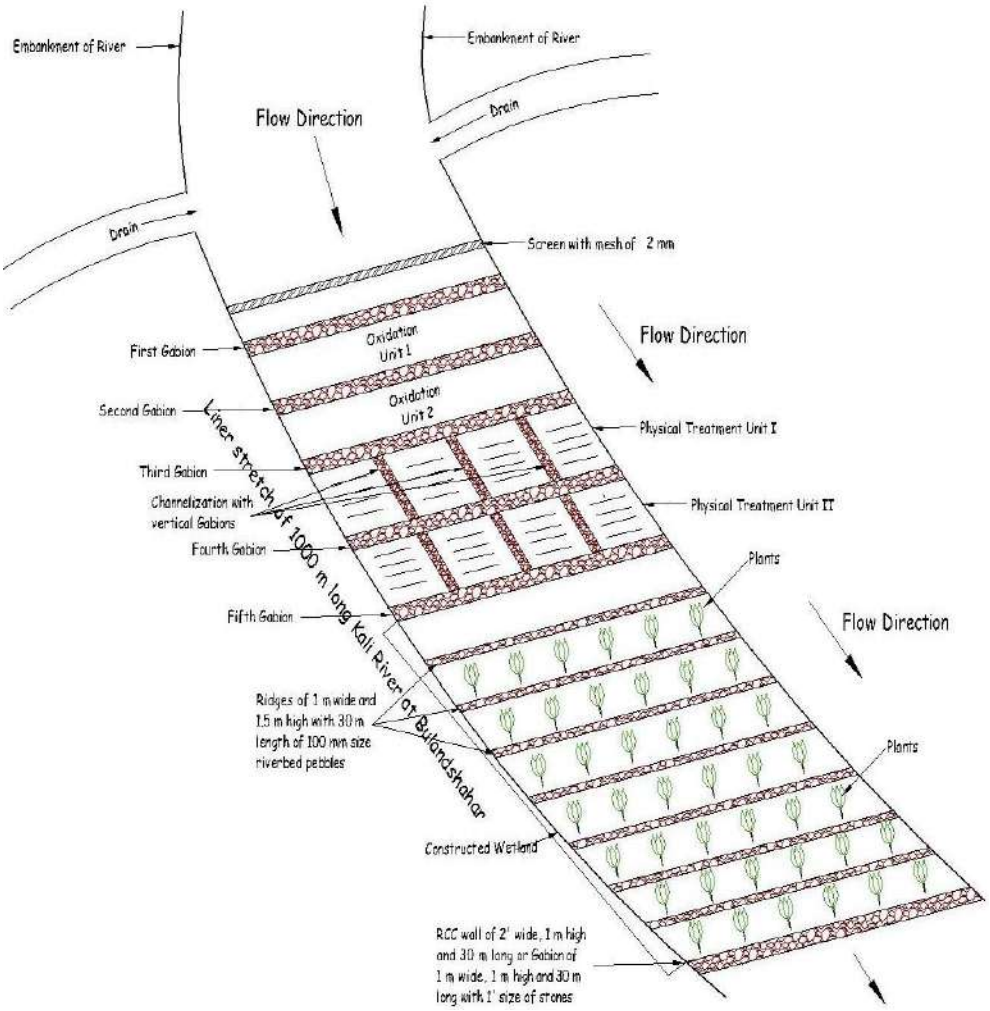


Figure: Schematic Diagram of Constructed Wetland Systems

A typical or ideal CW system should have the following components:

i. An aerobic oxidation pond with depth of water ranging from < 1m to 0.5m; water will be retained at least 8-10 hours and consequently there will be slight rise in the water level (up to 30cm) from the normal water level in the drain.
   (a) there will be a screen (iron mash having 4-10 mm aperture) before the oxidation pond to remove solid waste and there will be another screen (2-4 mm aperature before the water enters into two physical filter tanks / chambers/ zones/ channels) from oxidation pond.

ii. Three physical filter tanks/ chambers/ channels/ zones are ideal for efficient functioning; the physical filters chambers are separated by gabions of boulders of different sizes and embedded in iron mesh.
   (a) the first chamber/ channel/ zone is separated from the second chamber by a gabion made of boulders of 2' within the chamber channel and there will be 3 ridges made of stones/ pebbles of 200 to 250 mm.

(b) The second chamber is separated from third chamber by a gabion made of boulders of 1' size with 3-4 ridges of pebbles of 180 mm.

(c) The third chamber is separated from the constructed wetland by gabion made of boulders of 1' size with 3 to 4 ridges of river bed pebbles of 150 -120 mm.

iii. Constructed wetland having 5-10 furrows of 1 to 4 m wide separated by ridges of 1 m high, 0.5m wide and composed of river bed pebbles of 80-50 mm size.

iv. Cascade outlet is made of boulders, stones and pebbles with gentle slope from the overflow of the constructed wetlands. The water comes out from the cascade can be recycled /stored in stagnant water bodies / wetland or channelized into the downstream of the drain or river.

Table: Generic design details of Constructed Wetland System

	OXIDATION POND 1	OXIDATION POND 2	DRAINAGE	TREATMENT TANK 1	TREATMENT TANK 2	TREATMENT TANK 3	TREATMENT WETLAND 1	TREATMENT WETLAND 2	CASCADE	FIRST WETLAND
Length (Meters)	49	36	36.5	3.76	8	4	24	14	4.5	45
Breadth (Meters)	10	29	2	2	2	2	21	10	3	35
Water Depth (Meters)	0.50	0.75	0.25	0.50	0.50	water is flowing over the gravel	0.50	0.60	water is flowing over the rocks and through the plants	Upto 1.5
No. ridges of gravel	-	-	-	-	-	-	8	4	-	-
No of furrows of plants	-	-	-	-	-	-	8	4	-	-

Note:

(I) The height of gabions should be 1.0 m 1.5 m high and usually above the water level in the channels/ chambers/ ponds/ zones.

(II) The typical CW system outlined above is for in situ biological remediation where the sides of the chambers/ ponds/ channels / zones are the embankments of the drains.

(III) For ex-situ biological remediation, the four sides of chambers/ponds/ tanks should be made of stone meshed walls of 1.5 -2 m high and 0.5 m – 1 m wide and all the components should be contiguous with gradient so that water flows on its own. If a gradient does not exist, a gradient channel has to be constructed.

Management of CWs

For the proper management and sustainability of CWs on long term basis, the following precautions have to be carried out:

(I) The oxidation ponds should be desilted once in a month. The sludge, should be dried and used for manure.

(II) If the turbulence is decreased due to filling up the pores in the gabions by sludge, it should be flushed out with a jet. This should be carried out once in 3 months.

(III) The aquatic biomass dried should be harvested once in a year and used for mulching in plantation /horticulture.

(IV) If the river bed pebbles used for ridges are choked up with sludge these may be washed and reused once in a year in phased manner.

(V) If CWs is sediment heavily, it should be desilted carefully without damaging the rooted aquatic plants.

(VI) During monsoon, heavy run off may make CWs not functional because of rapid flows, but dilution of sewage with rain water make the water quality similar to the river water/treated water.

(VII) If gabions and ridges are damaged during heavy flows of monsoon water along with regular sewage, the gabions and ridges should be repaired.

Time required for development of CWs

Depending on the size of CWs, CWs can be developed and make functional within 6 to 12 months

Parameters for feasibility assessment

- Flow and retention time: The construction of wetlands requires large area hence large horizontal foot-print. The retention time within constructed wetland system is about 20 hours.
- Pollution Load: It can be designed for wide range of pollution load and effluent characteristics.
- Knowledge of wetland ecology and native wetland species is a pre-requisite.
- Periodic harvesting of the biomass is essential to maintain consistent performance.
- Design criteria is being developed for different kinds of wastewater under different climatic conditions.
- The constructed wetland system is scientifically proven and widely accepted alternate and/or complimentary technology to conventional technology for sewage treatment.
- It has been used by many countries in the world for the management of wastewater including sewage.
- DBT-CPCB has also brought out a manual on constructed wetland system wherein several designs are described.

Cost of CWs

As compared to STPs, CWs are very cheap and treatment of 1mld sewage with CWs may cost anywhere between 8 to 10 lakhs with annual maintenance cost of Rs 80000/-.

Annexure – III: Biodiversity Parks: A Holistic Approach for Rejuvenation of Rivers

The river ecosystems across the country are highly degraded, and the pollution loads are so high that the water in most of the rivers, particularly in urban stretches are unsuitable even for irrigation. The challenge is how to rejuvenate river ecosystems which are highly complex. To achieve this goal, there is a need for holistic approach. One such approach is the establishment of Biodiversity Parks along the floodplains of rivers of India. The Biodiversity Park approach involves restoration of degraded river ecosystems and recreation of lost ecosystems, biological treatment of waste waters that enter into river, and use of natural wetlands for cleaning channel water and storage of flood water. The Biodiversity Park approach is detailed in the following pages:

Concept of Biodiversity Parks

Biodiversity Parks are unique landscapes/riverscapes of wilderness where ecological assemblages of native species are recreated over marginal/degraded landscapes/riverscapes. Biodiversity Parks are based on the ecological restoration principle and the underlying principle is to establish self-sustaining ecosystems that have biodiversity and function that generate ecological services that contribute to well-being of humans.

Biodiversity Parks in riverscapes include restored/recreated river ecosystems along degraded stretches of rivers for their rejuvenation.

The Biodiversity Parks of floodplains of rivers include the restoration/recreation of diverse landscape elements of floodplains such as wetlands, marshes, swamps, lakes, forests and grasslands, besides riparian ecosystems and in-stream communities. It also includes the development of greenways along embankments, forest communities on adjacent uplands and treatment wetlands for cleaning river water and constructed wetlands for treatment of sewage and industrial effluents that enter into rivers.

The Biodiversity Park concept ensures the original ecological integrity of the landscape/riverscape and prevents introduction of any external element in the landscape/riverscape that might affect native flora and fauna.

The Biodiversity Park approach is innovative approach or model for recreation of lost biodiversity or natural heritage and it is a conservation approach. It involves conservation of ecosystems, communities, species, populations, and simulate National Parks/Wildlife Sanctuaries/Nature Reserves/Wilderness.

Functions of Biodiversity Parks

Biodiversity Parks have wide range of functions and encompass almost all the four categories of ecosystem services rendered by ecosystems, and include: (i) enrich human microbiome as the parks harbour rich environmental microbiome which in turn reduces the human health risks and public health burden; (ii) serve as filters for point and nonpoint source of air pollutants; (iii) store flood water and recharge ground water; (iv) prevent soil erosion and stabilize floodplains; (v) reduce flood water velocity; (vi) serve as hub for conservation, educational and cultural activities; (vii) promote ecotourism; (viii) connect the city and its citizens to nature

and biodiversity; (ix) provide livelihoods to local communities; (x) serve as living museum for understanding ecosystem processes and function; (xi) sequester CO_2 and impart climate resilience, buffer local weather and even cause local precipitation; (xii) serve as habitat for vanishing flora and fauna (xiii) purify water; (xiv) enhance biological productivity; (xv) sustain river ecosystem and, (xvi) rejuvenate rivers.

Biodiversity Parks of riverscapes have many other functions such as:

(i) contribute to self purification system of river water;

(ii) regulation of stream flows;

(iii) prevention of channel bank erosion;

(iv) uniform distribution of sediments;

(v) stabilization of floodplains;

(vi) trapping of sediments;

(vii) reducing flood water velocity;

(viii) immobilization of heavy metals and nutrients such as nitrogen and phosphates, including heavy metals;

(ix) regulation of nutrient cycle leading to enhanced water quality;

(x) storage of flood water;

(xi) recharge of groundwater and enhancement of base flow for sustained riverflow;

(xii) filtration of surface runoff from upland, embankments and watersheds;

(xiii) sink for CO_2 and buffer local weather;

(xiv) reduction in loss of water from surface evaporation;

(xv) provide diverse products to and livelihoods of local communities;

(xvi) provide recreation to the public;

(xvii) preservation and sustenance of diverse river ecosystems and the flora and fauna;

(xviii) promote ecotourism;

(xix) habitat for RET (Rare, Endemic and Threatened) aquatic and terrestrial plant and animal species;

(xx) regulate water temperature leading to enhanced water quality;

(xxi) bioremediate wastewaters that enter into river system; and

(xxii) cleaning of river water through treatment wetlands (natural).

These functions of Biodiversity Parks in riverscapes have already been discussed extensively in Chapters 2 and 3.

Structural Components of Biodiversity Parks

A Biodiversity Park can have wide range of landscape/riverscape elements, and it depends upon the space availability, nature of the ecosystems that used to exist before degradation, topography of the area and what the local communities need, besides the main goal of bringing back the lost pristine glory of the landscape/ riverscape and rejuvenation of rivers. An ideal Biodiversity Park has two zones: (i) the Nature conservation zone and (ii) the visitor zone. The nature conservation zone consists of terrestrial and aquatic ecosystems of the area where the natural forest ecosystems, floodplain wetlands, forests and grasslands, river channels and their interconnections with wetlands of floodplains are located. The visitor zone will have a number of elements such as representative ecosystems of the area, a herbal garden, an aquatic garden to preserve the aquatic resources, wetlands, butterfly conservatory, green ways along the embankment, diverse wetlands that attract diverse group of birds, NIC, constructed wetlands for treatment of wastewater, natural bathing sites for local community on specific festivals and Recreational Parks.

The Biodiversity Parks of riverscapes can have the following structural components:

(i) Forest communities along the river embankment and adjacent upland.

(ii) Greenways with walkways and cycleways long the river embankment/ bunds. The greenways have 3-storeyed native forest communities.

(iii) Greenways with Recreational Parks, where human settlements are located close to the river.

(iv) Floodplain forests and grasslands, marshes, wetlands and lakes on floodplains.

(v) A butterfly conservatory, an herbal garden, a recreational park and forest communities on elevated floodplains.

(vi) An NIC on the elevated floodplains/ embankment/ upland

(vii) Representative riparian ecosystems along the channel banks and riverbeds.

(viii) Natural bathing sites for local communities.

(ix) Natural treatment wetlands for cleaning of river water.

(x) Constructed wetlands for treatment of wastewater that enters into river.

(xi) An aquatic garden for conservation of aquatic flora.

(xii) Infrastructures for promoting awareness, education and training on the conservation of river ecosystems.

Size of Biodiversity Parks

The size of Biodiversity a Park depends upon the amount of land/the stretch of riverscape available. The minimum land required for biodiversity park is 100 acres, but 50 acres patch can also be developed into a Biodiversity Park. 10 patches of 10 acres each that are located in a cluster can also be used for development of Biodiversity Park. The Biodiversity Parks can be developed in linear fashion along Highways or rivers with stretches of 0.5-5.0 km wide. The upper limit of Biodiversity Park is similar to that of National Park, *i.e.* few hundred km^2.

The size of Biodiversity Parks in riverscapes depends upon the stretch (length) of the river available, the extent of floodplain width and the riparian zone, presence of wetlands and the extent of upland area. The stretch can be 1 km to 100 km long and 0.5-5 km or more wide on either side of channel. The Biodiversity Parks in riverscapes should be developed in linear fashion. Some of the major rivers of India, in the plains, have floodplains extending several 100 km stretch and include vast tracts of elevated floodplain forests.

Planning, Designing and Development of Biodiversity Parks in Riverscapes

Step-wise procedures involved in planning, designing and developing Biodiversity Parks in Riverscapes are outlined below:

1. Selection of the riverscape.

   Identify the stretch of river that is at least 1km long (the length may be anywhere between 1 and 100 km) that has lesser gradient, extensive floodplains (anywhere between 0.5 km – 5 km wide or more on either side of the water channel and the embankment/ bund) and an upland area of the size anywhere between 50 m and 500 m wide strip along the embankment/ bund.

   Stretches having threats, connectivity, services offered and potential of enhancing the integrity of the ecosystem considered and the potential of demonstrating an integrated approach for restoration may be preferred.

   The river stretch with high conservation values and under anthropogenic pressure should be identified for the Biodiversity Park. So that conservation of inhabiting species (e.g. Freshwater turtles) could be ensured through community engagement.

   There is a need to undertake the assessment of ecosystems, flora and fauna in the past and present at the site and its upstream and downstream areas. The past information can be obtained from the previous published information including floras and faunas and scientific papers, if any. The present information in the form of biodiversity mapping can be done by floristic and faunastic surveys. These surveys include the listing of kinds of species of plants and animals found, the vegetation types, the phytosociological features (dominance, abundance and frequency distribution of plants and birds), invasive species if found, and use of plant and animal species found in the area. This information is useful in selecting the species for community and ecosystem development.

   Proper environmental and ecological assessment of the proposed site taking into account the needs of local communities and participation of Panchayati Raj institutions should also be carried out.

   Regional Offices of Botanical Survey of India (BSI) and Zoological Survey of India (ZSI) may be approached for identification of plants and animals found in the area/region. Both BSI and ZSI also have databases of the plants and animals of the area/region and such databases are useful in Biodiversity mapping.

   Note: Please select the stretch where there is no agriculture in floodplains and human settlements on embankments and presence of a strip of upland close to the embankments. Location and design should not interfere with the hydrological,

geomorphological and ecological connectivity. Biodiversity Park should follow all existing rules and regulations including those related to social and environmental impacts.

At higher elevations (headwaters zone), the Biodiversity Parks may include the restoration/ recreation of in-stream communities, riparian ecosystems and also adjacent upland ecosystems besides the ecosystems of catchments and watersheds. In these areas, the floodplain is either narrow or absent. In hilly areas, where the riverscapes have extremely narrow floodplains, Biodiversity Parks of such sites include restoration/ recreation of in-stream ecosystems, riparian ecosystems, adjacent upland ecosystems and ecosystems of catchments and watersheds.

2. Secure the area by fencing along the embankment/ upland area and the boundaries of floodplains at the upstream and downstream of the stretch selected.

   It may be noted that identification of wetlands and demarcation of land for interventions should be done based on the study of natural drainage patterns and connectivity analysis along with consultations with the local communities, keeping in view their existing rights and privileges. Restoration of wetlands should be done on the principles of wise use concept.

   Note: No fencing should be done along the water channel front.

3. Survey the vegetation of uplands located in the neighbourhood of the site selected for selection of plant species of trees, shrubs, herbs, and grasses that will be used for the development of terrestrial communities on uplands, embankments and elevated floodplains.

   Note: The propagules of the species selected (seedlings, seeds and ramets/ root slips of grasses) should be collected and raised and multiplied in a Nursery.

4. Development of a Nursery in 2 to 5 acre plot located in embankment/upland area (depending on the size of Biodiversity Park) for the maintenance of saplings and multiplication of saplings.

5. Development of forest plant communities on elevated floodplains, flat floodplains, embankments and uplands:

   (a) Development of grasslands, to start with, on the upland, embankments and floodplains.

   (b) Plantation of saplings of top canopy tree species.

   (c) After 2-3 years of top canopy species plantation, plantation of underwood species should be done.

   (d) After 4-5 years of plant community development, plantation of herbaceous plants should be done.

Note: The vegetation developed will prevent erosion/reduce sedimentation load, enrich nutrients in the aquatic ecosystems and improve the water quality. All plantation activities should be done using native plants only.

6. Survey of floodplains for location of the wetlands, marshes, swamps, lakes, grasslands and forests. A GIS based map of the area may also be developed for planning.

(a) The elevated areas in floodplains should be developed into floodplain forest communities. The shallow and undulating depressions should be used for grasslands.

(b) Different grassland communities should be developed based on the moisture gradient. The grass species required may be collected from already existing floodplain grasslands on undisturbed stretches of river close to the selected site.

Note: Propagules of some grass species may also be collected from upland grasslands located in the neighbourhood of the selected site.

(c) If there are already existing wetlands, marshes, swamps and lakes, these ecosystems should be restored. The first step in the restoration is desilting (in case of marshes and swamps desilting should be done less than 1 m depth; in case of wetland, desilting should be done upto a depth varying from 1 to 3 m; and in case of lakes, the desilting can be done upto a depth of 3 to 5 m). The silted material can be used for landscaping around the waterbodies. These landscaped areas should be grassed with native floodplain grassland species.

After desilting, introduce phytoplankton, zooplankton, benthic fauna, and fishes into the restored floodplain wetland ecosystems. The other vertebrates colonize these ecosystems on their own soon.

(d) If wetlands, marshes and swamps and lakes were vanished at the site, these have to be recreated on the sites where some hydrophytes such as Cattail and *Phargmites* exist.

(e) To provide seed material of animal communities, two nursery ponds should be developed in the elevated floodplains zone/ upland area.

(f) If there are silted connecting channels between water channel and the wetlands and lakes, these silted channels should be desilted upto a depth of 1 m or so and the excavated material should be used for landscaping. The channel should be lined with reeds and cattails.

(g) If channels were vanished, these channels have to be created. These channels should be shallow (4-8 m wide and 1-2 m deep). These channels should be lined with reeds and cattail plants.

(h) If there are habitats that support riparian communities and the habitats are degraded, restore them and introduce the planktonic, benthic and other plant and animal communities characteristic of riparian communities.

(i) If the riparian ecosystems were vanished, the ecosystems have to be recreated in the riparian zone. If such zones cannot be created along the channel, simulated riparian ecosystems have to be developed in the floodplains close to the water channel, using boulders, stones and pebbles.

(j) If the water in the channel has lost in-stream biotic communities, these have to be introduced.

(k) If the water quality is low due to discharge of sewage and industrial effluents, the water from the channel has to be treated by passing it through treatment wetlands to be developed in the floodplains and channels have to be created in a way that channel water pass through these wetlands from the upstream and then enters into the downstream. In fact such treated wetlands and channelization of water all along the river in floodplains may rejuvenate the rivers.

(j) If storm drains carrying sewage is passing through the floodplains, the treatment wetlands have to be developed for in-situ biological remediation of sewage before it is discharged into river.

(m) If natural wetlands do not exist for the treatment of storm drain sewage, constructed wetland system has to be developed. The constructed wetland system has the following units:

(i) One or two oxidation zones / ponds/ units separated by mini weirs of 1 m or 1.5 m high; this is connected to (ii) physical filter zone/pond/ unit that have 5 to 10 gabions of 1m high, 2' wide with boulders of 2' size embedded in iron mesh, and this unit is connected to (iii) constructed wetland unit consisting of 8-15 ridges and furrows; the ridges are 1 m high and 2’ wide and made of stones/ pebbles of 180-200 mm; the furrows are used for plantation. The length and width of each unit depends upon the length and width of drain, hydrological features such flow rate, volume and organic load of sewage.

It is important to prevent pollution at the source, particularly the drains that carry industrial effluent by having a common effluent treatment plant and STP for domestic sewage and then recycle the treated water. In case prevention of pollution at the source is not possible, in-situ remediation of sewage entering into river from clusters of villages should be carried out using constructed wetland as a part of rejuvenation of river.

(n) Aided regeneration/plantation of native species to develop and support native ecology will be undertaken wherever it is necessary.

(o) While designing the restoration/ recreation of wetlands, it is necessary to keep in view the wetland functions so that activities such as development of embankments and other topographic changes should not alter the natural flux of water, sediments and species.

7. Development of Butterfly Park

This should be developed on upland/ embankment, and suitably landscaped. About 70-100 host plants for larvae and 70-100 flowering native herbs, shrubs and trees that produce nectar bearing flowers seasonally and serve as host plants for adult butterflies should be planted. About 50-100 species of butterfly will be attracted to the Butterfly Park. The area required for development of Butterfly Park is about 2 to 5 acres.

There should be 2-3 small shallow waterbodies scattered over the area. Each waterbody should be 10 m X 10 m and 1 m depth. This is needed for maintaining relative humidity. There should be shelter belt around the periphery of Butterfly Park with 1 or 2 rows of bamboo.

8. Development of Herbal Garden

An area of 5-8 acres in the upland/ elevated floodplains can be developed into a herbal garden for the conservation of native medicinal plants. Plants that can be used in home remedies can be grown and can be provided to local communities. About 100-150 species of local plants of medicinal value can be grown. The cultivation practices, medicinal properties of plants grown should be provided on signages and should be also displayed in the Nature Interpretation Centre.

The area should be suitably landscaped depending on the site characteristics.

9. Fruit Yielding Garden (Orchard)

A fruit yielding plant garden can also be developed along embankment/ upland. About 25-30 acres can be used for the development of local varieties of popular fruit yielding species in the region.

10. Birding Area

Besides cultivated fruit bearing plant garden, wild shrubs and trees bearing fresh fruits should also be planted to attract birds. This should be designated as Birding Area. This should be located over an area of 25 -30 acres in upland /elevated floodplains.

11. A Nature Interpretation Centre (NIC) is critical in a Biodiversity Park for promoting awareness among public and students on the need for river conservation and sustenance of river ecosystems to sustain water quantity and quality. It also serves as a platform for undertaking other activities related to Biodiversity Education and training.

A modest building (aesthetically designed with built up area of 10,000-15,000 sq. ft.) is adequate enough. It should have Toilets and a small Seminar Room where visitors can sit to discuss the issues relating to river ecology and management. An office complex of 5000 sq. ft. and a minor laboratory of 5000 sq. ft. may be attached to NIC. This complex should be developed in the upland area.

The Biodiversity Parks, once established, provide opportunities to people to learn from the Park itself. To achieve this objective, the Biodiversity Parks should include the following provisions:

(i) Guided tours;
(ii) Awareness education on Biodiversity and environment among students and people;

(iii) Preparation of leaflets and training modules for different target groups;
(iv) Popular talks by experts; and
(v) Linkages with research centres in local Colleges and Universities, and also with BSI and ZSI.

12. A recreational garden should be developed in and around NIC without interfering with the hydrological and ecological connectivity of the riverscape, landscape or wetlands. The area required will be 1 to 2 acres. The area should be suitably landscaped.

13. A network of trails connecting different structural elements of Biodiversity Park should be developed. The width of major trails should be 8’ wide and secondary trails connecting major trails should be 6' wide and tertiary trails that connect secondary trails should be 4’ wide. This network of trails should pass criss-cross way across the riverscape. No concretization of trails should be permitted; No paver blocks should be used.

14. A field vehicle, a tractor and a golf cart are essential for the Park.

15. A recreational park on 5 acres of upland/ embankment/ elevated floodplains should be developed.

16. Use of nature-based solutions for water and waste management including composting of aquatic weeds/ leaf litter and floating reed beds and floating fountains for treatment of water should also be integral part of the Biodiversity Park.

17. A weather station may also be installed in the Biodiversity Park and also information on hydrology should be collected.

18. The Biodiversity Parks should have a provision for conservation of local fish species, and their importance in ecology and culture should also be displayed in the NIC.

19. The Guidelines is also applicable for the development of Biodiversity Parks in river reaches which are not embanked.

20. Various climatological challenges should be factored in while preparing the project proposal for Biodiversity Parks.

21. Only eco-friendly construction materials should be used in developing the Biodiversity Parks.

22. Biodiversity Parks, once developed, should be sustainably managed so that no solid waste and other waste should be dumped.

23. In case if legacy waste is located in the floodplains and upland areas, the legacy waste should be remediated and restored as a part of rejuvenation of rivers through the development of Biodiversity Parks.

24. Legacy waste is the solid waste dumped in the floodplains of rivers and has become part of elevated and upland zones of floodplains. These legacy waste zones of floodplains are very common along major rivers and its tributaries, particularly in stretches where urban centres are located.

These legacy waste zones can be remediated by the development of grasslands and or site specific forest communities.

Many grass species like *Saccharum, Sporobolus, Vetiveria, Eragrostis, Bothriochloa, Heteropogon, Chrysopogon, Paspalum* and *Panicum* not only uptake heavy metals and immobilize them in by complexing with organic matter/ humus but also biodegraded toxic pollutants with the help of rhizospheric microbial communities.

The broad leaved forest species (trees, shrubs and herbs) with rich and diversified microbial communities biodegrade even Volatile Organic Compounds (VOCs), *i.e.* Polycyclic Aromatic Hydrocarbons (PAHs), emergent pollutants and other toxic chemical pollutants but also uptake and immobilize heavy metals. It may be noted that the forest communities together with grasses play key role in changing the physical features of legacy waste that transform into substratum that hold moisture, recycle nutrients and recharge ground water. In other words the quality of river water is sustained by regulating nutrient cycling. In this way legacy waste over a period of time is biophysically transformed into a substratum that supports biological communities and render ecosystem services including rejuvenation of river.

Schematic Layout of a Typical Biodiversity Park in Riverscape and a Constructed Wetland

To facilitate how to implement the design of Biodiversity Park planned in the riverscape without any difficulty to the stakeholders, a schematic layout of a typical Biodiversity Park in the riverscape showing different structural elements is provided (Figure 28). A schematic layout of a typical constructed wetland for in-situ biological remediation of sewage that enters into the river is also given (Figure 29).

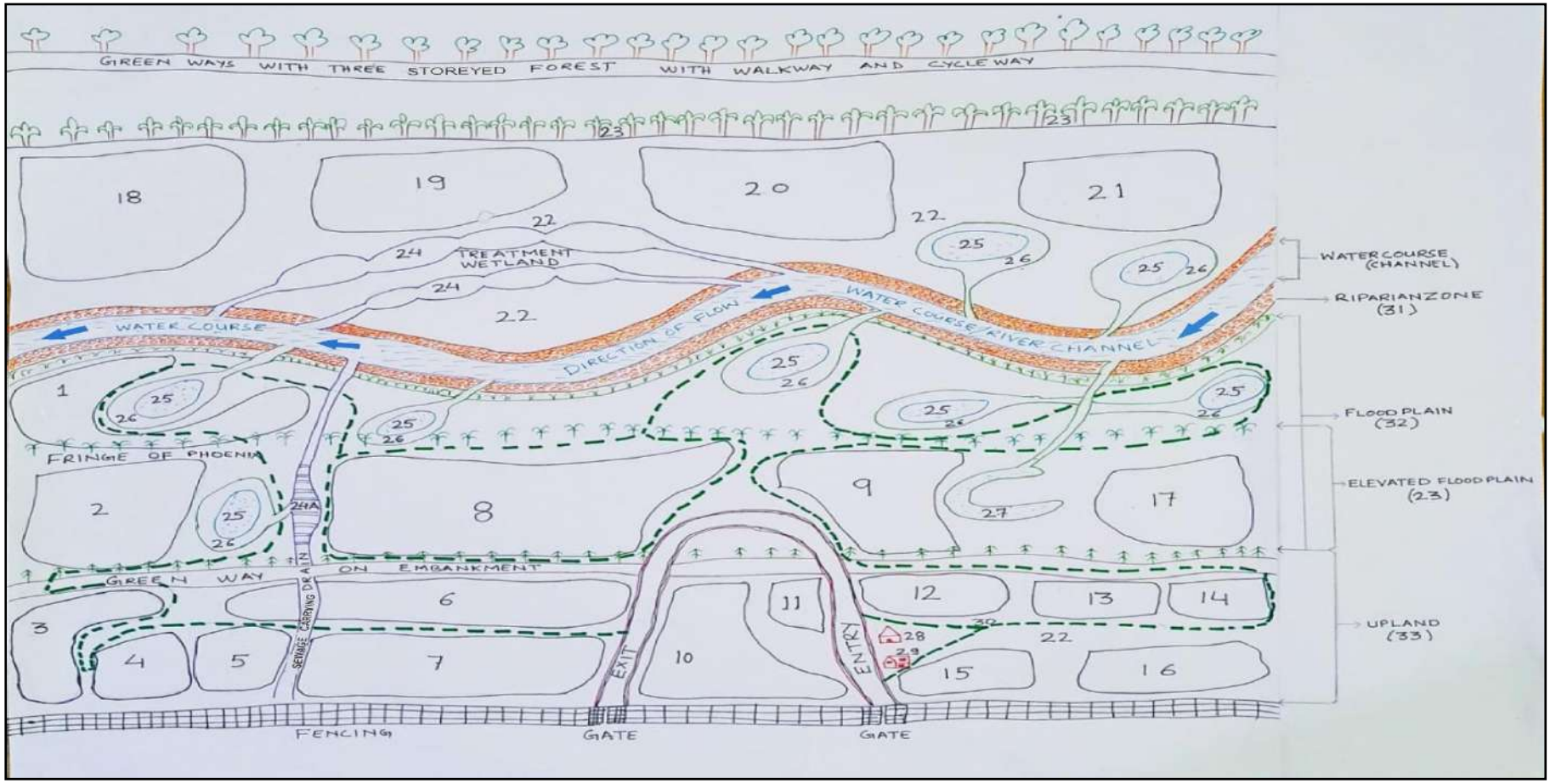


Figure: Schematic layout of a typical Biodiversity Park of the riverscape showing different structural components.

1 – Floodplain forest on the elevated ridge; 2 – Floodplain forest with *Acacia catechu*, *Bombax* and Ber, 3 – Wild fruit-bearing shrubs and trees (Birding Area), 4 – *Phoenix* groove, 5 – Shrubland, 6 – Orchard, 7 – Bamboo thickets, 8 – Grassland with scattered trees, 9 – Aquatic garden, 10 – Recreational Park, 11 – Butterfly Park, 12 – Herbal Garden, 13 – Nursery, 14 – *Sterculia* dominated community, 15 – *Butea* dominated community, 16 – *Holoptelea* dominated community, 17 – *Terminalia arjuna* dominated community, 18 to 21 – Different floodplain forest communities, 22 – Grasslands and marshes, 23 – Elevated floodplain, 24 – Treatment wetlands (natural), 24A – Constructed wetland, 25 – Catchment wetlands, 26 – Marsh, 27 – Oxbow lake, 28 – Nature Interpretation Centre, 29 – Office Campus, 30 – Dotted line ( ) indicates trails, 31 – Riparian zone, 32 – Floodplain, 33 – Upland

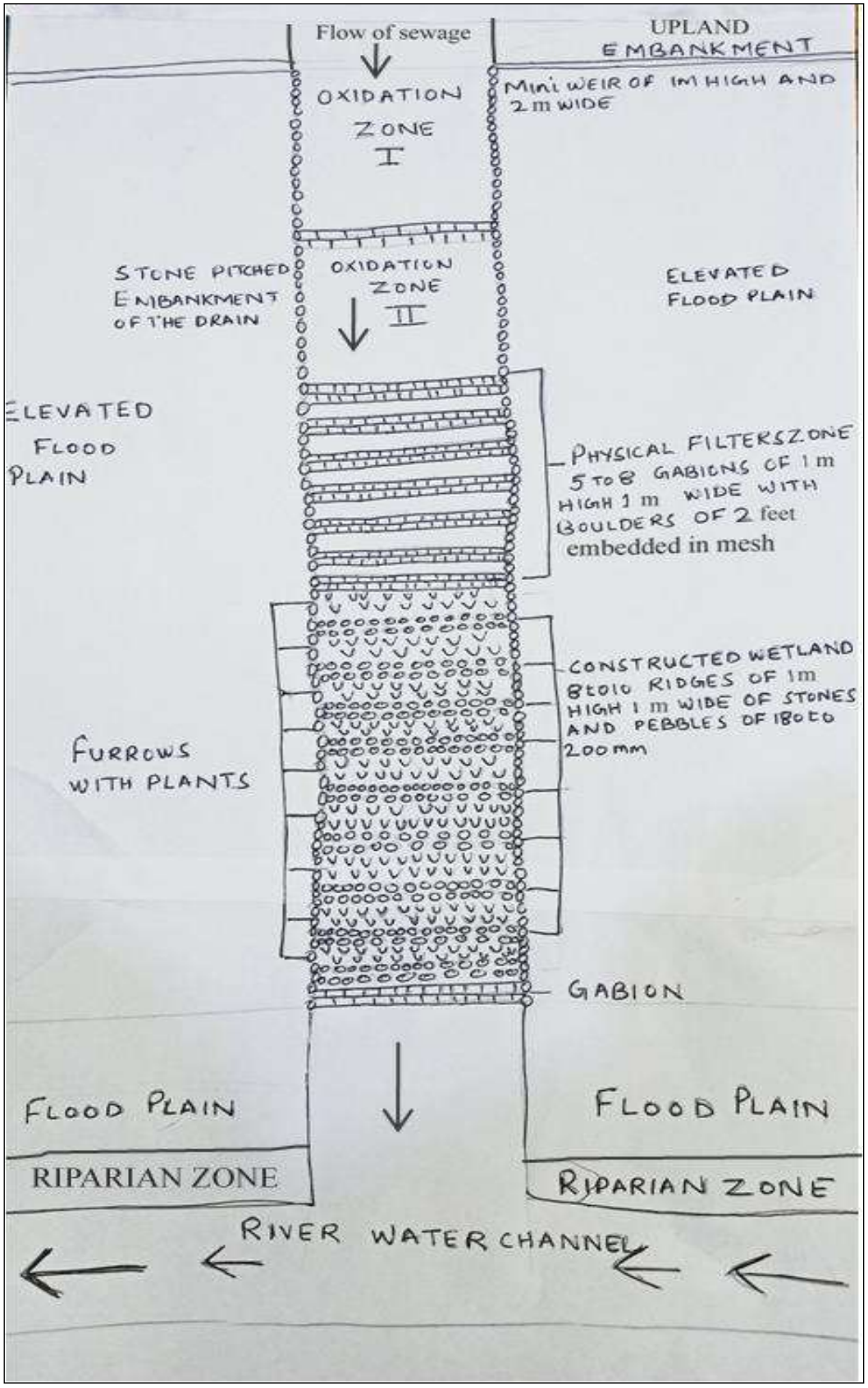


Figure: Schematic layout of a typical Constructed Wetland System for in-situ remediation of sewage/ industrial effluent of the drain that pass through Upland Elevated Floodplain of the riverscape.

Preparation of Detailed Project Report (DPR) for the Development of Biodiversity Parks in Riverscapes

After knowing the detailed procedural steps for planning, designing and developing of Biodiversity Parks in Riverscapes, it is important to know how to prepare DPR for approval of the Project by the Competent Authorities and for implementation.

The DPR should have the following details:

(1) A brief introduction to the Project. This should contain the background on the ecological issues of the stretch of river selected, and how Biodiversity Park would address the issues leading to the rejuvenation of the river stretch, and the benefits that the project can deliver to local communities. It should also include geomorphology and the hydrology of the river reach, in particular inflows and outflows.

(2) Contour map of the selected stretch with details in the upstream and downstream and upland area on either side of river banks; latitude and longitude, and topography of the selected site; demarcation of the area for Biodiversity Park on contour and also on Google Earth maps should be given.

(3) Description of site characteristics including the flora and fauna of upland area and embankment, details of floodplain landscape elements, riparian zone, in-stream characteristics such as flow rate, volume of water, depth of water, water quality, extent of fishing, aquatic flora and fauna, number of storm drains that carry sewage that enters into wetlands/ rivers, presence of wetlands/ swamps/ marshes/ lakes, and if present details of their vegetation and ecology, and land use of the site should be provided.

It should also include information related to: (i) its historical and cultural significance of the riverscape/ landscape/wetland and of that particular site; (ii) its environmental significance in terms of maintaining the balance of a healthy ecosystem; (iii) its ecological significance in terms of dependence of different life forms & abiotic compo**n**ents (the aquatic life, the terrestrial life, riverine flora) on this river and its resources; (iv) its subsistence livelihood dependencies; (v) various climatological challenges the river is facing; (vi) various man-made challenges the river is facing).

Regional Offices of BSI and ZSI can be approached for floristic and faunistic databases.

(4) Estimates for development of Nursery, which include costs of polythene bags, earthen pots, garden implements, a bore well, a polyhouse and fencing etc. and porta-cabin, should be given.

(5) Estimates for desilting or creation of wetlands/ marshes/lakes/swamps and use of desilted material for landscaping around the wetland /marshes/lakes/swamps (no transportation cost except in cases where it will be needed) should be provided.

The depth of wetlands /marshes/ swamps /lakes have already been specified in the earlier chapter; the width and length depends upon the existing wetlands/ marshes/ lakes or patches where hydrophytes (Cattails and *Phargmites*) are found.

(6) Estimation of costs for desilting of channels that connect the river/stream channel with wetland and lakes should be provided. The depth and width have already specified; the length depends upon the distance between the stream channel and the wetland/lake.

(7) Estimation of the cost of fencing as specified in the earlier chapters should be provided.

(8) Estimates for the restoration/recreation of riparian ecosystems, will involve the cost of stones and pebbles to be used in the area for diversification of habitat of the riverbed if the riverbed is not alluvial in nature, and desiltation, should be given.

(9) Estimation for the channelization and creation of treatment wetlands for treating stream water should be given. This depends upon the availability of area which cannot be submerged during low floods. The channelization should be atleast of 500m long and pass through a series of treatment wetlands.

(10) Estimates for the development of constructed wetland system for in-situ remediation of sewage that enters into channel through floodplains should be provided.

(11) Estimates for developing network of trails without concretization and paver blocks but lining on either side with stones should be provided.

(12) Cost of purchase of saplings from Forest Department nurseries and government nurseries for plantation should be given.

(13) Approximate cost of procurement of fish fingerlings of native fish species should be provided.

(14) Wages of atleast 20 Multi-Tasking Staff (MTS) as per the state government wages should be calculated.

(15) Salaries of 4 Scientists at the level of Scientist 'B' (one plant taxonomist, one animal taxonomist, one ecologist and one limnologist) should be included. Atleast 3 Field Supervisors at the level of Technical Assistant and one Administrative officer-cum-Accountant and one Office Assistant are required to develop and manage Biodiversity Parks. The salaries of these staff should be included in the annual recurring expenditure. The Biodiversity Park can hire a hydrologist as a consultant whenever his services are needed.

(16) Contingency and consumables are recurring grants, and these grants are also needed for day to day work and should be included in the budget.

(17) Costs of construction of NIC, toilets, office complex, and laboratory have to be estimated. Specifications have already been given in the earlier chapter.

(18) One Tractor with Accessories (about Rs. 8 lakhs), one field vehicle (about Rs. 4 lakhs) and one Motorbike (about Rs. 1 lakh) will be essential and should be included in the budget.

(19) Equipment for monitoring water quality will be required. This will cost about Rs. 5 lakhs.

(20) Estimates of one or two polyhouses of 20 m long and 10 m wide with exhaust fans should be provided.

(21) Depending upon the size of Biodiversity Parks, atleast 6-9 security staff will be required. The budget for engaging security staff should be provided.

(22) The duration of the project should be initially for 5 years.

(23) The DPRs should also include annual Operational and Maintenance (O&M) costs.

Management and Sustenance of Biodiversity Parks in Riverscapes

Riverscapes are dynamic systems and hence development, management and sustenance of river ecosystems require expertise, and continuous monitoring is a necessity. It is also important to document the lessons learned from the establishment of Biodiversity Parks.

About 4 scientists, 3 supervisors and 20 MTS are essential for the development of Biodiversity Parks in riverscapes. Atleast 6-9 security staffs are required. One Administrative Officer-cum-Accountant, one Office Attendant and one Documentation Officer are also needed.

An officer at the rank of Executive Engineer of Irrigation Department of the area or Divisional Forest Officer of the concerned Forest Division of the State Forest Department or a Special Officer on duty of the Municipal Corporation of the neighbouring town or urban centre should be the Incharge of the Biodiversity Park, and he/she will be responsible for the development and management of Biodiversity Parks. All the staff working in the Biodiversity Park will be reporting to him /her. A Technical Advisory Committee may be constituted with locally available experts (University/ College, BSI and ZSI) for providing technical help from time to time during the development of Biodiversity Parks.

Since the rivers and drains are under the control of State Irrigation Department, the management of Biodiversity Parks should be entrusted to state Irrigation department. Alternatively, the upland areas are mostly forest areas and belong to State Forest Department which has fairly large resources, and hence the state forest department jointly with Irrigation department should manage the Biodiversity Parks.

The State Pollution Control Boards (SPCBs) and CPCB should also be involved, as the Biodiversity Parks have role in improving the water quality and also in situ remediation of sewage that enters into rivers besides cleaning of river water through treatment wetlands.

A management committee consisting of senior representatives of Irrigation Department (Chief Engineer), Forest Department (Conservator of Forest of the concerned Division), Department of Fisheries (senior officer), Department of Tourism (senior officer), State Pollution Control Board (regional officer) and representative from the Municipal Corporation/Village Panchayat should be constituted to oversee the development of Biodiversity Parks.

The Chief Engineer of the Irrigation Department or Conservator of the concerned Forest Division will be the Chairman of the committee and EE or DFO (Incharge of Biodiversity Park) will be the member secretary of the Management Committee. The committee should be empowered one and should take all the decisions on the development and management of Biodiversity Parks.

It may be noted that any institutional arrangement to manage the Biodiversity Parks should involve local communities and the stakeholders in the riverscape and landscape because

community driver participatory management of Biodiversity Park will link community livelihoods with the sustenance of the Park.

Periodical appraisal of developed Biodiversity Parks should be done to ascertain their effectiveness. The management should also evolve a financial mechanism to meet the annual O&M costs.

The Guidelines may be revised after a decade, by which time the limitations if any in the present Guidelines is known.

Annexure – IV: Textile Charter

Save Water Stay Green

Charter for Pollution Prevention in Ganga Basin Area for Textile Industry



Annexure – IV: Textile Charter

1. Prologue

The Indian textile industry is one of the important and oldest industrial sectors of the country which has shown tremendous growth potential in past few years. This industry is marked with diversity features. Production capacity varies in Indian textile industry. It uses a wide variety of raw materials & processing technology which makes standardization of production process difficult. The industry also uses a wide spectrum of technology, which varies among industries as well as within the industry. The major challenges being faced by this industry are improvement in resource efficiency, sustaining in global competition, natural fibre shortage and addressing the environmental issues & challenges. Although during the last decade, the Indian textile industry has implemented various steps on the upgradation of technology and cleaner production initiatives leading to improvement in various indicators such as specific energy consumption, specific water consumption and specific effluent generation, issues of technological obsolesce and lack of standardization in production process are needed to be addressed urgently in a mission mode for the sustainable growth of textile industry in the new order of environmental compliance and in global competition.

2. Indian Textile Industry & categories

Textile industries in India are in various forms ranging from small scale scattered, hand-looms, to garmenting & in organized clusters, units having automated modern machines for manufacturing fibers to fabrics. It includes different types of fiber such as cotton, silk, wool, synthetic (mainly Polyester, Nylon and Acrylic) as well as mixtures of these fibers (such as cotton + synthetic, cotton + wool) are used in the Indian textile units. Processed textile comprise various processes like –

a) Spinning & Fibre processing
b) Weaving, Knitting
c) Processing
d) Industrial Textile / Garmenting

The process flow diagram for a typical textile mill is shown in Figure 1.

On the basis of raw materials to finished products, the textile mills can be grouped as composite mills where final products (textiles) are produced by the use of raw material (fibers) and these are large units where huge investments are required. In addition to this, there are certain small segments of large industry called as ginning, spinning, weaving, processing, garmenting, laundry etc.

Above processes can be further categorized as under depending upon difference in production lines & raw material involved.

1) Cellulosic Material
- Woven
- Knitting

2) Technical Textiles Manmade Material
- Woven
- Knitting
- Technical Textiles

3) Wool/Silk Material
- Woven
- Knitting
- Technical Textiles

4) Cotton/Synthetic Mixed Material

- Woven
- Knitting
- Technical Textiles

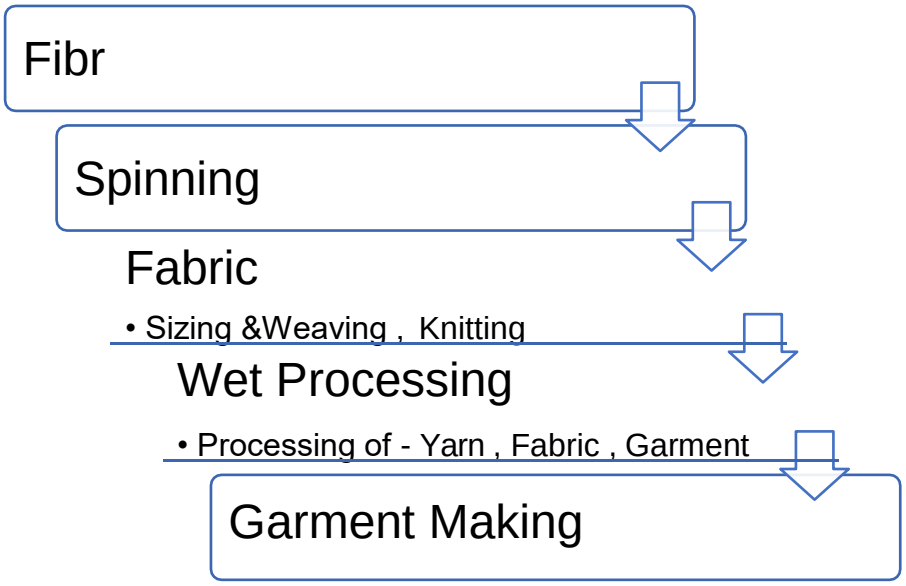


Figure 1 Generalized process flow diagram for a typical textile unit

Above mentioned broad segments may have various processes depending upon the end-product to be produced. For example, typical processing steps involved in producing different end-products from cellulosic, man-made fibers, wool and silk can be categorized as given in Table 1 and 2.

The process flow diagrams for various textile mills including carpet units are shown in Figures 2 to 7 given below. Above all segments have various processes depending upon end product. Processing steps involved in different end products can be categorized as under.

Table 1: General Processing Steps for Cellulosic Fiber, Man-Made Fiber, Cellulosic + Man Made Fiber Blend based, Carpet and Technical Textiles

Steps	Woven	Hosiery	Hosiery	Carpet / Tech Textile	100% Synthetic & others
Fibres used	**Cellulosic & Man-made Blends**	**Cellulosic**	**Cellulosic & Man-made Blends**	**Mix**	**Polyester / Acrylic/ Others**
Ginning Industry	Ginning	Ginning	Ginning	Ginning	
Spinning Industry	Carding/ Combing Blending	Carding/ Combing	Carding/ Combing Blending	Carding/ Combing Blending	
	Spinning	Spinning	Spinning	Spinning	Spinning
Fabric Making – Loom Shed	Sizing			Weaving	Weaving
	Weaving	Knitting	Knitting	Non-Woven	
	De-sizing				

Wet Processing Industry / Process-House	Scouring / Bleaching	Scouring / Bleaching	Scouring / Bleaching	Scouring / Bleaching	Scouring (Removal of lubricants)
	Dyeing / Printing	Dyeing / Printing	Dyeing / Printing	Dyeing / Printing	Dyeing / Printing
	Finishing	Finishing	Finishing	Finishing	Finishing
Garment industry	Garmenting	Garmenting	Garmenting	End Product	Garmenting
Laundry	Garment washing	Garment washing	Garment washing		Garment washes if required

Table 2: General Processing steps for wool & silk industry

Fibre cleaning	Scouring De-gumming, Bleaching
Fibre colouring	Dyeing
Spinning	Blending
	Spinning
Fabric making	Weaving/ Knitting
Wet Processing	Scouring / Bleaching
	Dyeing / Printing
	Finishing
Garment industry	Garmenting / End Product
Laundry	Garment washing

Textile Processing Operations

Typical textile processing operations involve over a dozen unit operations (or steps) and require nearly equal number of machines. Table 3 gives the typical list of various unit operations together with their applications. Table 4 gives the list of typical machines and the operation for which these are used.

In Table 3, various unit operations in textile processing & their applicability is mentioned in table no 3. All processing units may not essentially follow all the operations. Depending upon end-product & desired quality requirement, some operations may be combined or skipped.

Table 3: Textile process operations

S. No.	Process Name	Applicability on Substrate
1.	Desizing (using Enzyme)	Cotton Fabric / Garments
2.	Desizing (using Alkaline medium)	Cotton Fabric / Garments
3.	Kiering	Cotton Fabric
4.	Scouring	Cotton Grey Yarn and / Fabric
5.	Scouring- cum- bleaching	Cotton Grey Yarn and / Fabric
6.	Mercerizing	Cotton Grey Yarn and / Fabric
7.	Bleaching	Cotton Grey Yarn and / Fabric, Silk Fibre / Yarn , Wool Fibre/Yarn ,
8.	Neutralization / souring	Cotton Fabric / Yarn
9.	Carbonization	Blend (Cotton) Fabric
10.	Dyeing	All types of substrates- Cotton , Wool, Polyester, Acrylic, Silk, Viscose
11.	Reduction Clearing	Polyester.

12.	Anti-static finish	Polyester, Acrylic
13.	Soaping	Cotton, Wool, Polyester, Acrylic, Silk, Viscose.
14.	Finishing	Cotton , Wool, Polyester, Acrylic, Silk
15.	Printing (Screen , Rotary , Roller & Block)	Fabric - Cotton , Polyester, Silk, Regenerated cellulose

Table 4 Textile Processing Machines and Operations of their Use

S. No.	Machine Name	Wet Process Operation
1	Kier	Kiering, Boiling, Scouring
2	Desize	Desizing
3	Zero- Zero	Anti –shrinkage
4	Jigger	Desizing, Scouring, Washing, Bleaching, Dyeing, Soaping , Dye fixing, Neutralization / souring
5	Continuous Bleaching and / Dyeing Machine	Bleaching and / Dyeing of fabric
6	Winch	Desizing, Scouring, Washing, Bleaching, Dyeing, Soaping , Dye fixing Neutralization / souring
7	Mercerize	Mercerization
8	HTHP – Carrier	Fibre Dyeing, reduction, Soaping, Antistatic
9	HTHP – Package Dyeing	Yarn Dyeing
10	Soft Flow	Fabric Dyeing
11	HTHP – Jet Dyeing	Fabric Dyeing
12	Cabinet Dyeing	Hank Yarn Dyeing
13	Printing	Screen , Rotary , Roller & Block printing
14	Continuous Yarn Dyeing	Denim Yarn Dyeing (Continuous)
15	Stenter	Finishing

Figures 2 through 4 show the flow diagrams for typical composite cotton, silk and woolen textile mills for processing of raw cotton, silk and wool to finished textile products, respectively. Figures 5 and 6 show the process flow diagrams for garment manufacture from 100% grey cotton fabric and grey polyester + cotton and polyester+ viscose fabric, respectively. Figure 7 shows the typical process flow diagram for carpet manufacture. In each case, the operations requiring fresh water and generating wastewater are also indicated.

Waste Water	**Water**
Solids, BOD/COD pH, Color	
BOD/COD	
BOD/COD, pH	BOD/COD , pH

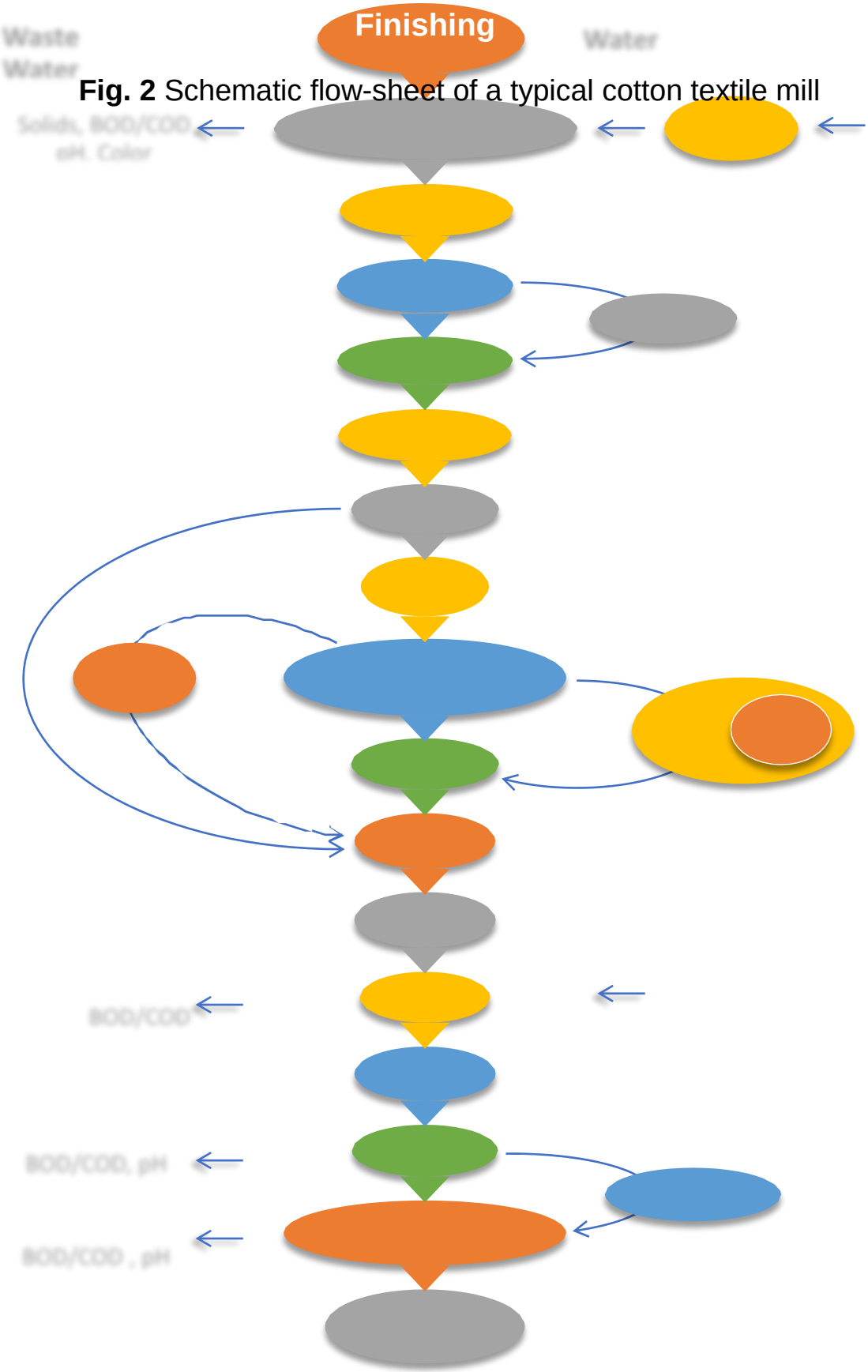


Fig. 2 Schematic flow-sheet of a typical cotton textile mill

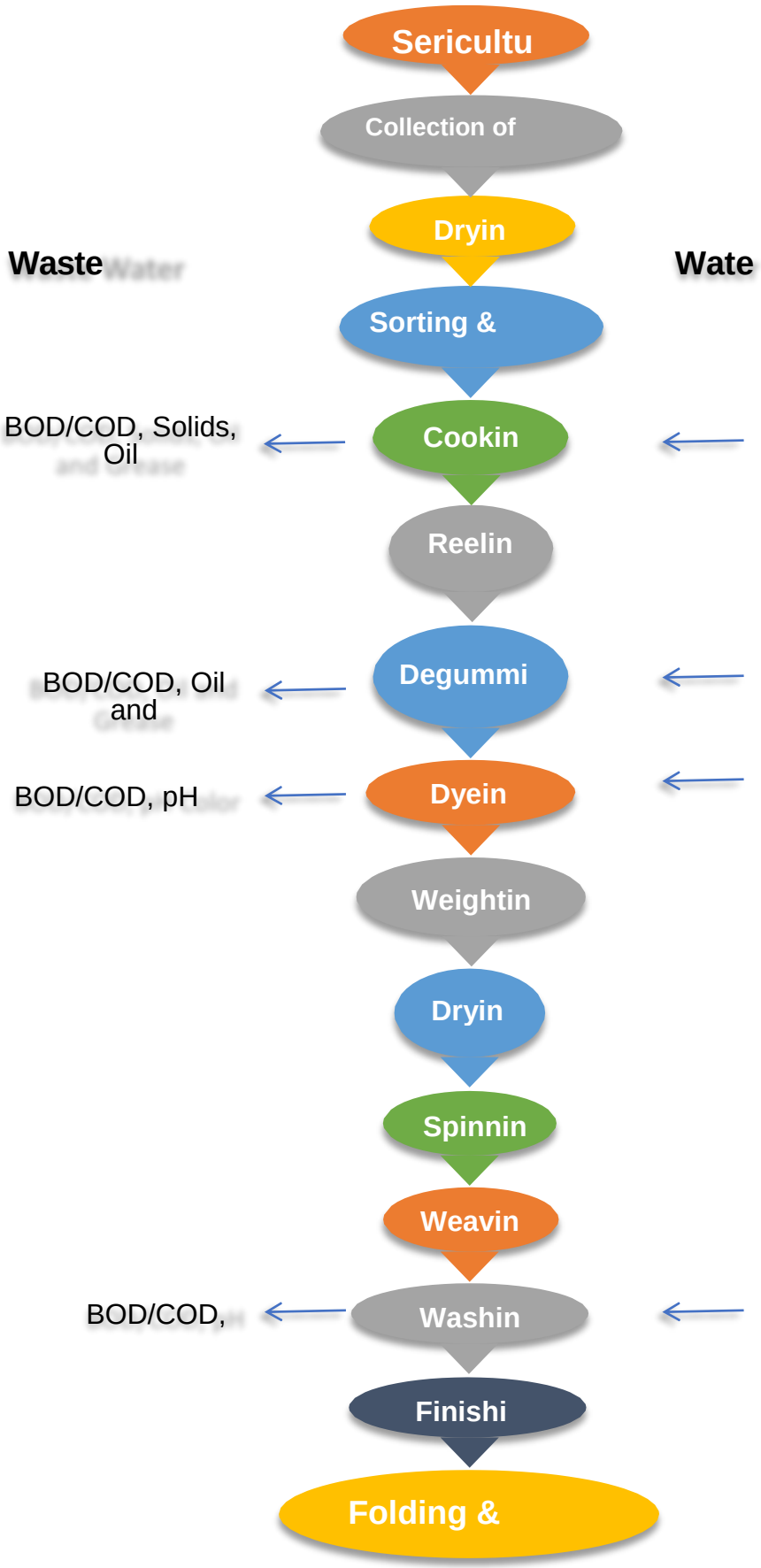


Fig. 3 Schematic flow-sheet of a typical silk textile mill

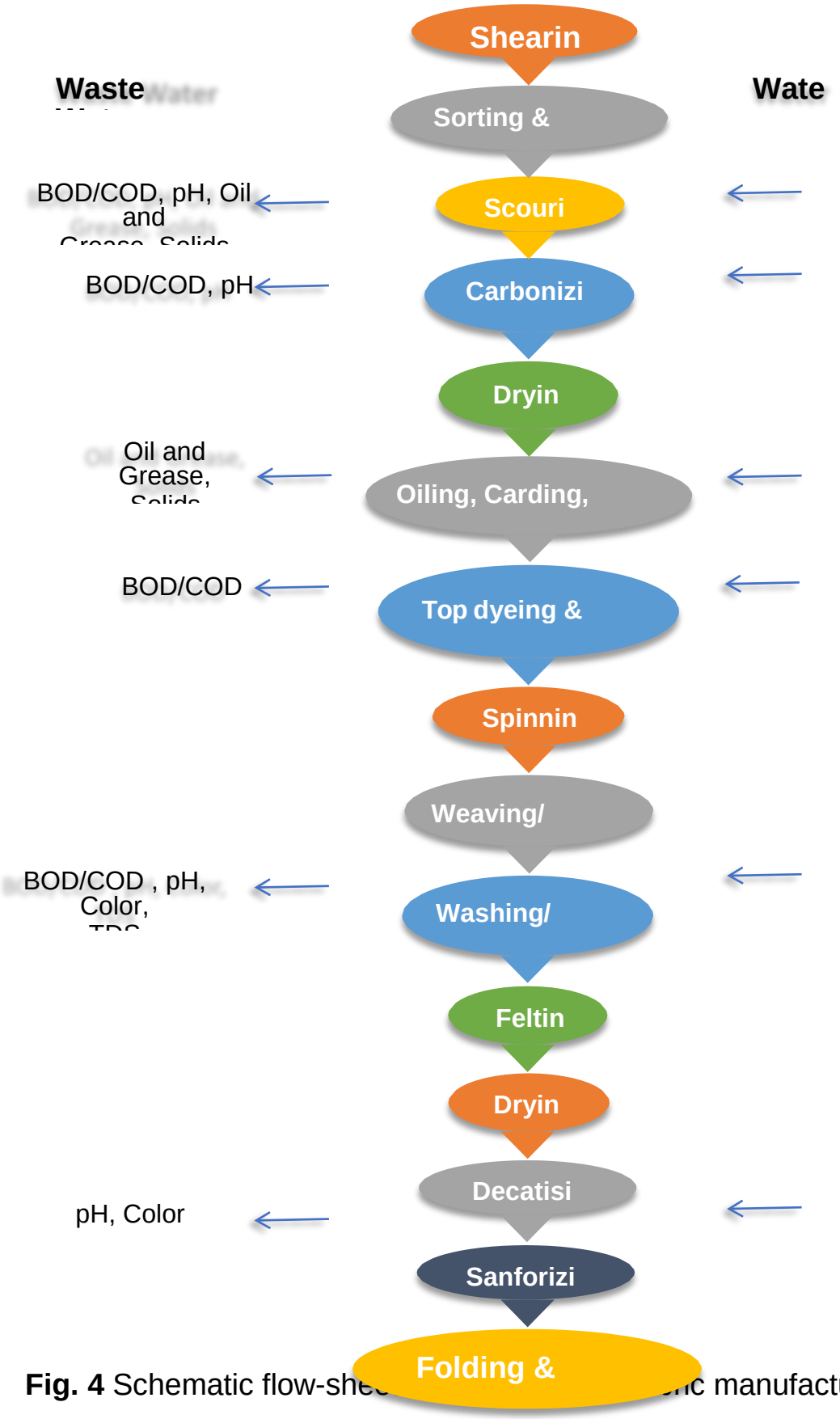


Fig. 4 Schematic flow-she ic manufacture mill

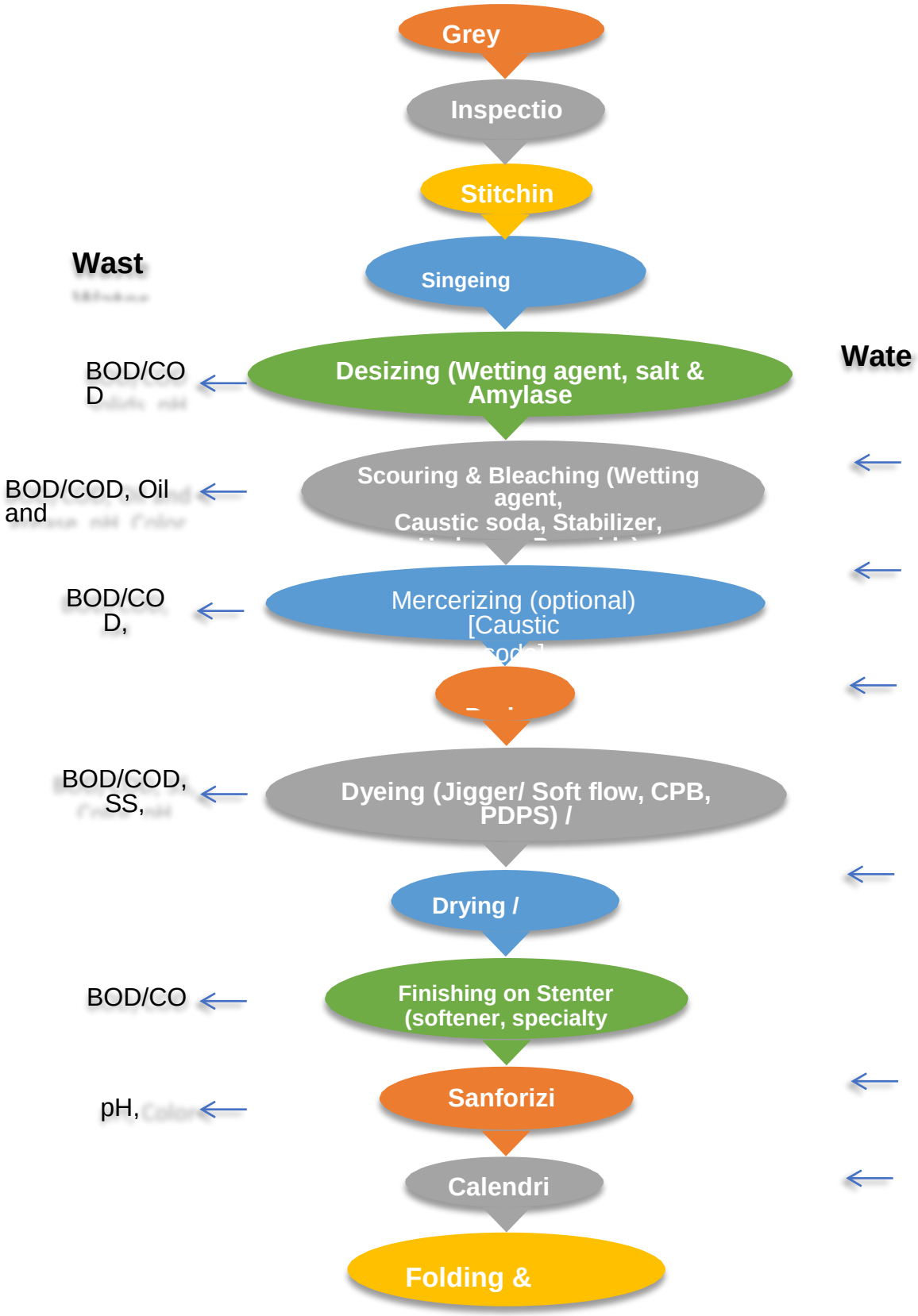


Fig. 5 Schematic flow-sheet of garment manufacture from 100% grey cotton fabric

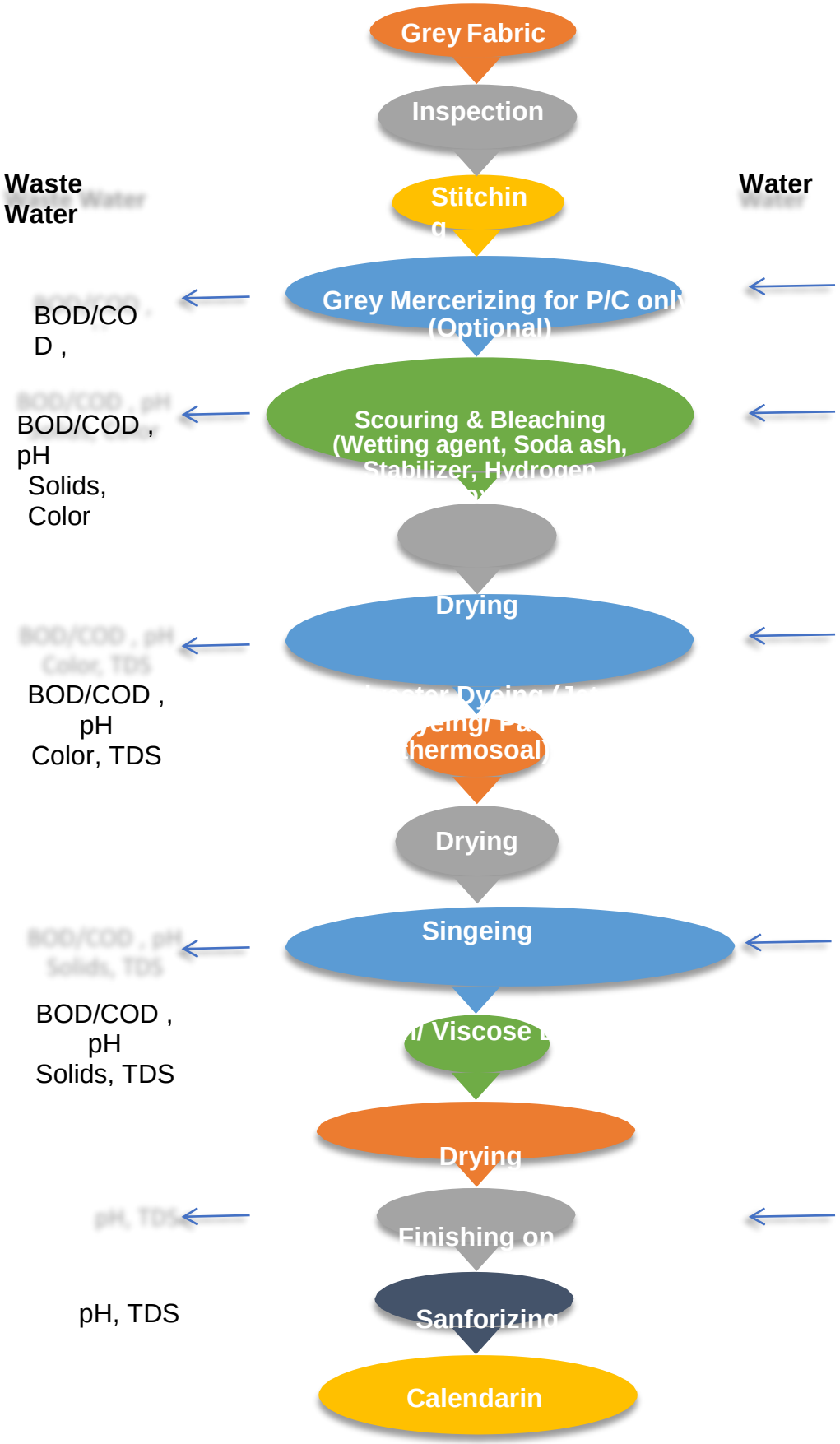


Fig. 6 Schematic flow-sheet of garment manufacture from gray polyester + cotton & polyester + viscose

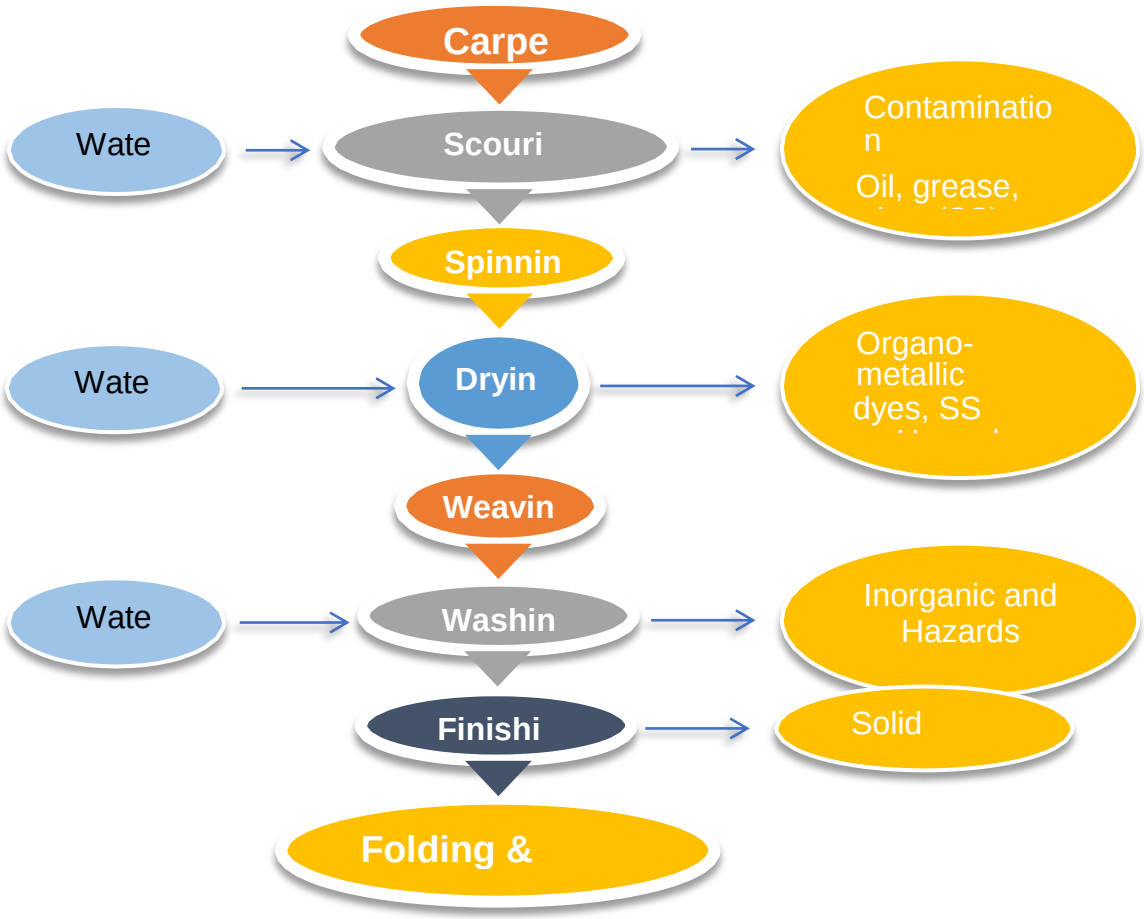


Fig. 7 Schematic flow-sheet of a typical carpet manufacturing process

Various processes being carried out in above mentioned textile industries that generate liquid pollutants together with their possible impact on receiving water bodies like river Ganga (and its tributaries) are listed in Table 5.

Table 5 Processes Generating Pollution Load and level of their Impact on Ambient Water Quality

Process	Steps	Impact	Remarks / Comments
Cleaning of fibre	Wool, Silk, Jute, Raw cotton package dyeing	Major	Effluent generation
Ginning Industry	Raw cotton mechanical cleaning	Minor	Major solid waste generation
Spinning Industry	Yarn making	Minor	Major solid waste generation
Fabric Making – Loom Shed	Sizing	Major	Effluent generation
	Weaving	None	
Wet Processing Industry / Process-House	De-sizing	Major	Effluent generation
	Scouring / Bleaching	Major	Effluent generation
	Dyeing & Printing	Major	Effluent generation
	Finishing	Minor	Effluent generation
Garment industry	Garment making	Minor	Solid waste generation
Laundry	Garment Washing, Dyeing, Printing	Major	Effluent generation

From Table 5 and Fig. 3 to 7, it is clear that almost all operations of textile industry generate varying volumes wastewater loaded with various pollutants that are likely to have varying levels of impact on receiving water bodies like river Ganga and its tributaries

From the basic processes discussed above for various textile industries and from the current practices adopted by the industry, it is evident that large volume of water and a variety of chemicals including dyes are used in textile mills at various stages from fiber processing to finished product manufacture. There is a need to understand the characteristics of effluent generated from textile mills to plan for effective and efficient waste water treatment. Characteristic parameters of typical textile mill waste water are as under:

1) Total Suspended Solids (TSS)
2) Total Dissolved Solid (TDS)
3) pH
4) Temperature
5) Color
6) Chemical Oxygen Demand (COD)
7) Biological Oxygen Demand (BOD)
8) Oil & Grease
9) Sodium Absorption Ratio (SAR)
10) Other Substances such as:
11) Total chromium as ‘Cr’
12) Sulfide as ‘S’
13) Phenolic compounds as ‘C_6H_5OH’
14) Ammonical nitrogen as ‘N’

NOTE: The parameters should be as per notified standards.

The liquid effluent thus generated is required to be treated for recycle and reuse in the process to minimize the discharge. It is also emphasized that efforts have to be made to use best practices and the processes to minimize water consumption besides using appropriate technology for wastewater treatment.

Specific norms for treated effluent have been notified under the Environmental (Protection) Rules, 1986 that must be strictly monitored before discharge outside the mill premises

It is understood that textile industry is one of the important and growing industries in India. Chemical wet processing of textile consumes approximately 10000 chemicals, dyes and auxiliaries and some of them are banned due to their carcinogenic nature and adverse impact on biota. It is imperative to produce quality goods at economical price but not at the cost of environment and human health and hygiene. Due to the hazardous nature of chemicals used in textile production, many adverse impacts are seen on human beings, animals / plantation and atmosphere which are a matter of global concern. To overcome this concern, it is essential to understand the matter in depth especially in textile production areas by using eco-friendly techniques right from fiber procurement and processing (cotton growing, jute growing, sheep rearing, sericulture and synthetic fiber manufacture) to finished marketable products manufacture. Especially the Indian textile processing industry being major consumer of water for processing and hence major polluter, from pre-treatment to finishing, needs to concentrate on selection of chemicals and process parameters. Self-assessment of chemical inventory and chemical management systems will further help to comply with global chemical legislation, Retailer & Brand Restricted Substance Lists (RSL's) and Manufacturing Restricted Substance Lists (MRSL's) not only in adhering to environmental norms but in getting fair share of global business.

Textile industries use different chemicals in different processes like De-sizing, Scouring, Bleaching, Dyeing, Printing, Finishing, Softening, Washing, etc. The textile processing industries consume large quantity of water and produce large volume of effluent from different steps of various processes. Waste water from textile processing and dye containing residues requires appropriate treatment before being released into environment.

Recent consciousness about eco-friendly processing in textile industry has increased awareness of environmental issues. Implementation of effective Chemical Management System CMS) can help to reduce NPO (Non-Productive Output) and hence the pollution load on ETP in addition to conforming to the quality of products right since beginning as per the customers' requirements.

2.1 **List of Chemicals used in Textile Industry**

There are various chemicals used in textile industry. These chemicals are categorized in to 11 priority groups as under;

1) Phthalates
2) Alkyl-phenol Ethoxylates (APEO),
3) Azo Dyes
4) Brominated & Chlorinated Flame Retardants
5) Chloro-phenols
6) Chlorinated Aromatics
7) Chlorinated Solvents
8) Organotin Compounds
9) Short Chain Chlorinated Paraffin's (SCCPs)
10) Heavy Metals
11) Per-fluorinated Chemicals (PFCs)

Process wise list of harmful constituents and related pollution parameter along with their characteristics and level of impact on environment is as given in Table 6.

Table 6
Major Constituents Involved in Various Textile Processes, their Characteristic Parameters and Pollution Impact

Process	Major Constituents	Characteristics	Pollution impact Low, Medium, High
Cleaning of Raw Fibres	- Oil, - Fats Waxes, - Proteins & Pectines	COD, BOD, Turbidity	H
Sizing	- Starch derivatives - Semi-synthetic sizing agents (CMC, CMS) - Synthetic sizing agents (PVAs, polyacrylates) - Additives : - Urea - Glycerin - Waxes and oils - Preserving agents	BOD COD Temperature	H M L M
Desizing	- Acids or Enzymes	BOD (30-40% of total) COD Temperature (60-70^{o}C)	H H
Scouring	- Saponified waxes, oils, fats - Surfactants - Alkali - High temperature	Oil, fats BOD (30% of total) pH (high) Temperature (70-80^{o}C) Dark colour	H H H H H
Bleaching	- Residual bleaching agents - Stabilisers - Surfactants - Wetting agents - Mild alkalinity		 M
Mercerisation	- Alkali (NaOH) - Surfactants - Dissolved matter	BOD pH (high) TDS	H H H
Dyeing	- Dyestuffs (direct, vat, reactive, sulphur, pigment) - Electrolytes - Carriers - Acids and alkali - Heavy metals - Oxidising agents - Reducing agents - Surfactants and levelling agents	Toxicity BOD Suspended solids pH Strong colour	H H H H H

L= Low, M= Moderate, H= High

Pollution load from textile mills differ widely depending upon the nature of fibre used and the level of processing employed. Organic ingredients in the waste water undergo bio-degradation and reduce dissolved oxygen content (DO) of the receiving water body and thus destroy the aquatic life. Phenolic chemicals impart bad odour and taste to the water mass. The organics should be removed to prevent any chances of stream water becoming unsuitable for agricultural, domestic and industrial use.

Solids in textile mill wastewaters come from fibrous substrate and process chemicals. These affect oxygen transfer capacity and reduce light penetration and thus affect photo-synthetic activity in the waterbody.

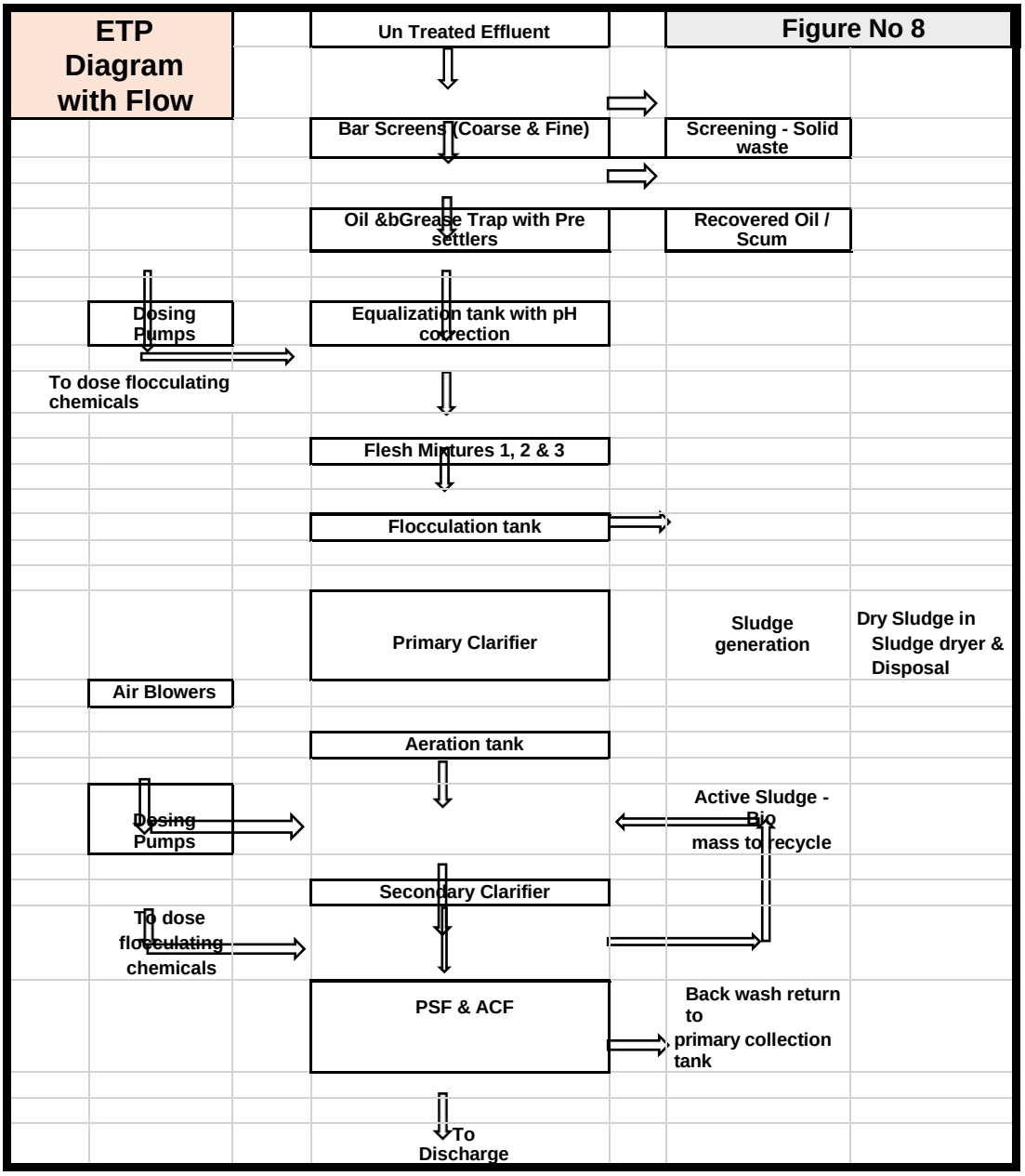
Soluble inorganic salts may make the receiving water bodies unfit for domestic and industrial use. Heavy metals are toxic to aquatic life.

Proper treatment of waste water will reduce the concentration of these chemicals and pollutants as well as their harmful effects and prevent environmental degradation and provide opportunities for further use of the treated water through recycle. Some measures may also need to be adopted to reduce pollution load (both in terms of concentration and volume) e. g.; strong rinse waters from dye houses may be used to prepare fresh dye-baths whereas dilute waste waters may be recycled after appropriate treatment within the plant. Saving of chemicals in the first situation may be enough to pay for the cost of treatment in the second situation.

After taking all possible steps to reduce pollution load and volume of waste water, the remaining pollutants still do not permit the disposal of wastewater in to a water body. These pollutants may be removed or reduced to an un-harmful level (conforming to the effluent disposal norms) by treating the waste water using a variety of treatment steps and combination of sequences. The best treatment sequence, however, may vary from mill to mill.

Figure 8 shows a typical treatment scheme for treating waste water from a standard textile mill. The waste water from various units is brought to a holding/equalization tank for evening out the concentration and flow. It is then passed across a screen to remove floating substances like fibres, etc. The screened effluent is then taken to a grit-chamber –cum-primary settling chamber where heavier and relatively lighter settleable inorganic and organic solids are removed by settling. The clarified effluent is then passed to a biological reactor (usually an activated sludge plant or ASP) coupled with a secondary settling chamber. Most of the biodegradable organic pollutants are removed through biological reaction in ASP and the excess bacterial mass thus formed is settled out in secondary clarifier. The clarified effluent from the secondary clarifier may be further treated by passing it through a tertiary treatment unit (a series of activated carbon filters + sand bed filters). The treated effluent may now be discharged onto land or into a receiving water body. If its recycling is required within the plant itself, it may have to be subjected to further treatment using ultra-filtration/nano-filtration/and/or reverse osmosis units. The sludge produced in primary and secondary settlers and tertiary treatments units is separately collected and suitably disposed of after appropriate treatment. In case it contains toxic chemicals, it has to be disposed of at land-fill sites built specially for such wastes.

Figure 8 The treatment scheme for treating waste water from textile mills



3. Problem Analysis

Focal Problems to be Solved

Textile industries have been put under the categories of grossly polluting industries. These industries have high water pollution potential. The major environmental issues related to Indian textile industries include high volumes of fresh water consumption and waste water discharge, adverse impact on receiving streams due to high pollution load, high color in effluents due to presence of dyes, ETP sludge disposal and management, and poor performance of ETPs. The effluent discharge standards implemented so far are based on the premises that the back-ground river water quality is very good and at least 10 times dilution is available. However, these conditions are not being met in most of the Indian rivers in which treated / partially treated / untreated industrial and domestic effluents are being discharged in increasing amounts. As such it is essential that treatment up to tertiary level be made mandatory.

In addition to this, there is a need to reduce water usage in textile industry. This will reduce the requirement of fresh water by the industry that can in turn lead to reduced consumption of natural resources like water, fuel & power.

The reduction of water input can be done by two ways;

1) Optimization of process parameters: Optimization of process parameters will

result in reduced water consumption which is quite possible by the use of latest developments in process technology and machinery manufacturing with low liquor ratio, smart washing cycle, and immaculate controls.

2) Water recycling - Water recycling between several processes is possible, but its potential has not been exploited by textile units. This is possible at two stages:
   - Recycling of water internally in selective processes.
   - Recycling of treated effluent by setting a UF/RO/Nano filters at the end-of- pipe line

Such reduction in fresh water consumption within processing units at various stages will reduce the pollution load on ETP and improve the quality of treated effluent.

Present scenario indicates that the ETPs of most of the textile units perform much below the expected level and the effluent discharge norms are violated quite often. Several reasons including lack of knowledge and expertise to manage the ETPs are cited by the industry for poor performance of ETPs. It is suggested that each textile unit must have properly qualified trained employees to run and maintain the ETPs. The industry must employ graduates with degrees in Environmental Science or Technology and/or B Tech. (Chemical/Civil/Textile Eng.). The B Tech (Civil/Textile) engineering graduates must have studied courses in environmental pollution control. All such persons should be periodically subjected through refresher courses/workshops/practical training programs of about a week duration.

At present there seems to be inadequate control on the quantity of fresh water used and waste water discharged from the textile industries due to use of obsolete process technology and age-old practices and lack of implementation of polluter pays principle. These coupled with the lack of awareness and typical mind set are the main de-motivating factors responsible for indiscriminate use of precious natural resources in general and fresh water in particular in most of the industries.

It would be appropriate to decide standard norms for usage of water by the textile industry with time bound commitments in a phased manner. The time line for this is described in Table 7 given below:

Table 7 - Time Line for Water consumption in Textile Industry

Process Category	Within six months	Within one year	Within two years
Unit	**L/kg**	**L/kg**	**L/kg**
Raw Wool	**250**	**200**	**170**
Scoured Wool	**100**	**80**	**68**
Polyester	**60**	**48**	**41**
Acrylic	**50**	**40**	**34**
Woven	**120**	**96**	**82**
Raw Silk	**200**	**160**	**136**
Processed Silk	**85**	**68**	**58**
Knit	**85**	**68**	**58**
Canvas	**45**	**36**	**31**
Carpet	**50**	**40**	**34**
Woven cotton	**120**	**96**	**82**
Blend PC	**120**	**96**	**82**
Blend PV	**90**	**72**	**61**
100% Poly	**60**	**48**	**41**

	100	**80%**	**68%**

Important Note: - The effluent generation will be calculated as 85% of water consumption in all the categories which can be calculated against Table No 7.

Table 7.1 - Time Line for Effluent Generation in Textile Industry			
Process Category	**Within six months**	**Within one year**	**Within two years**
Unit	**L/kg**	**L/kg**	**L/kg**
Raw Wool	**213**	**170**	**145**
Scoured Wool	**85**	**68**	**58**
Polyester	**51**	**41**	**35**
Acrylic	**43**	**34**	**29**
Woven	**102**	**82**	**70**
Raw Silk	**170**	**136**	**116**
Processed Silk	**72**	**58**	**49**
Knit	**72**	**58**	**49**
Canvas	**38**	**31**	**26**
Carpet	**43**	**34**	**29**
Woven cotton	**102**	**82**	**70**
Blend PC	**102**	**82**	**70**
Blend PV	**77**	**61**	**52**
100% Poly	**51**	**41**	**35**
	100	**80%**	**68%**

This chart shows water consumption / effluent generation at various stages of textile industries. Water consumption per kg of product for within six months from charter implementation has been frozen as upper limit. The next reduction targets have been kept within one year from charter implementation (20% reduction) and within two years from charter implementation (15% reduction), respectively for reduction in water consumption.
Effluent generation allowance limit will be considered as 85% of water consumed.

Root Cause of the Problems

Most of the textile-industries-are using obsolete technologies with average age of equipment/ machines much higher than obsolescence. This has resulted in high raw material, energy and water consumption and less efficient operations, causing high volume and concentration of waste streams.
Though most of the textile mills have enhanced their production capacity over the period of time but the augmentation and up-gradation of ETPs have not been adequately addressed to. Moreover, most of ETPs have been set up by mills themselves and are quite often based on improper design without being subjected to adequate performance assessment.

Presently, ETPs consist of two main stages physical and biological treatments and are not adequate to provide requisite level of treatment to the effluent to comply with the prescribed effluent norms and/or to meet the process water quality for wastewater recycling within the process.

The operation and maintenance of ETPs are not always satisfactory. Mills avoid operation of air blowers installed in the aeration tanks of ETPs regularly. More often than not, most mills neither have trained manpower for operating ETP nor proper laboratory facility for measuring and analyzing various performance parameters. Mills also lack proper record keeping and a sound system for monitoring of water consumption and effluent discharge.

SPCBs have inadequate resources for intensive performance monitoring and surveillance activities for compliance verification of these mills. There is a need for strengthening of institutional network to meet the technical requirements of textile industries such as technical knowhow for process and ETP up-gradation, training programmers and monitoring.
Most important thing is the mind set of mill owners and ETP officials that needs to be changed.

The upgradation in technology and process is therefore necessary for improved performance and competitiveness through quantifiable increase in productivity, quality improvement with reduced cost, better energy efficiency and environmental compliance. High cost of energy (specially fuel) and the consequent environmental implications, make it imperative for the textile industry to adopt energy efficient and eco–friendly technologies, increase automation and control, optimize process operations, increase reuse and recycling wherever possible of process water and treated effluent, upgradation / modification of ETPs, adoption of Chemical Management System (CMS) and Chemical Recovery System (CRS) for chemical and dye bearing waste water in textile mills (individual / common) and promotion of biotechnological applications.

Challenges

- The current practices adopted by the industry, it is evident that large volume of water and a variety of chemicals including dyes are used in textile mills at various stages from fiber processing to finished product manufacture. There is a need to understand the characteristics of effluent generated from textile mills to plan for effective and efficient waste water treatment.
- It is also emphasized that efforts have to be made to use best practices and the processes to minimize water consumption besides using appropriate technology for wastewater treatment.
- Waste water from textile processing and dye containing residues requires appropriate treatment before being released into environment.
- Most of the textile-industries are using **obsolete technologies** with average age of equipment/ machines much higher than obsolescence. This has resulted in high raw material, energy and water consumption and less efficient operations, causing high volume and concentration of waste streams.
- Though most of the textile mills have enhanced their production capacity over the period of time but the **augmentation and up-gradation of ETPs** have not been adequately addressed to. Moreover, most of ETPs have been set up by mills themselves and are quite often based on improper design without being subjected to adequate performance assessment.
- Presently, ETPs consist of two main stages physical and biological treatments and are not adequate to provide requisite level of treatment to the effluent to comply with the prescribed effluent norms and/or to meet the process water quality for wastewater recycling within the process.
- 'Charter for Water Recycling and Pollution Prevention in Textile Industries' (here in after referred to as 'the Charter') is formulated, with a view to **envisage upgradation of the status of textile industries** in terms of process technology, practices and environmental performance, besides substantial reduction in the fresh water consumption and waste water generation and compliance with the prescribed environmental norms to achieve desired level of environmental protection and to meet objectives of the National Mission for Clean Ganga.

- The Charter suggests **Bare Minimum Technology (BMT)** as an indication of the set of desired technologies or its appropriate alternatives required for implementation by the Textile industries operating in the Ganga River Basin States.
- the importance of resource conservation, water reuse and recycle, and efficient functioning of ETPs, it is essential to create an environmental management cell (EMC) (or strengthen it if already existing) and **establish laboratory facilities** for evaluating basic pollution parameters capable of indicating the functioning of ETPs will be mandatory.

4. Objectives of the Charter

Central Pollution Control Board (CPCB) has formulated the 'Charter for Water Recycling and Pollution Prevention in Textile industries in consultation with experts from the departments of Chemical Engineering & Technology, IIT (BHU), Textile Engineering, IIT Delhi, Polymer and Fiber Technology, IIT Delhi, Fiber and Textile Processing, ICT, Mumbai, UP Textile Technology Institute, Kanpur and Textile industries.

One of the important objectives of charter is to setup a bench mark for water consumption & optimize the use of water & chemicals in processing.

'Charter for Water Recycling and Pollution Prevention in Textile Industries' (here in after referred to as 'the Charter') is formulated, with a view to envisage upgradation of the status of textile industries in terms of process technology, practices and environmental performance, besides substantial reduction in the fresh water consumption and waste water generation and compliance with the prescribed environmental norms to achieve desired level of environmental protection and to meet objectives of the National Mission for Clean Ganga.

The Charter suggests Bare Minimum Technology (BMT) as an indication of the set of desired technologies or its appropriate alternatives required for implementation by the Textile industries operating in the Ganga River Basin States. The Charter takes a holistic approach for pollution prevention by emphasizing on process technology up-gradation, adoption of best practices, besides desired improvement in effluent treatment including tertiary treatment to reduce fresh water requirement, improve effluent quality and optimize water recycling. Compliance with the prescribed standards is mandatory. There will be no compromise with regard to the industry not meeting the prescribed standards.

All Time Compliance with Environmental Norms

The Charter envisages upgradation of the status of textile industries in terms of process technology, practices and environmental performance to the prescribed level, besides substantial reduction of fresh water consumption, waste water generation and compliance with the prescribed environmental norms on continuous basis.

Water Conservation

The ultimate objective of the Charter is to envisage the possible reuse & recycling of treated effluent into production process & to minimize fresh water consumption.

Increased Productivity

The Charter emphasizes on the installation of minimum impact technology to ensure better environmental performance, improved relation between various stakeholders (mills, regulatory

authorities and common people), increased productivity, cost savings and competitive market advantages. Increased productivity could ultimately amount to achieving the same production levels with lesser specific consumption of any or all of the resources involved in mill operations.

5. Proposed Strategy

In order to improve the health of the surface water bodies and ambient environment, discharge of pollutants in the river channels needs to be minimized. The effluent, appropriately treated, could be viewed as a source of water that can be used for various processes. Management of water in the textile mills need a four-stage action plan as given in Table 8.

Table 8 Time Frame and Target/Goals for Implementing the Charter

Objective Hierarchy	Time Frame	Target / Goal
Immediate action	Within six months of Charter Implementation	Meet notified discharge norms. Plan for installation/ upgradation of ETP as per charter
Short term objective	Within one year of Charter Implementation	Meet notified for discharge norms. Reduce Water consumption by 20% per kg of product Completion of installation/ upgradation of ETP as per charter
Long term objective	Within two years of Charter Implementation	Meet notified discharge norms. Reduce Water consumption by 15% in addition to last year's 20% per kg of product Completion of installation/ upgradation of ETP & water recycle as per charter
Ultimate overall objective	Within two years of Charter Implementation	Confirmation of 30% water recycle against total input (In other words, water consumption per kg should be reduced by 30% minimum)

1) Immediate plan is to meet the desired levels of effluent discharge as per notified effluent discharge norms, exhibit commitment to augment/establish ETP as per the charter and also plan to reduce water consumption through process improvement and implementation of recycle and reuse of water. A strict metering of the water used and waste water generation is recommended. Several technological and process improvement options are available to reduce net water consumption and thereby reduce the amount of effluent generated. Suggested technological up-gradation / measures for reduction in water consumption for achieving the benchmark / overall goal are mentioned in the Charter.

2) Second action plan (within one year of Charter Implementation) is to have quantum improvement on the individual ETPs by adding tertiary treatment units. This would result in producing industry grade water from waste water discharged from various processes for reuse within the industry. Extensive and regular monitoring protocol is to be followed by regulatory authorities for improved environmental performance. Monitoring and recording of inlet water consumption and reduction by 20% per kg of product within one year of Charter Implementation is mandatory.

3) Third action plan (within two years of Charter Implementation) is to have full working of ETP

with water recycling system and industry must be able to reduce input water consumption over and above that of the previous year's achievement of 20% reduction per kg of product.

Third party involvement is recommended for planning, assessment, design and monitoring of implementation of measures as prescribed in the Charter for process technologies as well as ETP up-gradation. Various export promotion councils (such as Carpet Export Promotion Council, Indian Silk Export Promotion Council, Wool Industry Export Promotion Council (WOOLTEXPRO), Wool and Woolens Export Promotion Council, The Synthetic & Rayon Textiles Export Promotion Council, The Cotton Textiles Export Promotion Council, Apparel Export Promotion Council, various Textile Research Associations (such as ATIRA, BTRA, SITRA & NITRA) Local textile mills association (such as Textile Association of India (TAI)) can take initiative. Educational institutes like IITs, ICT, DKTE, SASMIRA-Mumbai etc. can give technical support for meeting ultimate goal of charter.

Concerned SPCBs and CPCB should act for implementing the Charter in a time bound period and efficient manner. State Department of MSME may also facilitate textile mills for implementation of the charter.

6. Stake Holders

Several stake holders are involved in environmental pollution control programs. These include central and state level regulatory agencies (pollution control boards and the like). In case of Ganga Basin states, textile manufacturing other stake holders like textile mills, textile mill associations, concerned academic and professional organizations and experts are also to be included as stake holders. Thus, the various stake holders concerned with the proper implementation of the Charter are as under:

- National Mission Clean Ganga (NMCG)
- Ministry of Environment, Forests and Climate Change (MoEF &CC)
- Ministry of Textile
- Central Pollution Control Board (CPCB)
- State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs)
- Department of Micro Small and Medium Enterprises, State Government
- Textile Mills operating in Ganga River Basin States,
- Textile Mills Associations- AICMA, TAI, etc
- Experts & Resource Institutes (IITs/ ICT, Mumbai / DKTE Ichalkarangi, /ATRA, BTRA, SITRA, NITRA, NEERI/SASMIRA – Mumbai/UPTTI/TITS, Bhiwani/NITS and other consulting organizations)
- Carpet Export Promotion Council, Indian Silk Export Promotion Council, Wool Industry Export Promotion Council (WOOLTEXPRO), Wool and Woolens Export Promotion Council, The Synthetic & Rayon Textiles Export Promotion Council, The Cotton Textiles Export Promotion Council, Appearal Export Promotion Council

7. Plan of Activities

For effective and successful implementation of the Charter a set of activities are required to be planned and carried out. This will require phase wise planning of activities, steps to be initiated for the facilitation of the charter, process and technological improvements, water conservation and recycling methodologies, performance assessment of ETPs and their up-gradation, monitoring and surveillance of environmental compliance, strengthening of laboratory facilities, operation and maintenance of ETPs, and creation of environmental management cell. Actions to be taken and steps to be initiated for realizing the goals envisaged under above mentioned activities are elaborated in following tables 9:

Table 9 Time Frame for realizing Various Objectives		
Objective Hierarchy	Time Frame	Target / Goal
Immediate action	Within six months of Charter Implementation	Meet notified discharge norms. Plan for installation/ upgradation of ETP as per the charter
Short term objective	Within one year of Charter Implementation	Meet notified discharge norms. Reduce Water consumption by 20% per kg of product Complete of installation/ upgradation of ETP as per the charter Meet CPCB guidelines for discharge norms.
Long term objective	Within two years of Charter Implementation	Reduce Water consumption by 15% in addition to last year's 20% per kg of product Completion of installation/ upgradation of ETP & water recycle as per the charter
Ultimate Goal	Beyond two years of Charter Implementation	Confirmation of 30% water recycle against total input (In other words, water consumption per kg should be reduced by 30% minimum.

Facilitation of Charter

Following actions as enumerated in Table 10 need to be undertaken and completed within the dates as specified by the stakeholders as indicated:

Table 10: List of Activities and Related Action to be undertaken with Dead Line			
Sr No	**Activities**	**Action by**	**Completion date**
1)	**A) Self- assessment: Identification of third party, such as Export Promotion Councils, CTRI, industry associations, IITs etc. by mills to facilitate the charter implementation and coordination.** **B) Give commitments (Intent letter) for meeting the guide lines as per CPCB charter along with recommended areas of improvements from nominated agency – Third Party.** **C) CPCB / SPCB to collect letter of intent & confirm the association of mill & supporting agencies.**	**A) Textile Mills** **B) Textile Mills** **C) SPCB/CPCB**	**Immediate -** Within six months of Charter Implementation
2)	**A) Complete augmentation of ETP/Water recycling project** **B) Achieve 20% reduction in water consumption per kg of product by internal implementation of technology.**	**A) Textile Mills** **B) Textile Mills** **C) Submit status report by third party**	**a)** Within one year of Charter Implementation **b)** Within one year of Charter Implementation

	C) Monitoring agencies (Third party) to generate detailed reports with all supporting documents & submit to committee after 6 months (First progress status & finally target completion status)		**c)** Within six months of Charter Implementation & Within one year of Charter Implementation
3)	**A) Full working of ETP Project & submit water balance reports** **B) Reduction in water consumption by further 15% in addition to previous year's saving of 20% (to be calculated in L/kg of product)** **C) Monitoring agencies (Third party) to generate detailed reports with all supporting's & submit to committee after every 6 months (First progress status & finally target completion status)**	**A) Textile Mills** **B) Textile Mills** **C) Textile Mills** **D) Submit reports by third party**	**A)** Within two years of Charter Implementation **B)** Within two years of Charter Implementation **C)** Within six months of Charter Implementation **D)** Within two years of Charter Implementation

: Technological & Process Improvements

Mills will be required to initiate a set of process and technological improvement steps to improve efficiency and reduce chemicals, energy, and water consumption and reduce pollution load. These initiatives and stipulated deadlines are listed in Table 11.

Table 11

Process and Technological Improvement Activities to be initiated with respective Deadlines

Sr No	**Activities**	**Action by**	**Completion date**
1)	**Self-Assessment:** Policy statement with details of inventory of existing process technologies & practices. Identification of augmentation requirements & preparation of action plan for upgradation with supporting documents & pert chart	Mills	One Month
2)	**Third Party Evaluation &Validation:** Evaluation / validation of the reports on inventory, upgradation requirements and action plan	Mills to submit reports from nominated third party.	Two Months
3)	**Implementation of action plan:** Envisaged as per document of individual mills	Mills	As per Schedule
4)	**Monitoring & Assessment:** Submitting status / Progress reports on reduction in water consumption & effluent generation	Mills to submit progress reports to SPCB	Quarterly (Once).

		SPCB to submit verification reports.	
5)	**Verification of Progress** SPCB/CPCB will assess the progress once in 6 months & submit status reports.	SPCB/CPCB	Semi-annually (Once)

: Water Conservation & Water Recycling

Measures to conserve water and carryout water recycling wherever possible results in substantial reduction in water consumption and volume of wastewater generation. Table 12 lists a set of activities to be carried out by mills and the time frame for the same.

Table 12

Water Conservation and Water Recycling Practices to be adopted by Mills and their respective Time fames

Sr No	**Activities**	**Action by**	**Completion date**
1)	Installation of sealed flow meter and running hours meter on bore wells and inlet pipeline of different process section i.e. textile mill, textile production area, boiler etc.	Mills	One Month
2)	Colour coding of pipe lines carrying recycled process water and fresh process water	Mills	Two Months
3)	Maintenance of log book to record daily water drawn from bore well and water consumption unit wise after installation of meter. Record of power consumption – meter readings for inlet water pumps	Mills	Daily monitoring & recording
4)	Self-Assessment: Preparation of report of existing water consumption-section wise, reuse/ recycle practices; Preparation of work plan to achieve fresh water requirement targets	Mills	One month

Assessment, Augmentation and Up-gradation of ETPs for Improved Environmental Performance

Periodic assessment of ETPS should be routinely carried out. This helps in pinpointing units that are not working properly and deciding about the possible strategies for up-gradation and augmentation of the ETP. The activities to be carried out and responsible organizations with time frame are listed in Table 13.

Table 13

Improved Environmental Performance Parameters through Assessment, Augmentation and Up-gradation of ETPs

Sr No	**Activities**	**Action by**	**Completion date**

1)	**Self-Assessment:** Preparation of ETP adequacy assessment report & proposed augmentation & up-gradation report with design & drawing with monthly pert chart.	Mills	One Month
2)	**Third Party Evaluation & Validation:** Evaluation / validation of adequacy, and proposed augmentation / up-gradation plan, design / drawings	Mills	Two Months
3)	Implementation of action plan submitted	Mills	As per Schedule
4)	Submission of monthly progress report with evidences	Mills	One Month
5)	Verification of Submission- Progress reports	Third party	Quarterly (Once)
6)	Verification of Progress	SPCB	Quarterly (Once)

Monitoring & Surveillance of Environmental Compliance

Monitoring and surveillance of the environmental compliance by the textile mills as stipulated in the Charter should be carried out at several levels- such as self-monitoring and periodic report submission by the mills to SPPCB or a third party. The strategies to be adopted and the time frame are listed in Table 14.

Table 14: Strategies and Time Frame for Monitoring & Surveillance of Environmental Compliance

Sr No	Activities	Action by	Completion date
	Self-Monitoring & Reporting:		
1)	ETP performance monitoring by individual Mills and maintenance of Log Book as per the prescribed format	Mills	Daily
2)	**Submission of the performance report**: Reports to be submitted by Individual mill to SPCBs	Mills	Monthly
3)	**Review meetings**: Review meetings between Mills / Third party & SPCBs to help mills to improve ETP performance & sample analysis quality	Third party / SPCB	Quarterly
4)	**Regulatory Monitoring:** Periodic / Surprise monitoring and review meetings	SPCB	Quarterly
5)	**Training & Knowledge upgradation:** Organization of training programmes on process technology, best practices, ETP operation & maintenance, Sample analysis, Troubleshooting etc….	SPCB / CPCB	Periodically to organize & all mills must send their officials to attend.
6)	**Employment of Trained team: T**o make mandatory requirement - to employ one staff at every ETP with **Environmental Proficiency Certificate** or minimum 5 years	Mills	Periodic

of handling ETP plant.

Environmental Management Cell (EMC) and Laboratory Facility

In view of the importance of resource conservation, water reuse and recycle, and efficient functioning of ETPs, it is essential to create an environmental management cell (EMC) (or strengthen it if already existing) and establish laboratory facilities for evaluating basic pollution parameters capable of indicating the functioning of ETPs will be mandatory.

Setting up of Laboratory Facility at Textile Mills for Effluent Analysis

It would be worthwhile to have basic laboratory facilities for measuring all indicator pollution parameters as stipulated in the notified norms of CPCB for textile mills. These facilities and instruments will be over and above those incorporated in the **continuous online monitoring system.**

(a) As per the Environment (Protection) Rules, 1986 pH, DO, TSS, TDS, BOD, COD, Color, Oil & Grease, Total Cr, Phenol, Total Sulfide, Ammoniacal-Nitrogen and SAR (Sodium Absorption Rate) are mandatory to be measured for textile mills. Thus, the mills should have minimum analysis facilities for measuring these parameters. The list of basic laboratory equipment for a standard laboratory coupled with ETP is given in Table 15

Table 15
List of Equipment for ETP Laboratory

Instruments	**No of pcs**
pH Meter+ Paper strip	1+ Full set
pH Pen	3
TSS Meter	1
TDS Meter	1
DO Meter	1
BOD testing kits with Incubator	1 set
COD testing kits	1 set
Oven	1
Digital weighing balance: With 0.1 mg accuracy With 10 mg accuracy	 1 1
Necessary Glass ware	As per test procedures mentioned in "Standard test Methods"
Chemical reagents	

(b) The ETP and its laboratory should have properly qualified adequate scientific officials and technical staff for smooth its smooth operation. Details of such staff with their cadre and qualifications are given in Table 16.

Table 16 Scientific and Technical Staff for ETP and Laboratory

Minimum strength in ETP		
Post	Education / Experience	No of employees
Environment Officer	Graduate in Science / B.E. with 5 years' experience	1
Shift Supervisor cum Lab Technician	Graduate in Science	1
Fitters cum operators	ITI pass	3 (1 per shift)
Helpers	Adult workers	As per requirement
Necessary strength of relievers to be maintained for working on 7 days a week (Continuous process)		

(c) Training of the Staff
Necessary training to be given to each employee with minimum 8-man days in year by professional trainers from reputed organizations.

(d) Frequency of the analysis
A particular time schedule should have to be followed for measuring various pollution parameters. This frequency of such measurements is listed in Table 17.

Table 17
Frequency of Wastewater Analysis

Parameters	Frequency of Testing
pH	**Once in a shift of 8 Hours**
TSS	**Once in a Shift of 8 hours**
TDS	**Once in a Shift of 8 Hours**
Dissolved Oxygen	**Once in a shift of 8 hours**
Treatability study	**Once in a Day**
MLVSS/MLSS	**Once in a Day**
COD	**Once in a day**
BOD	**Once in a week**

Treatability study: -
Daily once this study to be done

Collect 10 Ltr of untreated effluent in Bucket.
Add dosing chemicals with correct measurement & check for flocks' generation & settling of flocks with various dosages of chemicals.

Note dosage of chemicals for best generation of flocks & also lowest settling time.

Continue with same amount of dosages for coming 24 hours with intermittent checking in actual process.

Operation & Maintenance of ETP

To achieve the designed performance from ETP, it is necessary to operate it under optimum conditions so as to meet the environmental discharge standards for which regular analysis of various process and pollution parameters and maintenance of records are necessary. For proper and optimum operation of ETPs, the mills should ensure that the plant is well maintained and

all equipment are in good working condition. Following guidelines must be religiously followed for proper operation and maintenance of ETP.

Key Guidelines for Operation & Maintenance

- Ensure proper and optimum conditions of each section of ETP as per the designed specification and manufacturer's instruction.
- Avoid fluctuation in effluent flow and pollution load so as to reduce the shock load to bio-mass and the system as a whole.
- Ensure proper addition of nutrients in aeration tank
- Maintain required level of MLSS/MLVSS concentration during biological treatment. It is cheaper, faster and also eco-friendly.
- Maintain desired level of DO in the aeration tank (1.5 to 2.2 mg/l).
- Ensure periodic & timely withdrawal of sludge from the clarifiers & settled bio mass from aeration tanks.
- Ensure proper maintenance of electric motors, pumps & blowers with diffuser system. etc.
- Use power saving technique in ETP operation as suggested below:
    - Optimization of blower speed (by VFD) in aeration tank linked with DO in aeration tank
    - pH control (Dosing of acid) to be linked with pH meter reading of effluent.
- Introduce the practice of proper documentation & record keeping
- Maintain proper record of fresh water consumption, effluent discharge, effluent analysis, and consumption of chemicals in ETP and utility (like steam and power)

For the benefit of Mills formats for daily monitoring & record keeping are provided as under. The Mills are required to prepare a proper log-book using these formats.

Water Consumption, Wastewater & Sludge Generation Data					
Date	Inlet Water, kL	Effluent Generated, kL	Sent to CETP/ ETP, kL	Sludge Generated, kg	Sludge Disposal, kg
1 Feb					
2 Feb					
3 Feb					

Wastewater and Treated Effluent Characteristics												
Date	Inlet Effluent at ETP						Outlet quality from ETP (To CETP)					
	pH	TDS	TSS	COD	BOD	Color	pH	TDS	TSS	COD	BOD	Color
		PPM	PPM	PPM	PPM	visual		PPM	PPM	PPM	PPM	visual
1 Feb												

2 Feb												
3 Feb												

Date	Biological treatment							
	pH	DO	MLSS	MLVSS	COD	BOD	Color*	Effluent flow
		PPM	PPM	PPM	PPM	PPM	visual	kL/h
1 Feb								
2 Feb								
3 Feb								
* Color can be mentioned as Dark, Medium, light, no								

Electric Power & Man Power utilization				
Date	Power consumption in ETP in units		Strength of Man power (staff + operator) Std Strength = ____	
	Meter Reading	Units	Staff	Operators + Helpers
1 Feb				
2 Feb				
3 Feb				

Mill must maintain supporting (date wise) documents for energy strength of work force per day

Chemical Consumption data						
Date	ETP					
	1	2	3	4	5	6
	kg	kg	kg	kg	kg	kg
1 Feb						
2 Feb						
3 Feb						
Record of Mal-functional/Non-functional ETP Units						

ate	ETP equipment							
	1	2	3	4	5	6	7	8
Date	Yes							
1 Feb		No	No					
2 Feb								
3 Feb								

ETP in-charge will be required to maintain data of non-working / under repair status on daily basis. This will help to know the non-functional sections and management can attend same on priority. Moreover, any deviation in outlet results can also be analyzed.

Creation of Environmental Management Cell (EMC)

Every mill will compulsorily setup an Environmental Management Cell (EMC) to effectively monitor the environmental compliance. The Environmental Management Cell will constitute of:

- Unit /Business Head
- ETP In-charge & staff
- Process Operations Heads
- Factory Manager
- Safety officer

Duties of Environmental Management Cell (EMC)

- The Environmental Management Cell (EMC) shall review the water consumption, measures taken and identify the areas for water conservation, resource recovery and pollution reduction every week.
- The detailed minutes of the decisions taken will be recorded and circulated to all members of (EMC) and follow up of the decisions will be monitored by the Unit Head & ETP In-charge.
- Review to be made in case of non-compliance by mill.
- Internal Audit to be done by the EMC on quarterly basis.
- EMC should arrange for External Environmental Audit on an annual basis.

8. Resource Planning and Implementation of Charter

Implementation of the Charter and the compliance with the prescribed norms / standards shall be the sole responsibility of the textile mills. The entire cost towards implementation of the Charter as per the Plan of Activities shall be borne by the individual textile mill. Textile Mills shall carry out all the activities related to self-assessment, preparation of action plan, including PERT Chart,

implementation of the Charter and self-compliance reporting. Participating mills may take technical / logistic assistance of experts or industry associations for carrying out various activities as per the plan of activities. Some of the activities to be carried out by the individual mills are as under:

1. Preparation of inventory of existing process technologies and practices.
2. Identification of process and technological up-graduation requirements w.r.t. the Charter.
3. Preparation of Action Plan, including monthly PERT Chart for implementation of the Charter for technological and process up-gradation.
4. Implementation of technological up-gradation action plan and submission of monthly progress report.
5. Preparation of ETP adequacy assessment report w.r.t. environmental compliance, actual production, pollution load generation and targeted water consumption; and design, drawing and preparation of proposed augmentation and up-gradation plan, including monthly PERT Chart in accordance with the Charter.
6. Implementation of ETP up-gradation action plan and submission of monthly progress report.
7. Installation of sealed flow meter along with running hours meter on inlet water (bore wells/ wells/ another source).
8. Installation of flow-meters at individual inlet pipe line of different process operation.
9. Setting up of online effluent monitoring system to monitor final effluent discharge. Those connected to CETPs can have common system installed at CETP discharge.
10. Color coding of pipelines carrying recycled process water and fresh process water.
11. Maintenance of logbook to record daily water drawn from bore wells.
12. Maintenance of logbook by individual process unit for recording daily water consumption.
13. Setting up of maximum water consumption targets for individual unit operation.
14. Report preparation of existing water consumption-section wise, reuse / recycle practices, strategies/work plan to achieve fresh water consumption targets.
15. Implementation of water recycling action plan and submission of monthly progress report.
16. Self-monitoring and reporting: Daily ETP performance monitoring and maintain log book as per the prescribed format.
17. Participation in periodic review meeting to be held by Third Party.
18. Strengthening of Environmental Cell and Laboratory facilities
19. Organizing training programme for their personnel (minimum 32 hours/person/year)

Third Party: Resource Institutes

Each of the participating mills may identify either any one of the identified Third Parties for evaluation and validation of their technical reports (self-assessment and planning reports: Preparation of inventory, ETP adequacy & upgradation, and action plans to implement the Charter) and physical verification of individual mills' progress reports under the Charter implementation programme. Third parties, after verification / validation of the progress reports, shall forward these reports to concerned SPCBs & CPCB on quarterly basis. However, regulatory verification shall be carried out by the concerned SPCB/CPCB to ensure timely implementation of the Charter and compliance with the prescribed norms.

The Third Party shall perform following activities as per the Plan of Activities:

- ✓ ETP adequacy assessment report, design / drawings and proposed augmentation / upgradation plan as per Charter
- ✓ Inventory, upgradation requirements and action plan for process upgradation
- ✓ Work plan by mills for reduction in water consumption/ effluent generation

Initial Phase

1. Evaluation & validation of individual mills Action Plan, including PERT Chart for implementation of the Charter for technological and process up-gradation.
2. Evaluation & validation of individual mills ETP adequacy assessment report w.r.t. environmental compliance, actual production, pollution load generation and targeted water consumption; and design, drawing and proposed augmentation and up-gradation plan, including PERT Chart in accordance with the Charter.
3. Evaluation & validation of individual mills assessment report of existing water consumption – section wise, reuse/recycle practices; and their strategies /work plans to achieve fresh water consumption targets.
4. Submission of validated individual mills action plans to concerned SPCBs and CPCB.

Quarterly Activities

Following activities will have to be carried out on quarterly basis:

a) Verification of progress made by individual mills on process technology / ETP upgradation as per their action plans
b) Verification of individual mills fresh water consumption, effluent generation and water recycling achievement etc.
c) Verification of progress reports submitted by participating mills
d) Compilation of Implementation Status Report for submission to SPCBs/ CPCB
e) Compilation of ETPs performance report for submission to SPCBs/ CPCB
f) Organizing Quarterly review meetings with participating mills/ SPCBs/ CPCB
g) Organizing quarterly review meetings with participating mills/ SPCBs/ CPCB
h) Periodic organization of training/ workshop programmes on process technology
i) & best practices, ETP operation & maintenance, sampling & analysis, etc. for mill personnel.

Cost of engaging third party / expert will be borne by the member mills. Participating Mills shall pay / reimburse fee to their selected Third Party towards meeting the expenditure for carrying out various activities / responsibilities assigned / to be assigned from time to time to the Third Party under the Charter. Each of the identified Third Parties shall provide the estimated project cost as per the scope of work to member mills willing to join them, who shall also be responsible for ensuring the payment of the services to Third Party.

State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs)

The concerned SPCBs / PCCs shall ensure proper implementation of the Charter by the individual mills. They shall be responsible for monitoring and surveillance activities to ensure environmental compliance. Participating Textile Mills will not be allowed, under any circumstances for bypassing of ETPs system and discharge of partially / un-treated effluent or episodic discharge. In case of any violation of the prescribed norms, concerned SPCBs will take appropriate actions, including issuance of closure notices, under the Water /Air Acts/ E (P) Act.

Each of the participating mills shall have option to join either Third Party for evaluation & validation of their technical reports (Self-assessment and Planning Reports, Preparation of Inventory, ETP Adequacy & Upgradation, and Action Plans to Implement the Charter), and Physical Verification of their progress reports under the Charter implementation programme.

Some of the activities identified for SPCBs/PCCs are as under:

- ✓ To ensure proper implementation of the Charter by the individual mills
- ✓ To carry out monitoring and surveillance activities to ensure environmental compliance
- ✓ To take appropriate actions under the Water/ Air Acts /E(P)Act in case of any violation of prescribed norms

- ✓ To participate in evaluation/validation of the status assessment reports, action plan for Charter implementation / process /ETP upgradation
- ✓ To conduct quarterly review meetings of Mills, Third Parties& CPCB to facilitate mills in timely implementation of the Charter
- ✓ To constitute Expert Committee for Evaluation & Validation of following reports directly submitted by the participating Mills to SPCBs (Mills have to decide whether to submit the action plans /progress reports to SPCB/ CPCB directly or through the third party).
    - ETP adequacy assessment report, design / drawings and proposed augmentation /upgradation plan as per Charter
    - Inventory, upgradation requirements and action plan for process upgradation
    - Work plan for reduction in water consumption/ effluent generation

- ➢ Surveillance Activities
    - ✓ Verification of progress reports (On quarterly basis in case of direct submission by participating mills, and on random basis in case of submission through Third Party)
    - ✓ Compilation of Implementation Status Report for submission to CPCB on Quarterly basis
    - ✓ Extensive surprise monitoring

- ➢ Organizing Quarterly Review meetings of participating Mills, Third Parties & CPCB to assess status of implementation of Charter and environmental compliance by mills.

Central Pollution Control Board (CPCB)

The CPCB shall supervise and co-ordinate with stake holders namely participating textile Mills, Third Parties, Expert Institutions, and SPCBs /PCCs. CPCB shall periodically review the progress of implementation of the Charter and carry out environmental compliance assessments. Based on findings of the review meetings, CPCB shall take necessary actions namely modification in the Charter/Action Plan /roles & responsibilities of participating agencies.

Some of the activities identified for CPCB are as under:

a) Participation in review meetings organized by third parties/ SPCBs
b) Organizing quarterly/ half-yearly review meetings of participating mills/ third parties/SPCBs to review the progress of the Charter implementation programme
c) To supervise, co-ordinate and provide support to stakeholders
d) To take necessary actions namely modification in the Charter/Action Plan / roles & responsibilities of participating agencies, interpretation of the provisions prescribed under the Charter, approval for any state-of-the-art technology, etc
e) Surprise Monitoring

9. Industry Specific Standards Notified under the Environment (Protection) Rules, 1986

Under the Environmental (Protection) Rules of 1986, the maximum limit of various pollution parameters as notified for textile mills is given in Table 19. It should be the responsibility of the mills to maintain & operate their ETP to get a treated effluent conforming to these norms, besides following other guidelines for reducing their energy, raw materials and water consumption.

Table 19 Existing Treated Effluent Quality Standards for Textile Mills

Parameters	Maximum Limits All values in Mg/Ltr (PPM) except pH, Color, SAR
pH	6.5 to 8.5
Suspended Solids (TSS)	100
Color (PCU- Pt-Co. Unit)	150
BOD (3 Days -27° C)	30
Oil & Grease	10
COD	250
Total Chromium as "Cr"	2.0
Total Sulphide as "S"	2.0
Phenolic Compounds as (C_2H_5OH)	1.0
Total Dissolved Solids (TDS)	2100
Sodium Absorption Ratio (SAR)	26
Ammonical Nitrogen (as N)	50

NOTES:

1) In case of direct disposal into rivers and lakes, the Central Pollution Control Board (CPCB) or State Pollution Control Boards / Pollution Control Committees (SPCBs / PCCs) may specify more stringent standards depending upon the quality of the recipient system.

2) Standards for TDS and SAR shall not be applicable in case of marine disposal through proper marine outfall.

3. The treated effluent shall be allowed to be discharged in the ambient environment only after exhausting options for reuse in industrial process / irrigation in order to minimize freshwater usage.

4. Any textile unit attached with the Common Effluent Treatment Plant (CETP) shall achieve the inlet and treated effluent quality standards as specified in serial number 55 of Schedule-I to the Environment (Protection) Rules, 1986 and shall also be jointly and severally responsible for ensuring compliance.

5. The standalone Micro, Small and Medium Enterprises (MSMEs) as per the MSME Development Act, 2006 shall meet the values specified above.

6. The standalone large-scale units shall meet the values specified above; however, CPCB or SPCBs / PCCs with the approval of CPCB, may mandate Zero Liquid Discharge in Large scale units in environmentally sensitive / critical areas.

7. The TDS value with respect to treated effluent shall be 2100 milligrams per litre; however, in case where TDS in intake water is above 1100 milligrams per litre, a maximum contribution up to 1000 milligrams per litre shall be permitted provided the maximum value of 3100 milligrams per litre is not exceeded in the treated effluent.".

10. Charter on Water Recycling & Pollution Prevention in Textile Industry

Textile mills are required to initiate following action plans to meet the requirements of the Charter for water recycling and pollution prevention.

Stage	Action to be taken by mills
1	Plan to reduce water consumption by implementation of new techniques. Within one year of charter implementation
2	Plan to start internal recycling methods depending upon selective re-use in process. Up to Within two years of charter implementation
3	Within two years of charter implementation, mill should plan to reduce water consumption by 30%.

Best Manufacturing Practice (BMP)

The Best Manufacturing Practice (BMP) is indicative of the systems, equipment, processes and practices that are generally considered essential to achievement of the objectives of this Charter.

Technology actually required or implemented by individual mills to achieve the same documented level of environmental protection may differ on account of their unique set of circumstances like scale of operations, equipment and system configuration, product portfolio, raw material mix, etc.

Ultimate aim is to (A) meet specified standards of discharge effluent and (B) Reduce water consumption by selection of technology and recycle of water.

Water saving techniques listed as under which can reduce water consumption (Mill can adopt below techniques & also can identify other methods to save water consumption. Aim is to achieve reduced water consumption target given in Table 20.

Table 20

Action to be taken for Reducing Water Consumption in Various Process Operations

Process	Suggested Action	Steps to be Taken by Mill
Pretreatment (Desizing, Scouring & Bleaching)	1) Try to recycle internally	○ Can explore possibility to use bleaching water in scouring & desize. ○ Can use water from washes of each process wherever possible through counter current method in soaper & also by storage in tank & re use.
	2) Avoid overflow rinses	○ Overflow rinses consumes 40% more water as compared to smart washing techniques.

	3) Combined Scouring & Bleaching process (Single bath scouring & Bleaching)	○ This will save water by 40% ○ Use counter current system for washing machines
	4) Use enzyme base technology	○ One can reduce water & energy consumption by reduction in temperature & number of washes.
		○ One can recycle this water back to process by topping-up of chemicals
Dyeing	1) Use single bath dyeing for PC blends	○ Saving of water, power, energy & time
	2) Use low salt dyes, 3) Use high exhaustion dyes, 4) Use of pad dry method instead of exhaustion method.	○ Approx. 205 to 60% water can be saved.
Finishing	1) Use of standing bath for batch wise application of finishing chemicals	○ Can save 15% of water. ○
	2) Can use hi suction slit on stenter	○ Can save 15% of water with compared to padding mangle. This also can reduce energy used in drying.
	3) To recycle cooling water on sanforise finish	○ 80% of water saving (Used in cooling)
New techniques	Use equipment's with low MLR	○ Can save 15% to 20% of water
	Recycle chiller plant water	○ Can save 80% of water
	Auto control of humidification room	○ Can save 25% to 30% of water
	Auto level control in processing machines	○ Can save 30% of water.
	Use nozzle with stop motion at the end of pipe during cleaning	○ Can save 25% of water
	Use of sensor for water flushing in toilets	○ Can save 50% of water.

The bare minimum technology (BMT) is indicative of the systems, equipment, processes and practices that are generally considered essential to achievement of the objectives of this Charter. BMT is suggestion for improvement & industry can decide as an optional (It is not mandatory)

Technology actually required, or implemented, by individual mills to achieve the same documented level of environmental protection, may differ on account of their unique set of circumstances like scale of operations, equipment & system configuration, product portfolio, raw material mix, etc.

Ultimate aim is to A) meet specified standards of discharge effluent and B) Reduce water consumption by selection of technology & recycle of water.

1) Textile is one of the profits making and sunrise industries in India. Chemical wet processing of textile consumes 8000-10000 chemicals, dyes and auxiliaries and some of them are banned due to their carcinogenic and other health impacts. It has been imperative to produce quality goods at economical price but not at the expense of environment, health & hygiene. To combat the difficulties raised by people who are in the business of textile; specially wet processors are compelled to employ eco-friendly wet processing right from pre-treatment to finishing ensuring good quality and reducing overall cost.
2) Textile industries use different chemicals in different processes like Desizing, Scouring, Bleaching, Dyeing, Printing, Finishing, Softening, Washing etc. The textile processing industries consumes large quantity of water and produce large volume of waste water from different steps in various processes. Waste water from textile processing and dyeing containing residues requires appropriate treatment before being released into environment.
3) Interest in eco-friendly processing in textile industry has increased with the awareness of environmental issues. Chemical management System can help to reduce NPO (Non-Productive Output) & reduces pollution load on ETP and also conform to the quality of product as per customer's requirements.
4) To overcome pollution issue and reduce its impact on environment, mill technocrats must understand CMS (Chemical Management System) to:
    - List out total chemicals being used in plant and know its impact on environment.
    - Select chemicals which are less harmful to environment as well as human beings. This can be done by adding environment related check point while selection of new chemical.
    - Follow instructions given in the Manual for Storage, Disposal and Safety (MSDS) and Technical Data Sheet (TDS) of chemical and know their pollution impact.
    - Follow standard process parameters as per TDS for best usage of chemical.

11. Chemical Management System (CMS)

The Textile Supply Chain is composed of several tiers as we go down the ladder from the consumer to the fiber manufacturer. Across this stream, chemicals are used at different stages. Maximum use of chemical and therefore risks – is in the processing section i.e. the garment laundries and the fabric dye-house (Fig. 9).

It is essential to manage the chemicals with proper understanding right from purchase, usages & up to disposal.

Looking towards seriousness of subject & need of an hour, CMS is developed. There are many consultants who work on CMS & guide industries for better outputs by reducing NPO's.

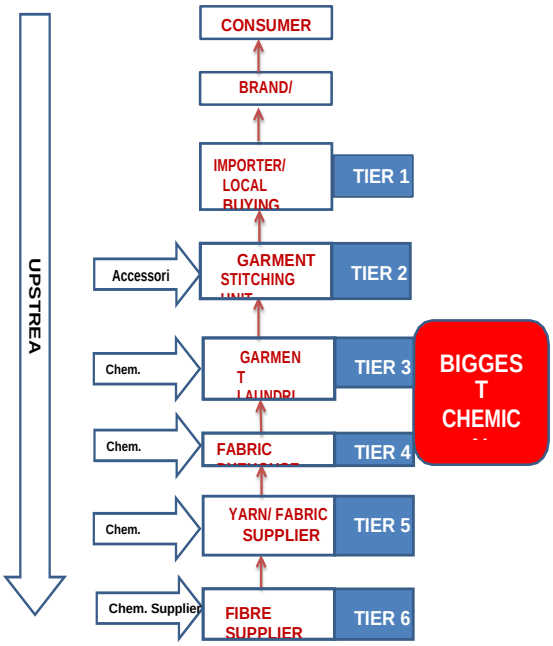


Fig 9: Textile supply chain

(A) Objectives of CMS

- Quality & performance of end product,
- Compliance to prescribed norms
- Productivity improvements.

(B) Advantages of CMS

- Cost savings
- Improve quality of end product
- Compliance in outputs (Product & effluents)
- Saving in water & energy
- Reduce accidents & improves Health & Safety

(C) How to Implement CMS

- Commitment for CMS
- Development of CMS team
- Development of CMS Policy
- Deciding authorities & responsibilities of team member from CMS team.
- Training to CMS team & work force
- Providing necessary formats for implementation of CMS in facility
- Development of MIS System - Daily / Monthly check points & reporting system to Top Management
- Self-grading system for future self-assessment.

(D) Examples for action

- Reduce chemical consumption by automation (pH control, Temp control, etc…)
- Use of Enzyme base technology in pre-treatments.
- Techniques to Reduce Salt consumption
- Replace Soda ash by Liquid alkali
- Know chemicals & its parameters for application
- Reuse
  - ✓ Water (standing bath technique, Counter current washing)
  - ✓ Water from Pre-treatments to be reused in to other baths like desizing.
  - ✓ Salt from Dye bath drain by Nano filter technology
  - ✓ Heat from Heat Recovery Unit
  - ✓ Water by using Vacuum slit instead of regular squeezing for better squeezing
  - ✓ Caustic recovery from mercerize wash liquor
  - ✓ PVA recovery system.

- ✓ Reuse of cooling water at various stages of processing (Cooling water from sanforise), Cooling towers etc….
- Single bath dyeing of PC blends for selective shades
- Use of Low salt dyes.
- Reduce MLR by various techniques
- Replace overflow rinse by normal washes.
- Use of standing bath for finishing.
- Auto dosing system for chemicals
- Use of laser techniques in place of Potassium Permanganate

12. BARE MINIMUM TECHNOLOGY (BMT)

BEST MANAGEMENT PRACTICES (BMP)

BMT is indicative of the systems, equipment, processes and practices that are generally **considered essential to achievement** of the objectives of this Charter in eco-friendly manner. Technology actually required, or implemented by individual mills to achieve the prescribed standards may differ on account of their unique set of circumstances like scale of operations, equipment & system configuration, product portfolio (cellulose, wool/silk/jute, polyester etc.).

However, in addition to the requirement of good manufacturing technology, the mills can also reduce their contribution in pollution load by resorting to Best Management Practices and good house-keeping measures. In the following pages a summary of the Bare Minimum Technologies and Best management Practices (BMP) are listed for effluent and emission control.

BMP is suggested practices which can reduce the consumption of natural resources like fuel, power & water. It also reduces overall load of pollution. This is **not considered as mandatory** as it can be applied depending upon the availability of technology (equipment & process) & also on quality of end product requirement.

Table 21: Bare Minimum Technologies (BMT) – Mandatory
Best Management Practices (BMP) - Optional

Measures to Be Taken by Facility			
Sl. No.	**Functional Area**	**BMT / BMP**	**Type of Action / Facility (Generic)**
1	**Raw Material Storage**		
1.1	**Storage of raw material**	**BMT**	Covered storage area with proper lighting, ventilation, and access to every stack. The storage area must have all requirements as per the current Factories Act.
1.2	**Storage of Dyes & Chemicals**	**BMT**	• Dyes & chemicals must be stored: - In a covered area – away from direct sun light. - In a place having good ventilation - With proper labeling • All storage / handling & first aid conditions to be maintained as per MSDS guidelines • First aid & firefighting equipment must be located as per the current Factories act. • Provision of containment area for storage for every chemical. • Provision of proper drainage lines so that seepage/spills of dyes and chemicals must reach to ETP. • Should follow storage conditions as per the current Factories act.

			• Correct system to measure mass or volume (kg or Liter). • Proper record of available stocks at any point of time.
		BMP - Optional	• To use stackers for vertical storage of material in racks • To display handling & safety measures for each chemical at storage area. • Display first aid measures in case of accident. • Provision of PPE • Install eye wash & shower with easy approach.
	Water storage	**BMT**	• Covered storage tanks for water with minimum capacity to store for 2 days of water consumption. • Measurement and record of water input & consumption in m^3/d.
		BMT	• To have a separate water tank as a reserve for any accident in premises.

Bare Minimum Technologies (BMT) - Mandatory Best Management Practices (BMP) - Optional			
Measures to Be Taken by Facility			
Sl. No.	**Functional Area**	**BMT / BMP**	**Type of Action/Facility (Generic)**
2	**Processing - (Pre-treatment / Cleaning, Dyeing /Printing, Finishing/Laundry etc...) & Laboratory**		
2.1	**Processing**		
2.1.1	**Pre-treatment / Cleaning**	**BMT**	1. All equipment with required inbuilt safety measures 2. Correct weighing balances to measure the material to be processed & also chemicals required to be issued exactly as per issue slip 3. Digital temperature measuring devices. (Optional auto control of temperature) 4. Measurement of water consumption during each process. 5. System to maintain process parameters as per MSDS guidelines / Technical Data Sheet. 6. Use of environmentally hazardous chemicals in process to be avoided (refer MSDS / CPCB guideline of hazardous nature) 7. Availability of PPE & First Aid boxes as per guidelines given in MSDS 8. Must follow the current Factories act guidelines for all equipment
		BMP - Optional	1. To use auto dosing system for dyes & chemicals. 2. pH measuring devices (auto control acid dosing to maintain pH)
2.1.2	**Dyeing & Printing**	**BMT**	1. Dyeing equipment with required inbuilt safety measures. 2. Correct weighing balances to measure the material to be processed & also chemicals required to be issued exactly as per issue slip

			3. Digital temperature measuring devices (Optional auto-control of temperature) 4. Light boxes for shade matching (Optional CCM along with light box) 5. Measurement of water consumption during each process (Optional auto control of water level). 6. System to maintain process parameters as per MSDS guidelines / Technical Data Sheet. 7. Use of environmentally hazardous chemicals in process to be avoided (refer MSDS for guideline of Hazardous nature) 8. Availability of PPE & First aid boxes as per guidelines given in MSDS 9. Must follow the current Factories act guidelines for all equipment.
		BMP - Optional	1. To use auto dosing system for dyes & chemicals. 2. pH measuring devices (auto control acid dosing to maintain pH)
2.1.3	**Finishing**	**BMT**	1. Finishing equipment with required inbuilt safety measures. 2. Correct weighing balances to measure the material to be processed & also chemicals required to be issued exactly as per issue slip 3. Digital temperature measuring devices (Optional auto control of temperature). 4. Measurement of water consumption during each process (Optional auto control of water level) 5. System to maintain process parameters as per MSDS / Technical Data Sheet. 6. Use of environmentally hazardous chemicals in processing to be avoided (refer MSDS for guideline of Hazardous nature) 7. Use of PPE & First aid treatment as per guidelines given in MSDS 8. Must follow the current Factories act guidelines for all equipment.
		BMP - Optional	1. To use auto dosing system for dyes & chemicals. 2. pH measuring devices (auto control acid dosing to maintain pH)
2.2	**Laboratory**		
2.2.1	**Incoming Raw material**	**BMP - Optional**	○ Testing of raw material for Count/Denier, GSM & other necessary parameters ○ Checking for impurities & contaminants in raw material (e.g. Oil % in polyester, size% for woven fabrics etc.)
2.2.2	**Dyes / Chemicals**	**BMP - Optional**	○ Testing of % purity of every dye & chemical.
2.2.3	**Finished Product**	**BMP - Optional**	○ Testing of finished goods for color fastness to washing & rubbing. ○ Testing for home laundering.

Bare Minimum Technologies (BMT) for ETP (Mandatory) Best Management Practices (BMP) for ETP (Optional)			
Measures to Be Taken by Facility			
Sl. No.	**Functional Area**	**BMT / BMP**	**Type of Facility (Generic)**
3	**Effluent Treatment Systems:** **One of the following combinations of effluent treatment technologies should be used to comply with treated effluent discharge standards notified under the Environment (Protection) Rules, 1986.** **1. ETP must have Primary/Secondary & Tertiary Treatment units** **2. Capacities of treatment tanks should be as per guide line given in below table for ETP** **3. Online measurement for pH, effluent flow, DO, TDS at various treatment tanks (optional online control- auto dosing for pH control & auto control of DO by invertor drive).** **4. Proper sludge drying system with separate sludge storage area with containment area.** **5. Laboratory for testing of inlet & outlet effluent for pH, TDS, TSS, BOD, COD & flow. These must be recorded on daily basis.** **6. Daily record of sludge generation & disposal**		
	The following individual plants are used for above schemes in different combinations.		
4.1	**Biogas generation**	**BMP - Optional**	• Anaerobic digestion is the biological decomposition of organic matter in absence of oxygen. It is the conversion of organic acid into methane and carbon dioxide by consortium of bacteria. This is generally applicable where sizing & desizing processes are carried out. This bio gas can be used in canteen. • COD reduction is around 60 to 70 %. The organic load in the digester is in between 5.0 to 8.0 kg/m^3/day. • One of the following biogas technologies are used as CSTR, UASB, Fixed Film and Thermophilic digester. **These processes can be used for treatment of effluent generated from sizing /desizing processes (in a volume)**
4.3	**Incineration of Bio-Sludge**	**BMP - Optional**	• Bio-sludge can be used as fuel along with supporting fuel such as coal, bagasse or other biomass whereas chemical sludge shall be taken to TSDF sites. • Bio sludge is generated in aeration tank & can be used as a fuel along with normal fuel in boilers.
4.4	**Membrane filtration /Reverse osmosis**	**BMP - Optional**	• Advance filtration technic (UF / Nano / RO) has been used commonly for advanced treatment of wastewaters to remove dissolved inorganic solids and some recalcitrant compounds. • The majority of the dissolved salts, low molecular weight organic materials, heavy metals, bacteria, viruses and suspended solids etc. are separated by the series of right membranes and are separated from the system as a brine

			which can be recycled back to dyeing process & reject to be dried in MEE. In this process, care to be taken in selection of pore size of Nano / RO.

Below is the BMT for each ETP (as per effluent volume generated). Facility should follow the suggestive guidelines mentioned below for getting desired results.
ETP should be operated by trained operators.
Operator should have recognized degree in Environmental Science/Engineering

Industry type		**Minimum design required depends on effluent generation L/day**		
Water consumption L/day	**Function/Description of Equipment**	**Upto 50000 L/day**	**50000- 2 Lac L/day**	**Above 2 lac L/day**
Primary collection tank/ Equalization tank	○ **To make homogeneous mixing of inlet effluent so that constant quality can be available for further process.** ○ **To maintain pH between 6.0 to 8.0** ○ **To maintain the ambient +/- 3^{o}C temperature**	○ **Minimum tank capacity with retention time of 36 hours with air mixing facility** ○ **Chemical Dosing tanks to maintain pH**	○ **Minimum tank capacity with retention time of 30 hours with air mixing facility** ○ **Chemical Dosing tanks to maintain pH (Online meter)** ○ **Surface aerators can be used to mix the effluent which can help to maintain the temperature.**	○ **Minimum tank capacity with retention time of 30 hours with air mixing facility** ○ **Chemical Dosing tanks to maintain pH (Online meter)** ○ **Surface aerators can be used to mix the effluent which can help to maintain the temperature.**
Flocculation/ Coagulation tank	○ **Dosing tanks for 3 chemicals to generate flocks. (de-colorant 1 tank & flocculating/ coagulating chemicals – 2 tanks**	○ **Tank capacity: for 30 min retention time** ○ **Low speed stirrer with regulator.**	○ **Tank capacity: for 30 min retention time** ○ **Low speed stirrer with regulator.**	○ **Tank capacity: for 30 min retention time** ○ **Low speed stirrer with regulator.**
Flocks settling Tank	○ **Effluent entry from bottom & exit from top.** ○ **Sludge removal valve at the bottom**	○ **Tank capacity: for 2 hours retention time.**	○ **Tank capacity: for 2 hours retention time**	○ **Tank capacity: for 2 hours retention time**
Primary clarifier	○ **Clarifier to separate & remove solid chemical sludge from top & bottom.**	○ **Storage capacity of clarifier should be 6 hours**	○ **Storage capacity of clarifier should be 4 hours**	○ **Storage capacity of clarifier should be 4 hours**
Aeration tank	○ **Aeration tank with biomass dosing system** ○ **Air blow with diffusers**	○ **Retention time in aeration tank - 24 hours**	○ **Retention time in aeration tank - 24 hours** ○ **Spare air blower**	○ **Retention time in aeration tank - 24 hours** ○ **Spare air blower** ○ **Online meters are essential**

	○ Online DO meter, pH meter	○ Not required if connected to CETP & fulfilling inlet norms of CETP. ○ Online meters are essential	○ Online meters are essential	
Secondary Clarifier*	○ Clarifier to separate & remove Biological sludge from top (scrapper) & bottom.	○ Storage capacity of clarifier should be 8 hours ○ Not required if Aeration tank is not installed.	○ Storage capacity of clarifier should be 8 hours	○ Storage capacity of clarifier should be 8 hours
Pressurized Sand Filter & Activated Carbon Filter	○ Sand Filter is required to remove fine particles from treated effluent ○ Activated Carbon Filter is required to adsorb bad smell gases from effluent.	○ Suitable for effluent volume	○ Suitable for effluent volume	○ Suitable for effluent volume
Micro Filter (Optional)	○ Two Bag Filters first 25 Micron & 5 Micron	○ Not required if connected to CETP	○ As per effluent volume	○ As per Effluent volume
Ultra-Filter (Optional)**	○		○ Sufficient capacity as per design	○ Sufficient capacity as per design
RO (Optional)**	○		○ Sufficient capacity with three stage RO - as per approved design	○ Sufficient capacity with three stage RO - as per approved design
Sludge Settling Tank	○ To settle the sludge from clarifier or drain from any section of ETP. This will thicken the sludge which can be dried quicker.	○ 10000 L	○ 30000 L	○ 50000 L
Sludge Press / Drying System [NOTE: Both should be there- Filter press for primary sludge and	○ To get thick sludge which will be dried in sunlight or sludge dryer (Sludge Press / Decanter)	○ Sufficient capacity as per design		
		○ Hazardous sludge should be stored properly in a covered area to avoid contact with rain water/air till the authorized vendor takes it away for final disposal through landfill or incineration.		

sand drying beds for secondary sludge]		
***. There are various types of clarifiers facility can select any & decide retention time of effluent for treatment.**		
****. Auto back wash to be designed to improve life of membrane.**		
ETP / Water recycling system must be getting approved. Facility officials must meet the desired conditions & standards as per valid consent to operate.		

It is suggested to keep a control on water consumption depending upon the categories mentioned in chart. Industry should confirm time bound action plan to reduce water consumption per kg of product generated.

4. Air Pollution Control

Settling Chamber	○ **To remove coarser particulates from flue gas**	**Stack dimensions (height and diameter should be as per norms of CPCB to ensure sufficient dilution**
		Settling chamber of suitable size (rectangular cross-section) should be close to the ground level.
Multi-cyclone	**To remove finer particulates with high efficiency**	**Dimensions of individual units and number of units in sequence to achieve the required removal efficiency**
Bag filters (Alternative to cyclones)	○ **To remove finer particulate matter** ○ **Fabric of bag should be able to bear high temperature**	**Sufficient capacity and number per bag house as per flow, particulate load and required removal efficiency**
Ash ponds	**To hold the boiler ash till disposal**	**Having sufficient capacity to hold ash generated during 2-3 months There should also be a stand by pond.**
Fuel & Energy source	○ **From renewable sources as much as possible**	**Facility should switch over to renewable energy source (rice husk, agro-biomass, solar)**
		Use of wood should be stopped to avoid/reduce deforestation

Annexure-V: List of Industries in the catchment of River Ganga and tributaries located in Varanasi & Bhadohi

S. No	District	Name & Address of Industry	Category/ Sector	Name of Main Tributary of River Ganga
1	Bhadohi	A R S Dyeing, Himmatpur Bakuchiya, Bhadohi.	Yarn/Textile Processing	Varuna/Ganga
2	Bhadohi	Ashoka Dyeing Centre, Ghosiya, G.T. Road, Bhadohi	Yarn/Textile Processing	Ganga
3	Bhadohi	B.C. Yarn Dyers, Morh Road, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
4	Bhadohi	Bee kay woollens (P) Ltd, By pass Road, Bhadohi.	Yarn/Textile Processing	Varuna/Ganga
5	Bhadohi	Bhadohi Carpets, BIDA Carpet City, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
6	Bhadohi	Bhikhoo Ram Yarn Dyers Harirampur, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
7	Bhadohi	Carpet International, Hariyon bypass Road, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
8	Bhadohi	Carpet Palace dyeing division, P.No.- 67-79, 79 A Carpet city BIDA Carpet City, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
9	Bhadohi	Champa Dyeing Pvt. Ltd., Gyanpur Road, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
10	Bhadohi	Chandra Wollen Pvt. Ltd.Ogapur Aurai, Bhadohi	Yarn/Textile Processing	Ganga
11	Bhadohi	D N Yarn Dyers Rayan Bhadohi	Yarn/Textile Processing	Varuna/Ganga
12	Bhadohi	D.P. Woollen Mills, Babu Sarai Maharajganj, Bhadohi	Yarn/Textile Processing	Ganga
13	Bhadohi	D.P. Yarn Dyers, Babu Sarai Maharaj Ganj, Bhadohi	Yarn/Textile Processing	Ganga
14	Bhadohi	Deepak Dyeing House, BIDA Carpet city, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
15	Bhadohi	Delight Dyeing Centre, Gopiganj, Bhadohi	Yarn/Textile Processing	Ganga
16	Bhadohi	Dewnathpur woollen mills pvt. Ltd., Laxman Patti Devnathpur Bhadohi	Yarn/Textile Processing	Ganga
17	Bhadohi	E Hill & Company Khamriya, Bhadohi	Yarn/Textile Processing	Ganga

S. No	District	Name & Address of Industry	Category/ Sector	Name of Main Tributary of River Ganga
18	Bhadohi	Eastern Export, Fattupr Suriyavan Road, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
19	Bhadohi	I.S. Dyeing Division, Ram Raypur, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
20	Bhadohi	Ideal Carpet Limited, Gopiganj, Bhadohi	Yarn/Textile Processing	Ganga
21	Bhadohi	Jai Bajarang Yarn Dyers, Khamriya Road, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
22	Bhadohi	Kas Carpet, Station Road, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
23	Bhadohi	Kohinoor woollen carpet industry, G.T. Road Ghatampur Aurai, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
24	Bhadohi	M S Trading Company, Main Road, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
25	Bhadohi	Mamb woollens Ltd., Jamunipur, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
26	Bhadohi	Manoj Dyers, Ahemadpur, Phulwariya, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
27	Bhadohi	O A C Woollen Mills, Fattupur, Morh Road, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
28	Bhadohi	Obeetee, Limited, Gopiganj, Bhadohi	Yarn/Textile Processing	Ganga
29	Bhadohi	Parkash dyeing centre Khamaria, Bhadohi	Yarn/Textile Processing	Ganga
30	Bhadohi	Pee Sons, Mariyad Patti, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
31	Bhadohi	Prasad Carpet Emporlium, Khamaria, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
32	Bhadohi	Bhadohi Dyers (Olde Name R R Dyers) Naya Bazar Zahid pur jaypur bypass road, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
33	Bhadohi	R.H. Dyers, Main Road, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
34	Bhadohi	Radha Dyeing Corporation, Carpet city BIDA, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
35	Bhadohi	Rainbow Woollens, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
36	Bhadohi	Raj Dyers, Mamdevpur, Bhadohi	Yarn/Textile Processing	Varuna/Ganga

S. No	District	Name & Address of Industry	Category/ Sector	Name of Main Tributary of River Ganga
37	Bhadohi	Rupesh kumar & brothers, BIDA Carpet City, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
38	Bhadohi	S.S. Dyers, BIDA Carpet City, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
39	Bhadohi	Sad woollens mills, Hariyaon Bhadohi	Yarn/Textile Processing	Varuna/Ganga
40	Bhadohi	Shesh Sons Pvt. Ltd. Bhadohi	Yarn/Textile Processing	Varuna/Ganga
41	Bhadohi	Home Flooring & Decor (P) Ltd. (Olde Name Shiekh Bhullan Carpet Pvt. Ltd.), Goppur Joharpur gopiganj, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
42	Bhadohi	Shobha woollens Pvt. Ltd., Hari Rampur Gyanpur Road Bhadohi	Yarn/Textile Processing	Varuna/Ganga
43	Bhadohi	Shubham Dyeing Centre, Aurai, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
44	Bhadohi	Shyam Lal (Dyeing Division), Hari Rampur, Aurai Road, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
45	Bhadohi	Sunny carpet pvt. Ltd., Khamaria, Bhadohi Sant Ravidas Nagar.	Yarn/Textile Processing	Ganga
46	Bhadohi	T S Dyers & processors, khanpur Bhadohi	Yarn/Textile Processing	Varuna/Ganga
47	Bhadohi	Taj Mahal Dyeing and spinning, Jalapur Bhadohi	Yarn/Textile Processing	Varuna/Ganga
48	Bhadohi	Unique Dyers, Lala Nagar, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
49	Bhadohi	Varanasi Carpet Exports Pvt. Ltd. Madhosingh, G.T. Road, Bhadohi	Yarn/Textile Processing	Ganga
50	Bhadohi	Zamaniya Dyers, Fattupur, Morh Road, Bhadohi	Yarn/Textile Processing	Varuna/Ganga
51	Jaunpur	Kas Carpet Yarn dyers, Industrial Area Sidhwan, Jaunpur	Yarn/Textile Processing	Varuna/Ganga
52	Jaunpur	Art Palace Export Pvt Ltd, Industrial Area Sidhwan, Jaunpur	Yarn/Textile Processing	Varuna/Ganga

S. No	District	Name & Address of Industry	Category/ Sector	Name of Main Tributary of River Ganga
53	Jaunpur	Bhokhara Industries Pvt. Ltd., Industrial Area Sidhwan, Jaunpur	Yarn/Textile Processing	Varuna/Ganga
54	Varanasi	Aishwarya Crations G.T. Road, Chandpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
55	Varanasi	Amarlata Prints S-15/243 Shamsher Singh Compound, Shivpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
56	Varanasi	Ananya Electroplators H.N.-26/20 Nawalpur, Meerapur Basahi, Varanasi	Metal Surface Treatment	Varuna/Ganga
57	Varanasi	Ashish Electroplators H.N.-S-26/42 K-24 Ashokpuram Colony, Meerapur Basahi, Varanasi	Metal Surface Treatment	Varuna/Ganga
58	Varanasi	Ashok Kalwani Prints P-4, I/S, Chandpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
59	Varanasi	Baijnath Sahu Electroplators H.N.-45/32 Luxa Nai Basti Varanasi	Metal Surface Treatment	Varuna/Ganga
60	Varanasi	Bajaj Hoisery Pvt. Ltd., Vyas Baag, Harhauwa, Varanasi	Yarn/Textile Processing	Varuna/Ganga
61	Varanasi	Balaji Prints, N-9/26-3 Patiya, Bajardiha, Varanasi.	Sari Printing & Washing	Ganga
62	Varanasi	Basant Chauchan Electroplators, Banarasi Ka Bara, Shivpurva, Varanasi	Metal Surface Treatment	Ganga
63	Varanasi	BHEL, Varanasi	Heavy Engineering	Varuna/Ganga
64	Varanasi	Bhumi Electroplators H.N.-S.H.-3/21 B, Nawalpur, Meerapur Basahi, Varanasi	Metal Surface Treatment	Varuna/Ganga
65	Varanasi	Bind Electroplators Shivpurva, Nirala Nagar, Lane No.-6 Varanasi	Metal Surface Treatment	Ganga
66	Varanasi	Brijesh Prajapati Electroplators, 10/5-1-A, Parmanandpur, Maheshpur, Varanasi	Metal Surface Treatment	Varuna/Ganga
67	Varanasi	Britech (Nikil wala) Lahartara, Bauliya, Varanasi	Metal Surface Treatment	Ganga

S. No	District	Name & Address of Industry	Category/ Sector	Name of Main Tributary of River Ganga
68	Varanasi	Chauhan Electroplators H.N.-45/145 Luxa Nai Basti, Varanasi	Metal Surface Treatment	Ganga
69	Varanasi	Chitra Kala Prints 8 A.E. Industrial Area, Chandapur, Maheshpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
70	Varanasi	Chitra Nirman Industrial Area, Chandapur, Varanasi	Sari Printing & Washing	Varuna/Ganga
71	Varanasi	Chitranashi S-15/243, Shivpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
72	Varanasi	D.L.W., Varanasi	Loco Engineearing	Varuna/Ganga
73	Varanasi	Devraj Prints S-15/243 Shamsher Singh Compount, Shivpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
74	Varanasi	Fauji Prints, S-22/1 Mall Godam Road, Cantt, Varanasi	Sari Printing & Washing	Varuna/Ganga
75	Varanasi	Golden Pecock Saree Pvt. Ltd., S-22/1 Mall Godam Road, Cantt, Varanasi	Sari Printing & Washing	Varuna/Ganga
76	Varanasi	Gupta Electroplators H.N. D-59/237 Madhopur, Sigra, Varanasi	Metal Surface Treatment	Ganga
77	Varanasi	Hanuman Crations, N-9/26-3 Patiya, Bajardiha, Varanasi	Sari Printing & Washing	Ganga
78	Varanasi	Hindustan Coca Cola Beverages Pvt. Ltd., Rajatalab, Varanasi	Soft Drink	Ganga
79	Varanasi	Indian Dyeing & Manufacturing J-12/63-102 Bunkar Colony, Chaukaghat, Varanasi	Sari Printing & Washing	Ganga
80	Varanasi	Kala Nidhi S-15/243 Shamsher Singh Compount, Shivpur, Varanasi	Sari Printing & Washing	Ganga
81	Varanasi	Laakhi Creations Industrial Area, Chandapur, Maheshpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
82	Varanasi	Manisha Electroplators H.N.-SH-3/26 K-5 M Rajeev Nagar, Nawalpur, Meerapur Basahi, Varanasi	Metal Surface Treatment	Varuna/Ganga

S. No	District	Name & Address of Industry	Category/ Sector	Name of Main Tributary of River Ganga
83	Varanasi	Manpasand, Karkhiyaon,Agropark, Varanasi	Food & Beverages	Naad River/Ganga
84	Varanasi	Mazda Prints, N. 10/60 DLW Road, Varanasi.	Sari Printing & Washing	Ganga
85	Varanasi	Mazeed Prints, C-26/3 Nawabganj, Varanasi.	Sari Printing & Washing	Ganga
86	Varanasi	Meera Prints C-3 Big Industrial Area, Chandpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
87	Varanasi	Mishra Electroplators Pishach Mochan, Lallapura, Varanasi	Metal Surface Treatment	Ganga
88	Varanasi	Nidhi Prints S-15/243 Shamsher Singh Compount, Shivpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
89	Varanasi	Nike Energy, Tarna, Varanasi	Metal Surface Treatment	Varuna/Ganga
90	Varanasi	Nilesh Chauhan Electroplators P.N.-S-341 Meerapur Basahi, Varanasi	Metal Surface Treatment	Varuna/Ganga
91	Varanasi	Parle Agro Ltd., Karkhiyaon, Agropark,Varanasi	Food & Beverages	Naad River/ Ganga
92	Varanasi	Pooja Prints S-15/243 Shamsher Singh Compount, Shivpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
93	Varanasi	Prahlad Electroplators Shri Ramnagar Colony, Maduadih, Varanasi	Metal Surface Treatment	Varuna/Ganga
94	Varanasi	Pushpanjali Sarees Pvt. Ltd. A-6 Industrial Area, Chandpur, Vaanasi	Sari Printing & Washing	Varuna/Ganga
95	Varanasi	Pushpanjali Sarees Pvt. Ltd. Unit-2 B-1, B-2, B-1E, B-2 E, Industrial Area, Chandpur, Vaanasi	Sari Printing & Washing	Varuna/Ganga
96	Varanasi	Raju Chauhan Electroplators H.N.-D-59/236, Shivpurva, Nirala Nagar, Varanasi	Metal Surface Treatment	Ganga
97	Varanasi	Ramji Electroplators H.N.-S-2/51 Nawalpur, Meerapur Basahi, Varanasi	Metal Surface Treatment	Varuna/Ganga

S. No	District	Name & Address of Industry	Category/ Sector	Name of Main Tributary of River Ganga
98	Varanasi	Rangoli, Mahamandal Nagar, Lahurabeer, Chandauli	Sari Printing & Washing	Ganga
99	Varanasi	Rangsan Shamsher Singh Compount, Shivpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
100	Varanasi	Rattilal Electroplators Aaraji No.-10 Nawalpur, Meerapur Basahi, Varanasi	Metal Surface Treatment	Varuna/Ganga
101	Varanasi	Riyaz Electroplators H.N.-S-2/301 B, Gilat Bazar, Varanasi	Metal Surface Treatment	Varuna/Ganga
102	Varanasi	S.N.D. Dyieng & Processing Co. Pvt. Ltd., A-7 Industrial Area, Chandpur, Varanasi.	Sari Printing & Washing	Varuna/Ganga
103	Varanasi	Sakeel Print, S-15/243 Shamsher Singh Compound, Shivpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
104	Varanasi	Saurabh Saree Pvt. Ltd. S-17/3 C-4 Krishna Nagar Colony, Pahariya, Varanasi	Sari Printing & Washing	Varuna/Ganga
105	Varanasi	Shaheen Prints, B-26/27, A-2, A-1 Nawabganj, Varanasi	Sari Printing & Washing	Ganga
106	Varanasi	Sheetals S-15/243 Shamsher Singh Compount, Shivpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
107	Varanasi	Shiv Kumar Electroplators H.N.-S-27/14 K.H., Nawalpur, Meerapur Basahi, Varanasi	Metal Surface Treatment	Varuna/Ganga
108	Varanasi	Shyam Creations S-15/243 Shamsher Singh Compount, Shivpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
109	Varanasi	Silpi Print, S-15/243 Shamsher Singh Compound, Shivpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
110	Varanasi	Sinar Electroplating (Nikil Ghar) D-65/421 K, Lahartara, Bauliya, Varanasi	Metal Surface Treatment	Varuna/Ganga

S. No	District	Name & Address of Industry	Category/ Sector	Name of Main Tributary of River Ganga
111	Varanasi	Slaughter House, Beniyabaag, Varanasi	Slaughter Houses & Meat Processing	Ganga
112	Varanasi	Slaughter House, Kamal gadaha, Varanasi	Slaughter House and Meat Processing	Varuna/Ganga
113	Varanasi	Slaughter House, Ramala Kuchehry, Varanasi	Slaughter Houses & Meat Processing	Varuna/Ganga
114	Varanasi	Suresh Chauhan Electroplators H.N.-S-26/23 K.H., Nawalpur, Meerapur Basahi, Varanasi	Metal Surface Treatment	Varuna/Ganga
115	Varanasi	Swastik Dyieng & Processing Co. Pvt. Ltd., P-3, Big Industrial Area, Chandapur, Maheshpur, Varanasi	Sari Printing & Washing	Varuna/Ganga
116	Varanasi	V.K. Electroplators H.N.-L-2/63 Nawalpur, Meerapur Basahi, Varanasi	Metal Surface Treatment	Varuna/Ganga
117	Varanasi	Vijay Laxmi Criations J-13/93 Cotton Mill Compound, Chaukaghat, Varanasi	Sari Printing & Washing	Ganga
118	Varanasi	Vishal Industries A-4 Industrial Area, Maheshpur, Varanasi	Sari Printing & Washing	Varuna/Ganga

Annexure – VI: Encroachment

कार्यालय कलेक्टर एवं जिला मजिस्ट्रेट, वाराणसी

पत्रांक– 332/NGT OA No 128/2021 दिनांक 07-07-21

आदेश

मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली में योजित ओरिजिनल एप्लीकेशन नं0 128/2021 सौरभ तिवारी बनाम यूनियन ऑफ इण्डिया एवं अन्य में पारित आदेश दिनांक 17.06.2021 जो **गंगा की सहायक नदियों वरूणा व अस्सी पर अतिकमण हटाये जाने के सम्बंध में है,** का अनुपालन कराये जाने हेतु निम्नलिखित टीम का गठन किया जाता है–

1. उपाध्यक्ष, वाराणसी विकास प्राधिकरण, वाराणसी द्वारा नामित प्रतिनिधि।
2. नगर आयुक्त, नगर निगम, वाराणसी द्वारा नामित प्रतिनिधि।
3. सम्बंधित उपजिलाधिकारी/अपर नगर मजिस्ट्रेट (प्रथम/द्वितीय/तृतीय/चतुर्थ)।
4. अधिशाषी अभियंता बंधी प्रखण्ड, सिचाई विभाग, सिगरा, वाराणसी।
5. क्षेत्रीय अधिकारी, उ0 प्र0 प्रदूषण नियंत्रण बोर्ड, भेलूपुर, वाराणसी द्वारा नामित प्रतिनिधि।

उपरोक्त टीम को निर्देशित किया जाता है कि **वरूणा नदी व अस्सी नदी पर हुये अतिकमण का चिन्हिकरण एवं हटाये जाने** सम्बंधी कार्यवाही करते हुये दिनांक 20.07.2021 के पूर्व अधोहस्ताक्षरी को प्रेषित करना सुनिश्चित करें, जिससे मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली में योजित ओरिजिनल एप्लीकेशन नं0 128/2021 सौरभ तिवारी बनाम यूनियन ऑफ इण्डिया एवं अन्य में पारित आदेश दिनांक 17.06.2021 का ससमय अनुपालन कराया जा सके। मा0 राष्ट्रीय हरित अधिकरण में याचिका की अग्रिम सुनवाई दिनांक 04.08.2021 निर्धारित है।

(कौशल राज शर्मा)
कलेक्टर एवं जिला मजिस्ट्रेट
वाराणसी

संख्या एवं दिनांक–उपरोक्त।

प्रतिलिपि–अपर जिलाधिकारी (नगर), वाराणसी को इस निर्देश के साथ प्रेषित कि सम्बंधित अधिकारियों से समन्वय स्थापित कर अनुपालन कराया जाना सुनिश्चित करें।

(कौशल राज शर्मा)
कलेक्टर एवं जिला मजिस्ट्रेट
वाराणसी

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मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली में योजित ओरिजिनल एप्लीकेशन नं0 128/2021 सौरभ तिवारी बनाम यूनियन ऑफ इण्डिया एवं अन्य में पारित ओदश दिनांक 17.6.2021, जो गंगा की सहायक नदियों वरूणा व अस्सी पर अतिक्रमण हटाये जाने के सम्बन्ध में है, के क्रम में कृत कार्यवाही का विवरण :-

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(अ) वरूणा नदी :-

क्र0सं0	तहसील	ग्राम	परगना	आ0नं0	रकबा(हे0 मे)	वर्तमान स्थिति
01	सदर	कोटवां	कसवार राजा	102	2.6240	मौके पर नदी है। कोई अतिक्रमण नही है।
02		कोटवां	कसवार राजा	1426	0.8700	मौके पर नदी है। कोई अतिक्रमण नही है।
03		टड़िया	कसवार राजा	359	2.5820	मौके पर नदी है। कोई अतिक्रमण नही है।
04		छितौनी	कसवार राजा	465	3.3030	मौके पर नदी है। कोई अतिक्रमण नही है।
05		भरथरा	कसवार राजा	213	2.3830	मौके पर नदी है। कोई अतिक्रमण नही है।
06		बेदौली	कसवार राजा	1	3.1160	मौके पर नदी है। कोई अतिक्रमण नही है।
07		फुलवरिया	देहात अमानत	537/1	4.8480	मौके पर नदी है। कोई अतिक्रमण नही है।
08		बड़ागांव प्रथम	देहात अमानत	1	0.7450	मौके पर नदी है। कोई अतिक्रमण नही है।
09		बड़ागांव द्वितीय	देहात अमानत	1	0.7330	मौके पर नदी है। कोई अतिक्रमण नही है।
10		कैण्टोमेन्ट	देहात अमानत	1	2.120	मौके पर नदी है। कोई अतिक्रमण नही है।
11		आराजी लाईन	देहात अमानत	1	0.684	मौके पर नदी है। कोई अतिक्रमण नही है।
12		नदेसर	देहात अमानत	1/1	3.003	मौके पर नदी है। कोई अतिक्रमण नही है।
13		चौका	देहात अमानत	1	3.4350	मौके पर नदी है। कोई अतिक्रमण नही है।
14		अलईपुर	देहात अमानत	1	2.1160	मौके पर नदी है। कोई अतिक्रमण नही है।
15		सरायहेड	देहात अमानत	150	0.4700	मौके पर नदी है। कोई अतिक्रमण नही है।
16		कोनिया	देहात अमानत	1/2 व 1/4	4.4440	मौके पर नदी है। कोई अतिक्रमण नही है।
17		किला कोहना	देहात अमानत	1/18	0.1010	मौके पर नदी है। कोई अतिक्रमण नही है।
18		सरैताबाद	देहात अमानत	1/3	0.2430	मौके पर नदी है। कोई अतिक्रमण नही है।
19		पिसौर	शिवपुर	1605	7.0900	मौके पर नदी है। कोई अतिक्रमण नही है।
20		दानियालपुर	शिवपुर	298	7.4750	मौके पर नदी है। कोई अतिक्रमण नही है।
21		इन्द्रपुर	शिवपुर	465 445	0.858 1.700	मौके पर नदी है। कोई अतिक्रमण नही है।
22		सिकरौल	शिवपुर	1042	2.3550	मौके पर नदी है। कोई अतिक्रमण नही है।
23		खजुरी	शिवपुर	168	3.2420	मौके पर नदी है। कोई अतिक्रमण नही है।
24		दानियालपुर	शिवपुर	164	1.9230	मौके पर नदी है। कोई अतिक्रमण नही है।
25		हाल	शिवपुर	54	1.9700	मौके पर नदी है। कोई अतिक्रमण नही है।
26		पुलकोहना	शिवपुर	152	1.5830	मौके पर नदी है। कोई अतिक्रमण नही है।
27		सलारपुर	शिवपुर	529	2.0480	मौके पर नदी है। कोई अतिक्रमण नही है।
28		खालिसपुर	जाल्हूपुर	136/306	3.6420	मौके पर नदी है। कोई अतिक्रमण नही है।
29		सराय मोहना	जाल्हूपुर	18/1	0.4050	मौके पर नदी है। कोई अतिक्रमण नही है।
30	पिण्डरा	महिमापुर	पन्द्रह	1	0.874	मौके पर नदी है। कोई अतिक्रमण नही है।
31				267	0.117	मौके पर नदी है। कोई अतिक्रमण नही है।
32				1023	0.676	मौके पर नदी है। कोई अतिक्रमण नही है।

33				1050	0.154	मौके पर नदी है। कोई अतिक्रमण नही है।
34				1051	0.478	मौके पर नदी है। कोई अतिक्रमण नही है।
35		सरावा	पन्द्रह	64	1.963	मौके पर नदी है। कोई अतिक्रमण नही है।
36				992	0.223	मौके पर नदी है। कोई अतिक्रमण नही है।
37		अकोढ़ा	पन्द्रह	1243	3.763	मौके पर नदी है। कोई अतिक्रमण नही है।
38		कुरू	पन्द्रह	492	2.023	मौके पर नदी है। कोई अतिक्रमण नही है।
39		पतेर	पन्द्रह	358	3.015	मौके पर नदी है। कोई अतिक्रमण नही है।
40		बलुआ	पन्द्रह	1190	3.076	मौके पर नदी है। कोई अतिक्रमण नही है।
41		हरेहू	पन्द्रह	209	1.497	मौके पर नदी है। कोई अतिक्रमण नही है।
42		चिलविला	पन्द्रह	360	2.023	मौके पर नदी है। कोई अतिक्रमण नही है।
43		कुडी	पन्द्रह	210	4.334	मौके पर नदी है। कोई अतिक्रमण नही है।
44		ईसीपुर	अठगांवा	72	1.668	मौके पर नदी है। कोई अतिक्रमण नही है।
45		गोरी	अठगांवा	262	0.717	मौके पर नदी है। कोई अतिक्रमण नही है।
46		इन्दरपुर	अठगांवा	1	0.372	मौके पर नदी है। कोई अतिक्रमण नही है।
47		मनियाकोन	अठगांवा	82	0.728	मौके पर नदी है। कोई अतिक्रमण नही है।
48		नेवादा	अठगांवा	323	2.274	मौके पर नदी है। कोई अतिक्रमण नही है।
49		सालवाहनपुर	अठगांवा	891	1.091	मौके पर नदी है। कोई अतिक्रमण नही है।
50		खलिया	अठगांवा	124	1.490	मौके पर नदी है। कोई अतिक्रमण नही है।
51		रसूलपुर	अठगांवा	799	2.829	मौके पर नदी है। कोई अतिक्रमण नही है।
52		चक्का	अठगांवा	187	0.458	मौके पर नदी है। कोई अतिक्रमण नही है।
53		अवसानपुर	अठगांवा	858	4.476	मौके पर नदी है। कोई अतिक्रमण नही है।
54		गहरवारपुर	अठगांवा	268	1.445	मौके पर नदी है। कोई अतिक्रमण नही है।
55		गोसाईपुर	अठगांवा	99	2.225	मौके पर नदी है। कोई अतिक्रमण नही है।
56		भगतपुर	अठगांवा	460	1.999	मौके पर नदी है। कोई अतिक्रमण नही है।
57		कैलहट	अठगांवा	99	0.706	मौके पर नदी है। कोई अतिक्रमण नही है।
58		कोईराजपुर	अठगांवा	1012	3.529	मौके पर नदी है। कोई अतिक्रमण नही है।
59		शहाबुद्दीनपुर	अठगांवा	360	0.048	मौके पर नदी है। कोई अतिक्रमण नही है।
60		पश्चिमपुर	अठगांवा	596	8.117	मौके पर नदी है। कोई अतिक्रमण नही है।
61		चमांव	अठगांवा	571	0.729	मौके पर नदी है। कोई अतिक्रमण नही है।
62		कोइरान	अठगांवा	460	0.611	मौके पर नदी है। कोई अतिक्रमण नही है।
63		अहिरान	अठगांवा	653	1.643	मौके पर नदी है। कोई अतिक्रमण नही है।
64		खेवली	कसवार राजा	01	1.9230	मौके पर नदी है। कोई अतिक्रमण नही है।
65		लच्छीपुर कुरौना	कसवार राजा	132क	1.3880	मौके पर नदी है। कोई अतिक्रमण नही है।
66		पतरेचक	कसवार राजा	1	0.849	मौके पर नदी है। कोई अतिक्रमण नही है।
67		बीरसिंहपुर	कसवार सरकारी	1	1.4930	मौके पर नदी है। कोई अतिक्रमण नही है।
68			कसवार सरकारी	2	0.5260	मौके पर नदी है। कोई अतिक्रमण नही है।
69			कसवार सरकारी	140	0.2670	मौके पर नदी है। कोई अतिक्रमण नही है।
70			कसवार सरकारी	141	0.2310	मौके पर नदी है। कोई अतिक्रमण नही है।
71	राजातालाब	तेन्दुई	कसवार राजा	1	1.0340	मौके पर नदी है। कोई अतिक्रमण नही है।
72		भिटकुरी	कसवार राजा	1	2.5490	मौके पर नदी है। कोई अतिक्रमण नही है।
73		भतसार	कसवार राजा	1	5.110	मौके पर नदी है। कोई अतिक्रमण नही है।
74		कुरौना उर्फ	कसवार राजा	295	1.3840	मौके पर नदी है। कोई अतिक्रमण नही है।
75		रामेश्वर	कसवार राजा	105	1.4730	मौके पर नदी है। कोई अतिक्रमण नही है।
76		जगापट्टी	कसवार राजा	1	0.802	मौके पर नदी है। कोई अतिक्रमण नही है।
77		परसीपुर	कसवार राजा	1क	1.8010	मौके पर नदी है। कोई अतिक्रमण नही है।
78		बजरडीहा	कसवार राजा	1	1.0110	मौके पर नदी है। कोई अतिक्रमण नही है।
79		इसवार	कसवार राजा	1	2.1690	मौके पर नदी है। कोई अतिक्रमण नही है।

80		ओदरहा	कसवार राजा	365	0.526	मौके पर नदी है। कोई अतिक्रमण नही है।
81		गैरहा	कसवार राजा	1	0.4860	मौके पर नदी है। कोई अतिक्रमण नही है।
82		गोगवा	कसवार राजा	1	0.656	मौके पर नदी है। कोई अतिक्रमण नही है।
83		लोहरापुर	कसवार सरकारी	1	3.733	मौके पर नदी है। कोई अतिक्रमण नही है।

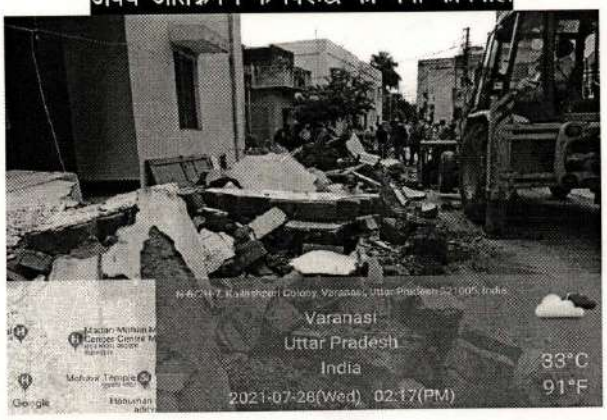
(ब) अस्सी नदी :-

कथित पौराणिक अस्सी नदी/नाला उद्गम स्थल ग्राम कंचनपुर से विभिन्न राजस्व ग्रामों के विभिन्न सरकारी व व्यक्तिगत भूखण्डों से होकर अपने अन्तिम बिन्दु अस्सी घाट पर पहुँचती है। स्थलीय निरीक्षण के आधार ग्रामवार वर्तमान में निम्न भूखण्डों से होकर बहाव जारी है, उसका विवरण निम्नवत् है :-

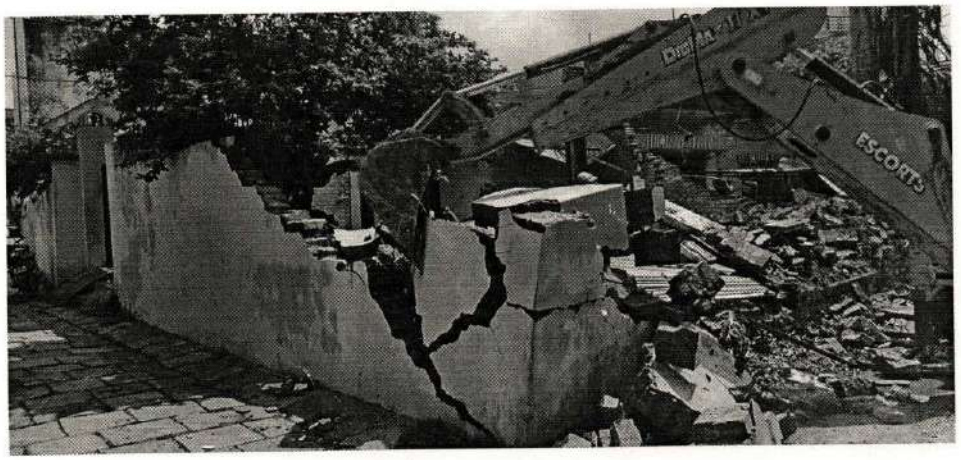
क्र0सं0	तहसील	ग्राम	आ0नं0	रकबा (हे0 मे)	नवयइत	वर्तमान स्थिति
01	सदर	कंचनपुर	मि0 134/6	0.406	पोखरी	मौके पर नाला स्थित है।
02			134/3	0.101	पोखरी	
03			133/2	0.032	नाली	
04			358मि0	0.486	सड़क	
05		चितईपुर	62	0.210	भूमिधरी	आ0नं0 17/2 रकबा 0.257 हे0 भूमि नाली के खाते की भूमि है, जिस पर दौरान सर्वेक्षण 11 व्यक्तियों का अवैध अतिक्रमण पाया गया, जिसे दिनांक 28 जुलाई, 2021 को हटवा दिया गया। सूची एवं फोटोग्राफ्स संलग्न है।
06			91	0.564	भूमिधरी	
07			17/2	0.259	नाली	
08			16	0.295	भूमिधरी	
09			15	0.368	भूमिधरी	
10		कर्माजीतपुर	1/1	0.352	नाली	इस ग्राम के आ0नं0-1 से होकर नदी/नाला बह रहा है। उक्त आराजी 1/1 रकबा 0.352हे0 वर्तमान में नाला खाते में अंकित है। आ0नं0-1 के अलावा आ0नं0-7 के भाग को भी बहार प्रभावित करता रहा है, जो सं0भू0 खाते की भूमि है।
11			1/2	0.040	भूमिधरी	
12			1/3	0.040	भूमिधरी	
13			1/4	0.068	भूमिधरी	
14			1/5	0.065	भूमिधरी	
15		करौंदी	4	-	मतरूक	नदी/नाला बह रहा है।
16			44	0.012	नाला	
17		सरायनन्दन	495/1	0.259	नाली	आंशिक रकबे में नाला बह रहा है।
18			495/2	0.028	बंजर	
19			505/1	0.494	नाली	
20			505/2	0.040	-	
21			505/3	0.243	बंजर	
22			526/1	0.263	-	
23			526/2	0.115	-	
24			526/3	0.115	-	
25			575/1	0.093	-	
26			575/2	0.020	-	
27		भदैनी तृतीय	2417	0.324	नाला	नदी/नाला बह रहा है।
28			2490	0.053	नाला (ना0जेडए)	
29			3283	0.162	नाला (ना0जेडए)	
30		नगवां	192/1	0.089	भूमिधरी	ग्राम के आ0सं0 175,193,194,195 व

31			192/2	0.034	भूमिधरी	196 तथा आ0नं0 236,244,245 होकर गुजरता है। जिसमें आ0नं0 175, 196 195 का सम्पूर्ण क्षेत्रफल खातेदारों के नाम अंकित है तथा आ0नं0-194 में रकबा 0.061हे0 भूमि नाले खाते में अंकित है और इसी क्षेत्रफल से नाला बह रहा है शेष रकबा खातेदारों के नाम है। आ0नं0 236, 244, 245 अभिलेख में उ0प्र0 सरकार विकास प्राधिकरण के नाम अंकित है। इन आराजीयत से वर्तमान में अस्सी नदी/नाला का मुड़ाव प्रवाह/बहाव गंगा नदी में रविदास पार्क से हो रहा है। नाले व आबादी के मिलान बिन्दु पर एस0टी0पी0 बांध है।
32				0.061	नाला	
33			193	0.486	भूमिधरी	
34			194/1	1.040	भूमिधरी	
35			194/2	0.295	भूमिधरी	
36			194/3	0.061	नाला	
37			195	0.409	भूमिधरी	
38			196	0.809	भूमिधरी	
39			236/1	0.340	उ0प्र0स0	
40				0.728	भूमिधरी	
41			244	0.121	उ0प्र0स0	
42			245	0.267	उ0प्र0स0	
43		भदैनी द्वितीय	3300 (बटा 1-6 तक)	0.537	भूमिधरी	इस ग्राम के भाग-2 के आराजी नम्बर 3300,3303,3304,3314,3315 से पूर्व में होकर गुजरता था। वर्तमान में अभिलेख के अनुसार यह सभी आराजियां विभिन्न खातेदारों के नाम संक्रमणीय भूमिध के रूप में अंकित है। वर्तमान में नदी सीधे गंगा की ओर प्रवाहित हो रही है।
44			3300(बटा 1-4 तक)	1.263	भूमिधरी	
45			3304	0.202	भूमिधरी	

अवैध अतिक्रमण के विरूद्ध की गयी कार्यवाही









कर अधीक्षक/,
प्रतिनिधि नगर आयुक्त
नगर निगम, वाराणसी।

संयुक्त सचिव/प्रतिनिधि उपाध्यक्ष,
वाराणसी विकास प्राधिकरण,
वाराणसी।

अधिशासी अभियन्ता,
बन्धी प्रखण्ड,
सिचांईविभाग, वाराणसी।

क्षेत्रीय अधिकारी,
उ0प्र0 प्रदूषण नियंत्रण बोर्ड
वाराणसी।

अपर नगर मजिस्ट्रेट (प्रथम)
वाराणसी।

अपर नगर मजिस्ट्रेट (तृतीय)
वाराणसी।

अपर नगर मजिस्ट्रेट (चतुर्थ)
वाराणसी।

उप जिलाधिकारी (पिण्डरा)
वाराणसी।

उप जिलाधिकारी (राजातालाब)
वाराणसी।

उप जिलाधिकारी सदर,
वाराणसी।

सेवा में,

जिलाधिकारी
वाराणसी।

महोदय,

आप द्वारा दिये गये आदेश के क्रम में पौराणिक अस्सी नदी के उद्गम स्थल से लेकर अस्सी घाट पर अन्तिम बिन्दु तक का स्थलीय एवं अभिलेखीय परीक्षण व निरीक्षण राजस्व विभाग व नगर निगम वाराणसी एवं वाराणसी विकास प्राधिकरण वाराणसी एवं सिंचाई विभाग बन्धी प्रखण्ड की संयुक्त टीम द्वारा किया गया, जिसका विवरण निम्न प्रकार है:-

कथित पौराणिक अस्सी नदी/नाला उद्गम स्थल ग्राम कंचनपुर से विभिन्न राजस्व ग्रामो के विभिन्न सरकारी व व्यक्तिगत भूखण्डों से होकर अपने अन्तिम बिन्दु अस्सी घाट पर पहुचती है। स्थलीय निरीक्षण के आधार ग्राम वार वर्तमान मे निम्न भूखण्डो से होकर बहाव जारी है उसका विवरण निम्नवत है:-

1-ग्राम कंचनपुर-ग्राम कंचनपुर के आराजी नम्बर 134 से ही अस्सी नदी का उद्गम हुआ है जैसा कि स्थलीय स्तर पर प्रचलित है और निरीक्षण से भी स्पष्ट हुआ। वर्तमान अभिलेख में इस भूखण्ड का रकबा 0.507हे0 पोखरी खाते की भूमि है तथा आंशिक रकबा विभिन्न खातेदारो के नाम भिन्न खाते में संकमणीय भूमिधर के रुप में अंकित है। आगे इसी ग्राम के आराजी नम्बर 358 से होकर गुजर रही है। आराजी नम्बर 358 व वर्तमान समय में सडक, आबादी व खातेदारो के नाम अंकित है। आराजी नम्बर 358 में कुछ भूमि पर मकान आदि बने है। उस स्थान पर बहाव थोडा उपर उत्तर तरफ से हो रहा है जो विभिन्न खातेदारो की भूमि है। उनकी सहमति के आधार पर ही ग्राम प्रधान कंचनपुर द्वारा निर्माण कराया गया है। संलग्न नक्शे में उस स्थान को लाल स्याही से दर्शाया गया है, बहाव परिवर्तित है। सम्बन्धित भूखण्ड सं0134 व 358 के उद्धरण संलग्न है।

क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0
1	2	3	4	5	6	7
1	कंचनपुर	मि.134/6 134/3 133/2	0.406हे 0.101हे0 0.032हे0	पोखरी पोखरी नाली		मौके पर नाला स्थित है।

	358मि	0.486हे0	सडक	

2–चितईपुर– ग्राम कंचनपुर के बाद नदी /नाला ग्राम चितईपुर में प्रवेश करता है और ग्राम चितईपुर के आराजी नम्बर 15, 16, 17, 62, 91 से होकर गुजरती है अभिलेख के अनुसार आराजी नम्बर 15 विभिन्न खातेदारो के नाम अंकित है। आराजी नम्बर 16, 62, 91 भी विभिन्न खातेदारो के नाम संक्रमणीय भूमिधर के नाम अंकित है। आराजी नम्बर 17/2 रकबा 0.257हे0 भूमि नाली के खाते की भूमि है। प्रभावित भूखण्डों के उद्धरण संलग्न है।

क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0
1	2	3	4	5	6	7
2	चितईपुर	62	0.210हे0	भूमिधरी	कमला देवी व ब्रिजेश कुमार व डा0 वन्दना घोष व	
		91	0.564हे0	भूमिधरी	ओप्रकाश वगैरह	
		17/2	0.259हे0	नाली	रत्नेश्वर प्रसाद नरायण सिंह वगैरह	
		16	0.295हे0	भूमिधरी	.....	
		15	0.368हे0	भूमिधरी	पन्नालाल वगैरह	
					विमल कुमार व फौजदार वगैरह	

3–कर्माजीतपुर– ग्राम चितईपुर के बाद ग्राम कर्माजीतपुर से प्रवेश करता है। इस ग्राम के आराजी नम्बर 1 से होकर नदी/नाला बह रहा है। उक्त 1/1 रकबा 0.352हे0 वर्तमान अभिलेख में नाला खाते में अंकित है। उद्धरण खतौनी संलग्न है। आराजी नम्बर 1 के अलावा आ0नं07 के भाग को भी बहाव प्रभावित करता रहा है जो सं0भू0खाते की भूमि है।

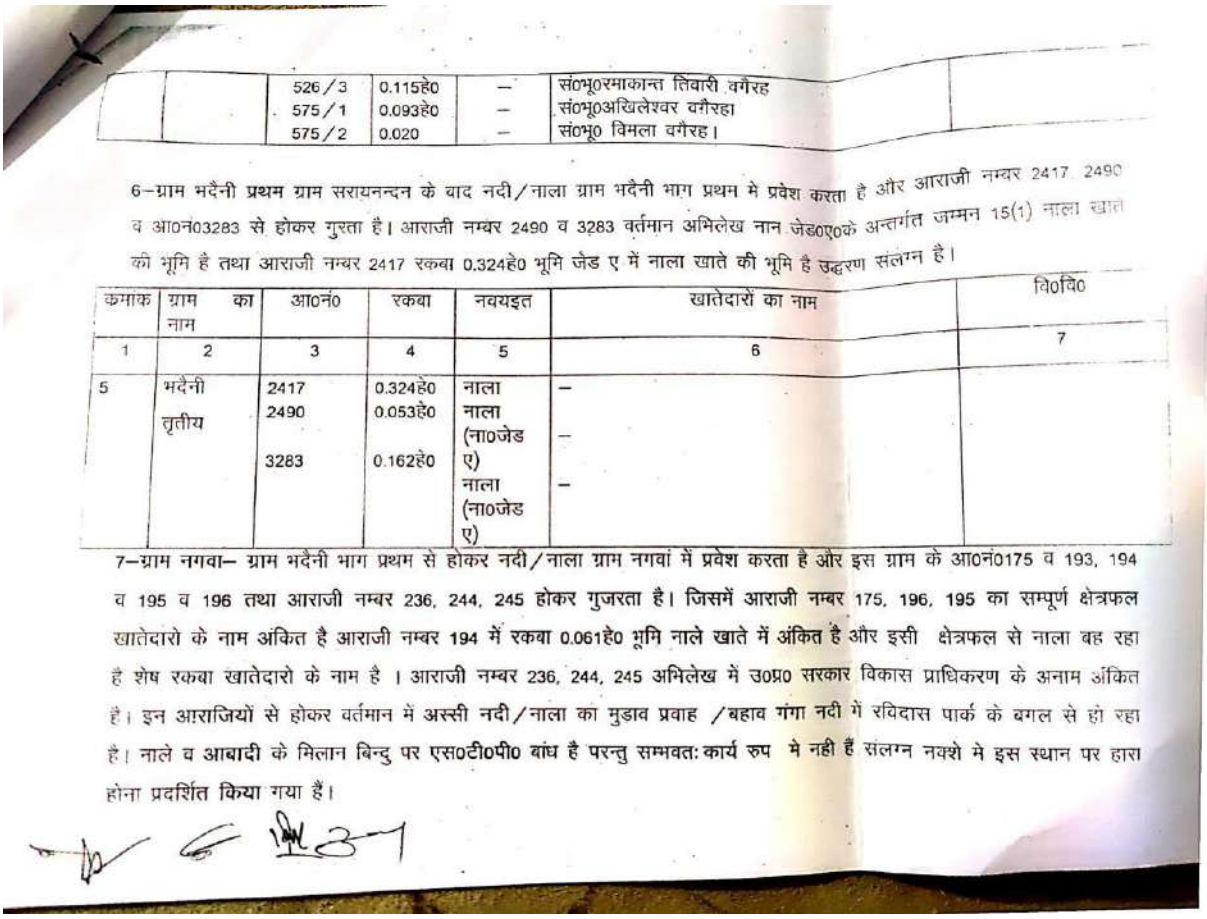
क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0
1	2	3	4	5	6	7
3	कर्माजीतपुर	1/1	0.352हे0	नाला	.....	
		1/2	0.040हे0	भूमिधरी	राजाराम व मिठाई लाल वगैरहा	
		1/3	0.040हे0	भूमिधरी	गोपीनाथ वगैरह	
		1/4	0.068हे0	भूमिधरी	नन्दू व बसन्तु व राजकुमार व राधेश्याम वगैरह	
		1/5	0.065हे0	भूमिधरी	गौरीशंकर वगैरह	

4–करौदी–ग्राम कर्माजीतपुर के बाद नदी/नाला ग्राम करौदी में प्रवेश करता है और ग्राम करौदी के आराजी नम्बर 4 व 44 से होकर गुजरता रहता है उपर से आराजी नम्बर 4 व 44 बन्दोबस्त के समय से ही नाला खाते की भूमि है और वर्तमान में भी नाला खात में ही अंकित है।

क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0
1	2	3	4	5	6	7
4	करौदी	4 44	– 0.012	मतरुक नाला	– –	

5–ग्राम सरायनन्दन– ग्राम सरायनन्दन में आ0नं0495 व 505 व 575 व 526से होकर गुजरता है। अभिलेख के अनुसार आराजी नम्बर 495/1 रकबा 0.257हे0 व आराजी नम्बर 505/1 रकबा 0.494हे0 भूमि नालीके खातेमें अंकित है। इसके आसपास के आराजियों के आंशिक क्षेत्रफल पर खातेदारो के नाम अंकित है तथा आराजी नम्बर 526 व 575 भिन्न–भिन्न खातेदारों के नाम विभिन्न खातों के सं0भू0के रुप में अंकित है संलग्न ग्राम के भूचित्र में नदी/नाले के मूलस्वरुप में परिवर्तन मौके पर है जिसे लाल स्याही से दशाया गया है। उद्धरण संलग्न है।

क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारो का नाम	वि0वि0
1	2	3	4	5	6	7
1	सरायनन्दन	495/1	0.259हे0	नाली	–	
		495/2	0.028हे0	बंजर	–	
		505/1	0.494हे0	नाली	–	
		505/2	0.040हे0	–	सं0भू0कन्हई वगैरहा।	
		505/3	0.243हे0	बंजर	–	
		526/	0.263हे0	–	सं0भू0 कौशिक मिश्रा वगैरह	आंशिक रकबे में नाला बह रहा है।
		526/2	0.115हे0	–	सं0भू0जगदीश प्रसाद विश्वकर्मा वगैरह	



		526/3	0.115हे0	—	सं0भू0रमाकान्त तिवारी वगैरह	
		575/1	0.093हे0	—	सं0भू0अखिलेश्वर वगैरहा	
		575/2	0.020	—	सं0भू0 विमला वगैरह।	

6–ग्राम भदैनी प्रथम ग्राम सरायनन्दन के बाद नदी/नाला ग्राम भदैनी भाग प्रथम मे प्रवेश करता है और आराजी नम्बर 2417, 2490 व आ0नं03283 से होकर गुरता है। आराजी नम्बर 2490 व 3283 वर्तमान अभिलेख नान जेड0ए0के अन्तर्गत जम्मन 15(1) नाला खाते की भूमि है तथा आराजी नम्बर 2417 रकबा 0.324हे0 भूमि जेड ए में नाला खाते की भूमि है उद्धरण संलग्न है।

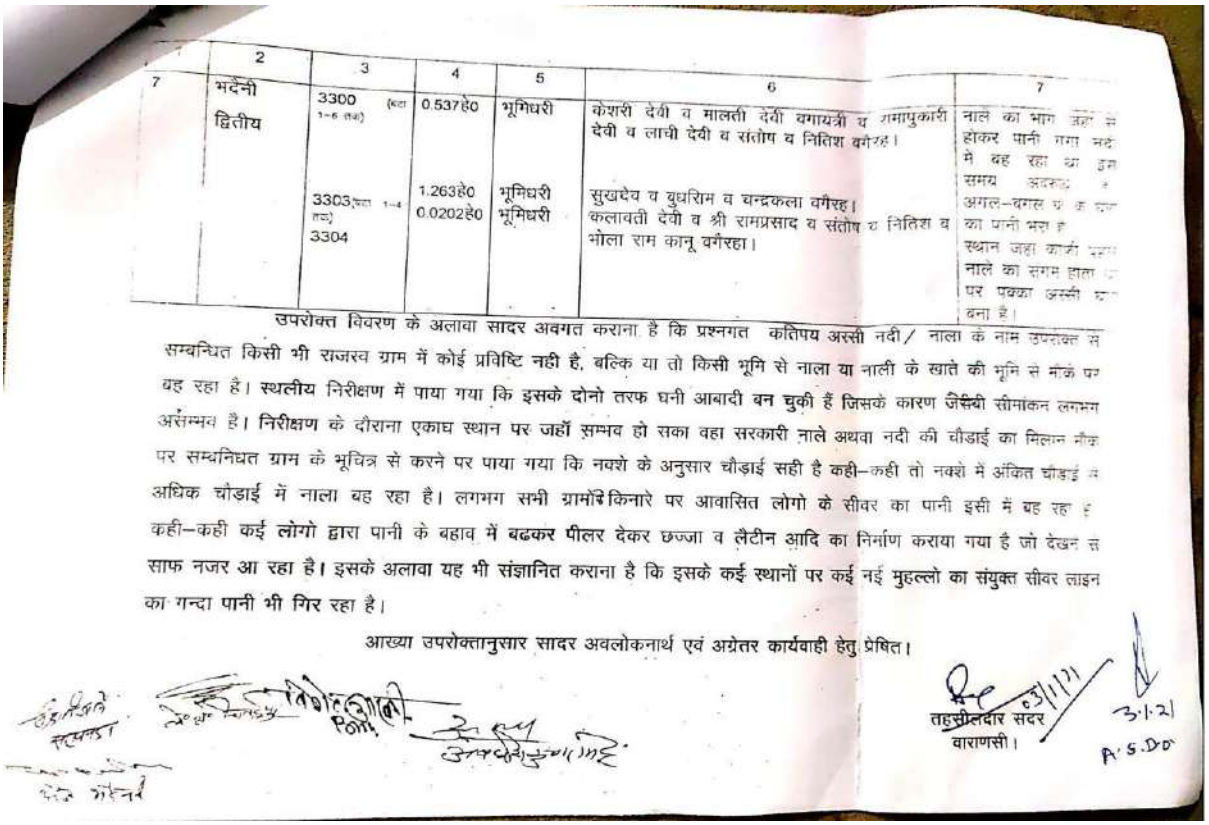
क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0
1	2	3	4	5	6	7
5	भदैनी तृतीय	2417	0.324हे0	नाला	–	
		2490	0.053हे0	नाला (ना0जेड ए)	–	
		3283	0.162हे0	नाला (ना0जेड ए)	–	

7–ग्राम नगवा– ग्राम भदैनी भाग प्रथम से होकर नदी/नाला ग्राम नगवां में प्रवेश करता है और इस ग्राम के आ0नं0175 व 193, 194 व 195 व 196 तथा आराजी नम्बर 236, 244, 245 होकर गुजरता है। जिसमें आराजी नम्बर 175, 196, 195 का सम्पूर्ण क्षेत्रफल खातेदारो के नाम अंकित है आराजी नम्बर 194 में रकबा 0.061हे0 भूमि नाले खाते में अंकित है और इसी क्षेत्रफल से नाला बह रहा है शेष रकबा खातेदारो के नाम है । आराजी नम्बर 236, 244, 245 अभिलेख में उ0प्र0 सरकार विकास प्राधिकरण के अनाम अंकित है। इन आराजियों से होकर वर्तमान में अस्सी नदी/नाला का मुड़ाव प्रवाह /बहाव गंगा नदी में रविदास पार्क के बगल से हो रहा है। नाले व आबादी के मिलान बिन्दु पर एस0टी0पी0 बांध है परन्तु सम्भवत: कार्य रुप मे नही हैं संलग्न नक्शे मे इस स्थान पर हारा होना प्रदर्शित किया गया हैं।

क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0
1	2	3	4	5	6	7
6	नगवा	192/1	0.089हे0	भूमिधरी	श्रीमती बनारसी देवी	
		192/2	0.034हे0	भूमिधरी	श्रीमती सोनपत्ती व श्यामप्यारी	
			0.061हे0	नला	–	
		193	0.486हे0	भूमिधरी	श्रीमती कुलवन्ती सिंह राणा, श्रीमती कपूरथली शुक्ला	
		194/1	1.040हे0	भूमिधरी	वगैरहा	
		194/2	0.295 हे0	भूमिधरी	अपराजिता व आत्मनन्दन वगैरह	
		194/3	0.061 हे0	नाली	श्रीमती आशा तिवारी व राजेश वगैरह	
		195	0.409 हे0	भूमिधरी	–	
		196	0.809 हे0	भूमिधरी	अवध बिहारी व आषा तिवारी वगैरह	
		236/1	0.340 हे0	उ0प्र0स0	अवध बिहारी सयव कलावती देवी वगैरह	
			0.728हे0	भूमिधरी	उ0प्र0 सं0 वि0प्रा0	
		244	0.121 हे0	उ0प्र0स0	कपिल देव तिवारी व महेन्द्र वगैरह	
		245	0.267हे0	उ0प्र0स0	उ0प्र0स0वि0प्रा0	
					उ0प्र0सं0विकास	

8–ग्राम भदैनी द्वितीय– ग्राम नगवा के बाद नदी/नाला पुनः ग्राम भदैनी भाग 2 में प्रवेश करता है और इस ग्राम मे भाग 2 के आराजी नम्बर 3300, 3303, 3304 ,3314, 3315 से होकर गुजरता है। वर्तमान अभिलेख के अनुसार यह सभी आराजियां विभिन्न खातेदारो के नाम संक्रमणीय भूमिधर के रुप में अंकित है। स्थलीय जांच के समय ग्राम भदैनी के भाग 2 के शजरे में इन भूखण्डो में चिन्हित नाले का मिलान बिन्दू पर करने पर पाया गया कि मौके पर नाले का स्वरुप तो है परन्तु बहाव अवरुद्ध है, कंछल अलग–बगल के आबाद लोगो द्वारा अपने घरो का सीवर का पानी बहाया जाता है वह पानी आता है और स्थिर है। स्थानीय लोगो द्वारा बताया गया कि पहले इसी रास्ते होकर अस्सीघाट पर अस्सी नदी व गंगा का संगम होता था, बल्कि ग्राम भदैनी का भूचित्र भाग दो पर अस्सी संगम शब्द लिखा है। इससे भी स्पष्ट होता है काफी पहले इसी स्थान पर अस्सी नदी/नाला गंगा नदी मे मिलता था परन्तु वर्तमान में इस स्थान पर पक्का अस्सी घाट , मन्दिर , साईकिल स्टैण्ड आदि बना हुआ है। संलग्न नक्शे में ग्राम नगवा में जिस स्थान से नदी/नाले के मुख्य बहाव को रविदास पार्क के बगल से गंगा नदी में मिलाया गया है। उस स्थान से आगे ग्राम भदैनी के भाग–2 के अवरुद्ध नाले को लाल स्याही से इंगित किया गया है।

क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0



1	2	3	4	5	6	7
7	भदैनी द्वितीय	3300 (भाग 1–6 तक)	0.537हे0	भूमिधरी	केशरी देवी व मालती देवी वगायत्री व रामापुकारी देवी व लाची देवी व संतोष व नितिश वगैरह।	नाले का भाग जहां से होकर पानी गंगा नदी में बह रहा था इस समय अवरुद्ध है अगल–बगल के घरों का पानी भरा है स्थान जहां कच्ची पक्की नाले का संगम होता है पर पक्का ढक्की बना है।
		3303 (भाग 1–4 तक)	1.263हे0	भूमिधरी	सुखदेव व युधरिम व चन्द्रकला वगैरह।	
		3304	0.0202हे0	भूमिधरी	कलावती देवी व श्री रामप्रसाद व संतोष व नितिश व भोला राम कानू वगैरहा।	

उपरोक्त विवरण के अलावा सादर अवगत कराना है कि प्रश्नगत कतिपय अस्सी नदी/ नाला के नाम उपरोक्त से सम्बन्धित किसी भी राजस्व ग्राम में कोई प्रविष्टि नही है, बल्कि या तो किसी भूमि से नाला या नाली के खाते की भूमि से मौके पर बह रहा है। स्थलीय निरीक्षण में पाया गया कि इसके दोनो तरफ घनी आबादी बन चुकी हैं जिसके कारण जैसेकी सीमांकन लगभग असंम्भव है। निरीक्षण के दौराना एकाघ स्थान पर जहाँ सम्भव हो सका वहा सरकारी नाले अथवा नदी की चौडाई का मिलान मौके पर सम्बन्धित ग्राम के भूचित्र से करने पर पाया गया कि नक्शे के अनुसार चौड़ाई सही है कही–कही तो नक्शे में अंकित चौड़ाई से अधिक चौड़ाई में नाला बह रहा है। लगभग सभी ग्रामोंके किनारे पर आवासित लोगो के सीवर का पानी इसी में बह रहा है कही–कही कई लोगो द्वारा पानी के बहाव में बढकर पीलर देकर छज्जा व लैटीन आदि का निर्माण कराया गया है जो देखने से साफ नजर आ रहा है। इसके अलावा यह भी संज्ञानित कराना है कि इसके कई स्थानों पर कई नई मुहल्लो का संयुक्त सीवर लाइन का गन्दा पानी भी गिर रहा है।

आख्या उपरोक्तानुसार सादर अवलोकनार्थ एवं अग्रेतर कार्यवाही हेतु प्रेषित।

तहसीलदार सदर
वाराणसी।

3.1.21
A.S.D.O

सेवा में,

जिलाधिकारी
वाराणसी।

महोदय,

आप द्वारा दिये गये आदेश के क्रम में पौराणिक अस्सी नदी के उद्गम स्थल से लेकर अस्सी घाट पर अन्तिम बिन्दु तक का स्थलीय एवं अभिलेखीय परीक्षण व निरीक्षण राजस्व विभाग व नगर निगम वाराणसी एवं वाराणसी विकास प्राधिकरण वाराणसी एवं सिंचाई विभाग बन्धी प्रखण्ड की संयुक्त टीम द्वारा किया गया, जिसका विवरण निम्न प्रकार है:-

कथित पौराणिक अस्सी नदी/नाला उद्गम स्थल ग्राम कंचनपुर से विभिन्न राजस्व ग्रामो के विभिन्न सरकारी व व्यक्तिगत भूखण्डों से होकर अपने अन्तिम बिन्दु अस्सी घाट पर पहुचती है। स्थलीय निरीक्षण के आधार ग्राम वार वर्तमान मे निम्न भूखण्डो से होकर बहाव जारी है उसका विवरण निम्नवत है:-

1-ग्राम कंचनपुर-ग्राम कंचनपुर के आराजी नम्बर 134 से ही अस्सी नदी का उद्गम हुआ है जैसा कि स्थलीय स्तर पर प्रचलित है और निरीक्षण से भी स्पष्ट हुआ। वर्तमान अभिलेख में इस भूखण्ड का रकबा 0.507है0 पोखरी खाते की भूमि है तथा आंशिक रकबा विभिन्न खातेदारो के नाम भिन्न खाते में संकमणीय भूमिधर के रुप में अंकित है। आगे इसी ग्राम के आराजी नम्बर 358 से होकर गुजर रही है। आराजी नम्बर 358 व वर्तमान समय में सडक, आबादी व खातेदारो के नाम अंकित है। आराजी नम्बर 358 में कुछ भूमि पर मकान आदि बने है। उस स्थान पर बहाव थोडा उपर उत्तर तरफ से हो रहा है जो विभिन्न खातेदारो की भूमि है। उनकी सहमति के आधार पर ही ग्राम प्रधान कंचनपुर द्वारा निर्माण कराया गया है। संलग्न नक्शे में उस स्थान को लाल स्याही से दर्शाया गया है, बहाव परिवर्तित है। सम्बन्धित भूखण्ड सं0134 व 358 के उद्धरण संलग्न है।

क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0
1	2	3	4	5	6	7
1	कंचनपुर	मि.134/6 134/3 133/2	0.406है 0.101है0 0.032है0	पोखरी पोखरी नाली		मौके पर नाला स्थित है।

	358मि	0.486हे0	सडक	

2–चितईपुर– ग्राम कंचनपुर के बाद नदी /नाला ग्राम चितईपुर में प्रवेश करता है और ग्राम चितईपुर के आराजी नम्बर 15, 16, 17, 62, 91 से होकर गुजरती है अभिलेख के अनुसार आराजी नम्बर 15 विभिन्न खातेदारो के नाम अंकित है। आराजी नम्बर 16, 62, 91 भी विभिन्न खातेदारो के नाम संक्रमणीय भूमिधर के नाम अंकित है। आराजी नम्बर 17/2 रकबा 0.257हे0 भूमि नाली के खाते की भूमि है। प्रभावित भूखण्डों के उद्धरण संलग्न है।

क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0
1	2	3	4	5	6	7
2	चितईपुर	62	0.210हे0	भूमिधरी	कमला देवी व ब्रिजेश कुमार व डा0 वन्दना घोष व ओप्रकाश वगैरह	
		91	0.564हे0	भूमिधरी		
		17/2	0.259हे0	नाली	रत्नेश्वर प्रसाद नरायण सिंह वगैरह	
		16	0.295हे0	भूमिधरी	.....	
		15	0.368हे0	भूमिधरी	पन्नालाल वगैरह	
					विमल कुमार व फौजदार वगैरह	

3–कर्माजीतपुर– ग्राम चितईपुर के बाद ग्राम कर्माजीतपुर से प्रवेश करता है। इस ग्राम के आराजी नम्बर 1 से होकर नदी/नाला बह रहा है। उक्त 1/1 रकबा 0.352हे0 वर्तमान अभिलेख में नाला खाते में अंकित है। उद्धरण खतौनी संलग्न है। आराजी नम्बर 1 के अलावा आ0नं07 के भाग को भी बहाव प्रभावित करता रहा है जो सं0भू0खाते की भूमि है।

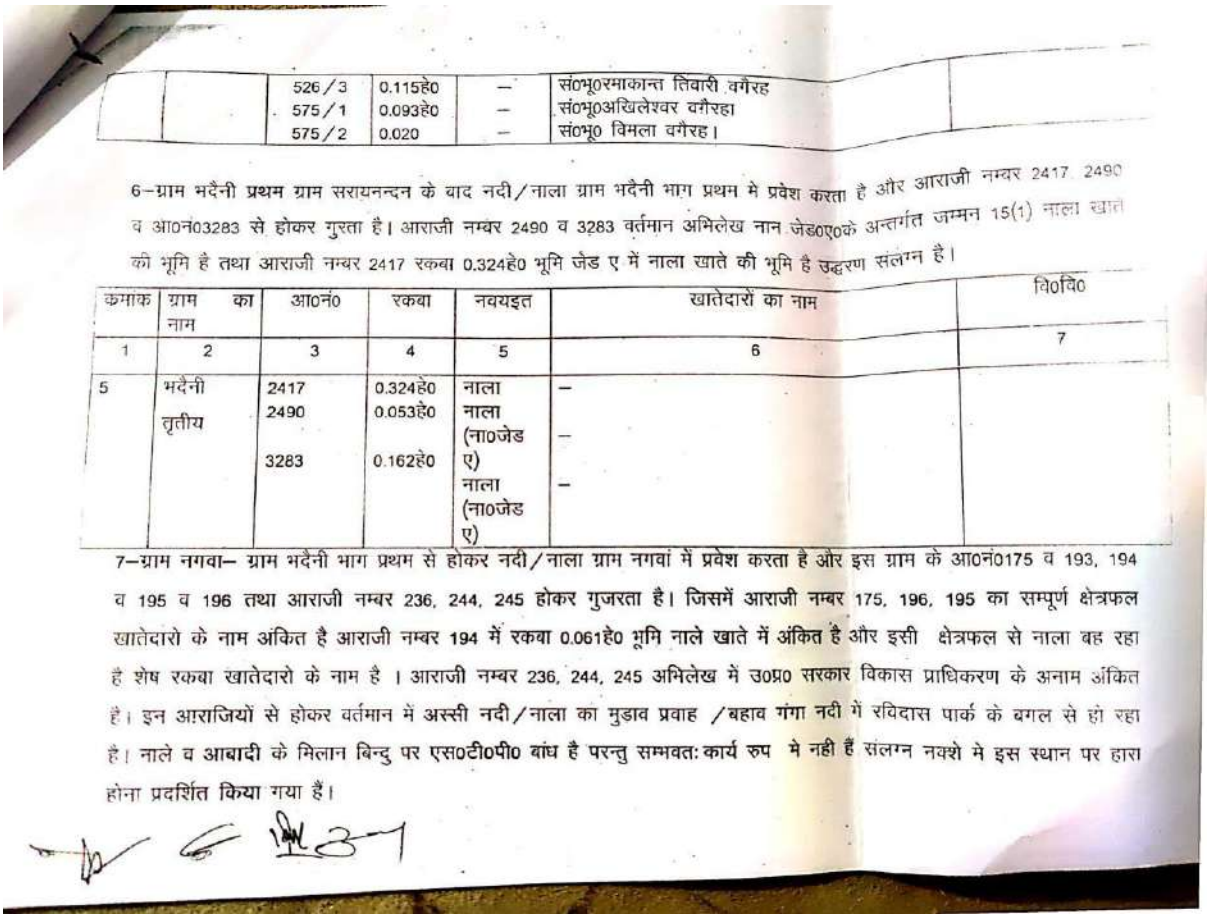
क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0
1	2	3	4	5	6	7
3	कर्माजीतपुर	1/1	0.352हे0	नाला	.....	
		1/2	0.040हे0	भूमिधरी	राजाराम व मिठाई लाल वगैरहा	
		1/3	0.040हे0	भूमिधरी	गोपीनाथ वगैरह	
		1/4	0.068हे0	भूमिधरी	नन्दू व बसन्तु व राजकुमार व राधेश्याम वगैरह	
		1/5	0.065हे0	भूमिधरी	गौरीशंकर वगैरह	

4–करौदी–ग्राम कर्माजीतपुर के बाद नदी/नाला ग्राम करौदी में प्रवेश करता है और ग्राम करौदी के आराजी नम्बर 4 व 44 से होकर गुजरता रहता है उपर से आराजी नम्बर 4 व 44 बन्दोबस्त के समय से ही नाला खाते की भूमि है और वर्तमान में भी नाला खात में ही अंकित है।

क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0
1	2	3	4	5	6	7
4	करौदी	4 44	– 0.012	मतरुक नाला	– –	

5–ग्राम सरायनन्दन– ग्राम सरायनन्दन में आ0नं0495 व 505 व 575 व 526से होकर गुजरता है। अभिलेख के अनुसार आराजी नम्बर 495/1 रकबा 0.257हे0 व आराजी नम्बर 505/1 रकबा 0.494हे0 भूमि नालेके खातेमेंअंकित है। इसके आसपास के आराजियों के आंशिक क्षेत्रफल पर खातेदारो के नाम अंकित है तथा आराजी नम्बर 526 व 575 भिन्न–भिन्न खातेदारों के नाम विभिन्न खातों के सं0भू0के रुप में अंकित है संलग्न ग्राम के भूचित्र में नदी/नाले के मूलस्वरुप में परिवर्तन मौके पर है जिसे लाल स्याही से दशाया गया है। उद्धरण संलग्न है।

क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारो का नाम	वि0वि0
1	2	3	4	5	6	7
1	सरायनन्दन	495/1	0.259हे0	नाली	–	
		495/2	0.028हे0	बंजर	–	
		505/1	0.494हे0	नाली	–	
		505/2	0.040हे0	–	सं0भू0कन्हई वगैरहा।	
		505/3	0.243हे0	बंजर	–	
		526/	0.263हे0	–	सं0भू0 कौशिक मिश्रा वगैरह	आंशिक रकबे में नाला बह रहा है।
		526/2	0.115हे0	–	सं0भू0जगदीश प्रसाद विश्वकर्मा वगैरह	



		526/3	0.115हे0	—	सं0भू0रमाकान्त तिवारी वगैरह	
		575/1	0.093हे0	—	सं0भू0अखिलेश्वर वगैरहा	
		575/2	0.020	—	सं0भू0 विमला वगैरह।	

6–ग्राम भदैनी प्रथम ग्राम सरायनन्दन के बाद नदी/नाला ग्राम भदैनी भाग प्रथम मे प्रवेश करता है और आराजी नम्बर 2417, 2490 व आ0नं03283 से होकर गुरता है। आराजी नम्बर 2490 व 3283 वर्तमान अभिलेख नान जेड0ए0के अन्तर्गत जम्मन 15(1) नाला खाते की भूमि है तथा आराजी नम्बर 2417 रकबा 0.324हे0 भूमि जेड ए में नाला खाते की भूमि है उद्धरण संलग्न है।

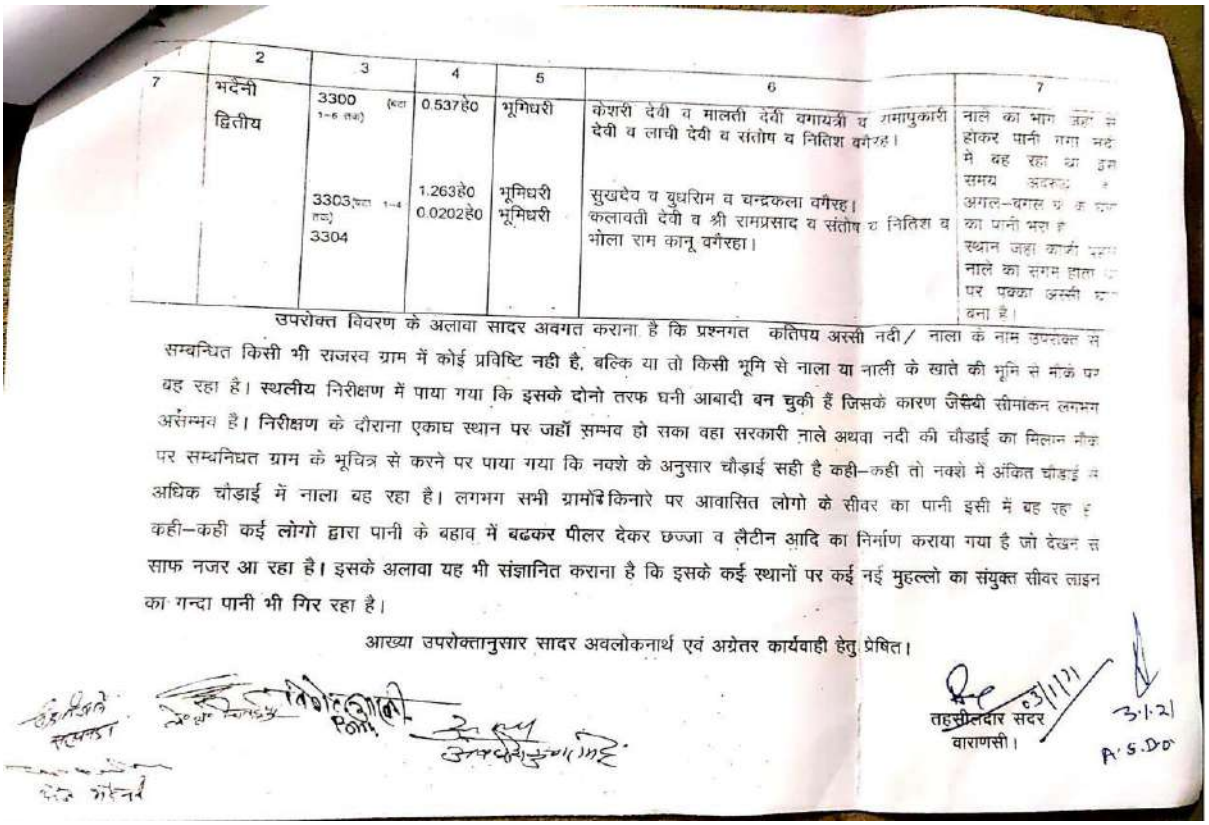
कमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0
1	2	3	4	5	6	7
5	भदैनी तृतीय	2417	0.324हे0	नाला	–	
		2490	0.053हे0	नाला (ना0जेड ए)	–	
		3283	0.162हे0	नाला (ना0जेड ए)	–	

7–ग्राम नगवा– ग्राम भदैनी भाग प्रथम से होकर नदी/नाला ग्राम नगवां में प्रवेश करता है और इस ग्राम के आ0नं0175 व 193, 194 व 195 व 196 तथा आराजी नम्बर 236, 244, 245 होकर गुजरता है। जिसमें आराजी नम्बर 175, 196, 195 का सम्पूर्ण क्षेत्रफल खातेदारो के नाम अंकित है आराजी नम्बर 194 में रकबा 0.061हे0 भूमि नाले खाते में अंकित है और इसी क्षेत्रफल से नाला बह रहा है शेष रकबा खातेदारो के नाम है । आराजी नम्बर 236, 244, 245 अभिलेख में उ0प्र0 सरकार विकास प्राधिकरण के अनाम अंकित है। इन आराजियों से होकर वर्तमान में अस्सी नदी/नाला का मुड़ाव प्रवाह /बहाव गंगा नदी में रविदास पार्क के बगल से हो रहा है। नाले व आबादी के मिलान बिन्दु पर एस0टी0पी0 बांध है परन्तु सम्भवत: कार्य रुप मे नही हैं संलग्न नक्शे मे इस स्थान पर हारा होना प्रदर्शित किया गया हैं।

क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0
1	2	3	4	5	6	7
6	नगवा	192/1	0.089हे0	भूमिधरी	श्रीमती बनारसी देवी	
		192/2	0.034हे0	भूमिधरी	श्रीमती सोनपत्ती व श्यामप्यारी	
			0.061हे0	नला	–	
		193	0.486हे0	भूमिधरी	श्रीमती कुलवन्ती सिंह राणा, श्रीमती कपूरथली शुक्ला	
		194/1	1.040हे0	भूमिधरी	वगैरहा	
		194/2	0.295 हे0	भूमिधरी	अपराजिता व आत्मनन्दन वगैरह	
		194/3	0.061 हे0	नाली	श्रीमती आशा तिवारी व राजेश वगैरह	
		195	0.409 हे0	भूमिधरी	–	
		196	0.809 हे0	भूमिधरी	अवध बिहारी व आषा तिवारी वगैरह	
		236/1	0.340 हे0	उ0प्र0स0	अवध बिहारी सयव कलावती देवी वगैरह	
			0.728हे0	भूमिधरी	उ0प्र0 सं0 वि0प्रा0	
		244	0.121 हे0	उ0प्र0स0	कपिल देव तिवारी व महेन्द्र वगैरह	
		245	0.267हे0	उ0प्र0स0	उ0प्र0स0वि0प्रा0	
					उ0प्र0सं0विकास	

8–ग्राम भदैनी द्वितीय– ग्राम नगवा के बाद नदी/नाला पुनः ग्राम भदैनी भाग 2 में प्रवेश करता है और इस ग्राम मे भाग 2 के आराजी नम्बर 3300, 3303, 3304 ,3314, 3315 से होकर गुजरता है। वर्तमान अभिलेख के अनुसार यह सभी आराजियां विभिन्न खातेदारो के नाम संक्रमणीय भूमिधर के रुप में अंकित है। स्थलीय जांच के समय ग्राम भदैनी के भाग 2 के शजरे में इन भूखण्डो में चिन्हित नाले का मिलान बिन्दू पर करने पर पाया गया कि मौके पर नाले का स्वरुप तो है परन्तु बहाव अवरुद्ध है, कंछल अलग–बगल के आबाद लोगो द्वारा अपने घरो का सीवर का पानी बहाया जाता है वह पानी आता है और स्थिर है। स्थानीय लोगो द्वारा बताया गया कि पहले इसी रास्ते होकर अस्सीघाट पर अस्सी नदी व गंगा का संगम होता था, बल्कि ग्राम भदैनी का भूचित्र भाग दो पर अस्सी संगम शब्द लिखा है। इससे भी स्पष्ट होता है काफी पहले इसी स्थान पर अस्सी नदी/नाला गंगा नदी मे मिलता था परन्तु वर्तमान में इस स्थान पर पक्का अस्सी घाट , मन्दिर , साईकिल स्टैण्ड आदि बना हुआ है। संलग्न नक्शे में ग्राम नगवा में जिस स्थान से नदी/नाले के मुख्य बहाव को रविदास पार्क के बगल से गंगा नदी में मिलाया गया है। उस स्थान से आगे ग्राम भदैनी के भाग–2 के अवरुद्ध नाले को लाल स्याही से इंगित किया गया है।

क्रमांक	ग्राम का नाम	आ0नं0	रकबा	नवयइत	खातेदारों का नाम	वि0वि0



1	2	3	4	5	6	7
7	भदैनी द्वितीय	3300 (भाग 1–6 तक)	0.537हे0	भूमिधरी	केशरी देवी व मालती देवी वगायत्री व रामापुकारी देवी व लाची देवी व संतोष व नितिश वगैरह।	नाले का भाग जहां से होकर पानी गंगा नदी में बह रहा था इस समय अवरुद्ध है अगल–बगल के घरों का पानी भरा है स्थान जहां कच्ची पक्की नाले का संगम होता है पर पक्का ढक्की बना है।
		3303 (भाग 1–4 तक)	1.263हे0	भूमिधरी	सुखदेव व युधरिम व चन्द्रकला वगैरह।	
		3304	0.0202हे0	भूमिधरी	कलावती देवी व श्री रामप्रसाद व संतोष व नितिश व भोला राम कानू वगैरहा।	

उपरोक्त विवरण के अलावा सादर अवगत कराना है कि प्रश्नगत कतिपय अस्सी नदी/ नाला के नाम उपरोक्त से सम्बन्धित किसी भी राजस्व ग्राम में कोई प्रविष्टि नही है, बल्कि या तो किसी भूमि से नाला या नाली के खाते की भूमि से मौके पर बह रहा है। स्थलीय निरीक्षण में पाया गया कि इसके दोनो तरफ घनी आबादी बन चुकी हैं जिसके कारण जैसेकी सीमांकन लगभग असंम्भव है। निरीक्षण के दौराना एकाघ स्थान पर जहाँ सम्भव हो सका वहा सरकारी नाले अथवा नदी की चौडाई का मिलान मौके पर सम्बन्धित ग्राम के भूचित्र से करने पर पाया गया कि नक्शे के अनुसार चौड़ाई सही है कही–कही तो नक्शे में अंकित चौड़ाई से अधिक चौड़ाई में नाला बह रहा है। लगभग सभी ग्रामोंके किनारे पर आवासित लोगो के सीवर का पानी इसी में बह रह है कही–कही कई लोगो द्वारा पानी के बहाव में बढकर पीलर देकर छज्जा व लैटीन आदि का निर्माण कराया गया है जो देखने से साफ नजर आ रहा है। इसके अलावा यह भी संज्ञानित कराना है कि इसके कई स्थानों पर कई नई मुहल्लो का संयुक्त सीवर लाइन का गन्दा पानी भी गिर रहा है।

आख्या उपरोक्तानुसार सादर अवलोकनार्थ एवं अग्रेतर कार्यवाही हेतु प्रेषित।

तहसीलदार सदर
वाराणसी।

3.1.21
A.S.D.O

Annexure – VII: Municipal Solid waste management Action Plan

Action Plan

Varanasi City Solid Waste Management
For 15th Finance commission

Varanasi Nagar Nigam,
Front of Saheed Udyan Park,
Sigra, Varanasi-221010
Email- mcvns1@gmail.com & nagarnigamvns@gmail.com

INTRODUCTION TO SOLID WASTE MANAGEMENT

Solid Waste Management (SWM) is an organized process of storage, collection, transportation, processing, and disposal of solid waste in a manner that is not detrimental to the environment. Today Solid Waste Management is an aggravating problem in urban areas of our country due to rapid population growth, coupled by an economic boom that encourages the consumption of goods and hence waste generation.
The local governing bodies namely municipalities and municipal corporations are responsible for providing SWM services in the urban areas. In most of the urban areas, insufficient funds, use of obsolete and/or inefficient technologies, lack of public awareness, and proper infrastructure had resulted in poor state of SWM. All this is changing with launching of new initiatives such as the Swachh Bharat Mission-Urban, publishing of Solid Waste Management Rules, 2016 and organizing Swachh Survekshan.

Swachh Bharat Mission-Urban was incepted in 2014 with the aim to modernize the SWM practices and augment the capacities of ULBs. The mission is actively engaging ULBs to take measures to keep the city clean by eliminating open dumping spots, promoting door to door collection of segregated waste, setting up scientifically designed solid waste management infrastructure and also reclamation of land from dumpsites.

Solid Waste Management Rules, 2016 were published by MOEFCC replacing the Municipal Solid Waste rules 2000. The new rules stresses on waste segregation, decentralized waste management, roles of Bulk Waste Generators and involvement of informal sector in solid waste management. Swachh Survekshan is a ranking exercise taken up by the Government of India to assess urban areas for their levels of cleanliness and active implementation of Swachh Bharat Mission initiatives in a timely and innovative manner. The objective of the survey is to encourage large scale citizen participation and create awareness amongst all sections of society about the importance of working together towards making towns and cities a better place to live in.

Varanasi City Profile

Varanasi is a city in the Indian state of Uttar Pradesh dating to the 11th century B.C. regarded as the spiritual capital of India, the city draws pilgrims who bathe in the sacred waters of River Ganges and perform funeral rites. Along its Vending streets are some 2,000 temples, including Kashi Vishwanath, dedicated to the Hindu God Shiva. The ancient city of Varanasi was not built in a day. The city has two remnants of a holy past: the first being Rajghat plateau, where the archaeological findings of wards date back to the period of very existence of urban settlement and the second being Sarnath, where Buddha gave his first sermon, “Turning the wheel of law” in 528 BC. Later during 3rd century King Ashoka built a monastery township there, which continued its existence till 12th century and was later destroyed. Since ancient times the natural and cultural landscapes of the city have retained an active social role in contemporary society closely associated with the traditional way of life.

The city is a place of pilgrimage and a holy site for sacred baths in the Ganga River, to have a good death, to get relief from transmigration, to learn and receive spiritual merit, etc. The city has still maintained its traditions. In spite of several downfalls and upheavals, traditions are fully alive even today. Being the holiest city of Hinduism, the impact of the religion is found everywhere in the city – the chanting bells and the monotonous but oddly soothing, chant of Sanskrit hymns, in the fragrant flower offerings, and the colored powders that are sold in a myriad roadside shops which decorate the foreheads of the devout, in the tens of thousands of worshippers and the thousands who offer them salvation or services. Ghats with stairways along the Ganga with presence of “dying homes”, charitable homes, pilgrims’ rest houses, are some of the city’s unique characteristics.

Apart from that, silk weaving and sari making, metal, wood and terracotta handicrafts, toy making, particular painting forms, etc., comprise the continuity of historical and cultural tradition. Varanasi is famous for its fairs and festivals with respect to variety, distinction, time, sacred sites, performers, viewers and sideshows.

Demographic Profile

The total population of Varanasi is 1198491 as per Census 2011. This population is 0.115% of total India population. If population growth rate would be same as in period 2001-2011 (2.67%year), Varanasi population in 2020 is estimated to be 15, 31,458. Owing to its rich tourism potential, the estimated daily flow of tourists and pilgrims to the city is 25,000. Varanasi shows a constant increase in the population with varying rate of increase from decade to decade. The population density of the city is considerably high at 14598 persons per sq km (i.e. 150 persons/ha). These data indicate the immensely overcrowded habitat conditions in the city. (As per trend of rate of population growth in last 10 year: 2001-2011), there was 4, 76,779 lakh households & population in Varanasi with nearly 15, 31,458. Varanasi is the historical cultural capital of India and an international tourist destination. Varanasi is one of the largest urban centres and fast-growing cities in the state of UP. The total area within Varanasi Nagar Nigam (VNN) is 82.1 km square for 90 wards and 86 more Villages have been merged with VNN area of 195 Sq km.

Varanasi City at a Glance:-

The over view of Varanasi city given in the table below:-

Varanasi City at a Glance		
S.No.	Name and Address	Varanasi Nagar Nigam, Sigra Varanasi
1	No. of Zones	5
2	Sub Zones	14
3	No. of wards	90
4	Population (census 2011)	11,98,491
5	No of House Hold (census 2011)	1,91,278
6	Population 2021	15,31,458
7	No of Household 2021	2,48,300
8	Area under Jurisdiction	82.1 sq km
9	Newly Merged Villages	86 Villages (20 wards approx)
10	Newly Merged Villages HH	151759
11	Newly Merged Villages population	476779
12	Location	Between 25.3176° N & 82.9739° E
13	Boundaries	Ganga River & Ram Nagar in East, Chandauli in East, Jaunpur Road in West, Azamgarh Road in North, Chunar Road in South
14	No. of Slums	210

15	No of Schools	507
16	No .of Hospitals	52
17	No .of Hotels	132
18	Market Complexes /Malls	4
19	RWAs	29
20	Commercial area	153
21	Mandi-Fruit	02
22	No. of Vegetables Markets	05
23	No. Fish Market	02
24	No. Agriculture Market	01
25	No. Dhalao / Kudaghar	23
26	No of PCTS	03
27	No of slums (current)	108
28	No. of Parks	110
29	MRF Collection Center Available	3
30	Space available for MRF with Location	14
31	No of vending Zones	15
32	Parks	136
33	Nullahs/Drains	93
34	Temple/tourist Places	20
35	Major Banquet Halls	55

STATUS OF EXISTING SWM SYSTEM AND GAP ANALYSIS

The total waste generated in Varanasi Municipal Area each 600 TPD. The Most of the waste generated comprises biodegradable, compostable, and recyclable materials. This is due to the high quantum of religious and vegetable waste the city generates along with a high amount of plastic waste. The major component of the waste is organic in nature, constituting almost 41.95%. The average waste generation of Varanasi is 0.400 kg per capita per day. The city at present generates 600 MT (Approx.) of waste per day at the rate of 0.400 Kg per capita per day and decadal population growth of 2.67 per Year (as per trend of rate of population growth in last 10 year: 2001-2011)

Population Projection and Waste generation for Varanasi City

Solid Waste Management Rules 2016

Year	House Hold	Population	Waste generation MT/Day (approx) @ 400 gm per capita per day
2011	**191278**	**11,98,491**	**479.39**
2021 (for 90 Wards)	**248300**	**15,31,458**	**612.58**
2021 (For 86 Newly merged villages- 20 wards)	151759	4,76,779	190.71
2035 (for 110 Wards)	512012	29,64,678	1185.87
2050 (for 110 Wards)	655375	40,93,136	1637.25

The Government of India published the Solid Waste Management Rules, 2016, the salient features of which are given below.

- The Rules are now applicable beyond Municipal areas and extend to urban agglomerations, census towns, notified industrial townships, etc.
- Source segregation of waste has been mandated.
- Responsibilities of Generators have been introduced to segregate waste in to three streams, Wet, Dry and domestic hazardous wastes and handover segregated wastes to authorized rag-pickers or waste collectors or local bodies.

- Integration of waste pickers/ rag pickers and waste dealers/ Kabadiwala in the formal system should be done by State Governments, and Self Help Groups.
- Generator will have to pay 'User Fee' to waste collector and a 'Spot Fine' for Littering and Non- segregation.
- Used sanitary waste like diapers, sanitary pads should be wrapped securely in pouches provided by manufacturers or brand owners of these products or in a suitable wrapping material and shall place the same in the bin meant for dry waste / non- bio-degradable waste.
- All manufacturers of disposable products such as tin, glass, plastics packaging etc. or brand owners who introduce such products in the market shall provide necessary financial assistance to local authorities for the establishment of waste management system and all such brand owners who sale or market their products in such packaging material which are non-biodegradable should put in place a system to collect back the packaging waste generated due to their production.

Duties of Local Bodies:-

It has emphasized that is duty of local bodies (as a prime responder of Solid Waste Management) to carryout of Collection, Transportation and Disposal of solid waste of scientific Manner on day to day basis. The rule further facilitates the local bodies to apply the penalty clause for the effective enforcement of the rule apart from the user charges accordingly bylaws has been framed by the Varanasi Nagar Nigam and published in district gazette.

Administrative Setup for MSW Management:

The area falling under Varanasi Municipal Corporation is currently divided into 5 zones and 14 Subzone and 90 wards for administrative purposes and 86 newly merged villages the details of which are as below:-

Sl. No.	Zone	Subzone	Ward No.	Ward's Name
1	Adampur	Adampur	56	Omkaleshwar
2			42	Nawapura
3			46	Pathani Tola(Salempura)
4			82	Chhittanpura
5			66	Saraiya
6			39	Jalalipura
7			43	Konia
8			49	Naya mahadev (Prahladghat)
9			8	Rajghat
10		Jaitpura	89	Basania (Bandhukacchibagh)

11			78	Kamalgarha
12			70	Katehar
13			36	Alaipura
14			58	Dhupchandi
15			90	Kamalpura
16			86	jamaludinpura
17			80	Kajisadullapura
18			75	Jaitpura
19			87	Agaganj
20			88	Rasulpura
21	Bhelupur	Bhelupur	55	Bhadaini
22			68	shiwala
23			63	Bagahara
24			64	Rewari Talab
25			51	Tilbhandeshwar(Pandeyhaveli)
26		Khojwa	29	Sunderpur
27			11	Nagwa
28			14	Nawabganj
29			13	Newada
30			31	Naria
31			40	khojwa
32		Nagwa	19	Tulsipur
33			9	Sarai Surjan
34			25	sudamapur (Jolha Uttari)
35			48	Bajardiha
36			23	Jolha (jolha South)
37			45	Bhelupur
38			27	Birdopur
39			59	Ranipura
40	Dashashwamedh	Chetganj	37	Jagatganj
41			24	Habibpura

42			28	Senpura(Chetganj)
43			61	Lahangpura
44			67	Sarai Gowardhan
45			73	Lallapura Kala
46		Dashaswamedh	77	Ramapura
47			72	Pandariba
48			62	Luxa
49			69	Jangawadi
50			81	Dashaswamegh
51			71	Bangalitola
52			83	Madanpura
53		Sigra	2	Loco Chhitupur
54			3	Lahartara
55			41	Lallapura Khurd
56			4	Shivpurwa
57			52	kazipura
58			32	Ghandhi nagar (Sigra)
59	Kotwali	Chowk	60	Piyari Kala
60			76	Hadaha
61			65	Beniya
62			84	Ganawasi Tola
63		Kotwali	54	Katuapura
64			79	Baluaveer
65			74	Daranagar
66			47	Iswargangi
67			50	Madhyameshwar
68			57	Goladinanath
69			53	Raj Mandir
70			44	Kameshwar Mahadev
71			85	Kal Bhairav
72	Varunapar	Nadeshar	21	Chaukaghat, Dhelwariya
73			18	Inglishiya line(Nadesar)
74			20	Rajabazar

75			12	Puranapul (Daniyalpur)
76			35	Ramrepur
77		Sarnath	30	Mawaiya(Akatha)
78			33	Proper Sarnath
79			26	Paharia
80			1	Indrapur
81			17	Narayanpur
82		Shivpur	10	Tarna
83			6	Sarsauli
84			22	Shivpur
85			34	Khajuri
86			15	Sikraul
87			7	Nai Basti
88		Sikraul	16	Pandeypur
89			5	Hukulganj
90			38	Dithori Mahal

86 Newly Added Village Details:-

Sr. No	Village Name	Added Zone Name
1	Bhikharipur khurd	Bhelupur Zone
2	Bhikharipur Kala	Bhelupur Zone
3	Kanchanpur	Bhelupur Zone
4	Chaitaipur	Bhelupur Zone
5	Avaleshpur	Bhelupur Zone
6	Nunwan	Bhelupur Zone
7	Kakarmatta	Bhelupur Zone
8	Suswahi	Bhelupur Zone
9	Sheergowardhanpur	Bhelupur Zone
10	Chittupur	Bhelupur Zone
11	Bhagwaanpur	Bhelupur Zone
12	Kandwa	Bhelupur Zone
13	Karaundi	Bhelupur Zone

14	Dafi Annshik	Bhelupur Zone
15	Tulsipur	Bhelupur Zone
16	Chooramanpur	Dasaswamedh Zone
17	Mandauli	Dasaswamedh Zone
18	Naathupur	Dasaswamedh Zone
19	Ganeshpur	Dasaswamedh Zone
20	Pahadi	Dasaswamedh Zone
21	Pogalpur	Dasaswamedh Zone
22	Naashirpur	Dasaswamedh Zone
23	maheshpur	Dasaswamedh Zone
24	Jalalipatti	Dasaswamedh Zone
25	Fulwariya	Dasaswamedh Zone
26	Shivdashpur	Dasaswamedh Zone
27	Lahartara	Dasaswamedh Zone
28	Manduwadih	Dasaswamedh Zone
29	Chandpur Anshik	Dasaswamedh Zone
30	Badagao Pratham	Varunapaar Zone
31	Aedhe	Varunapaar Zone
32	Harballampur	Varunapaar Zone
33	Vanvaripur	Varunapaar Zone
34	Lamhi	Varunapaar Zone
35	Soyepur	Varunapaar Zone
36	Rasulpur	Varunapaar Zone
37	Manjhmitiya	Varunapaar Zone
38	Mandwa	Varunapaar Zone
39	Hasimpur	Varunapaar Zone
40	Ramdattpur	Varunapaar Zone
41	Hariharpur	Varunapaar Zone
42	Sarsawan	Varunapaar Zone
43	Ahmadpur	Varunapaar Zone
44	Kanudih	Varunapaar Zone
45	Dandupur	Varunapaar Zone
46	Holapur	Varunapaar Zone
47	Parmanandpur	Varunapaar Zone
48	Lodhan	Varunapaar Zone

49	Hatiya	Varunapaar Zone
50	Ganeshpur	Varunapaar Zone
51	tarna	Varunapaar Zone
52	Basdevpur	Varunapaar Zone
53	Chuppepur	Varunapaar Zone
54	Baksada	Varunapaar Zone
55	Chattripur	Varunapaar Zone
56	Deenapur	Varunapaar Zone
57	Hasanpur	Varunapaar Zone
58	Singhpur	Varunapaar Zone
59	Mugdarpur	Varunapaar Zone
60	Khajuhi	Varunapaar Zone
61	Faridipur	Varunapaar Zone
62	Hridaipur	Varunapaar Zone
63	Rajanhiyan	Varunapaar Zone
64	Goithaha	Varunapaar Zone
65	Sandaha	Varunapaar Zone
66	Rustampur	Varunapaar Zone
67	Heramanpur	Varunapaar Zone
68	Tilmapur	Varunapaar Zone
69	Rasoolgarh	Varunapaar Zone
70	Raghunathpur	Varunapaar Zone
71	Khalispur	Varunapaar Zone
72	Ledhupur	Varunapaar Zone
73	Aashapur	Varunapaar Zone
74	Kotwan	Varunapaar Zone
75	Salarpur	Varunapaar Zone
76	Saraimohan	Varunapaar Zone
77	Kharagpur	Varunapaar Zone
78	Domri	Aadampur Zone
79	Soojabad	Aadampur Zone
80	Baniyapur	Varunapaar Zone
81	Bhawanipur	Varunapaar Zone
82	Pisaur	Varunapaar Zone
83	Daniyalpur	Varunapaar Zone

84	Bhitari	Bhelupur Zone
85	Bedauli	Bhelupur Zone
86	Lohta	Bhelupur Zone

The Municipal Commissioner heads the whole Varanasi Municipal Corporation and the department of Solid Waste Management comes under the ambit of the four Additional Municipal Commissioners. One Additional Commissioner looks after the Sanitation & Solid Waste Management. There is one Municipal Health officer to look after sanitation work. At the zone level five zonal officer one for each zone. Apart from this there is five Zonal officer,& fourteen Sanitary and Food Inspector (One inspector looking after Infectious area spry fogging work) AND Two of Executive Engineer's. Looks after Transportation & Processing and Disposal of the solid waste.

Wards are grouped in Subzone & Sanitary and Food Inspector (SFI) In charge of subzone. Under whom sanitary supervisor/beat in charge manages the Safai Mitra's. The Safai Mitra's are either direct, contractual or outsourced through outsourced agencies. The details of the manpower deployed for SWM in the Varanasi Municipal Corporation are as given below:

Manpower Engaged in VNN for MSW Management	
Designation	No
Municipal Commissioner	1
Additional Municipal Commissioner	1
Municipal Health officer	1
Executive Engineer's.(Transport & Processing-SWM)	2
Zonal Officers	5
Zonal Health officers	1
Sanitary & Food Inspector	14
Account Clerk	01
Account Officer	02
Safai Supervisors	93 (VNN-38 and Varanasi Waste Solution-40)
Safai Mitra's and drivers	5784 (VNN Safai Mitra's = 4171, VWSPL Safai Mitra-850, VNN drivers = 331, VWSPL Drivers- 195, Rag Pickers = 237)

Solid Waste management Problem and Gap analysis

The existing SWM practices prevalent in Varanasi city. The various sources of waste generation, the current primary & secondary waste collection practices, waste transportation & disposal mechanisms and gaps in the existing SWM system have been presented.

Characteristics of waste

Solid waste is generally classified in three major categories i.e. biodegradable, recyclable and other.

- Biodegradable waste includes flower waste, garden waste, fruit waste, vegetable waste, food waste, cattle waste etc.
- Non-Biodegradable waste includes plastic, glass, polythene, metal, paper etc.
- Domestic Hazardous & Biomedical waste, sanitary napkins, slaughter waste, electronic waste, construction & demolition waste etc. In that, the waste can be categorized by physical characteristics such as organics, paper, plastic, glass, metal, cloths and other residual wastes.
- Waste characterization of Varanasi shows 51.25% biodegradable waste, 15.30% recyclable waste and 33.45% other waste. Recyclable category includes Paper (32.80%), polythene (25.60%), plastic (7.30%), glass (5.70%), metal (5.80%) and others (22.80%). Source Provided by International Journal of Technical Innovation in Modern Engineering & Science (IJTIMES)

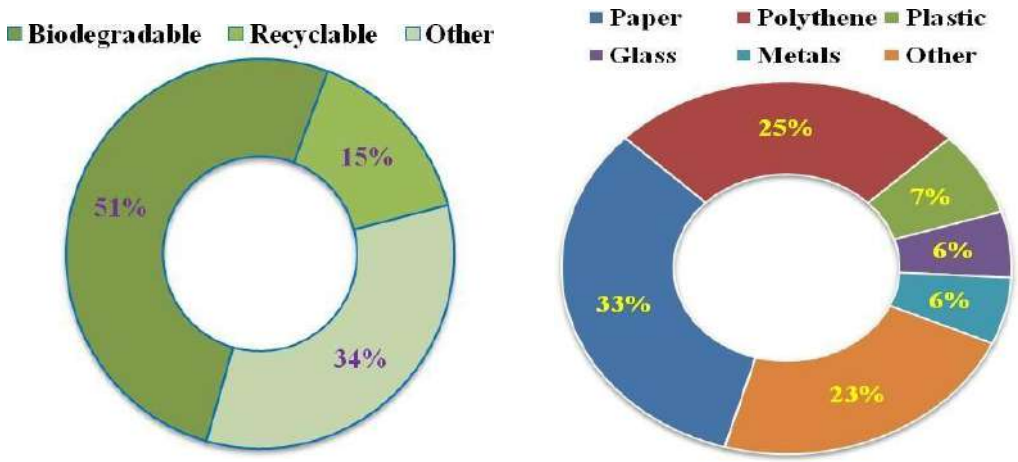


Figure-1a and 1b: Composition municipal solid waste

Problem Area, Gaps and challenges:-

Problem Area	Gaps	Challenges
Door to door collection	• Waste collectors are very less in number than required. • Limited vehicles for waste collection. • No proper waste collection route planning.	• Citizens deny for paying user fees for waste collection facility. • Fund for door to door collection facility is not sufficient. • Due to narrow street/lanes. • Timing issue.
Segregation at source level	• Lack of awareness in public regarding SWM rules 2016. • Lack of training in VMC/private waste collector regarding segregation. • Lack of twin compartment vehicles. • Lack of imposition of fine. • Lack of twin bin for primary collection. • Citizens are not willing to segregate their waste.	• No proper dissemination of SWM 2016 rules amongst citizens by Municipal Corporation. • Citizens find confusing and difficulty in segregating their waste at source. • No proper monitoring done by corporation staff.
Street sweeping	• No machine sweeping system. • Sweepers often skip sweeping in narrow lanes/streets. • Lack of monitoring by supervisor on sweepers.	• After sweeping, citizens again mess up on streets. • Lack of appropriate resources • Open and overflow drain
Improper Loading & unloading of waste	• Lack of automated vehicle. • Lack of proper strategy. • Lack of infrastructure.	• Require high capital cost like static Compator.
Domestic hazardous waste management	• No domestic hazardous waste collection center in the city. • No separate collection of HHH by	• Citizens mix their domestic hazardous waste with other wastes.

	waste collectors. • Lack of awareness amongst people regarding the management of domestic hazardous waste.	
Bio-medical waste	• Lack of biomedical waste collection facility. • Disposal of biomedical waste along with MSW. • Lack of biomedical waste collection vehicle than required. • Imposition of fine on hospitals/labs for disposing it with MSW is not strictly followed by VMC.	
Management of BWG wastes	• Lack of training and education on responsibilities of BWG according to SWM 2016 rule. • No regular inspection for SWM system in their premises by VMC staff. • Lack of imposition of fine who are not managing their waste.	• Lack of private vendor who can manage their wastes. • Limited space in their premises. •
Generation of garbage vulnerable points.	• Due to lack of waste management facility in respective areas. • Dustbins are less than required in an area. • Lack of imposition of fine.	
Burning of MSW	• Lack of municipal waste management facility nearby area. • Lack of awareness amongst people. • No impose of fine that burn their MSW. • Lack of monitoring by staffs.	
Plastic waste management	• No separate collection facility of plastic waste by waste collector. • Only a single plastic treatment facility in the city and lack of dissemination of work of this facility throughout	

	citizens of the Varanasi. • Lack of awareness amongst the citizens. • Existing of banned plastic in the city. • Collection of non-recyclable single used plastic.	
Processing of MSW	• Lack of decentralized processing facility. • Unsegregated MSW. • No proper strategy for managing MSW of the city. • Lack of decentralized community composting in the city. • Not practicing of source segregation of waste by citizens. • Collection of un-segregated waste by waste collectors. • Lack of material recovery facility for dry waste in the city.	• Require very high capital cost.
Construction and demolition waste	• No separate collection and disposal of C&D waste. • Limited collection centre in the city. • Lack of awareness amongst the citizen regarding their responsibility and management of C&D waste. • No treatment facility in the city. • Lack of imposition of fine who are not managing their waste.	• Collection & segregation of concrete, soil, steel and others and storage of construction and demolition waste generated. • To collect transportation charge from waste generators.

Goals /Objectives/Guiding principles/Strategy: -

Our objective is to set up the small goals so that the city can get high level of cleanliness including MRF centers and waste processing plants because as the number of tourist and population of city will increase, there would be high chances of getting the most of the municipal solid waste in mixed form and the chances of making the environment unhealthy will also increase. Our goals and objectives are not limited to the Municipal Corporation. This will also cover the activities from where the waste is directly generated. It also covers the IEC activities so that maximum people should aware the consequences of mixing up the waste and the city corporation can get the maximum waste in sorted form. Our vision also covers to build a centralized system to city level and make the solid waste management system more cost effective.

For converting the vision plan in real, we have some guiding principles that is also based on the six basic elements of Solid Waste Management; waste generation, onsite handling, collection, transfer & transport, recycling & processing and disposal. We will also cover how to reduce the volume of waste by composting and to generate the energy from the waste. The vision plan will also discuss how to sustain the cleanliness by making zero garbage vulnerable point in the city and how to engage with the society to follow sustainability.

Here are some bullets that will enlighten our guiding principles:

- Source segregation, processing and recycling.
- Composting
- Energy generation
- Zero vulnerable point
- Maintaining sustainability
- Waste reduction
- Engaging with societies etc.

This vision plan for Varanasi city in solid waste management:

- *Source segregation in three streams:* will educate the community by doing IEC for separating the waste in three categories; biodegradable waste, non-biodegradable waste and hazardous waste.
- *Promoting the 3R's:* by promoting the 3R's; reduce, reuse and recycle, we will be able to reduce the volume of waste right from its generation point and many useful things can be done by reusing & recycling the waste.
- *Composting:* by this strategy, people we learn how the compost is useful for soil rejuvenation and gardening.
- *Energy Generation:* energy can be generated from municipal waste by treating the organic waste in biomethanation plants and by gasification techniques for solid waste.
- *Developing MRF and processing unit for hazardous waste.*
- *Converting landfill into sanitary/engineered landfill.*
- *Linkage with formal sector in a systematic manner.*
- *Reduction of greenhouse gas emissions.*

Goal and Objectives

- Achieving high level of cleanliness in city.
- Waste reduction, reuse, recycling, recovery and optimum utilization of MSW for minimization the waste going to landfill
- Minimization its bad impact on environment and human health.
- Converting centralized system into decentralized system. (Optimum neutrization
- Making cost effective solid waste management.
- Sufficient awareness among the public and all stakeholders, organizations and institutions understand their role and responsibilities

Guiding principles

- Reduction and reuse of waste at source
- Waste recycling
- Waste to composting
- Waste to energy
- 100% collection and Segregation
- No any Garbage vulnerable point
- Engage of community
- Ensure system capacity
- Follow sustainability and waste management hierarchy
- Public Private Partnership (PPP)

Strategy:

- Segregation of waste at source in three streams
- Promoting home composting or community level
- Door to door Segregated collection
- Three bin system at secondary collection point
- Developing MRF for non-biodegradable, composting/Bio-meth nation unit for biodegradable and processing unit for household hazardous waste.
- RDF sends to the waste to energy project.
- Converting landfill into sanitary or engineered landfill.
- Linkage of informal sector in a systematic manner.

Waste Generation, Collection & Transportation

This section describes the various sources of waste generation, characteristics of waste, existing waste handling & management methods in Varanasi city. In a city, Solid waste gets generated at various places. Primary source of solid waste is household. The waste generated at household level is known as domestic waste. Domestic waste comprises leftover food, kitchen waste, packaging waste, electronic waste, sanitary waste, etc.
The other places where waste gets generated includes shops, markets, malls, parks, gardens, hotels, schools, temples, offices, hospitals and construction sites.

Currently there are no 100% door to door collections in 90 wards of Varanasi. Most of the households, shops, and establishments throw their waste just outside their premises, on streets, in drains, in open spaces, in water bodies, and in other inappropriate places. These litters swept away by street sweeping and lifted by means of handcart or rickshaw trolley by Sweepers and waste collectors of VMC. This led to unsanitary condition across the city. Varanasi Nagar Nigam outsourced M/s Varanasi Waste solution Pvt.Ltd. For door to door collection in 90 wards, mechanized road Sweeping approx 22.1 km. daily basis (Sant. Athulananda to BHU) and toilet cleaning work of Varanasi. Apart from door to door collection three Ngo's named Anthill Services Pvt.Ltd; career consulting pvt. Ltd, Jan Vikas Kalyan Samiti; Engage for IEC activities for sanitation awareness in their respective wards.

All the Commercial area/public/tourist's area street sweeping also done in two times including night shifts and residential area swept in once in time. The length of roads, streets, lanes, bye-lens in the city is approximately 1200 km. Street sweeping starts between 8:00 AM and continues up to 2:00 PM. Though, the street sweeping starts at the stated time but the reporting of male workers starts at 7.30 AM while woman workers are relaxed for 30 minutes. The sweepers are provided with jhadoo (brooms), pans, favda, hand-carts, panji (bamboo stick used to clean nalas [drains]), gayti (pointed favda to clean roads), and buckets to clean nalas. During the sweeping process one sweeper The total area within Varanasi Nagar Nigam (VNN) is 82.1 km square and total road length including all street approx 1200 km, Bituminous road length 597 km, lane length 603 km, on both side of the bituminous road is 350 km and total approx length of drains 2400 km. Cover an area of 2400 km of roads and adjacent drains. They collect the waste on road sides.

Centralized and De-Centralized waste Processing & Disposal facility

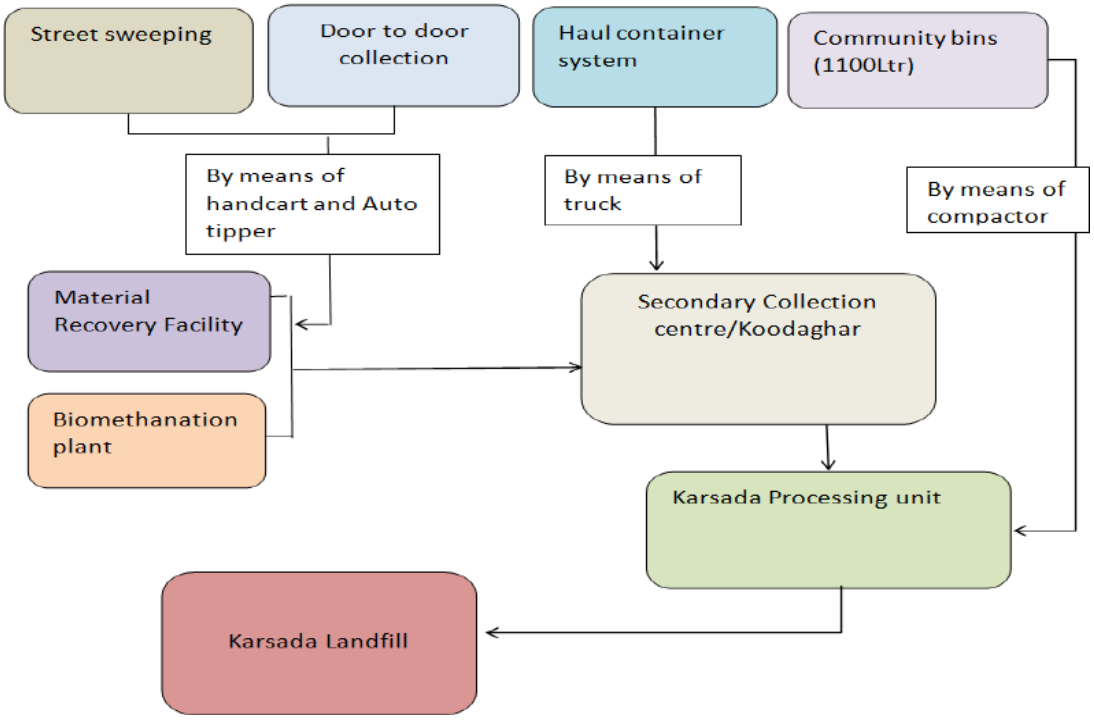
Varanasi generates around 600 Tons of Municipal Solid Waste daily which is collected and transported to Processing Plants. VNN has the following Processing Plants: -

Waste to Compost Plant: - Karsada Waste to Compost Plant capacity of 600 MTD. Constructed on CSR funds of NTPC this Plant produces Compost and Refuse Derived Fuel/RFD. The Compost is sold in bulk to fertilizer Plants and in small quantity to neighboring farms. The RFD is sold to Cement Plants. This Plant was under the Operation and Management of M/s. IL & FS till December 2019. From January 2020 Operation & Management has been in charge of M/s. Excel Industries Pvt. Ltd; Mumbai.

24 TPD KARSADA WASTE TO ENERGY PLANT: - This Plant constructed on CSR funds of NTPC and under O & M of M/s Ankur Scientific, Ahmadabad is functioning since 22nd November 2020. It processes waste to produce electricity.

De-Centralized Waste to Energy plants: - Three Waste to Energy Plants each of 5 Ton Per Day Capacity (Total 15 Ton Per Day) located at Bhawaniya Pokhri at Bhelupura; IDH at Adampur; and Pahadiya Mandi at Pahadiya established on CSR funds of M/s. IOCL and under O & M of M/s. ORSPL, Mumbai. All three Plants were functioning between 2017 to December 2019. The Plants produces Bio Gas, Electricity and Compost. The Bio-Gas is used in production of electricity which is used for running the plant. Excess electricity is used for street lightings. The Compost is supplied free of cost to municipal parks via Horticulture Department of VNN. Since January 2020 the Plants are non-functional due to ongoing renovation work before being handed over to VNN.

Flow Chart – D2D Collection & Transportation, processing and disposal



Material Recovery Facility: -

The Daily generation of the dry waste is 100. TPD approx as of now. The dry waste collected from the waste generators mainly contains used plastic material, plastic carry bags, plastic pouches, and rubber materials like tyre, chappal, resin material, glass, and tin boxes. Apart from the domestic hazardous waste such as discarded paint container, electronic waste and electrical waste are also collected and deposited in this material recovery facility centre.

The bailing machine is provided by UNDP and GIZ India. The recyclable material is being disposed to the vendors. The Non-recyclable material, but the calorific values are disposed to the Cement factories for furnace fuel usage. The records and registers are being maintained and documented.

At Present, MRF Centre is integrated as a part in the existing 1 Nos. of MRF Collection Centre and 2 Nos. of MRF facility Centers and 14 Nos. are being proposed.





The vehicle used for collection solid waste of households and market places to be served, right of way of the road

as well as traffic conditions on the road. Depending on the above factors, manual rickshaw, e-rickshaw or mechanized vehicles such as Tata Ace, tractor trolley etc. are used are given below: -

Sr. No	Vehicles Details	Nos.
1	Dumper	**18**
2	Compactors	**21**
3	Hopper	**12**
4	Tata ace hopper	**71**
5	Garbage H.P. Container (D.P. Container)	**10**
6	Tractor	**21**
7	Tata Ace CNG	**147**
8	Hook loader	**3**
9	Encroachment Vehicle	**2**
10	JCB	**9**
11	Skid Loader	**2**
12	JCB Chain Mounted Hydraulic Excavator	**1**
13	Tata Lander	**2**
14	Road Sweeping Machine	**3**
Total Mechanized Vehicles		**215**
1	Trolley	**1200**
2	Handkart	**800**
Operational manual Vehicle		**2000**
Total manual and Mechanized Vehicles		**2215**

Details of Manpower for collection of solid waste management facilities: -

Sr no	Details of employees working in cleaning and transport works	No. of employees
1	For Involved in sanitation work	4171
2	For transportation facilities	331
3	Rag pickers	237
4	VWSPL Employee	1100
	Total	5839

Cleaning of Ghats: -

Apart from cleaning of 90 wards 84 Ghats' cleaning work is going on by ILFS Environment Pvt.Ltd.

- Sweeping twice a day on general days.
- Need based cleaning/washing on festivals.
- Washing/mopping at least once every day.
- Lifting of garbage every day and transporting it to the dumping site.
- Removal of silt as and when required.
- Placing of twin bins and Shraddha Kalash (for Pooja waste material) after every 30m-50m.

Picture's for activities: -

Door to Door Collections



Covered transportation of Garbage in streets.



Collection and transportation of drain silt:-



Garbage Bins:-





Cleaning of Ghats:-





Processing Disposal:-




User Charges, Penalties and Spot fines and Enforcement of ban on Plastic

- Affordable User charges are being collected from residential, commercial, Institutional, BWG. Necessary By laws framed & notified in the state.
- Penalties & spot fine are notified in gusset for none segregated, anti-littering and non-compliance of SWM rule 2016.
- Implemented in 100% premises including littering in storm water drains and water nodes through the Enforcement committee formed exclusively for this purpose.
- Notified on complete ban on all plastic bags in the Varanasi city.
- Enforcement came to force as per SWM rule 2016

C&D Waste Management: -

Facilitation of use/processing or recycling of C&D waste (primarily for bulk waste generators). Gazette notification related to the management of C&D waste already published. At Present, There 31 nos. of designated places for the collection of C&D Waste.

At Ramna, the site belongs to corporation has been proposed to established C&D waste processing unit is under construction by IL&FS. The project cost is Rs. 10 Crore.

Citizen Grievance Redressal and SWM Activities monitoring mechanism: -

- **Integrated Smart Solid Waste Management System Software**
- Volume and Bin-Collection monitoring system
- Vehicle Tracking, fuel and Inventory Management System
- Attendance Management System
- Citizens Grievance Redressal System
- Community and Public Toilet Cleaning Monitoring system
- CCTV Surveillance of Koodaghar

- Weighbridge Integration at Waste treatment Plant

- **Mobile apps for:**
- Attendance
- Grievance Redressal
- Toilet Cleaning
- Door to Door Collection
- Mechanized Sweeping
- Vehicle on-route weight monitoring





Additional requirement of Monitoring Mechanism in Solid Waste :-	
Storage of MSW	• Total expenditure spent on storage facilities. • Cost used in maintenance of bins. • Distance between community bins.
Collection and Segregation of MSW	• Amount of mixed waste collected. • Amount of dry waste collected. • Amount of organic waste collected. • Amount of C&D waste collected. • Amount of plastic waste collected. • Amount of primary collection by private contractor (in tonnes) (if any) • No. of manpower used by private contractor. (if any) • Revenue per unit (tons) of MSW collected by corporation. • Revenue per unit (tons) of MSW collected by private contractor (if any). • Cost spent on maintenance of vehicles. • Frequency of waste collection.

	• Distance from primary collection center to secondary collection centre • Expenditure incurred on awareness programme per capita. • No. of personnel for door to door collection. • Suitable containers for collection of waste from doorstep.
Transportation of MSW	• Distance from secondary collection centre to Processing unit. • Distance from secondary collection centre to landfill • Total expenses used for transferring and transporting of waste from secondary collection centre to processing units. • Total expenses used for transferring and transporting of waste from secondary collection centre to landfill. • Total expenditure spent on maintenance of vehicles. • Type of transfer operation used in transfer station. • Availability of equipment and accessory requirements in transfer station.
Processing of MSW	**Bio-methanation Facility-** • Amount of MSW received daily. • Amount of organic waste separated. • Amount of rejected MSW. • Total manpower used. • How much electricity consumed in the facility? • How much electricity generated from per ton of waste? • Revenue generated per tonne of waste treated. • Quantity of digestate produced. • Total expenditure used for running the facility. • Revenue generated from per tonne of compost. • Total expense used for composting. **Material Recovery Facility-** • Total MSW received. • Amount of recyclables separated from MSW. • Amount of rejected MSW. • Amount of recyclables collected other than MSW. • Income from selling out recyclables. • Number of manpower used. • Total electricity consumed in the facility. • Total expenditure used for the facility.

Disposal of MSW	• Amount of waste disposed in tonnes /day • Revenue generated from recovery of landfill gas. • Operation and maintenance cost spent on landfill. (including leachate / gas treatment system) • Availability of technical personnel. • Availability of appropriate land. • Availability of institutional capacity. • Availability of financial resources.

Achieving Zero Land Fill Status

The level of carbon dioxide released into the atmosphere is increased and further increasing day by day, this is because of burning the fossil fuels such as coal, oil, gasoline and natural gas which is the major contributor of global warming and greenhouse effect. The emissions due to this forcefully keep the heat close to the earth's surface that leads to a rapid increase in the earth's temperature and climatic problems such as high sea level and storms. This emission can be reduced by reducing the demand of fossil fuels.

There are several ways to reduce the emission:

For the households:

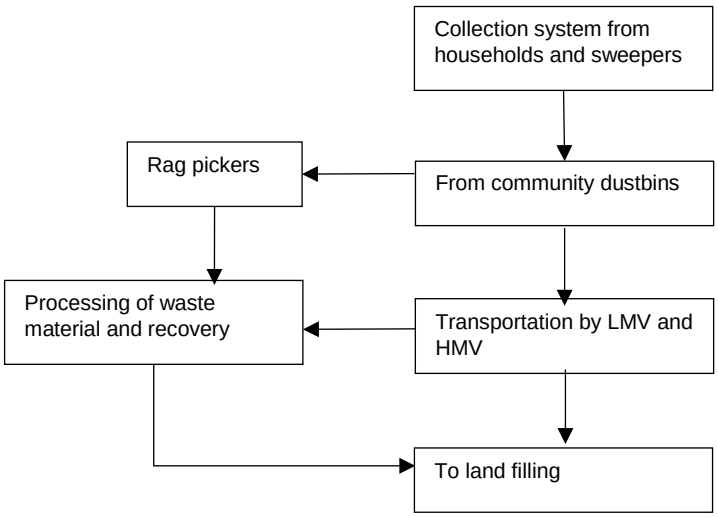
- Reduce, reuse and recycle: when the people learn the concept of reducing, reusing and recycling and start applying from their waste, they can save around 1 tons of carbon dioxide (CO2) each year.
- Buying energy efficient product: every electronic product has the Bureau of Energy Efficiency (BEE) rating, try to purchase the product which have the maximum rating. Use LED bulb instead of other standard bulbs because they use very less energy.
- Try to purchase hybrid vehicles instead of fuel vehicles: first try to use public transport but if there is a need to purchase of vehicle, try to avoid normal vehicles which run on fuels and buy a CNG of HYBRID vehicle. This will help to reduce the carbon footprints.
- Plant a tree: planting tree is the most important thing towards the reduction of emission because they absorb CO2 and in turn release oxygen (O2) in the atmosphere which is essential for living and also a tree absorbs around 1 ton of CO2 in whole of its life time.
- Using less hot water to reduce the energy consumption. This can also save the CO2 around 200 kg each year.
- Try to avoid the product of excessive packaging because the part of packaging will go to the waste and will increase the volume of waste.
- Don't use the energy to dry up the clothes and don't iron the wet clothes because it will generate unnecessary heat which will emit into the atmosphere that will result into increase greenhouse gases.
- Make a habit of switch off the electricity after use.
- Enhance the knowledge and spread it with the community.

For the Corporation:

- Removing or converting landfills into sanitary or engineered landfills.
- Use of Mechanized Sweeping Machines.
- Promoting bio-methanation plants, MRF centres, home composting etc.
- Awareness program to spread the knowledge of 3R's and 6 basic elements of MSW.
- Improving in collection and transportation structure.

Employment

From waste collection to its disposal, the formal and informal sector needs to work in a systematic manner and as the population is growing rapidly the volume of waste will also increase. So, the demand of workforce in formal and informal waste division to handle the waste will surely increase.



Handling of MSW

Additional Equipment's required for newly added 86 Villages

Sr No	Primary Collection & Transportation	No's	Costing	Total
1	Comparmental Mini Tipper (Capacity 2.2 Cu.M)	170	802390	136406300
2	Compactor (16 Cu.M)	15	3925000	58875000
3	Excavator Front end backho loader 96 H.P.	6	31735000	190410000
4	Road Sweeping Machine	4	18000000	72000000
5	Water Sprinkler (12 kld)	20	1800000	36000000
6	Tractor's (35 H.P.)	15	600000	9000000
7	Tricycle with 8 compartmental bins 40 ltr capacity each bin capacity	460	14328	6590880
8	Bins (100 ltrs) (for dry/wet/hazardous/sanitary waste) with Stand	1200	13500	16200000

9	PCTS 16-ton Capacity each	60	2300000	138000000
10	Hook loader 16 Ton carrying Capacity	15	4500000	67500000
11	**Total**	**1965**	**63690218**	**730982180**

15th CFC Action Plan to Achieve Baseline

Abstracts

Sr No	Name of the projects	Project Cost (Rs in Cr.)	2021-22 (Rs in Cr.)	2022-23 (Rs in Cr.)	2023-24 (Rs in Cr.)	2024-25 (Rs in Cr.)
1	Engaging outsourced Workers 1065 Rs. 336 for 312 working days for year	44.64	11.16	11.16	11.16	11.16
2	Engaging Outsources drivers 765 Nos Rs 415 per day for 312 working days for year..	39.6	9.9	9.9	9.9	9.9
3	Proposing of Newly added 86 villages Vehicles requirement for Solid Waste facilities.	73	15	17	20	21
4	Existing C&D plant O&M	15.32	3.83	3.83	3.83	3.83
5	Existing Karsada Waste to Compost plant O&M	2.88	0.72	0.72	0.72	0.72
6	Proposing for Plastic Waste Management Plant	5	0	5	0	0
7	Proposing for Plastic Waste Management Plant O&M	2.4	0.6	0.6	0.6	0.6
8	Proposing for Establishment of Dry Waste MRF Centre's Installation and O&M	4.68	2.4	1.56	0.36	0.36
9	SLF 3 Nos (2 lakh Cu.M)	0.6	0.2	0.2	0.2	0
10	SLF O&M	0.96	0.24	0.24	0.24	0.24
11	Existing Biomethanization 3 Waste to Energy Plant O&M	2.16	0.54	0.54	0.54	0.54
12	Newly Ramna W2E Plant O&M	1.8	0	0.55	0.6	0.65

13	LTP O&M	0.96	0.24	0.24	0.24	0.24

14	Collection Charges of newly added area (86 Villages) paid to Agency	72.96	18.24	18.24	18.24	18.24
	Total	**266.96**	**63.07**	**69.78**	**66.63**	**67.48**

(Rajat Gupta)
SWM Specialist
NMCG, Dilhi

(Dr A. K. Vidyarthi)
Additional Director & DH, WQM-II
CPCB, Dehli

(Kalika Singh)
Regional Officer
UPPCB, Varanasi

(Gulab Chandra)
ADM (City)
Varanasi