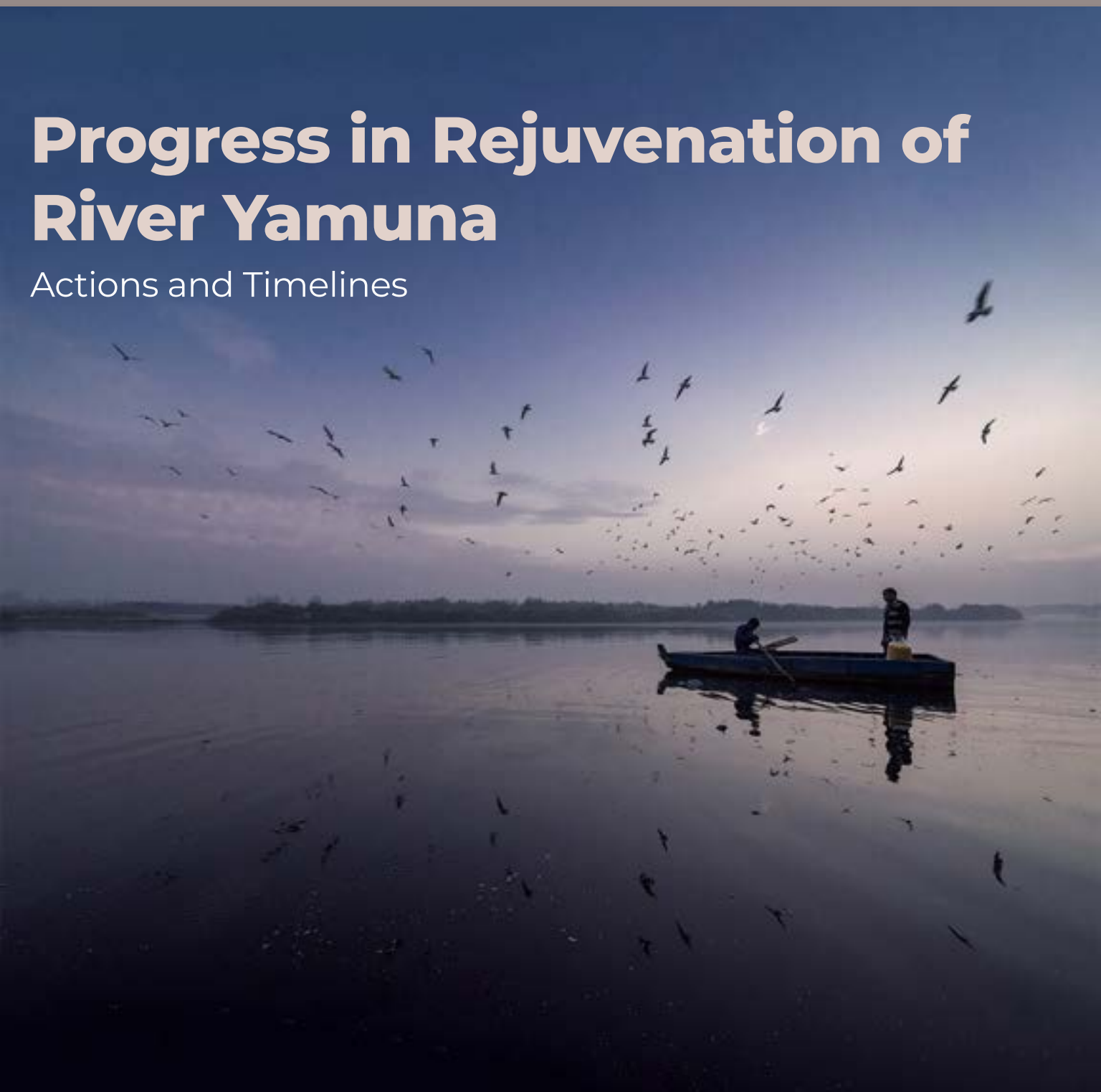
DPCC

Department of Environment
Government of the National
Capital Territory of Delhi

# Progress in Rejuvenation of River Yamuna

## Actions and Timelines



December 2022

# Contents



# Water Quality Monitoring

## by Delhi Pollution Control Committee (DPCC)

# 1 Water quality monitoring by DPCC

## Compliances with prescribed standards

The following is the current status of water quality monitoring by Delhi Pollution Control Committee at various points:

**River Yamuna**

at 8 locations

**22 drains**

out falling into River Yamuna

**35 STPs**

(operational)

at 20 locations

**13 CETPs**

(operational)

2 Parameters as per Hon'ble SC

# Water Quality of River Yamuna

As per the directions of Hon'ble Supreme Court, the three parameters to be considered for determining the water quality of River Yamuna are Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), and Faecal Coliform (FC).


## Dissolved Oxygen

DO is the amount of oxygen available in dissolved form. Fishes can survive at or above DO of 4 mg/l.
**Standards (5 mg/l): More DO is good**

## Biochemical Oxygen Demand

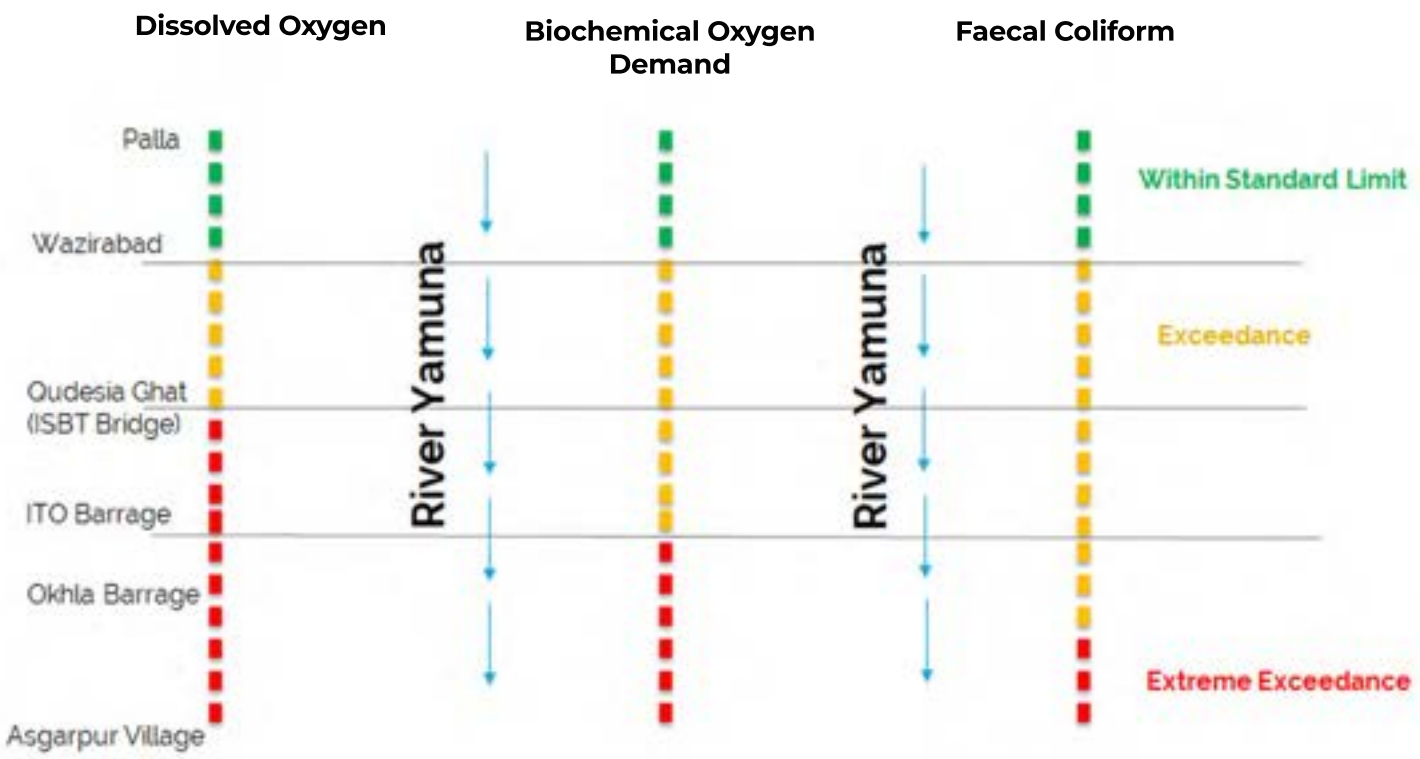
BOD is amount of DO required by aerobic microorganisms to decompose organic material present in a water body.
**Standards (3 mg/l) : Less BOD is good**

## Faecal Coliform

Fecal Coliforms are a group bacteria present in faeces of humans / homeotherms indicating discharge of untreated sewage in a water body.
**Standards: (500 MPN/100 ml): Less Fecal Coliform is good**

3 Parameters as per Hon'ble SC

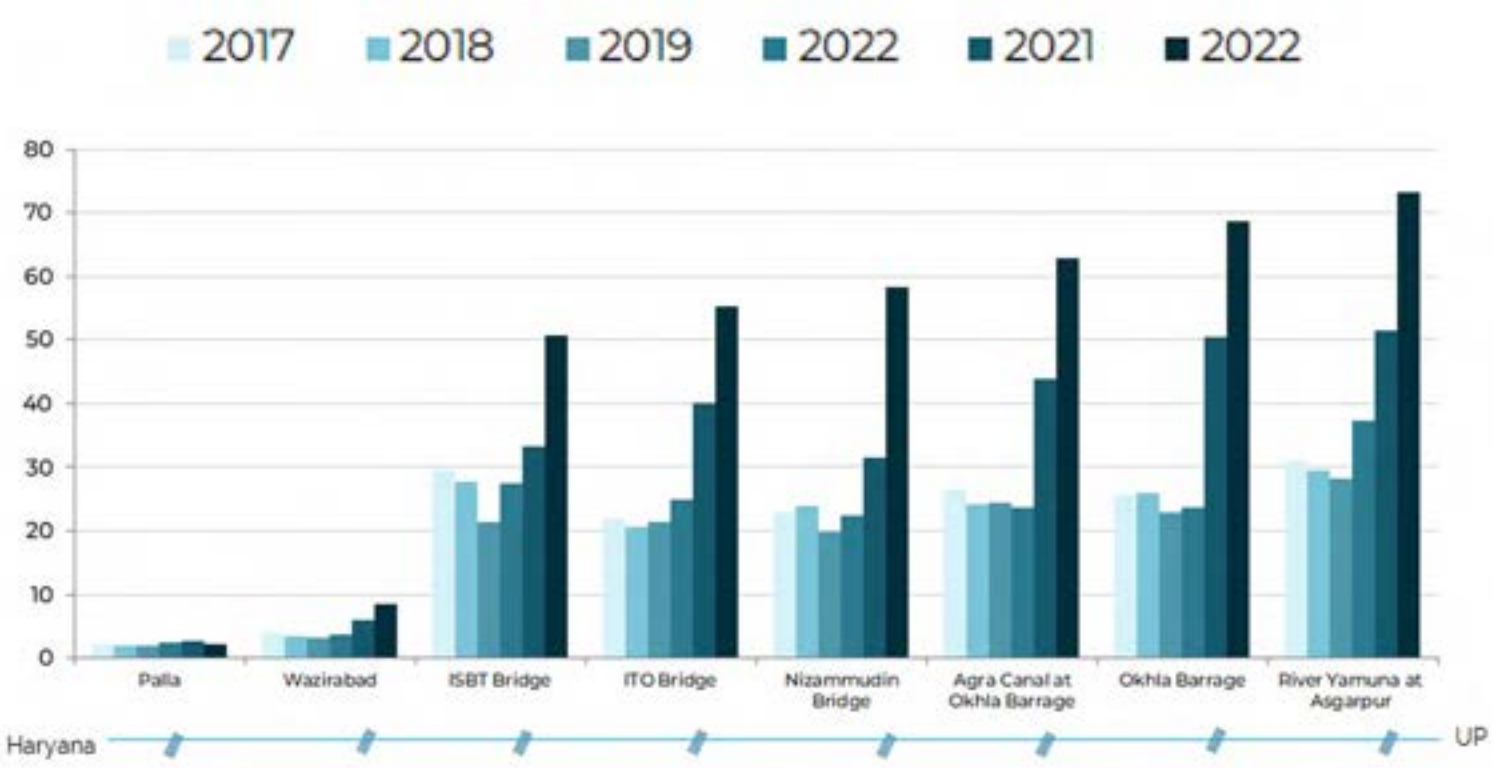
# Water Quality of River Yamuna

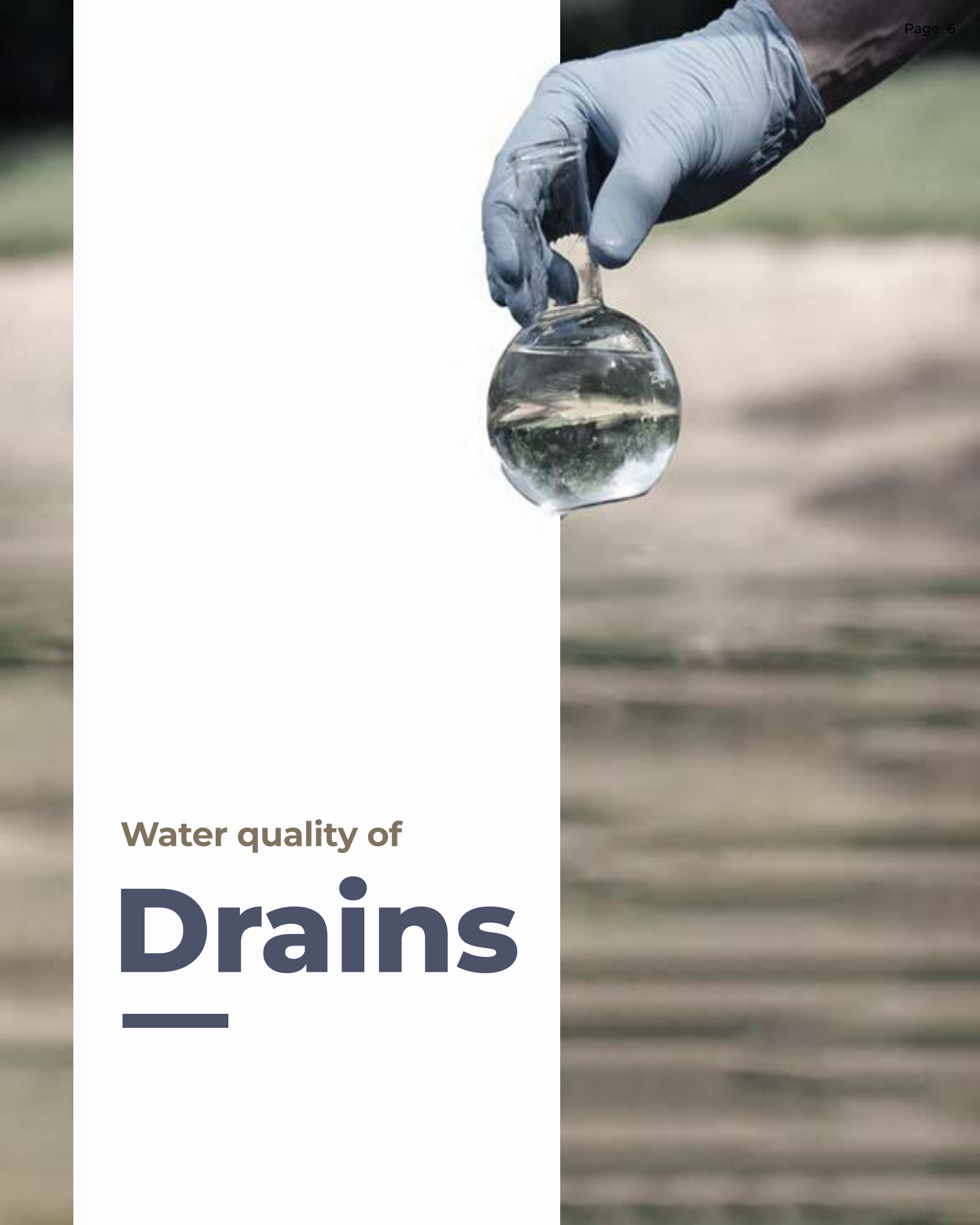



4

Annual Average

# BOD Value of River Yamuna



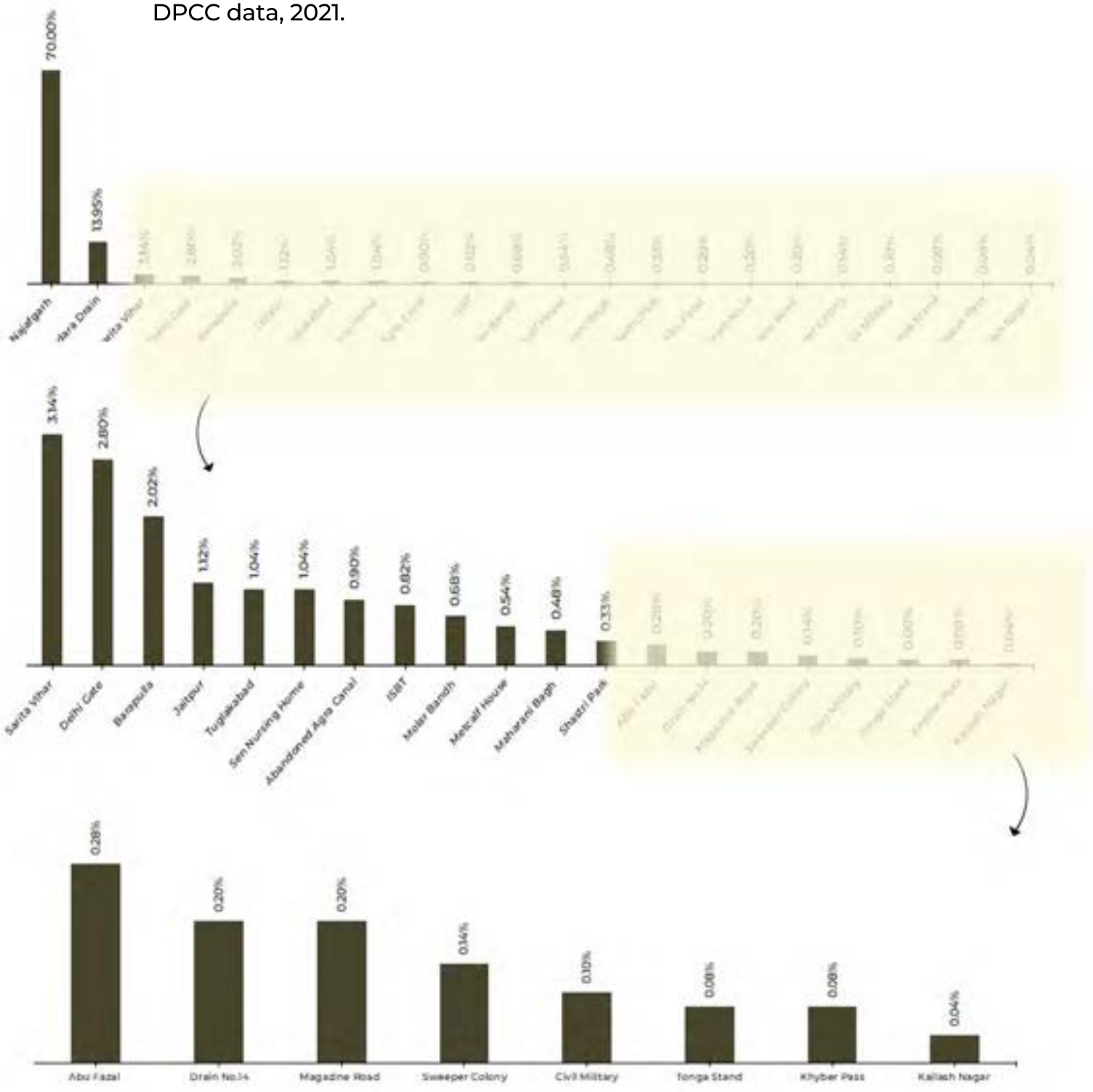
## Water quality of

# Drains

# 5 Discharge from major drains

## into River Yamuna at Delhi

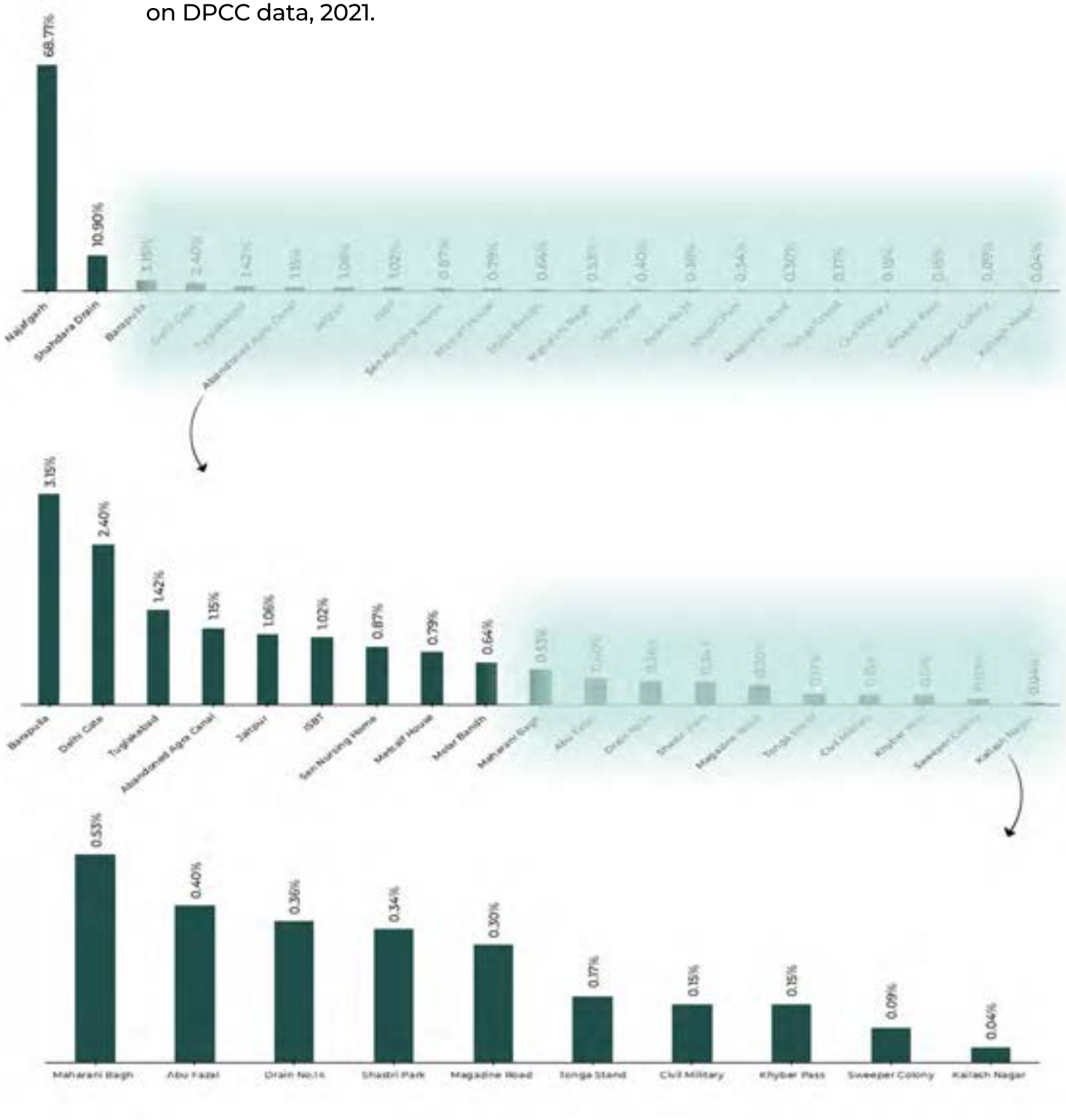
Discharge of BOD load from Major Drains into river Yamuna at Delhi, based on DPCC data, 2021.



# 6 Discharge from major drains

## into River Yamuna at Delhi

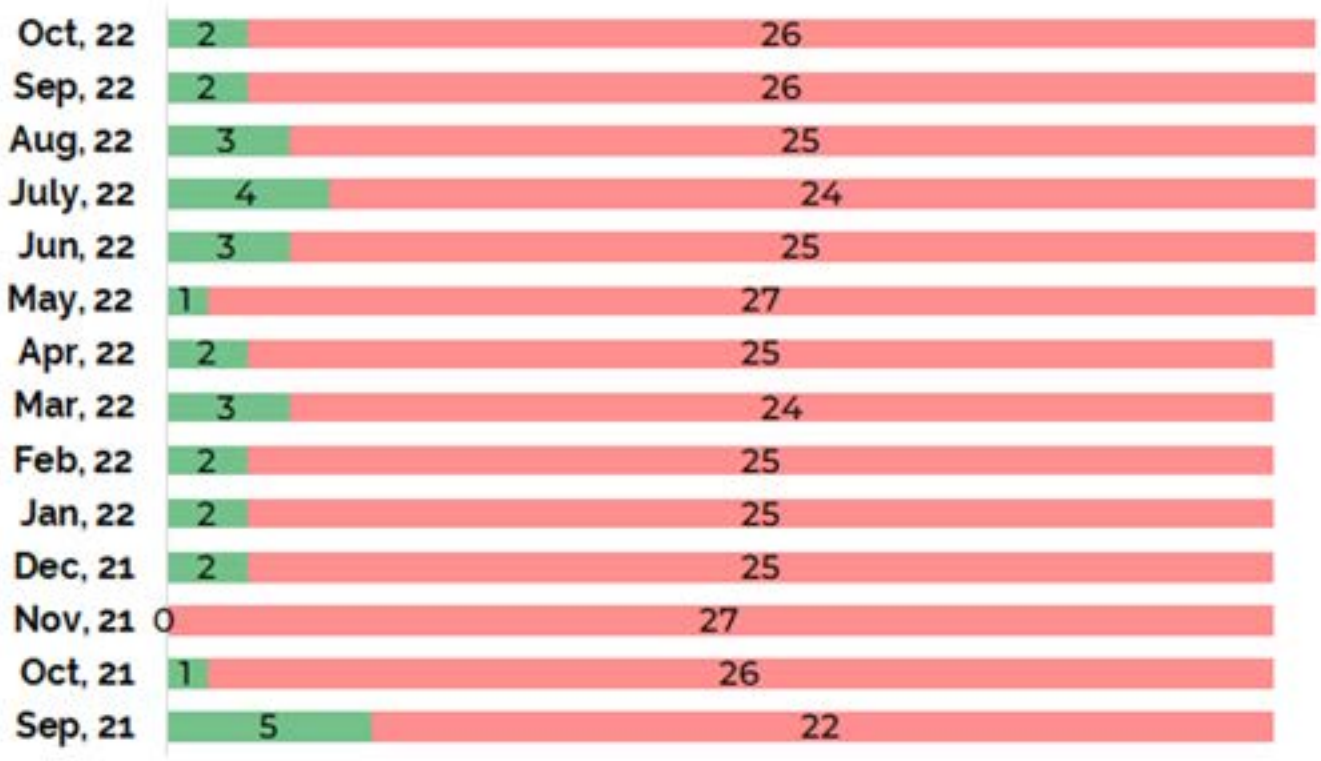
Discharge of wastewater from Major Drains into river Yamuna at Delhi, based on DPCC data, 2021.



# 7 Water quality monitoring

## of 28 drains

03 out of 28 drains complying with prescribed standards (w.r.t BOD 30 mg/l). The complying drains are Metcalf House, Tuglakabad and Drain No. 14.



## Water Quality of

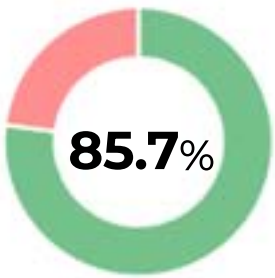
# Sewage Treatment Plants (STPs)

# 8 Water quality monitoring

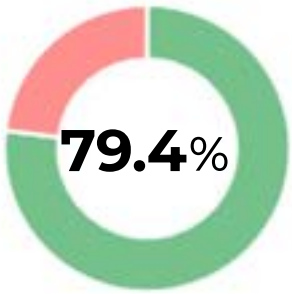
of 35 Sewage Treatment Plants (STPs)

Compliance with design standards - BOD: TSS (30:50 / 20:30 / 15:20 / 10:15)

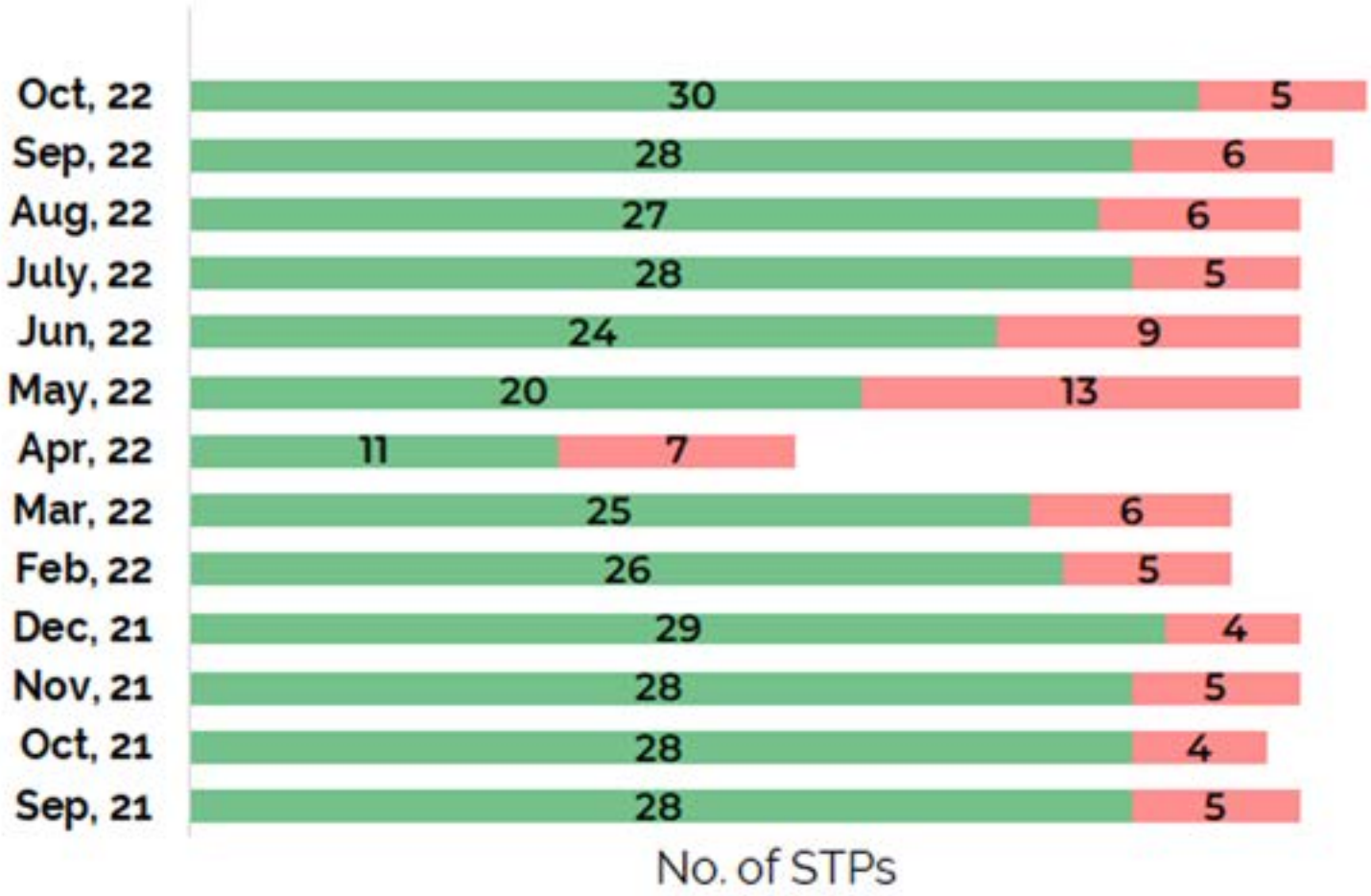
## STPs meeting design standards




30/35 STP




474.3/597 MGD

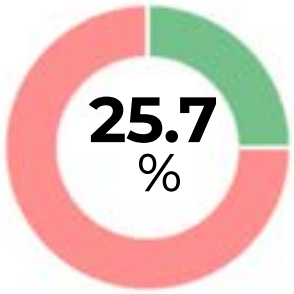


# 9 Water quality monitoring

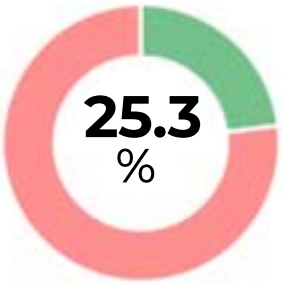
of 35 Sewage Treatment Plants (STPs)

Compliance with prescribed standards BOD:TSS (10:10)

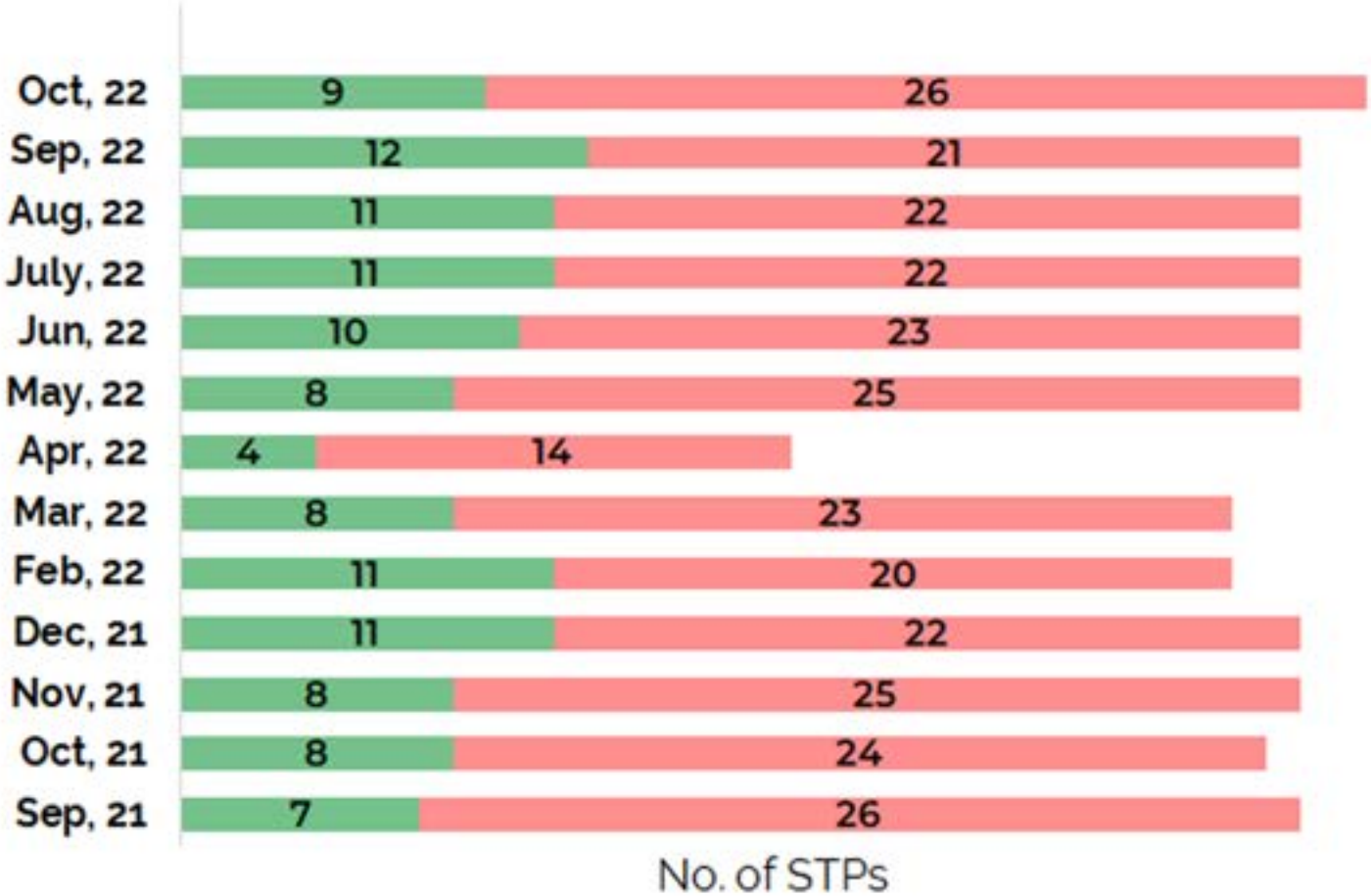
## STPs built to prescribed standards




9/35 STP




151/597 MGD



## Water Quality of

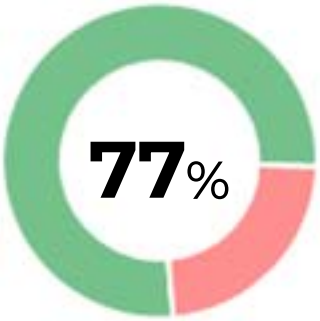
# Common Effluent Treatment Plants (CETPs)

# 10 Water quality monitoring

of 13 Common Effluent Treatment Plants (CETPs)

Compliance with prescribed standards - 30:100 (BOD:TSS)

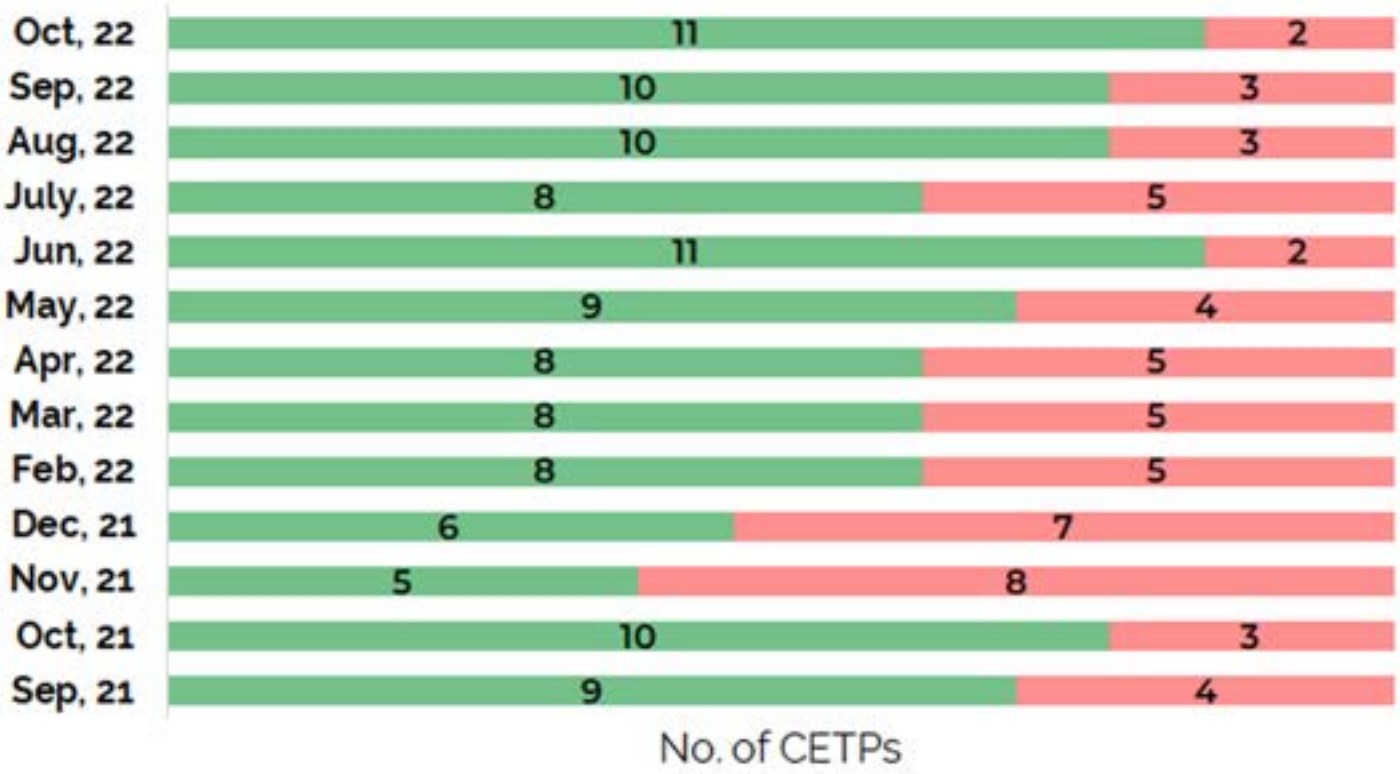
## CETPs meeting design standards




10/13 CETPs

**CETP: Treatment systems specifically designed for collective treatment of effluent generated from small-scale industrial facilities in an industrial cluster.**

Utilization Capacity (Oct, 2022): 67.20 MLD/212.3 MLD (31.65%)



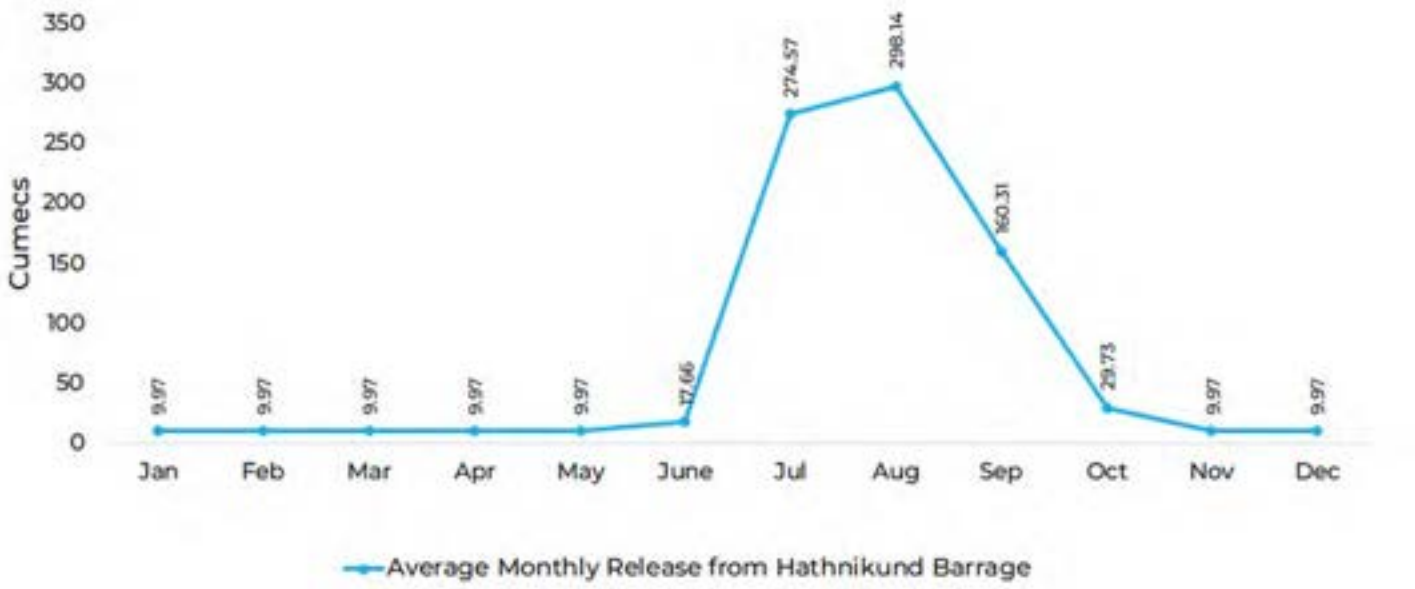
## Improvement of water quality in Yamuna

# Actions taken & Gaps

# 11 Minimum Environmental Flow (e-flow)

DEFINITION

E- Flow :Minimum quantity of flow of water that a river must have in order to preserve its ecosystems.




Minimum e-flow for dilution of polluted water in river Yamuna in Delhi is required to meet desired water quality levels in river Yamuna for bathing purpose i.e. BOD < 3 mg/l & DO >5 mg/l.

To assess minimum required e-flow of river Yamuna for stretch between Hathini Kund to Okhla, a comprehensive study was assigned by NMCG to National Institute of Hydrology (NIH), Roorkee on 24.12.2018.

# 12 Minimum Environmental Flow (e-flow)

As per Final Draft Report submitted by NIH to NMCG. E-flow of **23 Cumecs (437 MGD)** in lean season (May) has been recommended in NIH study.
Points : Hathnikund to Okhla Barrage
Present E flow: Approx. 10 Cumecs (190 MGD)
**Gap : Approx. 13 Cumecs (247 MGD)**

**Possibilities:** Early construction and completion of below mentioned dams/Canals.
Renuka Dam project (GoI) - Approx. 13 Cumecs (Expected drinking water share of Delhi)
Lakhawar Dam project (GoI)
Kishau Dam project (GoI)

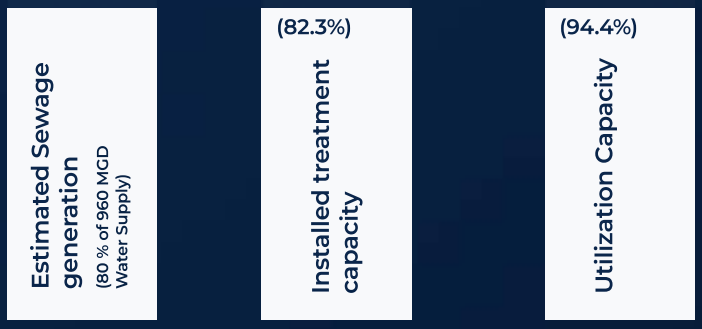
Water sharing agreement of 1994 among riparian states of Uttarakhand, HP, UP, Haryana, Rajasthan and NCT Delhi is due for revision only in 2025.

**Under e-flow of 23 Cumecs, the BOD level would come down from 25 to 12 mg/l (Ideal BOD : 3 mg/l)**
**For bathing standards of BOD 3 mg/l – e-flow required is more than 390 Cumecs (7410 MGD).**

# 13 Augmentation and Rehabilitation
of Sewage Treatment

## Generation, Treatment and Gap
in sewage treatment

in MGD




## Treatment Capacities

**722** (94 %)

**Total treatment capacity by Dec ‘22**

**925.5** (120.5 % of present sewage generation rate)

**Total treatment capacity by Dec ‘23**

**160**

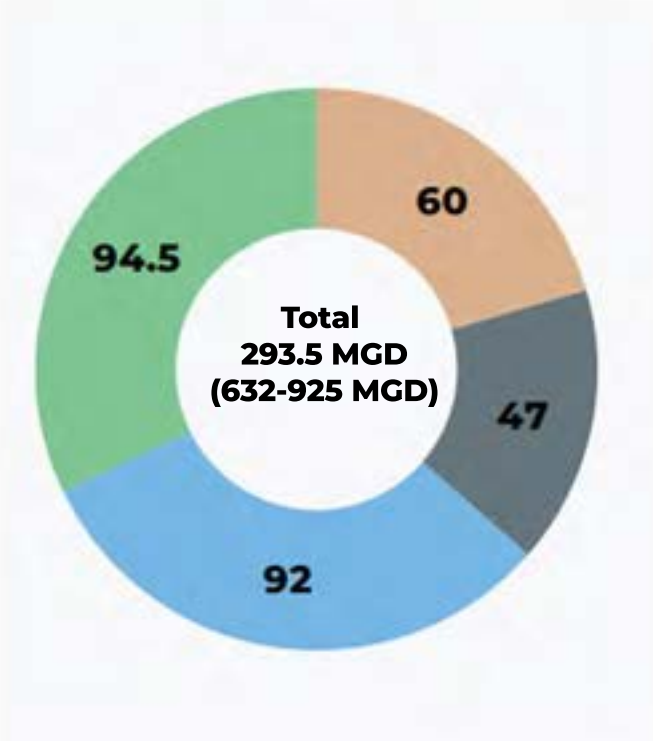
**Present treatment capacity** (as per prescribed standards)

**925.5**

**Treatment as per prescribed stds. by Dec ‘23**

# 14 Augmentation and Rehabilitation of Sewage Treatment

Focus Areas for Enhancing Sewage Treatment Capacity



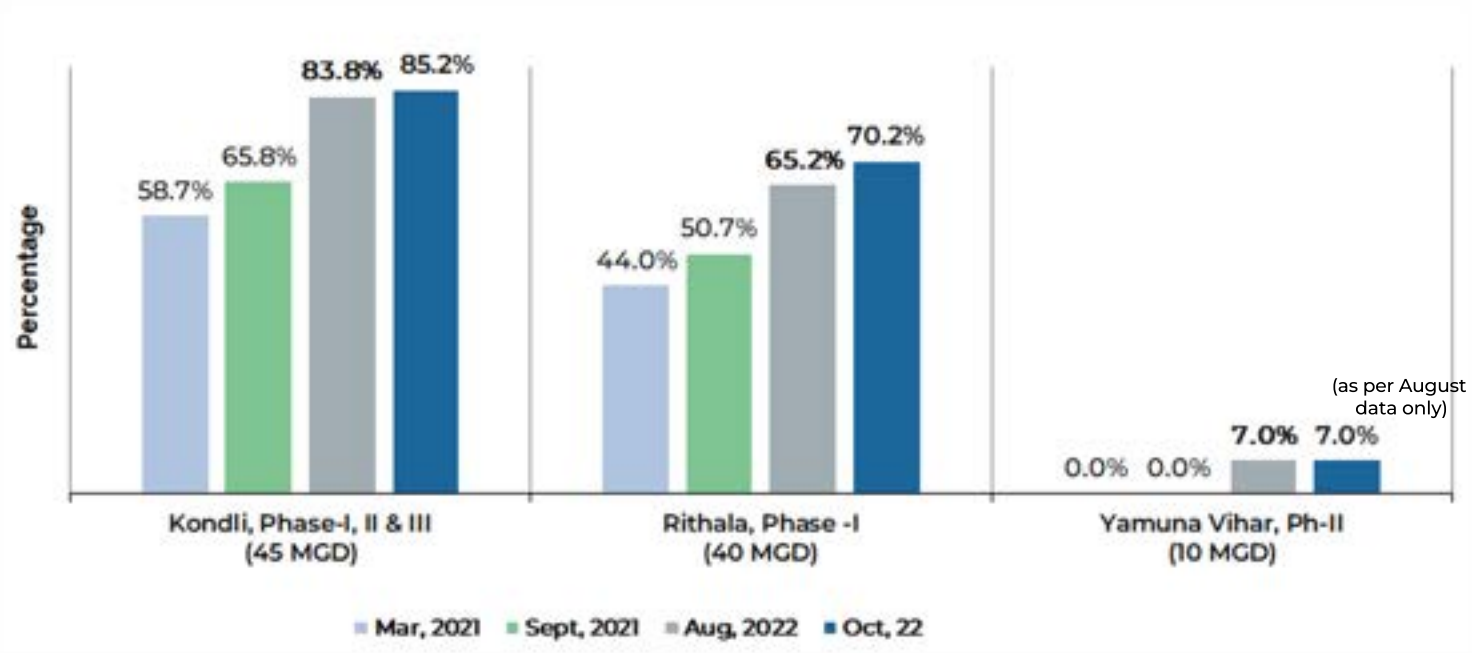

- Upgradation and increasing capacity of existing STPs (16)
- Rehabilitation of existing STPs (3)
- ReConstruction of New STPs at Okhla, Delhi Gate & Sonia Vihar (3)
- Construction of 41 New DSTPs

(Existing Capacity of 35 STPs - 632 MGD)

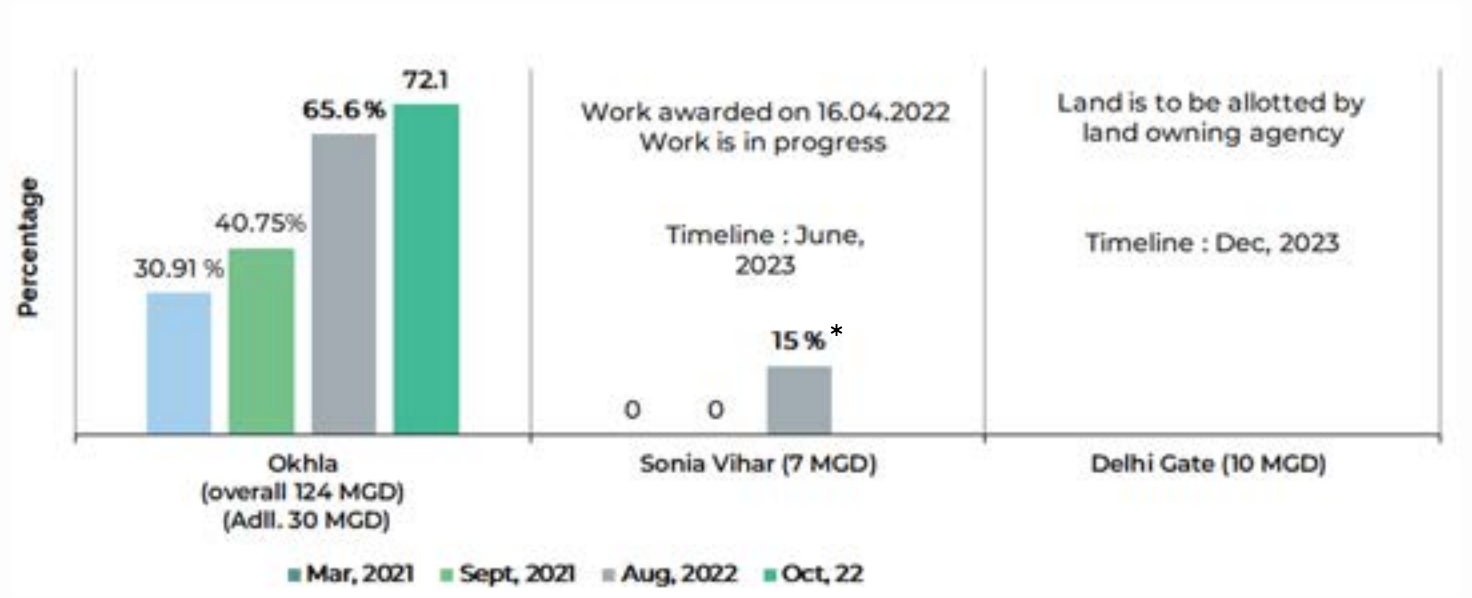
| S. No | Sector | Plant | Additional Capacity (MGD) | Timelines |
|---|---|---|---|---|
| 1 | I | Kondli (Phase II) | 20 | Dec,2022 |
| | | Rithala | 40 | |
| | | Okhla | 30 | |
| | | **Sub Total** | **90 MGD** | |
| 2 | II | 27 Decentralized STPs at various locations of Delhi | 60 | Dec, 2023* |
| 3 | | 14 STPs in Najafgarh Drainage Zone | 32 | |
| 4 | III | Construction of New STPs at Delhi Gate(10 MGD) and Sonia Vihar (7 MGD) | 17 | June, 2023* |
| 5 | IV | Capacity Augmentation of Existing 16 STPs through latest technology of IFAS (Integrated Fixed Film Activated Sludge) | 94.5 | |
| **Sub Total** | | | **203.5 MGD** | |
| **Total Additional Capacity by Dec, 2023** | | | **293.5 MGD** | |
| Total Capacity of STPs by December, 2022 - 722 MGD [632 MGD + 90 MGD] | | | | |
| Total Capacity of STPs by Dec, 2023 - 925.5 MGD [632 MGD + 293.5 MGD] | | | | |

# 15 Progress in rehabilitation & construction of Sewage Treatment Plants (STPs)

Rehabilitation capacity addition: 60 MGD




Construction capacity addition: 47 MGD



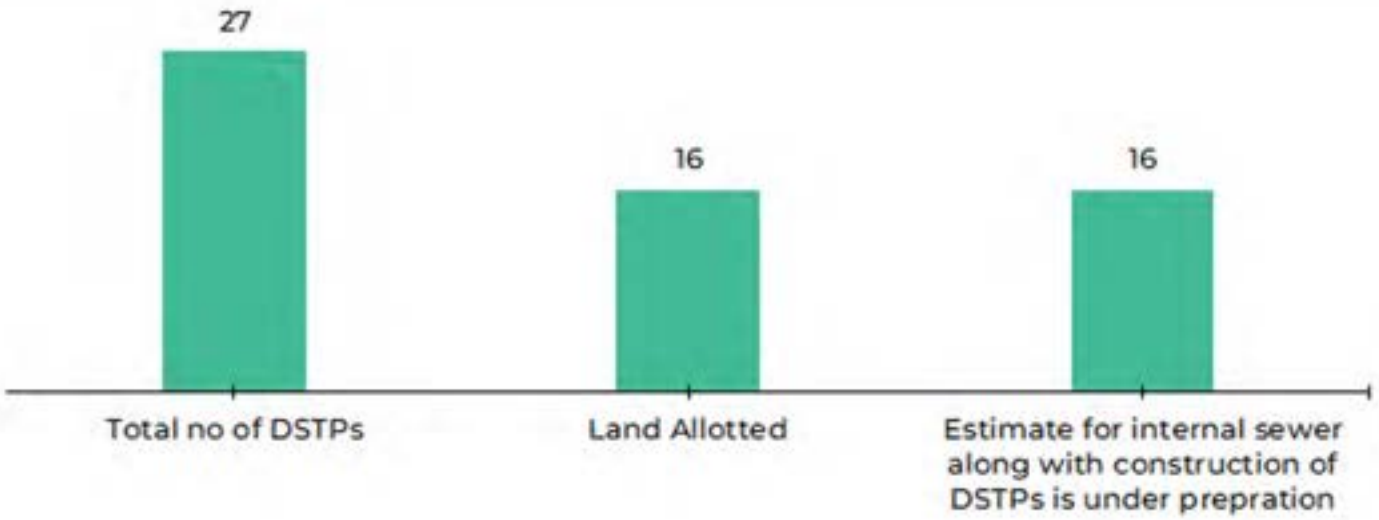
# 16 Construction of 41 new DSTPs

Capacity Addition: 92 MGD

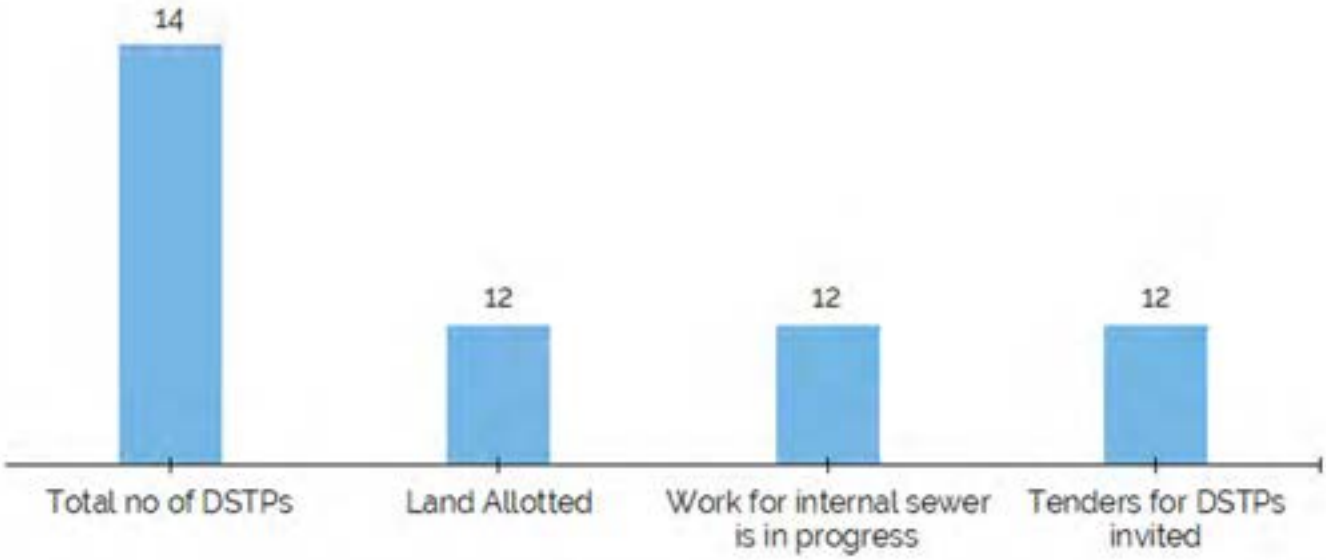
Timeline for completion – Dec, 2023

## Rehabilitation capacity addition: 60 MGD

** 13 DSTPs: Subject to Land availability*




## 14 DSTPs in Najafgarh Drainage Zone



# 17 Tapping and Treatment
## of Sewage in drains

### 13 drains tapped out of 18 major drains

| Status of Drains | | |
|---|---|---|
| 1 | Magazine Road Drain | Tapped (As per NMCG) |
| 2 | Sweeper Colony Drain | |
| 3 | Metcalf House Drain | |
| 4 | Tonga Stand Drain | |
| 5 | Moat Drain(Vijay Ghat) | |
| 6 | Tehkhand Drain | |

| Status of Drains | | |
|---|---|---|
| 7 | Khyber Pass Drain | Tapped (As per NMCG) |
| 8 | Civil Military Drain | |
| 9 | Drain No 14 | |
| 10 | Kalkaji Drain | |
| 11 | Tughlaqabad Drain | |
| 12 | Delhi Gate Drain (Power House Drain) | Partially Tapped Land is required |
| 13 | Sen Nursing Home Drain | Partially Tapped |

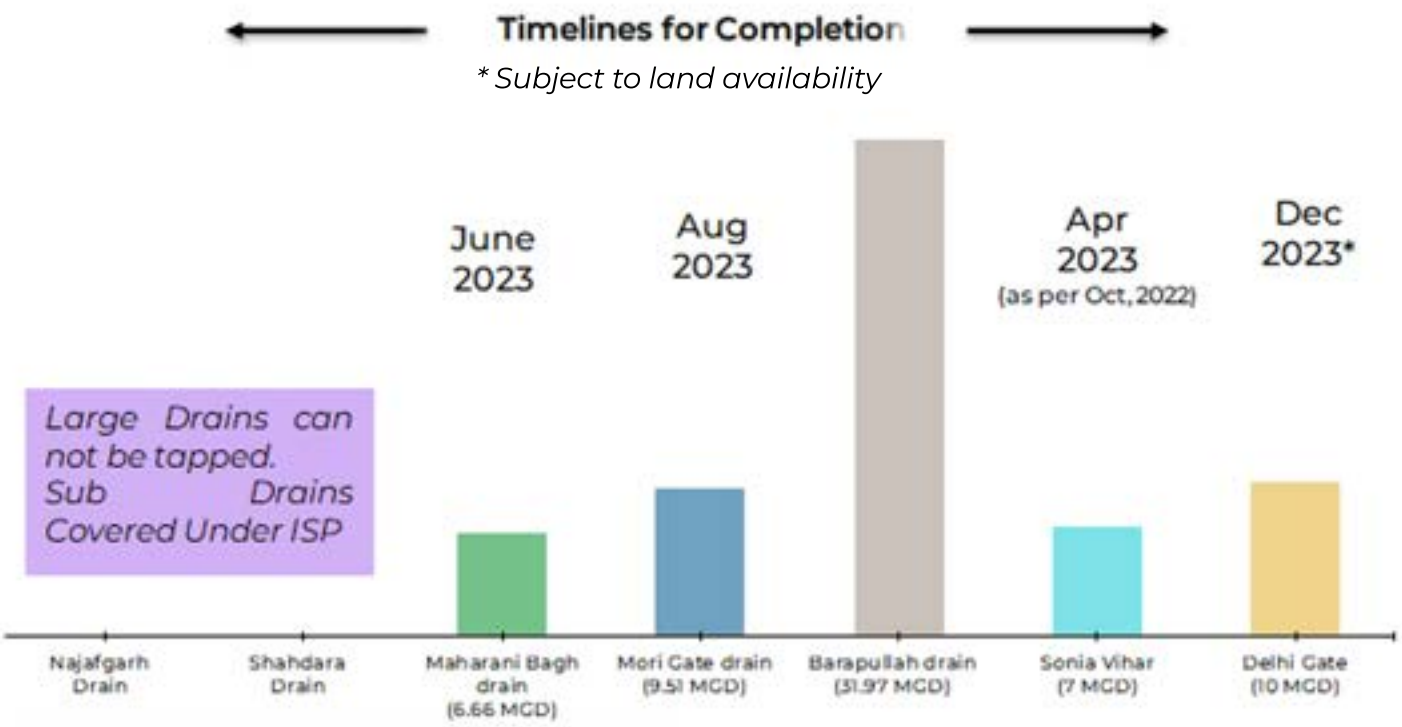
| Status of Drains | | |
|---|---|---|
| 14 | Najafgarh Drain | Untapped (Covered under ISP) |
| 15 | Shahdara Outfall Drain | |
| 16 | Qudsia Bagh + Morigate Drain (ISBT Drain) | Untapped (Flow to be diverted to Coronation Pillar) |
| 17 | Barapullah Drain | Untapped (Flow to be diverted to Okhla STP) |
| 18 | Maharani Bagh Drain | |

| Status of Drains | | |
|---|---|---|
| 19 | Kailash Nagar Drain | Partially tapped |
| 20 | Shashtri Park Drain | |
| 21 | Drain Near LPG Bottling Plant | Partially tapped |
| 22 | Sarita Vihar | |
| 23 | Jaitpur Drain | Discharge will be tapped after laying of Sewage network in Badarpur/unauthorized colonies |

| Status of Drains | | |
|---|---|---|
| 24 | Abul Fazal Drain | Discharge will be tapped after laying of Sewage network in Batla House GoC |
| 25 | Sonia Vihar Drain | STP proposed (7 MGD) |
| 26 | Supplementary Drain | Subsidiary of Najafgarh Drain – covered under ISP |
| 27 | Sahibabad Drain | Untapped/Action is to be taken by UP Govt. |
| 28 | Indrapuri Drain | |

# 18 Tapping of drains

## Remaining 5 untapped major drains




### Maharani Bagh Drain (6.66 MGD)

Will be intercepted and treated in Okhla STP. Work awarded 01.04.2022

### Mori Gate Drain (9.51 MGD)

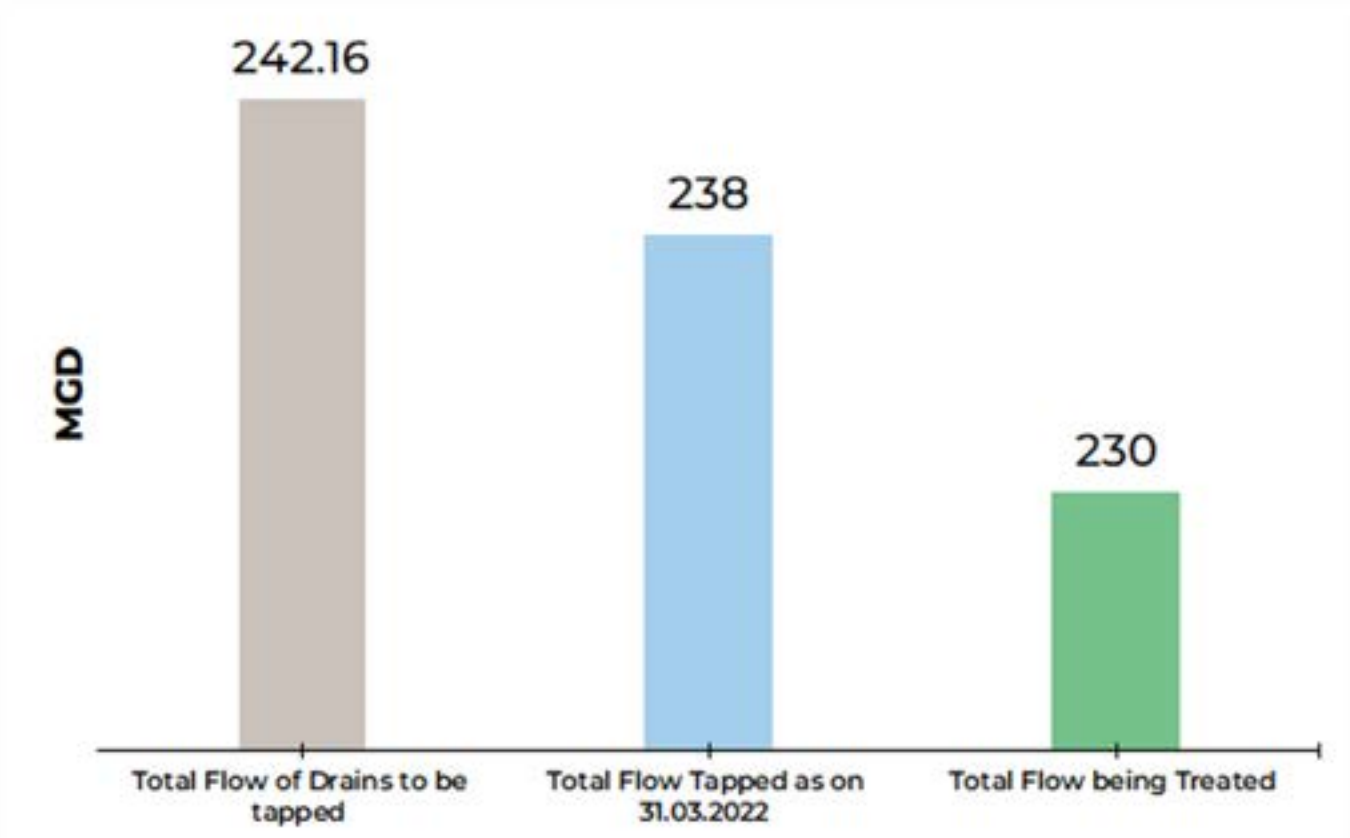
Will be intercepted and treated in Coronation Pillar STP. Tenders received and in process of approval.

### Barapulla Drain (31.97 MGD)

Will be intercepted and treated in Okhla STP. Work awarded 01.04.2022

# 19 Treatment of sewage in drains

Status of Interceptor Sewer Project (ISP) of DJB



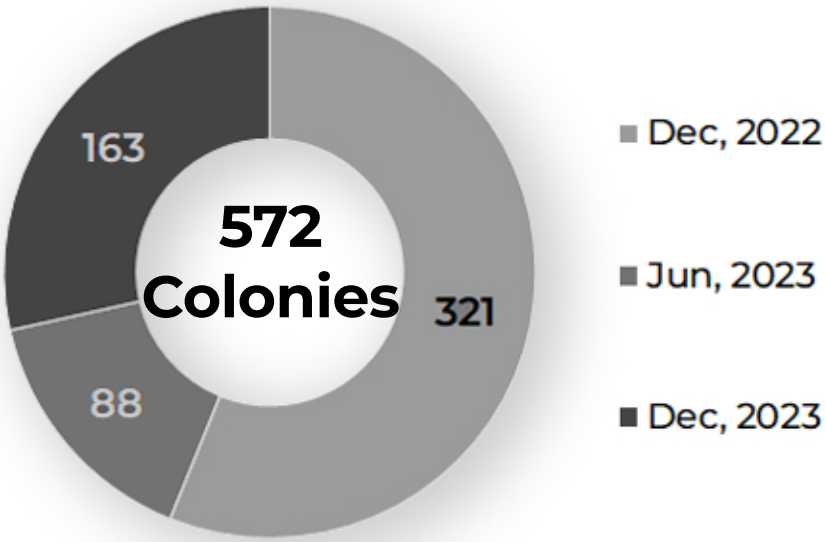

**Physical work of ISP** completed and commissioned.

**230 / 242 MGD** trapped & treated (238 MGD provisioned)

**Entire flow** to be trapped & treated by **Dec, 2022**
(after construction/rehab of Rithala & Kondli STPs under YAP-III)

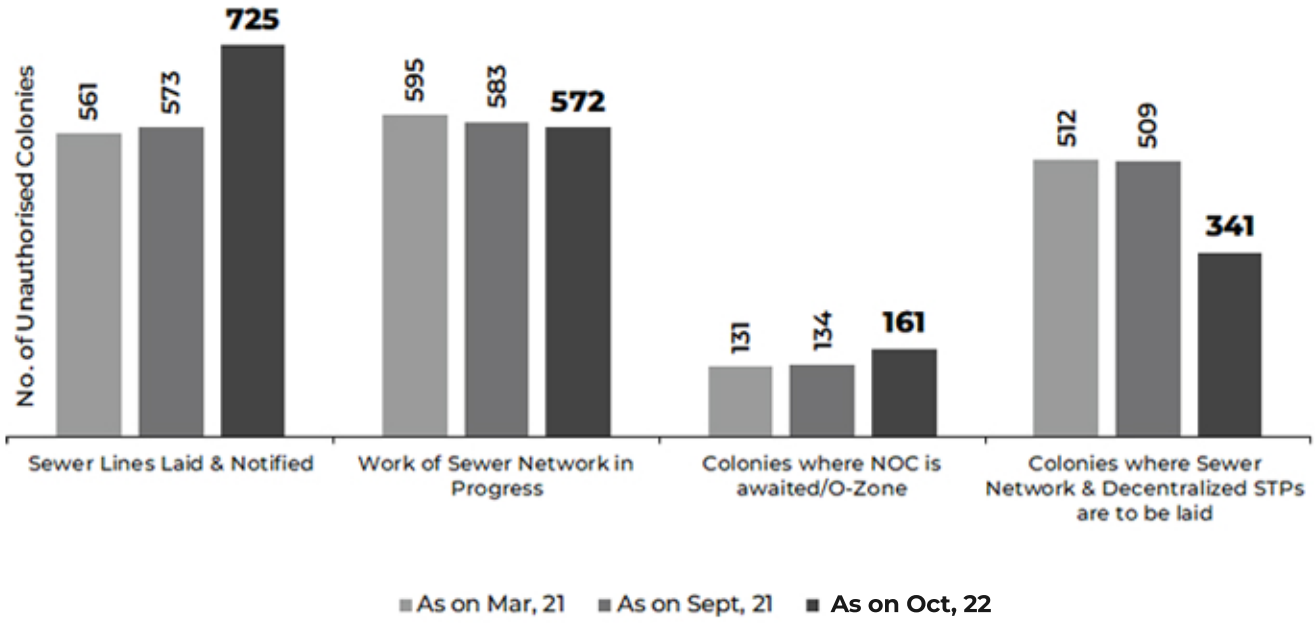
# 20 Sewage network
## in unauthorized colonies (1799)

### Status of Sewarage networks in progress




572 Colonies where laying Sewer Network in progress.

Completion by Dec, 23 (Diversion of 100 MGD from drains to STPs)



# 21 Connection of Drains/ Drainage system

## of JJ Clusters (630 Nos ) with sewerage network

| 630 | 540 | 48 | 42 |
|---|---|---|---|
| Total JJCs | Connected | Not feasible | in progress |

Connection of storm water drain at outfall points/ points of JJCs into nearest DJB sewerage system.

All storm water drains out falling from JJCs will be trapped into DJB sewerage system.

# 22 In-situ Bioremediation/Phytoremediation of Sewage in Drains

Bioremediation broadly refers to any process wherein a biological system, living or dead, is employed for removing environmental pollutants.

Phytoremediation technologies use living plants to clean up soil, air, and water contaminated with hazardous contaminants.

As per the NGT orders bioremediation/phytoremediation of sewage in drains is to be carried out.

**Status of 10 Drain Owning Agencies (DOAs) provided by DJB is as follows**

| S. No | DOA | Work Awarded / Progress | Timeline |
|---|---|---|---|
| 1 | SDMC | Pushp Vihar Drain (1.9 Km stretch of Chirag Delhi Drain) as pilot project. 85 % work completed. | - |
| 2 | EDMC Owns 205 SWDs | Constructed Wetland/ Treatment System of 3 MLD designed by NEERI at Jheel Park for treatment of Incoming Drains & functional. | - |
| 3 | North DMC (192 SWDs) | Taken up 350 meter stretch of Qudsia Bagh Drain as pilot initiative, 25% work completed. | Dec, 2022 |
| 4 | DSIIDC | Bioremediation/Phytoremediation is not possible for drains since smaller in size. | - |
| 5 | I&FC Deptt | • CompletedPilot Project in Ghogha Drain, Bawana. Constructed Wetland [Rs. 2 Crores to treat 1 MLD]<br>• Fatehpur Beri drain: Tenders invited but no response. Will be invited again<br>• Insitu treatment of Najafgarh & supplementary drain was started by construction of temporary weirs at 24 locations - Weirs removed before the onset of monsoon.<br>• Techno feasibility analysis for two new options namely concrete blocks and geo tubes is being explored by I&FCD.<br>• Work of installation of aerators have been awarded on 19.7.2022. In first phase 250 aerators shall be installed in Najafgarh Drain. | Timelines for floating wetlands yet to be provided |
| 6 | NDMC | Completed Bio-remediation on Kushak Nallah & it is functional | - |
| 7 | DCB | Carrying out In-situ treatment in 6 Drains through chemical dosing since discharge is less ( in the range of 1.5 MLD). | - |

# 23 Management of Faecal Sludge (Septage)

Delhi Water Board Septage Management Regulations 2018 dated 12.11.2018 for collection, transportation and disposal of waste of septic tanks (Septage).

As per said Regulations , necessary action is to be taken by DJB , District Magistrates & Local Bodies

DM - authorized to ensure enforcement as well as compliance of these regulations.
License issued by DJB to vendors for Collection, Transportation & Disposal at designated SPSs/STPs

**Septage Management Committees headed by concerned District Magistrates**

**Divisional Commissioner taking review meetings with DMs on weekly basis .**

**₹12.17 lakhs**

Total Amount of Environmental Compensation Imposed and received

**38**

Total No. of Meetings of Septage Management Committees held

**25**

No. of Tankers impounded in September, till 27.09.2022

**43**

No. of Vehicles/ Tankers impounded

**20**

No. of Challans/-notices issued

# 24 Management of Faecal Sludge (Septage)

## NGT Case (OA No. 365/2021) regarding Septage Management

Joint Committee headed by Hon'ble Justice (Retd.) Sh. S. P. Garg, members from CPCB, DPCC &DJB constituted by Hon'ble NGT vide Order Dated 22.04.2022 in OA No. 365/2021 for devising appropriate monitoring mechanism to prevent illegal dumping/ discharge of septage into drains in Delhi.

Joint Committee meeting DJB, DC (HQ)/ DMs, Police Deptt. etc for devising appropriate monitoring mechanism for improving the septage management in Delhi.

**Joint Committee to submit report to NGT with copy to Chief Secy for further remedial action.**

Centralized Control Room with contact No. of Nodal officer in each revenue district to be est. by DMs & DJB HO for complaints/ grievance

List available on websites of DJB & sent to Delhi Police / Delhi Traffic Police for checking unauthorized vehicles / tankers carrying Septage & for taking necessary action

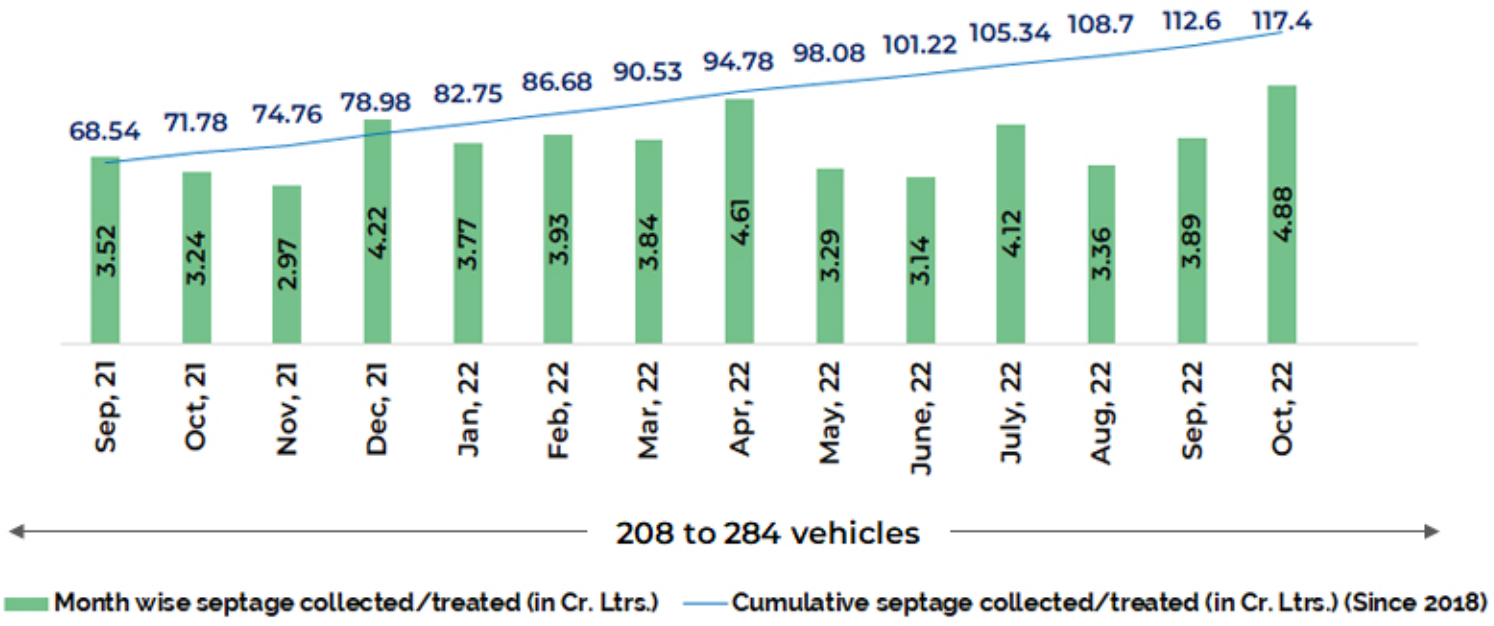
Centralized Monitoring System for tracking the licensee vehicles - DJB has floated Tender.

District wise Task Force to be constituted by DJB for checking unauthorized dumping of Septage & for monitoring compliance

List of 284 Authorized Vendors/ Tankers published by DJB in newspapers on 24.08.2022.

# 25 Faecal Sludge (Septage)
## Collection and Treatment

**112.6 Cr. Ltrs collected/treated till Sep, 22**




# 26 Regulation of Flood Plain

## Delhi Development Authority (DDA)

### Enforcement

600/1026 JJ/Chappar removed

5 Acre land reclaimed

42,000 MT of C&D waste lifted & utilized

477.8/1152.7 Ha. repossessed (7 Projects)

### Protection Measures

125 Security Guards

93 CCTV cameras at 27 locations

### Demarcation

1 in 25 years Flood Plain
Fencing with 591 Bollards
375 Flag Posts
27 Sign Boards

### Restoration projects

Landscaping
Wetland construction
Public Utilities - Pedestrian pathways, Cycling tracks, Bio-toilets, Entrance-plaza, Signage

# 27 Restoration & Rejuvenation of Flood Plains

## Status of 10 Projects of DDA

### Completed Projects (Phase I)

Asita East (197 Ha)
Kalindi Aviral (100 Ha)

### Projects in advance stage

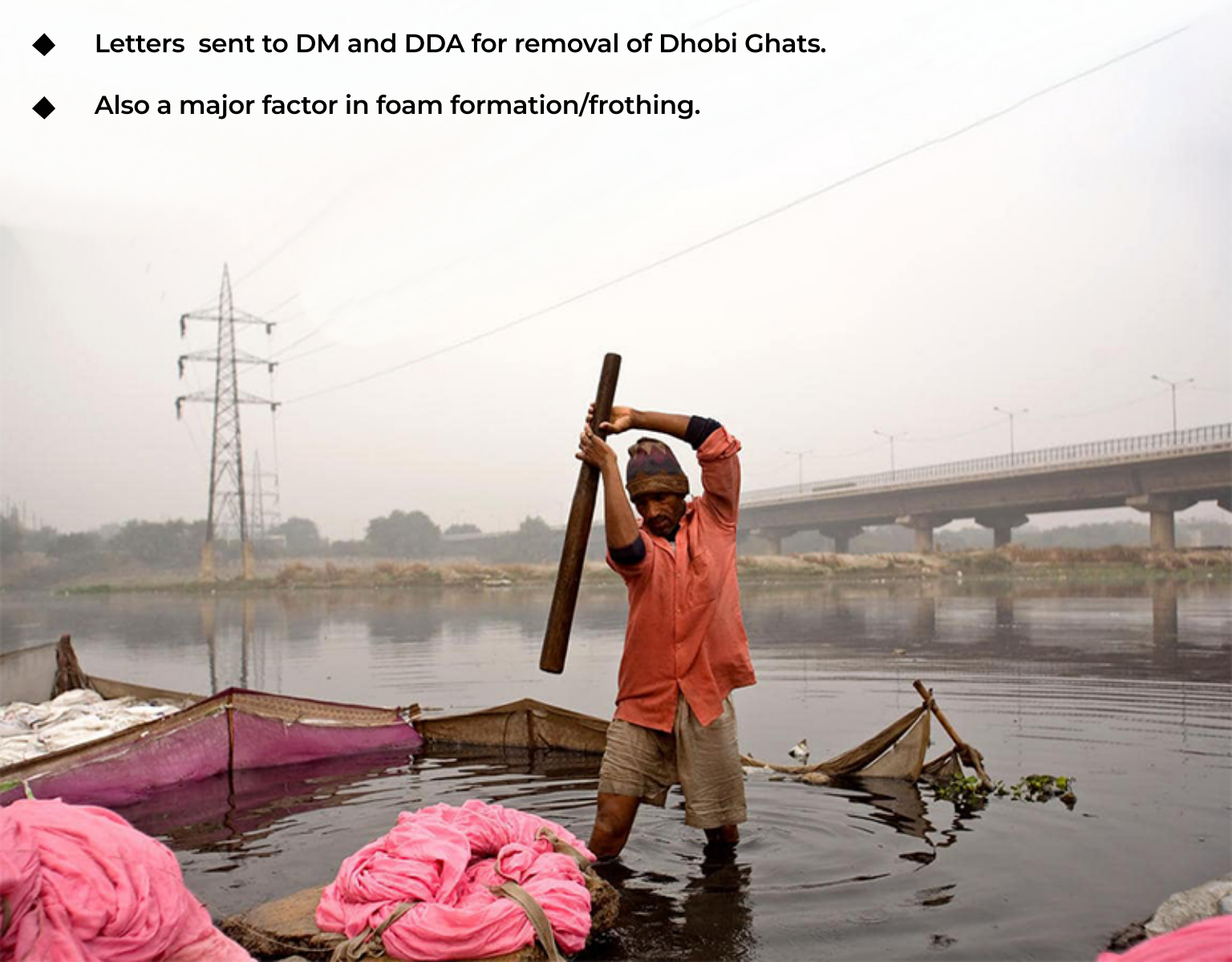
Kalindi Biodiversity Park (115 Ha)
Asita West (200 Ha)
Amrut Biodiversity Park (116.25 Ha)
Yamuna Vanasthali (236.5 Ha)

### Projects in initial stage

Wazirabad to Old Railway Bridge (66 Ha)
Mayur Nature Park (397.75 Ha)
Eco-Tourism Area (30 Ha)
Hindon Sarovar (45 Ha)

# 28 Removal of Dhobi Ghats from Flood Plains

- NGT directed to remove encroachments from Yamuna Floodplain, no construction activity in demarcated floodplain and repossessing floodplain area under illegal and unauthorized person.
- DDA to remove illegal Dhobi Ghats from the Yamuna River Banks.
- Directions issued by DPCC on 08.11.2021 for removal of Encroachment & Dhobi Ghats from the Yamuna Flood Plain .
- Letters sent to DM and DDA for removal of Dhobi Ghats.
- Also a major factor in foam formation/frothing.



# 29 Foam formation
## in River Yamuna

- Two locations : **Downstream side of ITO and Okhla barrages.**

- **Primary reasons :**
  Surfactants – phosphate in detergents/soap water
  At Okhla barrage wastewater is impounded and excess waste water released downstream.
  Release of waste water from barrage height agitates surfactants present.
  Foam quantities increase with discharge quantity of water from barrages.

  Dissolved phosphates: 6.9 to 13.4 mg/L [Discharge standard - 5 mg/L]

- **Short term Actions needed:**
  UP Irrigation Dept. to schedule opening of Okhla Barrage gates
  Removal of Dhobi Ghats
  During Chhath Pooja, 2022, no significant froth/foam was visible. As per the information by DJB, anti-surfactants/anti-foaming agent which were eco--friendly were used in downstream of Okhla barrage.

# 30 Industrial Effluent management

## 28

### Approved Industrial Areas

No. of industries 25253 (WPIs : 1334)

Effluent generation 28.75 MLD

Connected to 13 CETPs

11 Approved Industrial Areas not requiring CETPs since mostly non water polluting/ dry units.

Individual WPIs is having ETPs.

## 25

### Redevelopment Industrial Areas

Survey is being conducted by Jamia Milia Islamia of industries/ units operating in these areas.

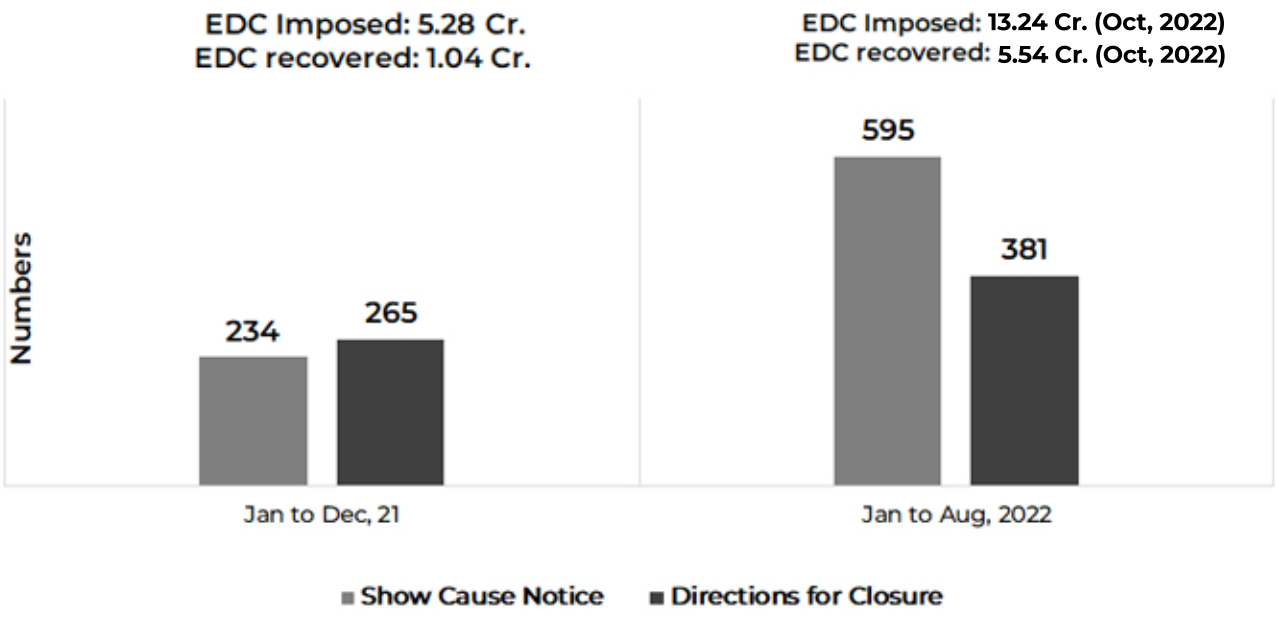
Survey completed in 15 redevelopment areas

Total no. of industries/ units surveyed – 5305

Whole survey expected to be completed by 15th Nov, 2022

Redevelopment Indl. Areas lack infrastructural facilities for which these areas are to be developed as per the provisions of MPD – 2021.

### Enforcement by DPCC: Action against Water Polluting Industries

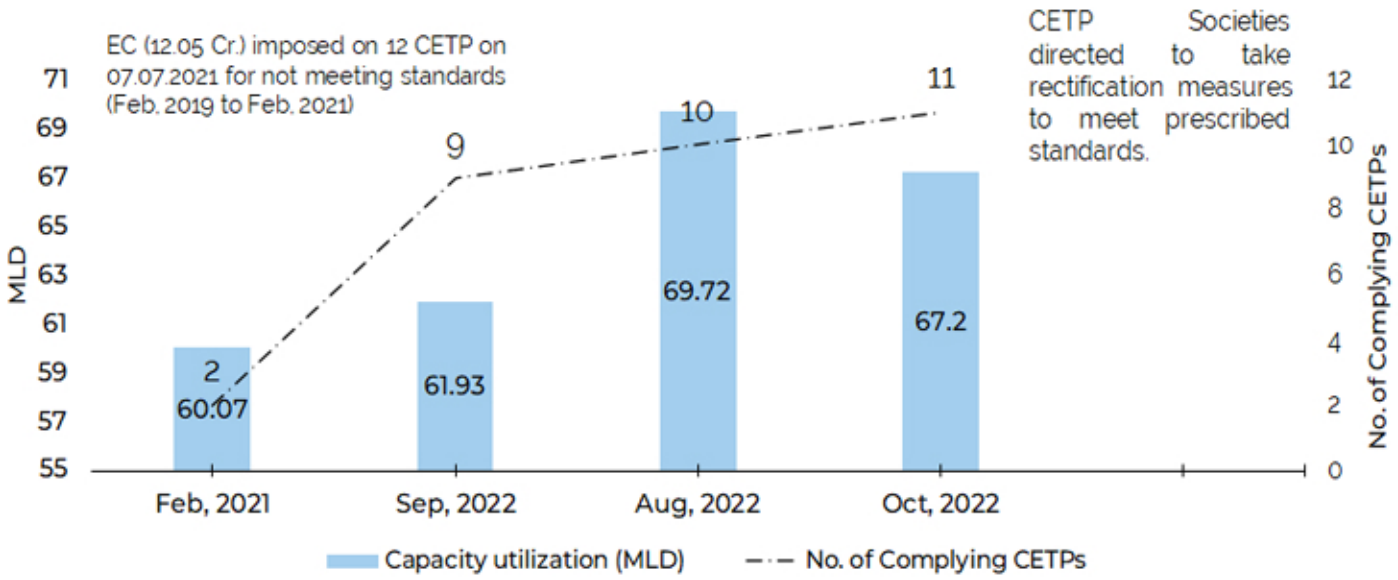


# 31 Industrial Effluent Management

## 13 CETPs

CETPs are designed to meet prescribed standards under EP Act (Installed Capacity of all the 13 CETPs: 212.3 MLD

**DPCC monitors CETPs on monthly basis**




**Upgradation of CETPs**

As per recommendations of YMC constituted by Hon'ble NGT, CETPs in Delhi and also considering suggestions given by Task Team of CPCB, CETPs are to be upgraded for meeting BOD/TSS (10/10) and for reuse of treated effluent.

DSIIDC engaged CSIR-NEERI (05.11.2019) for providing consultancy w.r.t various issues related to CETPs including up gradation of CETPs .

NEERI has carried out Overall Performance Evaluation of all 13 CETPs in Delhi & submitted to DSIIDC on 16.03.2022.

In principle approval of Hon'ble Lt. Governor to hand over the CETPs to DJB received.

As mandated by CETP Act, 15 days notice is being served to respective CETP Societies through Industries department.

Proposed timeline for upgradation of CETPs is December, 2023.

# 32 Utilization of treated wastewater

Action plan by DJB (570 MGD)

**90 MGD**

Being used in Horticulture etc.

**267 MGD**

Mandatory Return Flow in Yamuna

**597 MGD (Oct, 22)**

Total Treated Sewage

**70 MGD**

Proposed : Raw water use at Palla (Tertiary treatment at Coronation pillar)
Timeline : Dec, 23

**171 MGD**

Gap (Oct, 22)

# 33 Treatment of waste from dairies

## and reuse using biogas digesters

### Quantum

623 Dairy Farms as informed by Local Authorities/ MCD

10 Major Dairy colonies having 55842 animals with estimated wastewater generation of 11.3 MLD.

2 MLD wastewater generation (55842 Milch Animals) is estimated by a team of DPCC and Animal Husbandry Officer, GNCTD.

### Gap

Wastewater generated including cow dung is being discharged without treatment into drains

### Proposals to fill the gap

Proposed Bio-CNG Plants:
Ghogha (290 TPD)
Goyala (215 TPD)
Nangli (215 TPD)
Ghazipur Dairy (185 TPD)

However individual dairies are yet to comply with CPCB Guidelines for management for Environmental Management of Dairy Farms and Gaushalas.

DPCC issued public notices on 09.12.2019 and also in 2022 seeking application for Consent.

Guidelines for Environmental Management of Dairy Farms and Gaushalas uploaded on DPCC Website.

# 34 Leachate from dumpsites

## Quantum

As per the Report of Joint Committee (CPCB, NEERI & IIT Delhi)

**Bhalaswa Dumpsite – 0.45 MGD (2.05 MLD)**

**Ghazipur Dumpsite - 0.79 MGD (3.6 MLD)**

**Okhla Dumpsite – 0.34 MGD (1.55 MLD)**

## Gap

No leachate treatment plant for 3 existing dumpsites

## Proposals to fill the gap

Directions u/s 5 of E.P. Act issued by DPCC to 3 DMCs on 23.03.2021 for bio--mining of legacy waste management including adequate provisions for leachate treatment.

Directions u/s 33 (A) of Water Act also issued by DPCC to 3 DMCs on 31.01.2022, 18.02.2022 and 23.02.2022 regarding installation of Leachate Treatment Plants

No proposal received from DMCs / MCD for installation of Leachate Treatment Plant at 3 Dumpsites.

# 35 Dumping of solid waste

## in drains

Directions issued by Chief Secy. vide order dated 09.01.2019 for prevention of dumping of solid waste into drains for compliance by the Drain Owning Agencies in Delhi.

UD Deptt., GNCTD also issued order dated 15.01.2019 to the Drain Owning Agencies in Delhi including directions for imposition of Environmental Compensation of Rs. Fifty Thousand by the Drain Owning Agencies on the violators.

Matter is being coordinated by the UD Deptt. GNCTD.

DPCC issued Directions for idol immersion on 29.08.2022.

# 36 Yamuna Cleaning Cell

Yamuna Cleaning Cell (YCC) under chairmanship of Chief Executive Officer, DJB was constituted vide order dated 03.12.2021 and has been reconstituted vide order dated 09.02.2022.

Focus on following 6 action points for control of pollution in River Yamuna :

Increasing the capacity of Sewage Treatment Plants (STPs) and Decentralized Sewage Treatment Plants (DSTPs).

In-situ cleaning of 4 drains.

All industrial waste to be diverted to Common Effluent Treatment Plants (CETPs)

Connection of Drains/ Drainage system of JJ Clusters (630 Nos ) with the sewerage network.

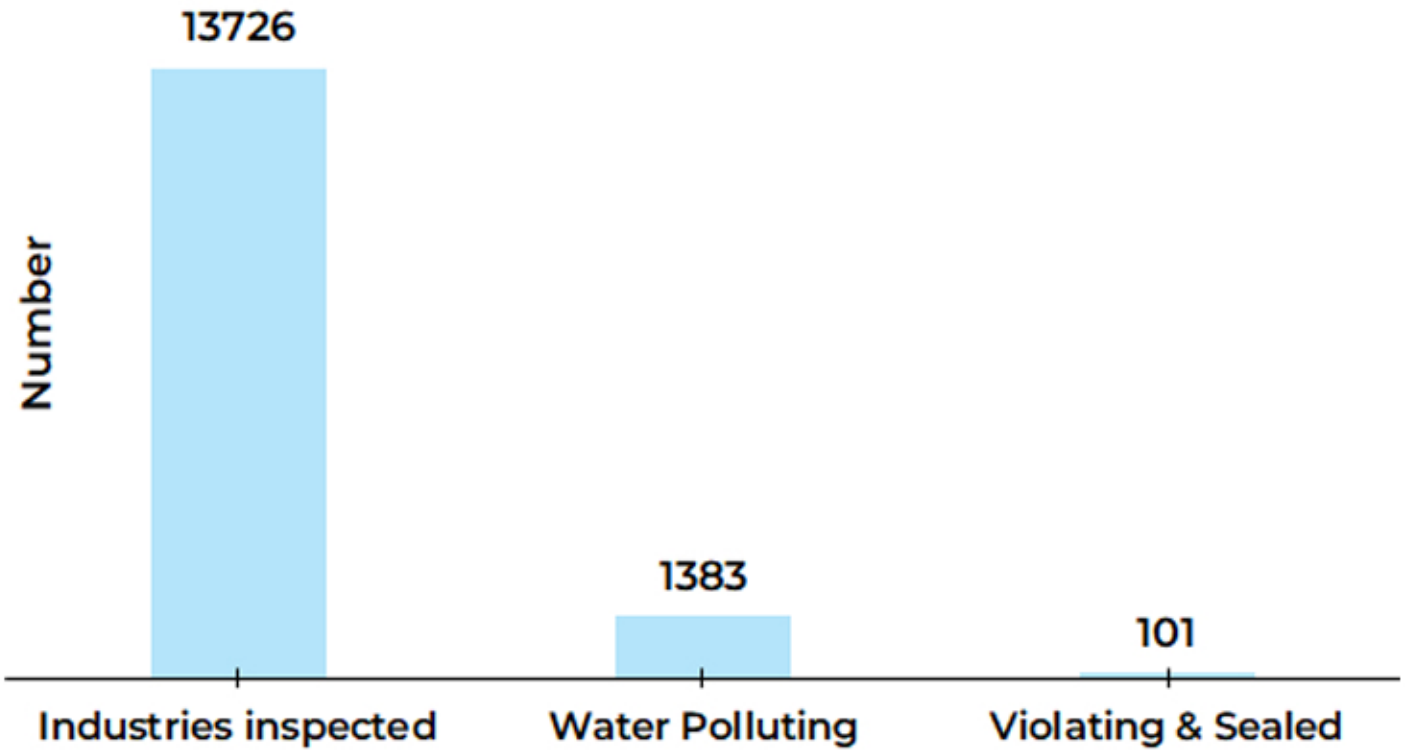
Connection of each and every household to sewerage network (including connections in all the 1799 unauthorized colonies)

Desilting of sewer lines.

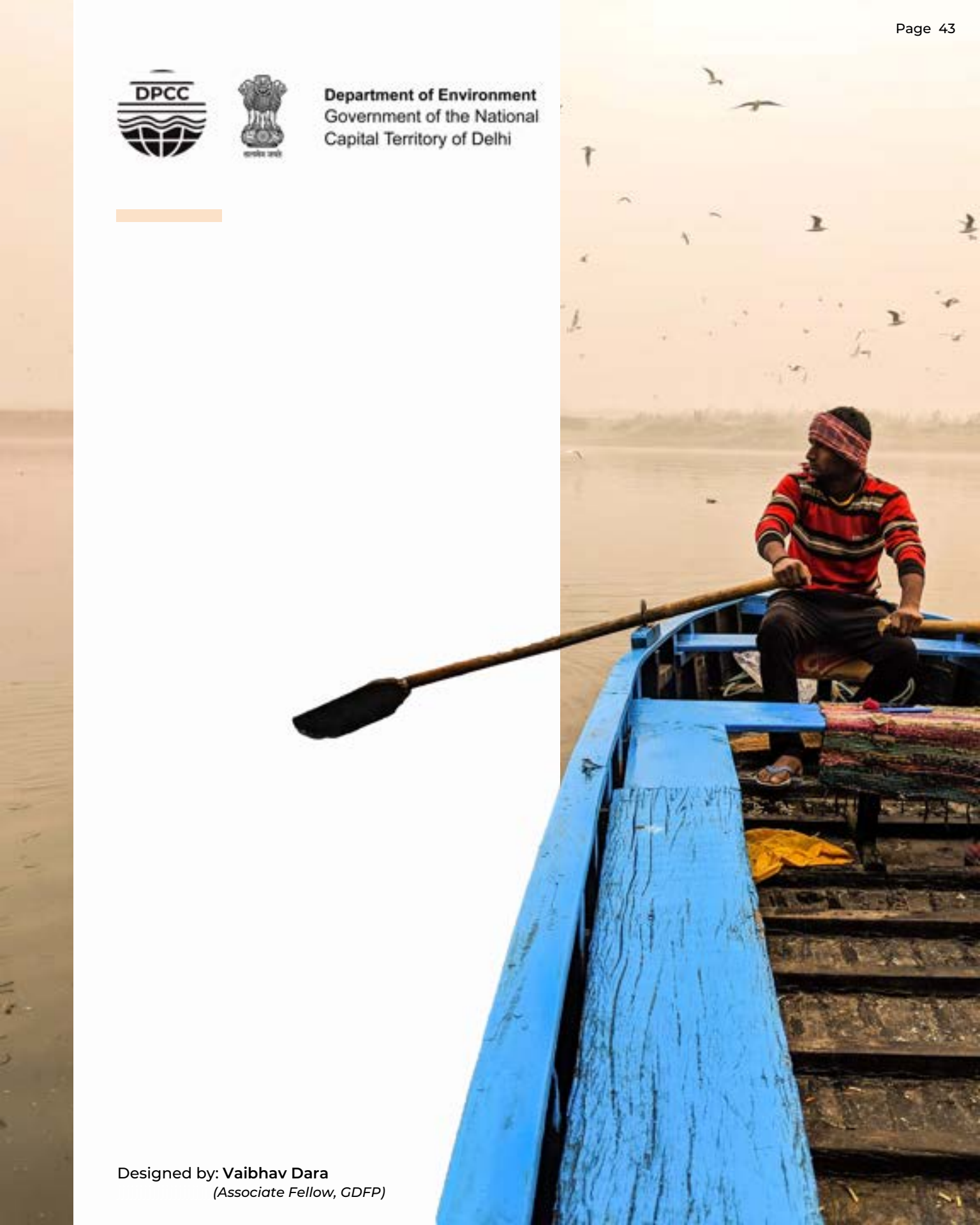
# 37 Enforcement
## by Yamuna Cleaning Cell

**Till date**

11 Teams comprising of DJB, DPCC, DSIIDC & MCD for Inspections and taking action against violating Water Polluting Industries / Units in Delhi.



**Department of Environment**
Government of the National
Capital Territory of Delhi



Designed by: **Vaibhav Dara**
*(Associate Fellow, GDFP)*