CHAPTER 8

ENVIRONMENTAL CONCERNS

Delhi is landlocked City in Northern India with limited resources. Rapid Urbanization of Delhi along with growth in economic activities in its surrounding areas is responsible for environment problems. Air pollution, water pollution, loss of biodiversity, noise pollution etc. are the major environmental challenges. In Delhi, Government has taken several steps in the recent past to improve the environment condition which includes massive focus on afforestation, installation of Anti Smog Gun at construction sites, promotion of bio-decomposer developed by IARI Pusa for stubble management, closing of thermal power plants, deployment of Mechanical Road Sweepers (MRS) & Water Sprinklers (WS), implementation of Electric Vehicle Policy, ban on single use plastic, better management of solid waste, treatment of waste water, prohibition on open burning of garbage/ dry leaves etc, improvement of sewage system, stringent industrial emission norms etc.

1.1 Increase in number of vehicles in Delhi is far faster than construction of roads. Besides large scale construction activity, the problem of air pollution gets aggravated due to Crop residue (parali) burning in the NCR and neighboring states in the winter month which does not favor dispersion of air pollutants. It is also evident that Delhi's Environment is highly influenced by different meteorological phenomena. In summer, the particulate is influenced by dust storm from Rajasthan and in winter by calm conditions and inversion as well as biomass burning in NCR. Government has undertaken special drive of inspections to prevent air pollution due to the burning of leaves/garbage in open areas.

1.2 Besides Air and Water Pollution, Hazardous Waste, Bio-medical Waste, Construction & Demolition and Electronic Waste are other serious threat to the environment. To mitigate environmental degradation, the Government has taken steps to increase the Green cover of the state, promote electric vehicles, encourage use of treated waste water, decentralised waste management etc.

- To combat air pollution Delhi Govt. announced followings 10-point "winter action plan" that focuses on dust control, using the bio-decomposer, installation of smog tower and checking waste burning and vehicular emissions.

1. Decomposer for parali
2. Anti-dust campaign
3. Fine on waste burning
4. Ban on crackers
5. Smog tower
6. Monitor hotspot

7. Green war room
8. Green Delhi app
9. India's first e-waste park
10. Stop vehicular pollution

- The Delhi Government has set up "Green War Room" (24X7 services for monitoring the grievance uploaded on Green Delhi App) to reduce vehicular pollution in the National Capital. Delhi government started the awareness campaign "Red Light On, Gadi Off" in Delhi.
- To improve Delhi's air quality and create an entire supply-chain ecosystem for this new segment of vehicles, Delhi Govt. established a policy 'Delhi Electric Vehicles Policy, 2020'. In order to significantly benefit Delhi's air quality, the policy intends to deploy 25% of all new vehicles to be battery-operated vehicles by 2024.

1.3 As a result of the initiatives taken by the Government of NCT of Delhi, forest and tree cover area has been increasing steadily since 1997.The forest and tree cover area increased to 342 sq km in 2021 increasing thereby the share of forests in the total area to 23.06 per cent. The growth of forests and tree cover has particularly been monumental post-1997. Delhi has the second-highest tree cover as a percentage (9.91%) of the total geographical area of the States/ UTs after Chandigarh (13.16%). The overall increase in Delhi's green cover is a good sign.

2. Ambient Air Quality

2.1 The city of Delhi has a complex urban environment with respect to air pollution and faces severe air pollution of PM_{10}, $PM_{2.5}$ and NO_2. Year-wise annual mean ambient air quality levels in Delhi during 2015 to 2021 (Till December) is presented in Statement 8.1

STATEMENT 8.1
AMBIENT AIR QUALITY LEVELS IN DELHI: 2015-2021

DPCC CAAQMS Yearly City Average of Various Pollutants 2015 – 2021								
Year	**PM $_{10}$ (ug/m^3)**	**PM $_{2.5}$ (ug/m^3)**	**SO_2 (ug/m^3)**	**NO_2 (ug/m^3)**	**O_3 (ug/m^3)**	**NH_3 (ug/m^3)**	**CO (mg/m^3)**	**C_6H_6 (ug/m^3)**
Standard	**60 (ug/m^3)**	**40 (ug/m^3)**	**50 (ug/m^3)**	**40 (ug/m^3)**	**100** (ug/m^3)**	**100 (ug/m^3)**	**2** (mg/m^3)**	**5 (ug/m^3)**
2015	295	133	17.54	71.96	45.11	43.97	1.51	4.41
2016	303	137	20.52	71.63	39.78	43.16	1.84	6.28
2017	277	130	23.28	74.01	43.60	37.99	2.07	5.20
2018	277	128	18.61	50.00	38.57	40.00	1.52	3.10
2019	230	112	14.76	48.18	34.69	37.80	1.44	4.25
2020	187	101	13.54	40.30	35.74	36.17	1.27	3.34
2021	221	113	12.79	42.31	32.57	40.65	1.34	2.91

* *City average is calculated from 2015-2017 for 4 stations & from 2018-2021 for 24 stations*

** *For 8 hrs & for 1 hr O_3 is 180 (ug/m^3) & CO is 4 (mg/m^3)*

Source: DPCC

2.2 DPCC monitored air quality through 26 online continuous ambient air quality monitoring stations at 26 locations. The real time air quality monitoring data can be seen at DPCC's website which is accessible to the public. Sustained efforts by the Government of Delhi along with the Cooperation of all stakeholders, Delhi is showing signs of improvement in reducing the pollution level since the past few years.

2.3 Particulate Matter for measuring Pollution: Particulate matter is an indicator of ambient pollution. Particulate matter is basically a mixture of extremely small particles and liquid droplets like acids, chemicals, gas, water, metals, soil dust particles, etc. It is also known as particle pollution or PM.

2.4 **Particulate Matter (PM_{10})**: Annual city average of PM_{10} decreased from 295 $\mu g/m^3$ in 2015 to 221 $\mu g/m^3$ in 2021 (till December). Annual city average at all the monitoring locations is exceeded the prescribed standard i.e. 60 $\mu g/m^3$.

2.5 **Particulate Matter ($PM_{2.5}$):** Annual city average of $PM_{2.5}$ also decreased from 133 $\mu g/m^3$ in 2015 to 113 $\mu g/m^3$ in 2021(till December). Annual city average at all the monitoring locations is exceeded the prescribed standard i.e. 40 $\mu g/m^3$.

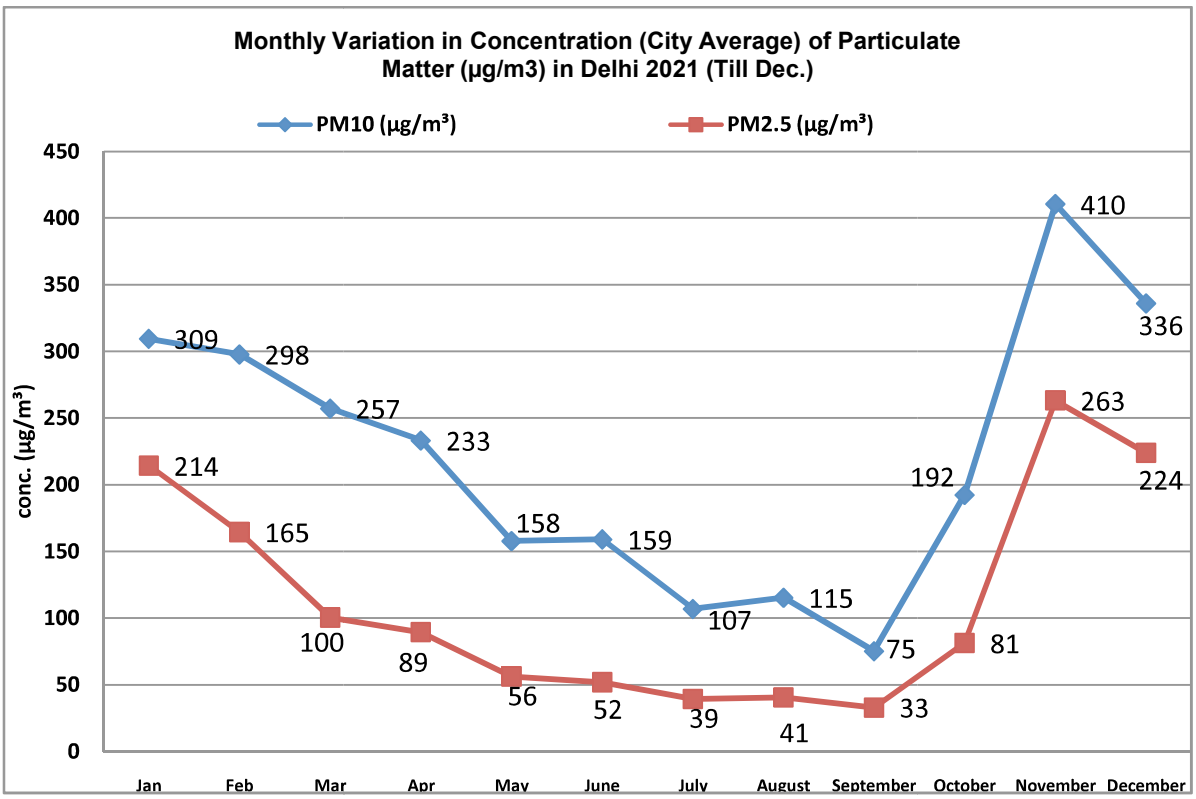
2.6 **Sulphur Dioxide (SO_2)**: The highest annual city average SO_2 recorded at 23.28 $\mu g/m^3$ in 2017, has been decreased 12.79 $\mu g/m^3$ in 2021(till Dec). The Annual city average at all the monitoring locations is within the prescribed standard i.e 50$\mu g/m^3$.

2.7 **Nitrogen Dioxide (NO_2)**: Annual city average of NO_2 concentration has shown the decrease as compared to the year 2015. The highest annual average was observed in 2017 (74.01 $\mu g/m^3$). In 2021(till Dec.) the average value was 42.31 $\mu g/m^3$. Annual city average at all the monitoring locations at par within the prescribed standard i.e. 40 $\mu g/m^3$.

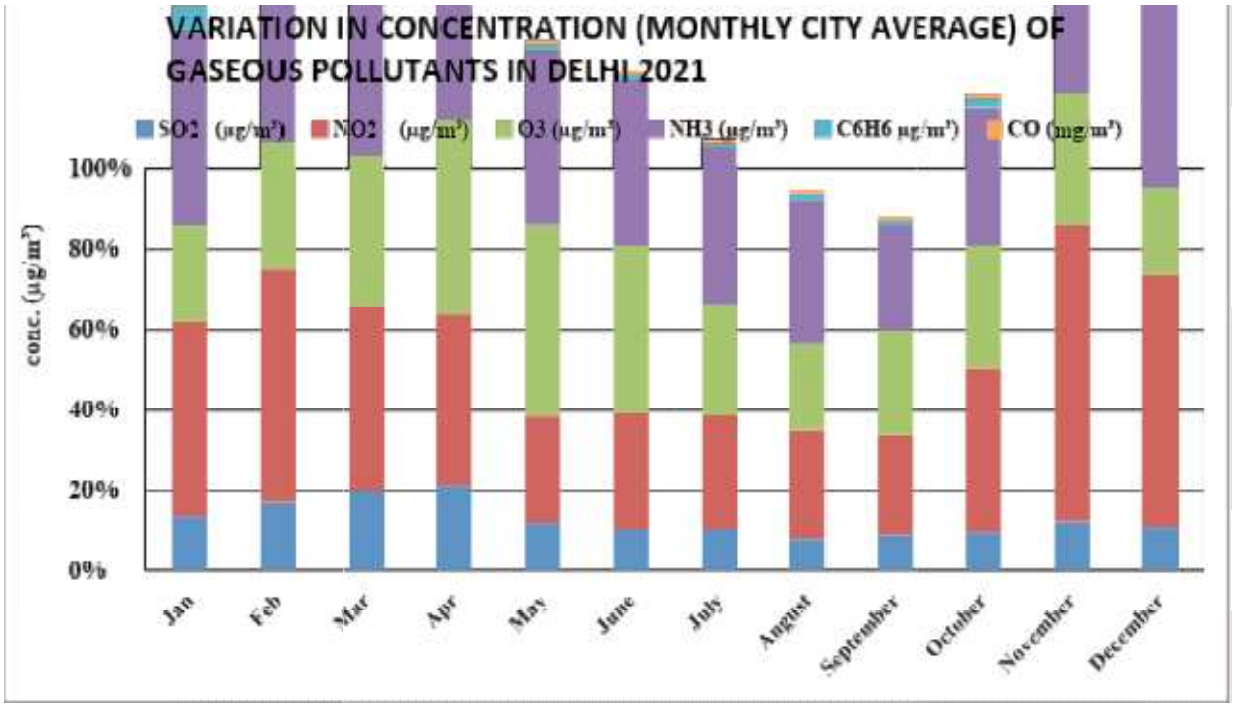
2.8 **Carbon Monoxide (CO)**: Annual city average of CO concentration has shown the decrease as compared to the year 2015. In 2021(till Dec.), the city average value was 1.34 mg/m^3. Annual city average at all the monitoring locations is within the prescribed standard i.e. 2 mg/m^3.

2.9 **Ozone (O_3):** Annual city average of O_3 varied from 2015 to 2021(till Dec.) by 45.11 $\mu g/m^3$ to 32.57 $\mu g/m^3$. Annual city average at all the monitoring locations is within the prescribed standard i.e. 100 mg/m^3.

CHART 8.1
MONTHLY CITY AVERAGE OF CRITICAL POLLUTANTS DELHI 2021



Source: Delhi Pollution Control Committee (DPCC)



Source: Delhi Pollution Control Committee (DPCC)

2.10 Delhi has a network of 26 stations operated by DPCC are as presented in Statement 8.2.

STATEMENT 8.2
CONTINUOUS AMBIENT AIR QUALITY MONITORING STATIONS (CAAQMS) ESTABLISHED IN DELHI

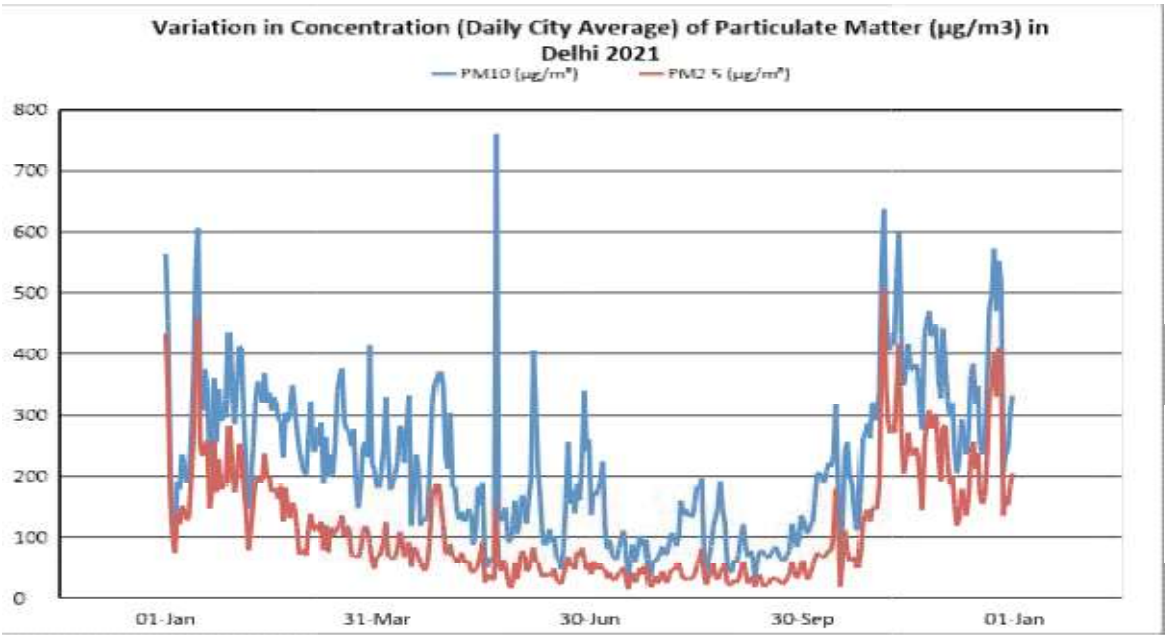
S.No	Name of CAAQMS	S.No	Name of CAAQMS
1	Maj. Dhyanchand National Stadium	14	MGICCC, Alipur
2	Jawahar Lal National Stadium.	15	NIT&RD, Sri Aurobindo Marg
3	Dr Karni Singh Shooting Range	16	ITI, Jahangirpuri
4	PGDAV College, Sriniwaspuri	17	IARI, PUSA
5	Mother Dairy Plant, Patparganj	18	NIMR, Sector-8, Dwarka
6	Satyawati College	19	DITE, Wazirpur
7	Mundka Metro Residential Colony	20	ITI, Shahadra
8	S.S.College of Business Studies, Rohini	21	Anand Vihar
9	ITI, Narela	22	Mandir Marg
10	WTP (DJB), Sonia Vihar	23	Punjabi Bagh
11	DITE Okhla	24	R.K.Puram
12	Ch. Brahm Prakash Ayurvedic Hospital	25	Civil Lines
13	Maharishi Valmiki Hospital, PoothKhurd	26	Airport

2.11 Air Pollution Control:

During Corona virus pandemic, Delhi Government took the step to declare a state lockdown from 19.04.2021.The lockdown period gave a rarest set of data, which showed impact of localized lockdown.

Chart 8.2 shows the variation in the concentration of $PM_{2.5}$ and PM_{10} from 1st January to 31st December 2021. The average concentration was 113µg/m³ and 221µg/m³ respectively for $PM_{2.5}$ and PM_{10}.The peak of PM_{10} was recorded on 23rd May 2021, when the concentration of PM_{10} reached up to 761µg/m³. However, $PM_{2.5}$ reached up to 152µg/m³ on the same day.

CHART 8.2



Source: Delhi Pollution Control Committee (DPCC)

2.12 Measures taken to Control Air Pollution in Delhi:

Keeping in view prevailing COVID-19 pandemic, onset of winter and enforcement of Graded Response Action Plan (GRAP) from 15.10.2020, emphasis has been given on following issues and directions have also been issued to the Local Urban Bodies/land owning agencies and other concerned departments for ensuring:

- Deployment of Anti-Smog Guns, Mechanical Road Sweepers and Water Sprinklers to reduce re-suspension of dust by local urban bodies
- Identifying vacant plots to control the open dumping of garbage and construction and demolition waste to reduce re-suspension of dust by land owning agencies
- Road repairing and pot holes filling
- Road side greening and paving to control re-suspension dust
- Closure of industrial units exceeding emission norms.
- Prevention of open burning
- Prevention of vehicle emission control and reduce traffic congestion etc.

Other Measures that are continuously being taken to Control Air Pollution in Delhi:

1. **Monitoring and Action against persons for burning of waste material/garbage in open** :

   i. Sub Divisional Magistrates (SDMs) along with Tehsildars (Executive Magistrate), Department of Revenue, GNCTD, have been authorized to take action against violations. A penalty is being imposed in accordance with the directions of Hon'ble National Green Tribunal. Further, MCDs & DDA have also been roped in to prohibit the burning of dry leaves/ garbage/ plastic etc.

2. **Monitoring and Action against violators of dust control measures:** Govt. has launched a special drive to improve air quality by way of enforcing Dust Control Measures by the construction project agencies/ individuals. Area SDMs, Tehsildars, Assistant Engineers of Public Works Development (PWD) and Delhi Pollution Control Committee (DPCC) are regularly inspecting projects for checking the compliance of dust control and levy compensation for violations of dust control measures.

   i. DPCC has imposed fine on construction projects who have obtained Environmental Clearance (built up area more than 20,000/- sq. mtr.)

   ii. Environmental Compensation collected by Delhi Pollution Control Committee in FY 2020-21 (unaudited) is about: ₹ 9.17 crore

3. **NGT Orders/ Judgments in O.A. No 21/2014** regarding air pollution control are being complied in coordination with concerned departments. As per directions of the Hon'ble NGT as contained in the Order dated 18.12.2017 followed by order dated 27.07.2018 in OA 44/2018 (Earlier OA 21/2014) in the matter of Vardhman

Kaushik Vs Union of India, quarterly progress Report on comprehensive Action Plan (CAP) is submitted to CPCB action taken report is being sent to CPCB.

4. **Implementation of Comprehensive Action Plan** (**CAP):** The Hon'ble NGT in order dated 08.10.2018 in O.A. No. 681/2018 in the matter of: news item published in the Times of India authored by Shri Vishwa Mohan Titled "NCAO with Multiple Timelines to clear Air in 102 Cities to be released around August 15" has directed constitution of Air Quality Monitoring Committee (AQMC) in respect of Delhi to prepare action plan to control air pollution. Quarterly Progress Report on Comprehensive Action Plan (CAP) is submitted to CPCB.

5. **Promotion of Battery Operated Vehicles**:- With the view to promote non-polluting e-vehicles through financial incentives, Delhi Electric Vehicle Policy-2020 has been notified by the Transport Department, GNCTD on 07.08.2020

6. **Ban on bursting and sale of Firecrackers:** Hon'ble NGT in OA 249/2020 titled Tribunal on its own Vs MOEF&CC, & Ors with OA No. 254/2020 with OA 255/2020 with OA 93/2020 vide its order dated 01.12.2020 has put total ban on sale and use of all kinds of fire crackers in the NCR and all cities/towns in the country where the ambient air quality falls under the 'poor' and above category.

7. **Imposition of Charge on lights and heavy duty commercial vehicles entering Delhi:** In compliance with the order dated 09.10.2015 and 16.12.2015 of Hon'ble Supreme Court, Environment Compensation Charge (ECC) is levied on Delhi bound light and heavy duty commercial goods vehicles. Notifications have been issued as per Hon'ble Supreme Court directions.

8. **Greening of City**: As per the latest Forest Survey of India Report 2021, the green cover of Delhi has increased to about 342 sq km (23.06% of total area of Delhi) from 26 Sq. Km in 1997. The increased green cover also acts as a carbon sink. Massive tree plantation drive was conducted during 2020-21 involving 20 greening agencies, eco-clubs and RWAs for plantation of 25.80 lakh tree saplings.

9. **Implementation of Graded Response Action Plan (GRAP):**

Effective implementation of Comprehensive Action Plan (CAP) and Graded Response Action Plan (GRAP) are being done in Delhi. As per recommendation of Environment Pollution (Prevention and Control) Authority (EPCA), provisions of very poor/ severe category of Graded Response Action Plan (GRAP), has been enforced from 15th October 2020.An order dated 16.02.2022 has been issued for the implementation of GRAP in Delhi NCR.

10. **To Control local Sources of Air Pollution at source,** 13 Hotspots namely, Narela, Bawana, Mundka, Wazirpur, Rohini, R.K. Puram, Okhla Ph-II, Jahangirpuri, Anand Vihar, Vivek Vihar, Punjabi Bagh, Mayapuri and Dwarka have been identified on the basis of Annual concentration of $PM_{2.5}$ & PM_{10} in Delhi. Specific action plans have been drawn up for identifying and mitigating the

local sources of air pollution such as plastic & garbage, Malba / C&D waste removal, road patches and pot holes repair, De-congestion of congested traffic points, Mechanical road sweeping and Water sprinkling of roads, Closure of polluting & unauthorized industries, Night patrolling to check violations with respect to Bio-mass burning, C&D waste dumping etc, greenery development etc so that there is immediate impact on the improvement in the air quality around these hotspots. The Dy. Commissioners of MCD zones have been made responsible as Nodal Officers for the execution of the action plan and the officers from other concerned line agencies have been made members of the execution team on ground so as to ensure effective coordinated action.

11. **Implementation of Notification issued on Approved Fuel:**
Contribution by the industries to air pollution in National Capital Territory of Delhi is minimal compared to other sources. All the industries in National Capital Territory of Delhi, which have boiler/furnace, have been directed to convert to Piped Natural Gas (PNG). About 1635 units have been converted into PNG.

12. **Public Awareness:**

Intensive Environment Awareness Campaign against idling of vehicle at intersection traffic from 18th October to 18th December 2021(i.e. two months campaign): Vehicle idling at traffic signals is a common phenomenon in Delhi and idling engine can emit up to twice tailpipe exhaust emissions compared to the vehicle in motion. Delhi Government conducted a campaign from 18th October to 18th December 2021 using 2500 Civil Defence Volunteers between 8 AM to 8 PM in two shifts at 100 major traffic intersection points with digital clocks indicating waiting time more than 15 seconds.
Regular public awareness advertisements/ notices/ pamphlets on various Environmental awareness issues through print media and digital media.

Air & Noise and water pollution Control awareness was conducted online with Eco-Club Schools/ Colleges through Directorate of Education, GNCTD

13. **Compliance to directions of CAQM:**
A Commission on Air Quality Management in the National Capital Region and Adjoining Areas has been constituted through an Ordinance and promulgated by the Hon'ble President of India on 28th October 2020. Necessary steps are being taken by all stakeholder department for compliance to various decisions/ directions of the Commission.

2.13 New Initiatives by Delhi Government:

I. **Installation of Smog Tower:** In compliance with this Hon'ble Supreme Court order dated 13.01.2020, Smog Towers had to be installed at Anand Vihar Bus Terminal and Baba Kharak Singh Marg, Connaught Place. Smog Tower at Connaught Place was inaugurated on 23.08.2021 by Hon'ble Chief Minister of

Delhi. IIT Bombay is currently conducting the performance evaluation of effectiveness of the Smog Tower.

II. **Anti Smog Guns**: The Major Construction Projects and construction agencies have been directed to use of Anti Smog Gun(s) on constructions projects/ agencies/ departments to control fugitive dust emissions.

III. **Bio decomposer Technology to control Stubble burning**: Institute of Agricultural and Research Institute (IARI) Pusa, has developed its own bio-decomposer technology for crop residue decomposition. Development Department sprayed the solution of Bio-decomposer in 1935 acre area of four districts of Delhi i.e. North, North-West, South-West & West.

2.14 NCR States related Issues which impact Ambient Air Quality of Delhi:

Following issues as mentioned below specifically relate to the NCR States which impact Ambient Air Quality of Delhi:

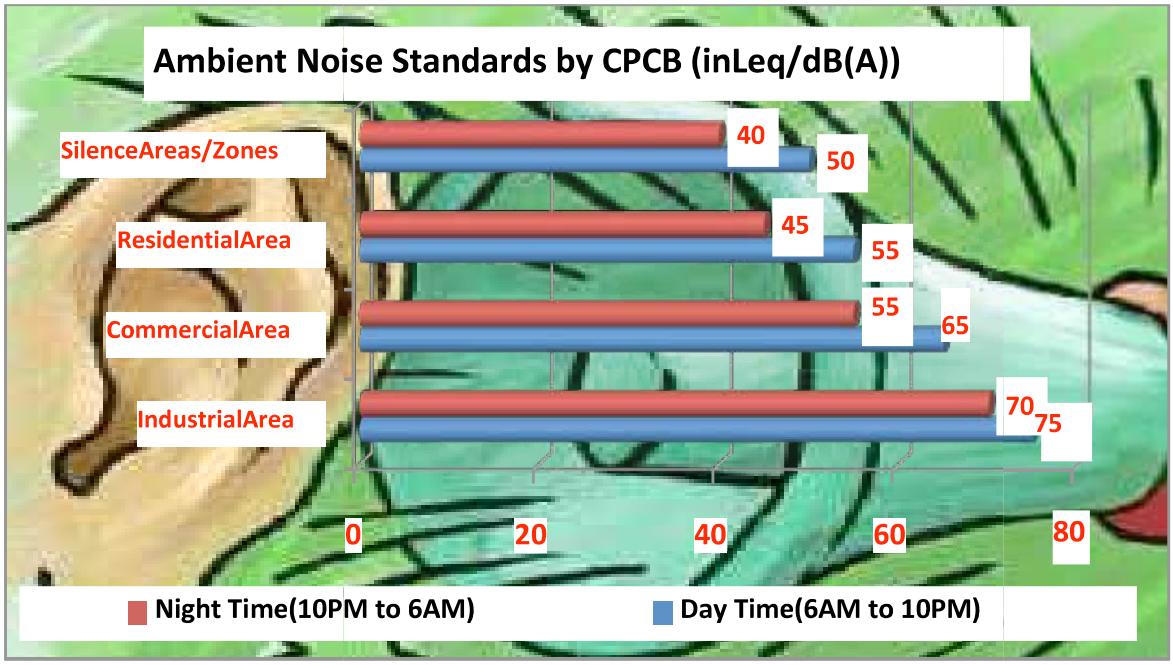
- Air quality monitoring stations to be set up in NCR with an online display of data.
- The neighbouring states must ensure that all the construction sites must undertake the dust suppression methods to control the dust emission from the construction sites.
- Open burning of garbage in Delhi's neighbouring areas should be strongly discouraged.
- The practice of burning of paddy stubs in the agricultural zones adjoining Delhi needs to be stopped.

2.15 Though, stringent steps have been taken/being taken by Delhi Govt. for reducing air pollution in Delhi, there is an urgent need that the NCR States also take similar steps as taken by GNCTD of Delhi.

3. Noise Pollution

3.1 Delhi witnesses excessive noise on account of a large number of the vehicle of all sorts including those who come from other areas where CNG is not available, construction activities, diesel generating sets, etc. Use of high sound loudspeakers during festivals and many social gatherings in public place directly increases the noise pollution in the affected areas. GNCTD has notified an area of 100 metres around the hospitals with 100 beds or more, educational institutions with 1000 students or more, all court complexes, all government complexes as Silence Areas/Zones. The Central Pollution Control Board published the information regarding permitted ambient noise levels in different areas. The prescribed ambient noise levels are as presented in Chart 8.3.

CHART 8.3
AMBIENT NOISE STANDARDS BY CPCB (IN LEQ/DB(A))



Source: Noise Pollution (Regulation and Control) Rules, 2000, Ministry of Environment, Forests and Climate Change Government of India.

Notes: 1. Day Time from 6 AM to 10 PM and Night Time from 10 PM to 6 AM.

2. Silence zone is an area comprising not less than 100 meters around hospitals, educational institutions, courts, religious places or any other areas which are declared as such by the competent authority.

3.2 DPCC recently strengthened the Noise Monitoring Network in Delhi with 31 (26 New + 5 Old) Noise monitoring stations. These stations were installed in different land use areas to assess the real time noise levels. Seven stations are situated in silence zone which include educational institute and hospitals, Eleven station are situated in commercial zone which include markets and stadiums, Eight station are situated in residential zone and five station are situated in industrial area.

3.3 The yearly average of real time ambient noise level during day time was in the range of 53.1 db(A) at Najafgarh Station to 72.4 db(A) at Karol Bagh Station in 2021 till the month of December. A detailed statement of station wise day time noise data from the year 2015 toDecember, 2021 is available at table no. 8.1.

3.4 The yearly average of real time ambient noise level during night time was in the range of 49.6 dB(A) at Najafgarh to 65 db(A) at Shahdara in 2021 till the month of December. A detailed statement of station wise night time noise data from the year 2015 to December, 2021 is available at table no. 8.2.

3.5 Noise limiter notification:

In compliance to Hon'ble National Green Tribunal directions in OA no. 519/2016 with OA No. 496/2018 (M.A. No. 1159/2018), with OA No. 196/2018 with OA No. 197/2018 titled Hardeep Singh & Ors Vs SDMC with Akhand Bharat Morcha Vs

UOI & Ors, GNCTD issued Noise limiter Notification on 21st November 2019 under sub-rule(3) of rule 3 and sub-rule (3) of rule 5 read with clause (c) of rule 2 of the Noise Pollution (Regulation and Control) Rules, 2000, to ensure that no audio system or public address system shall be let out / installed without being fitted with Sound limiter in any Government or non-Government function in the whole of National Capital Territory of Delhi. Further no Sound System to be sold/ purchased / supplied / used by any manufacturer / dealer / shopkeeper/ any agency who lets out the Public Address System etc./ individual without having sound limiter in it.

3.6 Noise Complaint lodging platform:

If someone violates the noise rules and creates excessive noise, complaint may be lodged by citizen at following:

- Green Delhi App
- Website: ngms.delhi.gov.in
- Helpline number 155271.

4. Water Pollution

4.1 The river Yamuna, the reason for Delhi's existence, has suffered heavily from pollution. The entire stretch of the Yamuna River in Delhi is highly polluted due to the flow of untreated sewage and also the discharge of inadequately treated industrial effluents.

- 54 KM Stretch in Delhi from Palla to Badarpur (Delhi-Haryana border).
- 22 KM Stretch from Wazirabad (Downside of Wazirabad Barrage) to Asgarpur Village (after Okhla Barrage), which is less than 2% of the river length, accounts for about 76% of the pollution load in the river.
- During the dry season, spreading over nearly nine months of the year, the river has no fresh water downstream of Wazirabad Barrage and the only flow available is sewage(both treated and untreated).
- 18 Major Drains outfall into river Yamuna with discharge of about 3026 MLD (about 666 MGD) of waste water into the River Yamuna including 105 MGD waste water coming into Najafgarh Drain from Haryana and 14 MGD coming into Shahdara Drain from Ghaziabad. About 264 TPD is the pollution load in terms of BOD.
- 10 Cumecs of Water is being released by the State of Haryana at Hathanikund during lean season. However, most of it evaporates or percolates before it reaches Wazirabad during the lean season and therefore it is highly inadequate to meet the dilution requirement to achieve the desired water quality of Bod < 3 mg/l & DO $\geq$5 mg/l.

4.2 **Water Quality of River Yamuna:**

- Water quality of river Yamuna is monitored by DPCC on monthly basis at 8 Locations i.e. Palla, Wazirabad, ISBT Bridge, ITO Bridge, Nizamudin Bridge, Agra Canal (Okhla), Downstream Okhla Barrage, Asgarpur.

- As per the trend analysis of CPCB carried out for the water quality in river Yamuna for the last 5 years:
  - Dissolved Oxygen (DO) & BOD levels in river Yamuna are complying with water quality criteria for outdoor bathing at 2 locations, namely, Palla and Surghat.
  - At other locations the water quality is non-compliant with the DO & BOD standards. BOD concentration varies from highest levels of 58 mg/l at Asgarpur (after confluence of Shahdara & Tuglakabad drains) and 54.44mg/l at Downstream Okhla Barrage (after meeting Shahdara Drain).
  - The high concentration of BOD and COD levels at these locations is due to discharge of untreated waste water and joining of various drains at points between Shahdara and Okhla.

- Online Monitoring System have been installed at Palla,Wazirabad and Okhla Barrage for monitoring the Water Quality of river Yamuna.

- Online Monitoring System for measuring the concentration of Ammonia in river Yamuna at Palla has been installed by DPCC. This will help in issuing early alerts to the DJB water treatment plant at Wazirabad in the event of deterioration in water quality received at Palla due to discharge of sewage/industrial effluent from Haryana.

4.3 DPCC has been conducting monthly water quality monitoring of river Yamuna (at 8 locations) and major drains (27 drains) falling into river Yamuna. Statement 8.3 (at 8 locations) and 8.4 (27 drains) indicate average water quality of River Yamuna from January-2021 to December-2021. Water quality monitoring reports of river Yamuna indicate that the water quality parameters are meeting the Water Quality criteria of "C" class, at Palla only, which is upstream of Wazirabad Barrage.

4.4 The highest average of DO is 9.54 mg/l at Palla and lowest is 0.08 at Okhla Barrage (after meeting Shahdara Drain). The average of BOD has ranged from 2.99 mg/l at Palla to 58 mg/l at Asgarpur (after confluence of Shahdara & Tuglakabad drains). The average level of pH (mg/l) of Yamuna River is within the range. The water quality standards for DO and BOD as per CPCB norms are 5 mg/l and 3 mg/l respectively for class “C” of river water. The water quality monitoring results in the Delhi stretch clearly indicates that river water is grossly polluted. A detailed statement of average water quality of River Yamuna at different locations from January 2021– December 2021 is available at table no. 8.3.

4.5 Water quality monitoring results of the drains indicate that most of the drains still have to meet the standards with respect to Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Total Suspended Solids (TSS). The average water quality of 27 drains at different locations in Delhi from January 2021– December 2021 is presented in the table no. 8.4.

4.6 **Status of Sewerage Network in Unauthorized Colonies**

As the sewerage system is not provided in unplanned habitats, the wastewater generated in the unplanned area is discharged into drains. Delhi Jal Board has prepared a plan to provide sewerage facilities in unauthorized colonies. In Delhi, about 78% of population is already connected to sewerage network. The unsewered areas mainly consist of unauthorized colonies. There are 1799 unauthorized colonies out of which sewer lines have been laid and commissioned in 706 colonies and the work is in progress in 448 colonies. In 161 Colonies NOC is awaited/O Zone, in 484 colonies sewerage network is to be laid along with Decentralized STPs (as on 31.01.2022).

4.7 **Measures taken for Control of Pollution in River Yamuna-Sewage Treatment**

- Sewage Generation – 744 MGD
- Functional Sewage Treatment Plants (STPs) – 34 (at 20 Locations)
- Capacity of 34 Functional STPs – 577 MGD (78% of Sewage generation)
- Treatment of Sewage (as on 22.12.2021) – 514.7 MGD (89.1% of Installed Capacity & 69.2%of Sewage Generation)
- Gap between Sewage Generation & Installed Capacity (as on 28.02.2022) – 167 MGD (22.45%)
- Gap between Sewage Generation & Treatment – 229 MGD (30.78%) (Dec., 2021)
- Sewage Treatment Capacity after completion of Proposed Projects (ISP, Rehabilitation / Upgradation of 12 STPs & New STPs at Coronation Pillar & Okhla) – 707 MGD (Dec.,2022)

  [577.26 MGD (Existing Capacity) + Additional 130 MGD (after construction of New Coronation Pillar STP 40 MGD + Okhla 30 MGD + Rithala 40 MGD + Kondli 20 MGD)

  List of 34 Functional Sewage Treatment Plants (STPs) & their capacities are given in table no. 8.5.
- Monitoring of the Functional STPs of DJB is being carried out by DPCC Laboratory on monthly basis and Analysis Results are uploaded on the website of DPCC and also communicated to DJB for taking rectification measures to meet the prescribed standards.
- All the functional STPs have installed Online Continuous Effluent Monitoring System (OCEMS) and the same are connected to the servers of CPCB & DPCC. OCEMS at the STPs are regularly calibrated by DPCC.

4.8 Interceptor Sewer Project (ISP)

Delhi Jal Board initiated the process of laying of interceptor sewers along 3 major drains (Najafgarh Drain, Supplementary Drain and Shahdara Drain) for trapping of 108 sub drains out falling into these drains. About 242 MGD of sewage generated from the colonies/ other sources & coming through the 108 sub drains will be trapped before reaching the above mentioned major drains and the same would be diverted to the existing under utilised STPs / New STPs for treatment of sewage. Entire flow of 242.16 MGD shall be trapped and treated by December, 2022 after construction/ rehabilitation of Coronation Pillar & Rithala and Kondli STP under YAP-III.

Status of Interceptor Sewer Project (ISP) of Delhi Jal Board

Total flow to be trapped	Cumulative Status as in Jan, 2022 Provision of trapping made	Timeline for completion of work	Cost of Project	Remarks
1100.86 MLD (242.16 MGD) (from 108 Subdrains)	**1082 MLD** (238 MGD)	**Completed**	**₹ 1395 Crores**	About 771.5 MLD (169.7 MGD) is being trapped and treated out of 1082 MLD (238 MGD). Entire flow shall be trapped and treated by December, 2022 after construction / rehabilitation of Coronation Pillar, Rithala & Kondli STP under YAP-III. Provision for remaining trapping of 4 MGD to be made by March, 2022

4.9 Trapping of Drains

18 Major drains outfall into river Yamuna with discharge of about 3026 MLD (about 666 MGD) of waste water into the River Yamuna including 110 MGD waste water coming into Najafgarh Drain from Haryana and 14 MGD coming into Shahdara Drain from Ghaziabad. About 264 TPD is the pollution load in terms of BOD.

STATEMENT 8.3

MAJOR DRAINS OUT FALLING IN TO THE RIVER YAMUNA

Major DrainsOut falling into river Yamuna	18
Drains Already Trapped [58.75 MGD]	13[Magazine Road, Sweeper Colony, Khyber Pass , Metcalf House, Tonga Stand, Moat Drain(Vijay Ghat), Civil Military, Delhi Gate, Drain No.14, Tughlaqabad, Kalkaji, Tehkhand and Sen Nursing Home]
Remaining Drains to be Trapped	5 [Najafgarh , Shahdara, Mori Gate, Barapullah & Maharani Bagh]

a) 2 Major drains i.e.Najafgarh & Shahdara are included in Interceptor Sewer Project & 108 sub drains are to be trapped.

b) Individual STPs are proposed at the mouth of Mori Gate (9.51 MGD) and Barapullah (31.97 MGD) drains.

c) Maharani Bagh drain has been partially trapped to the extent of 9 -10 MLD flow & balance 15 MLD flow will be trapped in the Batla House Sewerage System by December, 2023.

4.10 Rehabilitation / Up-gradation of Existing STPs & Construction of New STPs by DJB

Following existing Sewage Treatment Plants (STPs) of DJB (as mentioned in the Table given below) are proposed / being Rehabilitated / Up-graded to meet the more stringent prescribed standards of BOD – 10 mg/l & TSS - 10 mg/l. New STPs are being constructed at Coronation Pillar and Okhla as mentioned in the Table given below:

STATEMENT 8.4

EXISTING STPs (TO BE UPGRADED) AND NEW STPs (TO BE CONSTRUCTED)

S. No.	Name of STP	Capacity	Timeline	Remarks
Rehabilitation / Up-gradation of Existing STPs				
1	Yamuna Vihar STP Phase II	10 MGD	June, 2023	Plant is operational as per existing design and parameters.
2.	Kondli STP Phase I, II & III	45 MGD [10+25+10]	December, 2022	Tree cutting permission granted by Forest Department in September, 2021 in respect of Phase- II.
3.	Rithala STP Phasel	40 MGD	December, 2022	
Construction of New STPs				
4.	Coronation Pillar	70 MGD	February,2022	A New 70 MGD (318 MLD) CapacitySTPatCoronation Pillar is under construction & after commissioning capacity will be enhanced by 40 MGD.
5.	Okhla Phase	124 MGD	December, 2022	A New 124 MGD (564 MLD) Capacity STP will be constructed at Okhla at new location in place of existing STPs (Phase I to IV). Till commissioning of new STP existing STPs will remain in operation.
	Total (2 STPs)	**194 MGD (882 MLD)**		**Capacity - 194 MGD (By 30.06.2023)**

The total capacity of STPs in Delhi is 770 MGD.

4.11 In-situ Bioremediation / Phytoremediation of Sewage in Drains

- Integrated Drain Management Cell (IDMC) headed by Chief Secreatary, GNCTD has been constituted vide order dated 17.03.2020 for remediation and management of all drains of Delhi as per the orders of Hon'ble NGT in OA No.06/2012.
- IDMC is having members from all the Drain Owning Agencies (DOAs).
- Meetings of IDMC are held on regular basis and 11 Meetings have been held so far.
- DOAs have submitted / are submitting their Action Plan with time line subject to availability of fund.
- DDA, EDMC & DCB have started implementation of Action Plan.
- EDMC has also submitted action plan with estimated cost of ₹59.70 Crore but due to financial crunch not able to proceed further. One pilot project of EDMC at Shahdara Jheel is in progress (about 70 % work completed).
- The waste water in Kushak Nala running through NDMC areas is under bio-remediation.
- SDMC has given consultancy to IIT Delhi and projected an estimated cost of ₹129.9 Crores but due to financial crunch not able to proceed further. They have undertaken the pilot project for Phyto / Bio Remediation of Pushp Vihar drain for which tenders have been invited.
- North DMC has given consultancy to IIT Delhi. They have projected an estimated cost of ₹ 53.52 Crore but not able to proceed due to crunch of fund. They have undertaken the pilot project for Phyto / Bio-Remediation of Kudesia Nallah.
- DDA has already submitted action plan and constructed/Constructing wetland in Yamuna flood plain in Kilokari/ Maharani Bagh/ Dhobhi Ghat.
- Drain Owning Agencies have been directed to start a small pilot project on some of their drains. Drain Owning Agencies have also been requested to submit Action Plan along with timelines to treat the entire length of drain under their command for management of waste water in their drains.
- Delhi Jal Board has adopted natural treatment technology to treat raw sewage for rejuvenation of existing water bodies. At present work of 50 water bodies has been awarded, where Phytorid Treatment Technology developed by CSIR-NEERI is adopted to revive existing water bodies.
- Natural Treatment Technology under the guidance of Centre for Science & Environment has been adopted to recycle waste water at the DJB office at Jal Sadan.

4.12 Sewage and Fecal Sludge Management (Septage Management):

- Septage Management Regulations notified by the Urban Development Department, GNCTD on 12.11.2018 and necessary action is to be taken by Delhi Jal Board, District Magistrates and Local Bodies / Municipal Corporations as per the provisions of the said Notification. On an average 6 to 7 lakh litres of septage per month is being collected and treated at the STPs of DJB.

- DJB has so far registered 208 licensed vendors (Emptiers) for collection and transportation of sewage from the septic tanks and has identified 86 SPS points for receiving the Septage.

Agency	No. of Emptiers Vehicles Authorised by DJB (As on 31.01.2022)	No. of Functional SPSs for collection of septage from vendors	Septage collected & Treated in January, 2022	Septage treated by DJB (As on 31.01.2022)
DJB	**260**	**86**	**3.77 Crore Litres**	**82.75 CroreLitres**

4.13 Prevention of Dumping of Solid Waste in Drains and River Yamuna

- For preventing the dumping of solid waste in the drains, all the concerned Departments/ Agencies have been directed vide order dated 09.01.2019 of Chief Secretary and Order dated 15.01.2019 of UD Department, GNCTD for taking necessary action against the violators including imposition of Environmental Compensation of ₹ 5000 on dumping of Pooja Material/ Flowers etc. and ₹ 50,000 on the dumping of Construction Material /Malba in River Yamuna.
- Wire Nets etc. have been provided at the Bridges across river Yamuna by the Bridge Owning Agencies in Delhi to prevent throwing of Pooja Material / Flowers etc into river Yamuna.
- Wire Nets etc have been provided at the mouth of the drains before their out fall into river Yamuna to prevent entering of Solid Waste into river Yamuna.

4.14 Rejuvenation of Water Bodies:

- DJB, IFCD, DDA, Local Bodies / Municipal Corporation & other Agencies responsible for maintaining Water Bodies in their areas of jurisdiction are required to identify & prepare Action Plan for Protection and Restoration of Water Bodies w.r.t the orders of Hon'ble NGT in Original Application No. 325/2015 in the matter of Lt. Col. Sarvadaman Singh Oberoi Vs. Union of India & Ors.
- 362 water bodies have been taken up by Delhi Jal Board for revival/rejuvenation. For 130 water bodies estimation is under process of approval. Out of remaining 232 water bodies 12 have been rejuvenated, 44 are under progress and 176 are under tendering process.

4.15 Protection of Flood Plain of River Yamuna

- As per the orders of Hon'ble NGT dated 13.01.2015, Flood Plain of River Yamuna is to be protected, Unauthorized Habitation/ Settlements/ Encroachment are to be removed by DDA and cultivation of Edible Crops are prohibited. Following action has been / is being taken by DDA for protection of Flood Plain of river Yamuna and prevention of Encroachment:

Demarcation of Flood plain and Removal of Illegal Encroachments:

(a) Demarcation of 1 in 25 years Flood Plains & Fixing up of Bollards and Fencing:

- The demarcation of 1:25 years flood plain of River Yamuna pertains from Wazirabad to Jaitpur on both banks. 100% work for demarcation of flood plains completed. 591 Bollards (marked with GPS Coordinates), 375 Flag Posts & 27 sign boards for the entire stretch from Wazirabad barrage to Dhobi ghat Jaitpur have been installed.

(b) Engagement of Private Security to stop illegal Dumping:

- 125 Security Guards have been deployed by DDA round the clock in three shifts at vulnerable points, with 4 patrolling vehicles in the Yamuna Flood Plain area from Wazirabad Barrage to Okhla Barrage to check illegal dumping of malba and to prevent encroachment. GPS monitoring of security guards & patrolling vehicles is being done.

(c) Installation of Electronic Surveillance System:

- 81 No. CCTV cameras have been installed at 27 locations from Wazirabad Barrage to Okhla Barrage to check the illegal dumping of Malba in the Yamuna Flood Plain area.

(d) Removal of Encroachment from the Flood Plain:

- 600 Jhuggies / Chappers have been demolished and 5 Acre land has been reclaimed. 150 Jhuggies in 2 acre land could not be removed due to stay by Courts.

(e) Demolition Program:

- 477.79 Hectares area has been retrieved from the encroachment by DDA in the flood plains of River Yamuna.

(f) Removal of C&D Waste:

- 36,200 metric tonnes of C&D waste lying in floodplain has been lifted to IL&FS site or utilized for development of Yamuna Project by DDA.

(g) Restoration and Rejuvenation of the Floodplains of River Yamuna.

- DDA is going ahead with the Restoration and rejuvenation of floodplains of River Yamuna. The complete stretch of Zone-'O' falling under the jurisdiction of DDA has been subdivided into 10 projects including the development of Bio-diversity Park near Kalindi Kunj Colony.

4.16 Ban on Idol Immersion :

- DPCC has issued Directions u/s 33 A of the Water (Prevention and Control of Pollution) Act, 1974 on 13.10.2021 for the immersion of idols on festive occasion of Durga Pooja etc.As per the said Directions Idol Immersion is not permitted in River Yamuna. The said directions contain:
    - Directions for Idol Makers/ Sellers of Idols/ Pooja Samitis making Idols in- situ.
    - Directions for General Public/Resident Welfare Association /Pooja Samiti etc.
    - General Directions for Local Bodies / Authorities.

4.17 Effluent Management:

- Number of Industries/Units in 28 Approved Industrial Areas: 25253
- Number of Industries/Units having ETPs in 28 Approved Industrial Areas: 1334
- Number of Water Polluting Industries /Units in 28 approved Industrial Areas: 1334
- Quantity of Effluent generated from the industries /Units in 28 approved Industrial areas: 28.75 MLD
- Common Effluent Treatment Plants (CETPs): 13 (212.3 MLD) Capacity for 17 approved Industrial areas.

List of 13 Common Effluent Treatment Plants (CETPs) in Delhi alongwith their capacities is given in the table no. 8.6:

- Rest of the 11 Approved industrial areas out of 28 Approved Industrial Areas are not having CETPs as they are not generating substantial liquid waste.
- All the existing 13 CETPs are being monitored by DPCC Laboratory on monthly basis and Analysis Reports are placed on the website of DPCC. Sufficient treatment capacity (212.3 MLD) is available with existing 13 CETPs for management of industrial effluent generated from 17 approved industrial areas. The units which are operational in non-CETP industrial areas have individual waste water treatment facilities.
- Online Monitoring System (OLMS) have been installed on all the 13 CETPs for measuring the pH, TSS, BOD & COD at the outlet of the CETPs. All these OLMS are connected to servers of DPCC and CPCB. Calibration of OLMS installed at CETPs is being carried out by DPCC Water Laboratory from time to time.
- Show Cause Notices / Directions for Closure are issued by DPCC u/s 33(A) of Water (Prevention and Control of Pollution) Act, 1974 and Environmental Compensation is also imposed on Non Complying / Violating Water Polluting Industries / Units in Delhi.

4.18 River Rejuvenation Committee (RRC):

In compliance to the directions of the Hon'ble National Green Tribunal issued videorders dated 20.09.2018, 19.12.2018, 08.04.2019, 06.12.2019, 29.06.2020 & 21.09. 2020 in O.A. No. 673/2018 in the matter of : News item published in 'The Hindu' Authored by Sh. Jacob Khoshy Titled "More river stretches are now critically polluted: CPCB" a River Rejuvenation Committee for Delhi (RRC Delhi) has been constituted.

i) RRC Delhi has submitted the Action Plan for Rejuvenation of river Yamuna in Delhi to CPCB in February, 2020. Monthly Progress Reports of Delhi are being submitted to the Secretary, Ministry of Jal Shakti & CPCB and Chief Secretary, Delhi is also reviewing the progress from time to time as per the orders dated 06.12.2020 & 29.06.2020.

ii) RRC Delhi is functioning under the overall supervision and coordination of Pr. Secretary (Env.)

iii) Chief Secretary, Delhi is also monitoring the progress of various projects of DJB etc. and issues related to control of pollution in river Yamuna.

iv) Monthly Progress Reports of Delhi are being sent to Ministry of Jal Shakti & CPCB regularly.

v) As per the directions of the Hon'ble NGT in OA No. 673 / 2018 Dated 20.09.2018, polluted river stretches are to be rejuvenated at least for bathing purpose with quality of river as given below:

Quality Parameter	Standards to be Achieved
BOD	≤ 3 mg/l
Dissolved Oxygen (DO)	≥ 5.0 mg/l.
Faecal Coliform	≤500 MPN/100ml.

vi) Revised Action Plan for Rejuvenation of River Yamuna in Delhi, approved by the River Rejuvenation Committee for Delhi (RRC Delhi) was submitted to CPCB vide letter dated 21.02.2020.

vii) Task Team of CPCB recommended the Revised Action Plan of RRC Delhi for Rejuvenation of River Yamuna in Delhi subject to revision of action plan as per suggestions given by Task Team (major suggestion: DJB to approach NGT for revision of timelines).

4.19 Agencies/ Departments involved / responsible for implementation of the Action Plan for Yamuna

- Delhi Development Authority (DDA), Delhi Jal Board (DJB), Irrigation and Flood Control Department (IFCD), Delhi Pollution Control Committee (DPCC), Forest Department, Public Works Department (PWD), Industries Department , Delhi State Industrial and Infrastructure Development Corporation (DSIIDC), Urban Development Department, Local Authorities & Municipal Corporations.

5 Waste Management

5.1 Municipal Solid Waste Management:

Municipal Solid Waste is to be managed as per the provisions of Solid Waste Management Rules, 2016. Duties and responsibilities of Local Authorities & Village Panchayats, Urban Development Department, Waste Generators, District Magistrates, and other Departments / Agencies / Ministries are mentioned in the said Rules. 5 Local Bodies / Municipal Corporations in Delhi are responsible for the proper Solid Waste Management including its collection, processing & disposal. The details of generation, processing and disposal of the municipal solid waste is briefed in the statement 8.5:

STATEMENT 8.5

MUNICIPAL SOLID WASTE GENERATION, PROCESSING AND DISPOSAL

S. No.	Particulars	North DMC	SDMC	EDMC	NDMC	DCB	Total
1	Municipal Solid Waste (MSW) Generation (in TPD)	4500	3600	2700	247	72	11119
2	Area (in Sq. Km)	636	656.91	105.98	42.67	42.8	1484.36
3	Population(in Lakh)	90	64	50	2.57	1.332	207.902
4	No. of Wards	104	104	64	14 (Circles)	8	294
5	No. of House Holds (in Lakh)	16.5	1.68	10.5	0.47	0.10	29.25
6	No. of Dhalaos	372	900	304	Nil	Nil	1576
7	Processing of Waste in TPD (in %)	2300 (51%)	2043 (56.7%)	15 (0.56%)	247 (100%)	41 (57 %)	4646 (41.8%)
8	Disposal of MSW in Land Fill/Dump Sites	2200 (49%)	1557 (43.7%)	2685 (99.4%)	Nil	31 (43%)	6473 (58.2%)
9	Operational Engineered Sanitary Land Fill(SLF)	One (at Bawana)	None (Proposed at Tehkhand)	None	-	-	One Operational & One proposed
10.	Operational Waste to Energy Plant	One (at Bawana – 1300 TPD)	One (at Okhla - 1950TPD)	One (at Ghazipur – 1300 TPD#)	-	-	3 (4550 TPD)
11	Operational Centralised Compost Plants	One (at Bawana- 700 TPD)	One (at Okhla- 200 TPD)	-	-	-	2 (900 TPD)
12	Operational Decentralised Biomethanation Plant	2 (5 TPD each)	4 (5 TPD each)	2 (5 TPD each)	6	Nil	14 (Capacity – 50 TPD)
13	Operational Decentralised Composter Plants	5 (1 TPD each)	4 (1 TPD each)	10 (1 TPD each)	-	2 (0.125 TPD) +0.05TPD	21 (Capacity – 19.175TPD)

**Excluding about 425 TPD of rejects landfilled at Engineered Landfill Facility at Bawana*

Note : 1. 118 Compost Pits, 2 Organic Waste Convertor (OWC) & 6 Biogas Plants in NDMC area having total capacity of 78.6 TPD.

2. Most of the Five & Four Star Hotels and Major Hospitals having 50 Beds or more have installed Organic Waste Convertor.

(a) Collection, Segregation & Transportation of Municipal Solid Waste :

For proper management of municipal solid waste, waste segregation at source is pre-requisite before its door to door collection, intermediate storage, transportation to the processing & disposal facilities. Local bodies are implementing a detailed plan of waste segregation at source, door to door collection, intermediate storage and transportation in covered vehicles to the processing & disposal facilities in Delhi. The collection of waste from households is 100%. However, segregation of waste at source has been implemented in 94 wards out of 294 wards (32%) which include 100% in NDMC and Delhi Cantt. areas.

(b) Municipal Solid Waste Processing and Disposal Facilities:

There is one Integrated Solid Waste Management Facility at Bawana for processing of 2000 TPD of municipal solid waste having Waste to Energy Plant, Compost Plant and Engineered Sanitary Landfill. One Engineered Sanitary Land Fill is proposed to be developed by South Delhi Municipal Corporation (SDMC) at Tehkhand. An Integrated Solid Waste Management Facility for 2000 TPD was proposed to be developed by East Delhi Municipal Corporation (SDMC) in joint venture with NTPC at Ghonda Gujran however Principal Committee constituted by Hon'ble NGT has not permitted the said Facility since it was falling in the Flood Plain of River Yamuna.

Waste to Energy Plants :

Delhi has 3 Waste to Energy Plants (WTE Plants) of capacity 4550 TPD at 3 different locations in Delhi namely Okhla, Ghazipur and Bawana. One New Waste to Energy Plant of capacity of 2000 TPD is under construction at Tehkhand and one New Waste to Energy Plant of capacity of 1500 TPD is proposed at Ranikhera. After commissioning of these 2 proposed WTEs capacity of WTE Plants will increase from 4550 TPD to 8050 TPD by December, 2023. The brief of the existing operational Waste to Energy Plants in Delhi is given in the statement 8.6:

STATEMENT 8.6
EXISTING OPERATIONAL WASTE TO ENERGY PLANTS IN DELHI

S. No.	Waste to Energy Plant & Name of Operator	Existing Capacity	
		Waste Processing (in TPD)	Electricity Generation Capacity (in MW)
1.	**Waste to Energy Plant at Okhla** (Operated by M/s Timarpur Okhla Waste Management Company Ltd., Old NDMC Compost Site, Okhla)	1950	23
2.	**Waste to Energy Plant at Ghazipur** (Operated by M/s East Delhi Waste Processing Company Ltd., Ghazipur)	1300	12
3.	**Waste to Energy Plant at Bawana** (Operated by M/s Delhi MSW Solutions Ltd., Narela Bawana Road, Bawana)	1300	24
	Total	**4550**	**59**

Monitoring of the stack emissions and Ambient Air Quality is also carried out by CPCB during the inspections and report is submitted by CPCB to Hon'ble National Green Tribunal from time to time. Online Continuous Emission Monitoring System (OCEMS) has been installed by all the 3 operational Waste to Energy Plants in Delhi and connected to the Servers of CPCB & DPCC.

STATEMENT 8.7
PROPOSED WASTE PROCESSING FACILITIES & SANITARY LAND FILL IN DELHI

S. No.	MSW Facility	No (s)	Location	Local Body	Capacity (in TPD)	Expected Timeline for Completion
1.	Waste to Energy Plant	1	Tehkhand	SDMC	2000	September, 2022
	Integrated Municipal Waste Processing Facility [Including Waste Collection, Segregation, Transportation, Processing & Disposal]	1	Ranikhera [For 3 Zones of North DMC (City – SP, Karol Bagh & Narela Zone)	North DMC	2500	December, 2023
3.	Bio CNG Plant	2	• Tehkhand • Okhla	SDMC	200 TPD 300 TPD	March, 2023 December, 2022
4	Compressed Bio Gas (CBG) Plant	1	Hastsal	SDMC	100 TPD	December, 2022
5	Bio-methanation Plant of NDMC	1	NDMC /SDMC Area	NDMC	30	September, 2022
6.	Sorting cum Composter Plants	5	Tigris Road & Kirby Place in Delhi Cantt.	Delhi Cantonment Board	70 (Total Capacity of 5 Plants)	March, 2022
7.	Decentralised Bio-methanation Plants	2	Naraina Industrial Area Ph-I & Mangolpuri Industrial Area Ph-I	North DMC	10 (5TPD each)	March, 2022
8.	Decentralised Composter Plants	3	• Ramleela Ground • Ashok Nagar • Vishwas Nagar	North DMC EDMC EDMC	3 (1TPD each)	March, 2022
9.	Engineered Sanitary Landfill (SLF)	1	Tehkhand	SDMC	-------	December, 2022
10.	**Total**	**16 + One SLF**			**5213 TPD**	

Decentralised Bio- Methanation & Compost Plants :

The three Municipal Corporations have installed decentralized Waste Management Facilities (Bio- Methanation / Compost Plants Plants) so that the solid waste generated is segregated and treated near the source and the transport and dumping of waste in far away areas can be done. The details of the decentralized plants already commissioned and those at different stages of commissioning are as follows:

STATEMENT 8.8

WASTE MANAGEMENT FACILITIES UNDER LOCAL BODIES

Local Bodies	Operational Plants		To be Commissioned	
	Composter Plants (1TPD)	Bio-Methanation Plants (5TPD)	Composter Plants (1TPD)	Bio-Methanation Plants (5TPD)
NORTH DMC	5 (at Bhorgarh Nursery, Rajendra Nagar Nursery, Maurya Enclave at Pitampura Mori Gate and Sector -11 Rohini)	2 (at Roshanara Bagh and MVID Hospital)	One Composter Plant of 1 TPD at Nursery of Ramleela Ground by **March, 2022**	2 Plants (at Mangolpuri Industrial Area Phase I and Naraina Industrial Area to be Commissioned **by February, 2022.**
EAST DMC	10	2 (at Geeta Colony & Shastri Park)	2Plant (Ashok Nagar and Vishwas Nagar) **By February, 2022.**	-
SOUTH DMC	4 (at Chirag Delhi, Punjabi Bagh Nursery Near Lady Sriram College, East of Kailash and Sec-14 Dwarka)	4 plants commissioned at Sarita Vihar, Dwarka Sector 14, Punjabi Bagh Nursery and Masood Pur in Vasant Kunj		

5.2 NGT Case OA No. 519 / 2019 & OA No. 386/2019 regarding Remediation of Legacy Waste (Old MSW) from the 3 Dumpsites in Delhi

- There are 3 Dumpsites at Ghazipur, Bhalaswa and Okhla in Delhi where Municipal Solid Waste have been dumped in the past for several years accumulating legacy waste of 28 Million Tons.
- Hon'ble National Green Tribunal vide order dated 17.07.2019 in OA No. 519 / 2019 and OA No. 386/2019 in the matter of "Centre for Wildlife and Environment Litigation" Vs Union of India & Ors." Hon'ble NGT has directed the Municipal Corporations to go for bio mining using trommels instead of capping of the dump sites at Bhalswa, Ghazipur and Okhla.
- 76 Trommel Machines have already been installed at three landfill sites for treatment of waste.

5.3 Biomedical Waste

5.3.1 Ministry of Environment, Forests and Climate Change, Govt of India has notified Bio-Medical Waste Management Rules, 2016 on 28.03.2016. The prescribed authority for implementation of the provisions of these rules is the Delhi Pollution

Control Committee. About 8661465 kg of Bio-Medical Waste was generated during 2021 and treated in Delhi excluding COVID-19 waste. There are following two Common Bio-Medical Waste Treatment Facilities (CBWTF) in Delhi for the treatment of the Bio-Medical Waste generated from the Health Care Establishments in Delhi:

(i) M/s Biotic Waste Solutions Pvt. Ltd at SMA Industrial Area, GTK Road, Delhi
(ii) M/s SMS Water Grace BMW Pvt. Ltd., near Nilothi STP of DJB.

5.3.2 These CBWTFs have a total capacity of 63 Tons/ Day and having Incinerators, Autoclave and Shredders for the treatment and disposal of the Bio-Medical Waste and have installed Online Monitoring System.

5.4 Electronic Waste

5.4.1 Ministry of Environment, Forests and Climate Change, Govt. of India has notified E-Waste (Management) Rules, 2016 on 23.03.2016 which have come into force from 1st October 2016. List of Authorities and corresponding duties are specified in Schedule IV of the said Rules.

5.4.2 CPCB has issued Guidelines on E-waste management also in 2016. Moreover, the E-Waste Rules got amended on 22.03.2018. There are amendments for Extended Producer Responsibility (EPR) and there are no new directions for Consumers or bulk consumers.

5.4.3 CPCB grants EPR authorization to the Producers as well as Producer Responsible Organisations (PROs) and its compliance is being monitored by the DPCC and violations, if any, are being intimated to CPCB for further necessary action.

5.4.4 DPCC has issued authorization to 03 Refurbishers and 02 Dismantlers under the said Rules in NCT of Delhi.

5.5 Plastic Waste

Plastic Waste Management Rules, 2016 as amended 2018 issued by MoEF & CC, GOI

The rules cast responsibilities on various stakeholders including generators, producers, Urban Local Bodies, Urban Development Department, Local Administration and the Pollution Control Board/ Committee

Prescribed Authority	Mandate
The State Pollution Control Board and Pollution Control Committee	Registration, Manufacturing & Recycling
The concerned Secretary-in-charge of Urban Development Department of States / UTs	Waste Generator, Use of plastic Carry bags, sheets or like etc.
The concerned Gram Panchayat shall be the authority in the villages	Waste Generator, Use of plastic Carry bags, sheets or like etc.
District Magistrates	Assisting above authorities in enforcement of the PWM Rules within territorial limits.

Status of Plastic Waste generation : 1000 Tons/day (approx)

5.6 Ongoing Action/ status by DPCC in respect of Plastic Waste Management

a. ULBs have been directed to encourage the use of plastic waste (preferably the plastic waste which cannot be further recycled) for road construction or energy recovery etc.

b. Registration under the Plastic Waste Management (Amendment) Rules, 2018:

No. of registered Plastic Manufacturing or Recycling (including multilayer, compostable) unit. (Rule 9) in FY 2020-21	
Type of Unit	**Number of units**
Producer (Bags/ sheets/ Multi layered & Like)	251
Recyclers	315
Plastic Raw Material/Producers	364
Total	**930**

c. Carry bags made of virgin or re-cycled plastic less than 75 microns are banned in Delhi for production and use. Further carry bags and plastic products made of re-cycled plastic are also banned in Delhi for storing, packaging of ready to eat or drink food stuff.

d. From 01.04.2020 till 07.01.2021, 34 plastic units were inspected, Environmental Compensation of ₹ 28,535,500/- imposed on violating units and 21 number of Show cause notices were issued to units, which were found engaged in burning/dumping of plastic waste in Bawana and Narela Industrial Areas.

5.7 Ban on Single-Use Plastics

- Govt. of Delhi had imposed ban on manufacture, sale, storage, usage, import and transport of all kinds of plastic carry bags in NCT of Delhi vide Notification dated 23.10.2012. This notification was challenged in the Hon'ble High Court of Delhi by All India Plastic Industries Association (WPC 7012/2012). On 05.12.2016, Hon'ble High Court of Delhi transferred the matter to the Hon'ble

NGT vide an interim order dated 10.08.2017 Hon'ble NGT directed complete prohibition on use of less than 50 micron non-compostable plastic carry bags in the NCT of Delhi and that the defaulters shall be liable to pay ₹ 5000/- per default as Environmental compensation. Teams of officers from Revenue Department, NDMC, 3 MCDs, DPCC and Delhi Cantonment Board are implementing the said NGT directions in their respective areas of jurisdiction..

- Department of Environment has identified the single use plastic items to be banned in NCT of Delhi as suggested under the Standard Guidelines for single use plastic by MoEF&CC, Govt of India.

- As per condition No. 4(2) a&b of Plastic Waste Management (Amendment) Rules, 2021 Notified on 12.08.2021 "The manufacture, import, stocking, distribution, sale and use of following single use plastic, including polystyrene commodities shall be prohibited with effect from the 1st July, 2022:- (a) ear buds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, polystyrene [Thermocol for decoration; (b) plates, cups, glasses, cutlery such as forks, spoons, knives, straw, trays, wrapping or packing films around sweet boxes, invitation cards, and cigarette packets, plastic or PVC banners less than 100 micron, stirrers (except commodities made of compostable plastic).

5.8 Construction and Demolition Waste

I. Construction and Demolition Waste Management:

- Approximate total C&D waste generation in Delhi - 4000 TPD
- 4 Construction and Demolition Waste Processing / Recycling plants are functioning at present with installed capacity of 4150 TPD (Jahangirpuri-2000 TPD, Shastri Park- 1000 TPD, Rani Khera-150 TPD & Bakkarwala – 1000 TPD). Additional 2500 TPD facilities are proposed at Maidangarhi (1000 TPD), Ranikhera (1000 TPD), Libaspur (500 TPD).
- With the existing and proposed processing facilities, it is expected that the entire C&D waste generated in Delhi will be managed properly in a scientific manner.

II. Processed construction and demolition material is used for making tiles/ pavement blocks and also for ready-mix concrete, aggregates etc.

5.9 Hazardous Waste - Setting up of Treatment Storage and Disposal Facility (TSDF) at Bawana for disposal of hazardous waste of Delhi

Delhi Govt. is in the process of setting up of TSDF for disposal of hazardous waste of Delhi at Bawana. DSIIDC has been assigned the task and is in the process of setting up of TSDF through M/s Tamil Nadu Waste Management Ltd. Environmental Impact Assessment and public hearing for this project have been conducted, Environmental Clearance has been granted by MoEF& CC, Govt. of

India on 23.11.2020. M/s Tamil Nadu Waste Management Ltd. has been granted Consent to Establish by DPCC on 31.12.2020.

6. Climate Change Mitigation Measures

6.1 In order to address the challenges of climate change, Delhi Government has been finalized Delhi Climate Change Action Plan which is aligned with National action plan on climate change.

6.2 Following sectors have been identified as critical to the impact of climate change and comprehensive strategies have been drawn in State action plan on climate change.

a) Enhanced Energy Efficiency
b) Sustainable Habitat
c) Green India
d) Water Mission
e) Strategic Knowledge
f) Solar Mission

7. Green Delhi App

7.1 Green Delhi app has been developed for information, awareness and redressal of grievances of the citizens at single platform. Green Delhi App has been launched by Hon'ble Chief Minister Govt. of Delhi on 29.10.2020 for redressal of grievances of citizens of Delhi with regard to various offences related to pollution. Green War Room (GWR) is a 24X7 pollution monitoring and mitigation initiative setup at Delhi Secretariat for monitoring the grievance uploaded on Green Delhi App. The app assign the complaints to the concerned department(s) for resolution. Green Delhi App is aimed to resolve grievances related to Air and Noise pollution on priority by the 28 Agencies of Delhi. The GWR facilitates the process of resolution for each complaint raised on the Green Delhi App.

7.2 39,372 Complaints have been received on Green Delhi App (as on 07.03.2022) out of which 37,335 has been resolved by 28 Agencies and only 6.03% of the complaints are pending.

For efficient functioning of the GWR, the following six stakeholders are responsible:

1. Incharge GWR: Responsible to carry out overall operation of the GWR.
2. DPCC Trainees: Responsible to carry out day to day operation of GWR.
3. Nodal officers of Agencies: Responsible for timely resolution of complaints within their departments.
4. Green Marshals: Group of Civil Defense volunteers have been deputed with the responsibility to assist in quick on ground inspection and verification & resolution of complaints. The Green Marshall have been grouped into two categories:

a. Green Marshall Field Team: Responsible for carrying out inspection and on ground verification.
b. Green Marshal Coordination Team: Responsible to assist coordination between GWR and Green Marshall Field Team.
5. DPCC Engineers: Cell Incharge(s) of DPCC are responsible for taking action on the complaints including imposing EDC on the agencies responsible for redressal of complaints, in case of default.
6. Green Delhi App IT Team (DPCC): Responsible to manage Green Delhi App Dashboard and other IT requirements of the GWR

7.3 How can the citizens of Delhi help in reducing pollution?

Pollution in Delhi is a perpetual problem which needs to be looked upon as a serious issue not only by the Government but also by the citizens of Delhi:

- One of the easiest ways is that there should be an effective involvement of Resident Welfare Associations in various localities in the collection, segregation of garbage from houses and the societies.
- Citizens can take steps to convert the garbage into compost in their localities.
- More and more trees must be planted in every locality.
- Stop open burning.
- Stop bursting firecrackers.
- Control dust pollution at construction sites.
- Every individual should keep a proper check on the pollution level of their vehicles.
- Making more use of CNG.
- One of the best ways to control pollution is to manage wastes of all types in a proper manner.
- Each and every citizen should use buses and metro instead of cars and scooters, as they can carry a lot more people in one journey. A carpool is also a good option.
- Controlling the use of energy and making use of electricity in an efficient manner.
- One can also reduce water pollution by reducing the use of chemicals, cleaning agents, pesticides, herbicides, fertilizers etc.
- Install rainwater harvesting structures.
- Be vigilant and report violation.

7.4 It is the duty of every citizen to think in a broader perspective to control pollution. We really don't want our future generations to live in an unhealthy environment in Delhi.

8. DELHI PARKS AND GARDENS SOCIETY (DPGS)

8.1 Delhi Parks and Gardens Society (DPGS) maintain parks and gardens of Delhi. DPGS involves RWAs /NGOs, in maintaining and developing parks of Delhi with the objective to increase the greenery in Delhi. It provides financial assistance to RWAs /NGOs and financial assistance increased w.e.f. 02/11/2020 from ₹ 2.00 lakhs per acre to ₹ 2.55 lakhs per acre for maintenance of parks and gardens without STPs and ₹ 2.80 lakhs per acre including STPs, ₹ 3.55 lakhs per acre for creation / development of new parks without maintenance cost of STPs. One time financial assistance for setting up of decentralized STPs increased from ₹ 2.00 lakhs to ₹ 3.50 lakhs per acre in Delhi, based on the NOC from the concerned land owning agency, Delhi Jal Board and the area MLA.

8.2 **Performance of DPGS during 2020-21 and 2021-22**

- During the year 2020-21, financial assistance of ₹801 lacs for maintenance of parks and gardens provided for area measuring 555.26 acres with the participation of 414 RWAs /NGOs covering 1722 No of parks, and for the financial year 2021-2022 up to Janurary-2022, for area measuring 558.66 acres with the participation of 394 RWAs /NGOs covering 1719 No of parks.

Target For 2022-23

- During the financial year 2022-23, DPGS intends to cover 2200 parks covering an area of 650 acres with the participation of 500 RWAs /NGOs.

Free Distribution of Plants From DPGS Nursery

- During 2020-21; 258491 plants were procured / raised and maintained in DPGS Nursery and distributed for plantation. During the financial year 2021-22 up to February, 2022; 276081 plants have been procured / raised and maintained in DPGS Nursery and distributed for plantation to RWAs/NGOs, Educational Institutions/ Armed Forces and general public of Delhi for plantation. A target of 250000 plants for free distribution from DPGS Nursery has been fixed for the year 2022-23.

Financial Assistance of Setting Up To Decentrilized STP:-

- DPGS also provides one time financial assistance to RWAs/ NGOs for setting-up of decentralized STPs @ ₹ 3.50 lakhs per acre, on receipt of NOC form the concerned land owning agency, Delhi Jal Board and area MLA.
- DPGS also provides technical support to other agencies in the greening activities.

9. FOREST IN DELHI

9.1 Delhi has 23.06% of geographical area covered under Forests and Tree Cover in 2021, which was 19.97% in 2011 i.e. an increase of 45.8 Sq. Km. in absolute terms and which is an increase of 3.09 per cent points. This is result of Delhi's sustained efforts to enhance forest cover with aim to maintain a balance between ecology and development. The vegetation of Delhi is mainly thorny scrub, which is found in the arid and semi-arid zones.

9.2 The green cover of Delhi is increasing on the lines of National Forest Policy, 1988 which stipulates a minimum of 1/3rd of the total land area of the country should be under forest or tree cover. There are limitations in increasing the forest cover in Delhi since there is limited forest land, which is being taken care by promoting Tree Cover in Delhi. Delhi has 195 Sq. Km. of forests and 147 Sq. Km. of Tree Cover. Delhi is making all endeavours to meet the policy targets and is constantly adding to the green cover of the State which is reflected in the change in forest and tree cover given as follows:

STATEMENT 8.9
FOREST AND TREE COVER AREA OF DELHI 1997-2021

(Sq. Km)

S. No.	Year	Forest and Tree Cover	Absolute Increase In Area	% of Total Area
1.	1997	26	--	1.75
2.	1999	88	62	5.93
3.	2001	151	63	10.20
4.	2003	268	117	18.07
5.	2005	283	15	19.09
6.	2009	299.58	16.58	20.20
7.	2011	296.20	-3.38	19.97
8.	2013	297.81	1.61	20.08
9.	2015	299.77	1.96	20.22
10.	2017	305.41	5.64	20.59
11.	2019	324.44	19.03	21.88
12	2021	342.00	17.56	23.06

Source: India State of Forest Report, 2021

9.3 As indicated above Government of NCT of Delhi has taken initiatives to increase forests and tree cover area to keep the environment green in Delhi. As a result of the initiatives taken, forest and tree cover area has been increasing steadily since 1997.The forest and tree cover area increased to 342 sq km in 2021 increasing thereby the share of forests in the total area to 23.06 per cent. The growth of forests and tree cover has particularly been monumental post-1997. Of the total 342 sq km of forest area in NCT of Delhi, nearly 254 sq km has been added during the period 1999 to 2021.

STATEMENT 8.10
FOREST AND TREE COVER IN DELHI IN 2021

(Area in Sq Km)

FOREST AND TREE COVER IN DELHI	2021Assessment
Geographical Area	1483
Very Dense Forest	6.72
Moderate Dense Forest	56.60
Open Forest	131.68
(A) Total Forest	**195.00**
(Per cent of the Geographical Area)	**13.15**
(B) Tree cover	**147**
(Per cent of the Geographical Area)	**9.91**
Total Forest and Tree Cover (A+B)	**342**
(Per cent of the Geographical Area)	**23.06**

Source: India State of Forest Report, 2021

9.4 It may be observed from Statement 8.9 that the growth of forest and tree cover area of Delhi increased from 26 Sq. Km in 1997 to 342 Sq. Km in 2021. The percentage of forest and tree cover area to the total area of Delhi has increased manifold from a mere level of 1.75 per cent in 1997 to 23.06 per cent in 2021. Forest Cover in the State has decreased by 0.44 sq km as compared to the previous assessment reported in ISFR 2019.

9.5 The report states that Delhi is the second highest tree cover (9.91%) as percentage of total geographical area of the States/ UTs after Chandigarh (13.16%). The overall increase in Delhi's green cover is a good sign. Delhi's green cover has increased from 21.88% in 2019 to 23.06 during 2021.

9.6 Forest Cover in Major Mega Cities:

Among the seven major mega cities, Delhi has largest forest cover 194.24 sq km followed by Mumbai 110.77 sq km and Bengaluru 89.02 sq km.

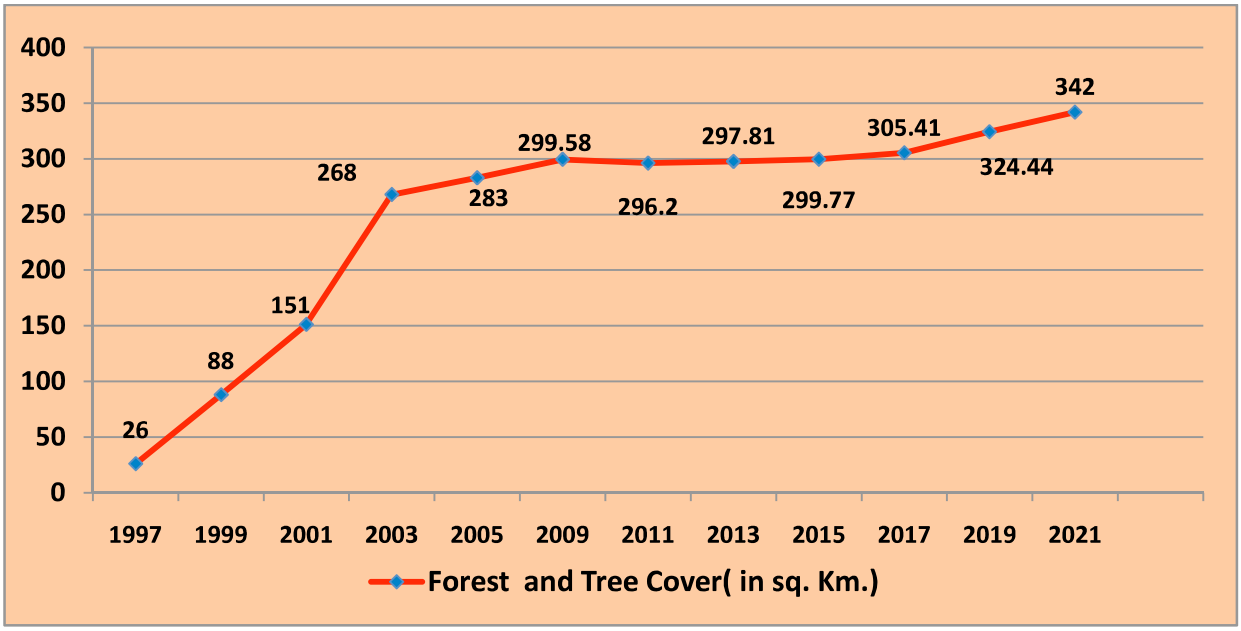
STATEMENT 8.11
FOREST COVER IN MAJOR MEGA CITIES (ISFR 2021)

(Area in Sq. Km.)

S. No.	Name	Area as Per digitized Boundary	Very Dense Forest	Medium Dense Forest	Open Forest	Total Forest Cover	% of total Forest Cover wrt area of digitized boundary	Scrub
1	Ahmedabad	455.32	0.00	1.59	7.82	9.41	2.07	4.85
2	Bengaluru	1307.35	0.00	12.66	76.36	89.02	6.81	14.87
3	Chennai	430.07	0.00	7.66	15.04	22.70	5.28	1.77
4	Delhi	1540.63	6.74	56.34	131.15	194.24	12.61	0.45
5	Hyderabad	634.18	0.00	17.68	64.13	81.81	12.90	29.96
6	Kolkata	186.55	0.00	0.10	1.67	1.77	0.95	0.00
7	Mumbai	435.91	0.00	51.13	59.65	110.77	25.41	0.00
	Total	**4990.01**	**6.74**	**147.16**	**355.82**	**509.72**	**10.21**	**51.90**

Source: India State of Forest Report, 2021
**Shapefile of digitized boundaries as provided by NIC Delhi in 2021*

CHART 8.4
FOREST AND TREE COVER AREA OF DELHI 1997-2021



9.7 The information regarding the district-wise forest cover area and total geographical area of Delhi is presented in Statement 8.12.

STATEMENT 8.12
DISTRICT-WISE FOREST COVER IN DELHI - 2021

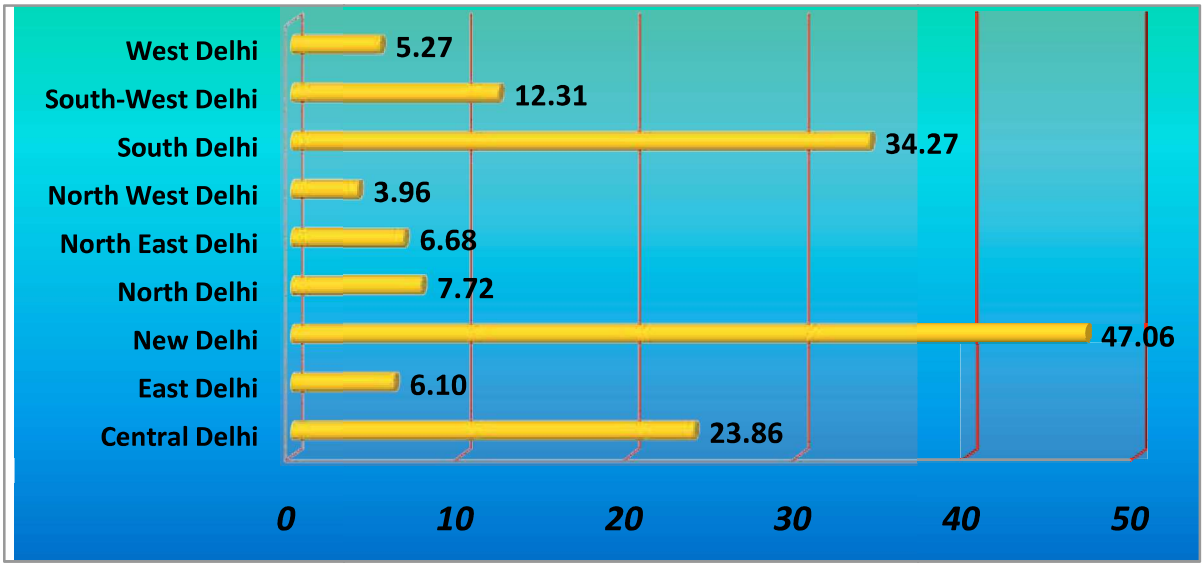
(Sq. Km)

S. No.	Districts	Geographical Area	Forest Cover Area	% of Geographical Area
1.	Central Delhi	21	5.01	23.86
2.	East Delhi	63	3.84	6.10
3.	New Delhi	35	16.47	47.06
4.	North Delhi	61	4.71	7.72
5.	North East Delhi	62	4.14	6.68
6.	North West Delhi	443	17.53	3.96
7.	South Delhi	247	84.64	34.27
8.	South-West Delhi	421	51.81	12.31
9.	West Delhi	130	6.85	5.27
	Total	**1483**	**195.00**	**13.15**

Source: India State of Forest Report, 2021

9.8 Statement 8.12 clearly indicates that South Delhi constitutes the highest forest cover area at 84.64 sq. km, South West Delhi at 51.81 sq. km, North West Delhi at 17.53 sq. km, New Delhi at 16.47 sq. km, respectively. On the contrary, the lowest forest cover observed in East Delhi at 3.84 sq. Km. The information regarding district-wise percentage forest cover of the geographical area in Delhi is also depicted in Chart 8.5.

CHART 8.5
DISTRICT-WISE PERCENTAGE FOREST COVERS OF GEOGRAPHICAL AREA IN DELHI – 2021



Forest Cover inside Green Wash:

Very Dense Forest	3.19 sq. km
Moderately Dense Forest	16.05 sq. km
Open Forest	39.93 sq. km
Sub Total	59.17 sq. km

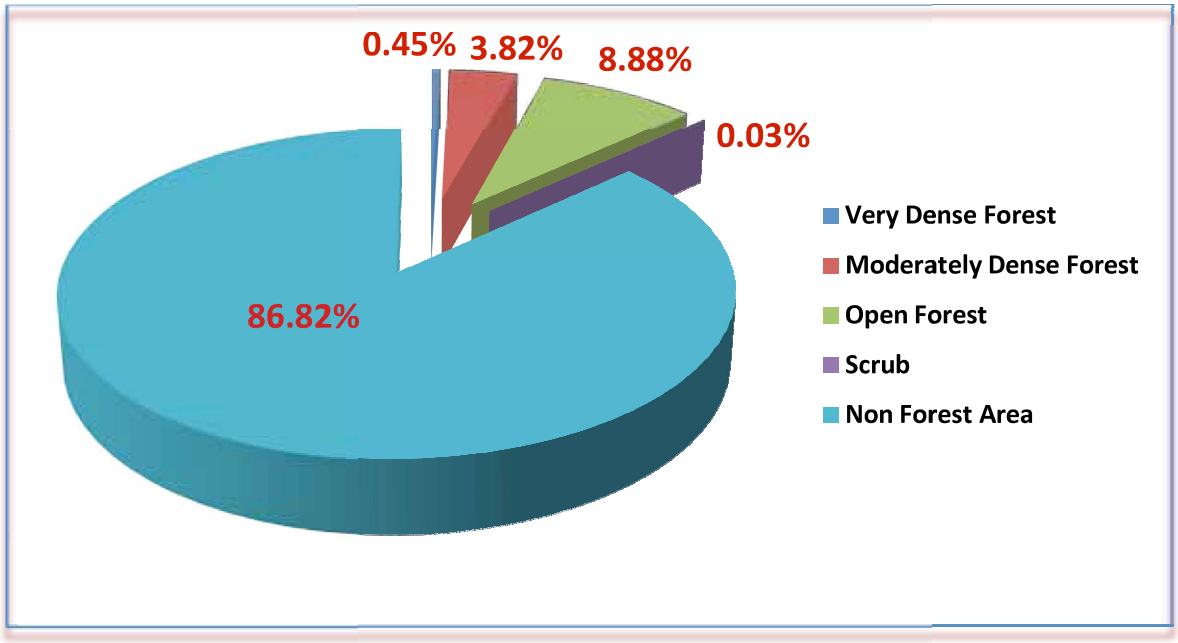
Forest Cover outside Green Wash:

Very Dense Forest	3.53 sq. km
Moderately Dense Forest	40.55 sq. km
Open Forest	91.75 sq. km
Sub Total	135.83 sq. Km
Total Forest Cover	195 sq. km
Tree Cover	147 sq. km
Total Forest & Tree Cover	342 sq. km
Of State's Geographical Area	23.06 %

9.9 Composition of forests in terms of its density is shown in Chart 8.6. Out of the total geographical area of NCT of Delhi, a very dense forest is spread over 0.45 per cent, a moderately dense forest is spread over 3.82 per cent, an open forest is spread over 8.88 per cent and scrub is spread over 0.03 per cent, which is almost negligible.

CHART 8.6

COMPOSITION OF FOREST COVER (%AGE) IN NCT OF DELHI IN 2021



Source: India State of Forest Report, 2021

9.10 Extent of Trees Outside Forest (TOF)

Trees outside Forests (TOF) refer to tree resources found outside the forests as defined in the Government records. Forest cover outside the Recorded Forest Area (RFA) is derived using boundaries of RFA or Green Wash (GW). Extent of Trees Outside Forest therefore, may be estimated as the sum of extent of forest cover outside the recorded forest area (RFA) and tree cover as given in the statement 8.13:

STATEMENT 8.13
EXTENT OF TREES OUTSIDE FOREST (TOF)

(Sq Km)

Forest Cover Outside the RFA/GW	Tree Cover	Extent of TOF
136	147	283

Source: India State of Forest Report, 2021

10. Water Conservation by Wetland Authority of Delhi

10.1 The Wetland Authority of Delhi was constituted on 23rd April 2019 under the Department of Environment and Forests, GNCTD. The Authority in coordination with sixteen water body owning agencies has taken up the task of formalizing a framework for restoration, protection and rejuvenation of the water bodies.

10.2 Inventorisation and reconciliation of 1040 water bodies in Delhi is completed through coordination with 16 water body owning agencies. GIS mapping of 1011 water bodies has successfully been carried. Geo mapping of remaining 29 water bodies is planned within two weeks through validation and ground-truthing with water body owning agencies such as DDA.

10.3 Seven Districts has been identified model ponds (North, North West, South, South West, New Delhi, North East and West). Bench marks for Model Ponds prepared and sent to all District Magistrates by Wetland Authority of Delhi.

10.4 Brief Documents in prescribed format of Ministry of Environment Forest and Climate Change, Government of India, is a statutory requirement under Wetland Rules, 2017. This crucial document which contains ecological attributes and management challenges of the water body has been prepared in respect of 685 water bodies of Delhi.

10.5 Hon'ble NGT, in OA No. 325/2015, (Lt. Col. Sarvadaman Singh Oberoi Vs. Union of India & Ors.) had directed preparation of action plans for restoration of all wetlands. These action plans which propose conservation actions to be done in each water body has been completed in respect of 685 water bodies.

10.6 Preparation of both these documents by water body owning agencies require professional and technical assistance which was provided through weekly online hand holding workshops by Wetland Authority of Delhi during September – November 2020. Training videos on drafting of brief documents and action plans were uploaded on Authority's Youtube channel for subsequent assistance of water body owning agencies. The resource team of Wetland Authority of Delhi also visited DM offices and helped Revenue Department prepare brief documents of around 100 wetlands in their jurisdiction in ten days during the last fortnight of March, 2021.

10.7 Citizen engagement and public participation in the conservation of wetlands is planned through declaring wetland mitras, who can assist the authority in protection and restoration of wetlands, thus deepening government's engagement with stakeholders. Twenty seven wetland mitras are empanelled by Wetland Authority so far, seven more applications has been received which are in the process of being empanelled. First meeting of Wetland Mitras was convened on 31.08.2021. Celebrated Iconic Week under Azadi ka Amrut Mahotsav on 04.10.21 with Wetland Mitras creating awareness about their roles and responsibilities. Pledge was taken by Wetland Mitras to dedicate themselves for noble cause of wetland conservation and protection. Fresh advertisement shall be issued for inviting more applications.

10.8 In pursuance of Wetlands (Conservation and Management) Rules, 2017 a Technical Committee under Chairmanship of Dr. Madhu Verma, Chief Economist at the World Resources Institute at Delhi consisting of six wetland experts formed on 01.07.2021. First meeting of technical Committee was held on 05.08.2021. Technical Committee has started review of brief documents prepared by Departments. Based on the recommendations, Wetland Authority shall make recommendations to the Govt. for notifying the wetlands. Five significant wetlands were declared by MoEF&CC on 09.05.2019 and Sanjay Lake was declared by MoEF&CC as a potential Ramsar site (Communication dated 22.09.2021). Wetland Authority has prioritized 10 waterbodies for immediate notification which are as follows:

Sanjay Lake, Hauz khas Lake, Bhalswa Lake, Smriti Van (Kondli), Smriti Van (Vasant Kunj), Najafgarh Jheel, Welcome Jheel, Daryapur Kalan, Sultanpur Dabas and Poth Kalan (Sardar Sarovar Lake)

10.9 In pursuance of Wetlands (Conservation and Management) Rules, 2017 a "Grievance Committee under Wetland Authority of Delhi was constituted on 01.07.2021 as a mechanism for hearing and forwarding grievances raised by the public to the Wetland Authority on Wetlands falling under their respective jurisdiction.

10.10 Wetland Authority of Delhi conducted an online training of master trainers program on Wetlands in Delhi on 15.04.2021 towards creation of awareness drives/skits etc. by the trained master trainers towards celebrating "Bharat ka Amrut Mahotsav" launched by Hon'ble Prime Minister to commemorate 75 years of India Independence, and 787 School teachers were trained on wetland values. Animated presentations were shared with around 2000 Eco clubs Schools/Colleges on wetland values.

10.11 Delhi was chosen as pilot for onboarding brief documents onto the Govt. of India's national wetland portal and user training for Wetlands of India Portal was

conducted for Wetland Authority of Delhi officials by Ministry of Environment, Forests and Climate Change, Govt. of India on 24.09.2021. The portal will be a single point access system that synthesizes information on wetland sites, projects, initiatives and trainings and will be a platform for people to learn more about wetlands and get involved in their conservation and management.

10.12 Wetland Authority has prioritized 100 water bodies for beautification based on their size and water quality and free from encroachment.

10.13 In pursuance of Hon'ble NGT order in EA No. 16/2019 Wetland Authority prepared Environment Management Plan (EMP) of Najafgarh Jheel through an Expert Committee and was duly submitted as per Hon'ble NGTs order.

10.14 On 01.02.2022, orientation cum sensitization session on values of Wetland conservation were conducted for 48 Junior Environmental Engineers of Delhi Pollution Control Committee and around 25 Green Fellows of Department of Environment & Forests, GNCTD.

10.15 A webinar on "Developing a Multi Stakeholder Engagement Plan for Conservation of Wetlands in Delhi" was conducted by Wetland Authority of Delhi on 07.02.2022.

10.16 Wetland Authority of Delhi organized an "Online Training Session for Wetland Mitras" on 26th February' 2022 on the celebration of Bharat ka Amrut Mahotsava. The main aim of the meeting was to gather information about their areas of interests and their prefer Districts of performing activities for conservation and protection of Wetlands.

10.17 The future plan of the Wetland Authority is to prepare a protocol for catchment area management, evolving low cost restoration techniques, and actively engage, coordinate and help land owning agencies to prioritize wetlands based on the brief documents prepared and notify them, thus ensuring long term protection and conservation of wetlands in Delhi.

STATEMENT 8.14
WETLANDS IN DELHI

Natural Wetlands	Human made Wetlands
Najafgarh Jheel	Bhalswa Lake
Sanjay Lake	Hauz khas Lake
Welcome Jheel	Smtiti Van Lake (Kondli)
Tikrikhurd Lake	PoothKalan (Sardar Patel Lake)
Smriti Van (Vasant Kunj)	DaryapurKalan (Kh. No. 107(19-17)

Source : Department of Environment, GNCTD

10.18 Fire Prone Forest Classes

Geographical area under different classes of forest fire proneness is given in the following statement:

STATEMENT 8.15

(In sq km)

S. No.	Forest Fire Prone Classes	Forest Cover	% of Total forest cover
1.	Extremely fire prone	0.00	0.00
2.	Very highly fire prone	0.00	0.00
3.	Highly fire prone	0.00	0.00
4.	Moderately fire prone	0.00	0.00
5.	Less fire prone	195.00	100.00
	Total	**195.00**	**100.00**

Source: India State of Forest Report, 2021

10.19 Major Species of Trees in Delhi

10.19.1 Diameter class-wise distribution of top five species in numbers derived from the forest inventory is presented in the table below:

STATEMENT 8.16

(In Sq Km)

S. No.	Species	10-30	30-60	>60
1.	Prosopis Juliflora	475	25	6
2.	Acacia Lenticularis	172	8	0
3.	Azadirachta Integrifalia	45	18	0
4.	Holoptelea Integrifolia	33	4	0
5.	Ficus Virene	6	8	0

Source: India State of Forest Report, 2021

10.19.2 Dominant Tree Species in Trees Outside Forests (TOF):

Top five species in numbers of Trees Outside Forests in Delhi in Rural and Urban areas are given in the statement 8.17:

STATEMENT 8.17
TOP FIVE TREE SPECIES IN TREES OUTSIDE FORESTS (RURAL) IN DELHI

S. No.	Species	Relative abundance (%)
1.	Prosopis Juliflora	29.52
2.	Azadirachta Indica	13.06
3.	Eucalyptus spp.	8.07
4.	Leucaena leucocephala	7.72
5.	Ficus spp.	5.29

Source: India State of Forest Report, 2021

STATEMENT 8.18
TOP FIVE TREE SPECIES IN TREES OUTSIDE FORESTS (URBAN) IN DELHI

S. No.	Species	Relative abundance (%)
1.	Azadirachta Indica	10.77
2.	Prosopis Juliflora	8.11
3.	Poyalthia longifolla	6.20
4.	Morus spp.	6.03
5.	Ficus religiosa	5.80

Source: India State of Forest Report, 2021

11. Asola Bhatti Wild Life Sanctuary

11.1 Asola Bhatti Wildlife Sanctuary spread over 4845.57 acres is situated near Tughlakabad Fort in South Delhi. The Wildlife Sanctuary is considered the breathing lung of the cosmopolitan city of Delhi. It was established in 1992 with the aim to protect the wildlife in the area between Delhi and Surajkund (Delhi-Haryana border). The legal status of the Southern Ridge was considered uncertain till 1986 when the community land of villages Asola, Sahurpur and Maidangari (2679.29 Acre) were notified and the land of Bhatti village area (2166.28 Acre) was notified in 1991 as Sanctuary.The Forest Department has also undertaken several soil moisture conservation works in the central and southern ridge area in the form of small checkdams. This is very important to check run off, soil erosion and increase the percolation of rainwater in the underground aquifers thereby serving an important ecosystem function of enhancing the water security of the city.

11.2 Reclamation of Bhatti area of Asola Bhatti Wild Life Sanctuary through ECO Task Force (ETF)

11.2.1 Forest Department, Government of NCT of Delhi is implementing the project of rehabilitation of about 2100 acres of Bhatti Mines area since October 2000 through ETF, which is a part of Asola-Bhatti Wild Life Sanctuary. The project period for five years was approved in 2000 at a cost of ₹ 8.23 crore and kept on extending regular. Thus, the total project cost of ₹ 85.71 crore already approved by the EFC for the period w.e.f. 09.10.2000 to 31.03.2017.

11.2.2 EFC has again approved the extension of the project period for rehabilitation of degraded forest land in the Southern Ridge area of Asola Bhatti, Dera Mandi, Maidangarhi, Ghittorni and Rajokri through Eco-Task Force from 01.01.2017 to 31.03.2022 at an estimated cost of ₹ 90.25 crore (₹ 48.75 crore for Establishment cost of ETF and ₹ 41.50 crore for Project cost which includes plantation work & its maintenance for five years) for improving and sustaining the wildlife habitat through plantation. Project cost includes expenditure for the creation of plantation of 2 lakh saplings per year for a period of five years.

Details of City Forests under Department of Forest & Wildlife, GNCTD:

Keeping the objective of having more green/tree cover in Delhi and resultant benefit on environment, Department of Forest and Wildlife, Govt. of NCT of Delhi has created and planned to create City Forests at following sites.

City Forests Developed in Delhi

S. No.	Name of City Forest
1.	Mitraon City Forest-Pkt A
2.	Nasirpur City Forest
3.	Alipur City Forest
4.	Mitraon City Forest-Pkt B
5.	Butterfly Park, Tughlaqabad
6.	Aravali Arenya Kendra, Tughlaqabad
7.	Taj Enclave City Forest
8.	Shastri Park near colony City Forest
9.	Garhi Mandu Pkt A2 City Forest
10.	City Forest at ITO chungi Loop No. 4
11.	City Forest Hauz Rani

Details of City Forests under Development/ Planning Stage

S. No.	Name of City Forest
1.	City Forest At Shastri Park Metro Station
2.	Mamoorpur City Forest
3.	City Forest Aya Nagar
4.	City Forest Jaunapur
5.	City Forest Dera Mandi
6.	City Forest Chhattarpur

Photos of City Forests under Department of Forest and Wildlife, GNCTD

HAUZRANI CITY FOREST

MITRAON CITY FOREST

Garhi Mandu City Forests

12. Major Achievements:

Plantation work in last 7 Years by Civic Agencies

S. No.	Year	Plantation	Distribution	Total
1.	2014-15	9,66,032	6,46,857	16,12,889
2.	2015-16	9,73822	6,77,626	16,51,448
3.	2016-17	21,04,246	3,71,419	24,75,665
4.	2017-18	16,08,105	Nil	16,08,105
5.	2018-19	24,59,730	4,36,086	28,95,816
6.	2019-20	23,45,274	5,24,242	28,69,516
7.	2020-21	25,80,144	6,60,678	32,40,822

13. Plantation by Forest Department from 2016-17 to 2021-22 (upto Jan, 2022) & Target for 2022- 23

S. No.	Year	Plantation by Forest Department (in Lakhs)
1.	2016-17	2.96
2.	2017-18	1.29
3.	2018-19	4.51
4.	2019-20	5.21
5.	2020-21	5.48
6.	2021-22	4.93
7.	2022-23	5

- 30 KM of Forest Boundary Wall to be constructed in 2022-23.
- 95 km of Forest Boundary wall constructed till date.
- 10 Lakh seedlings to be raised in various sites under Forest Department

13.1 During 2020-21

13.1.1 Massive tree plantation drive was conducted during 2020-21 involving 20 greening agencies, eco-clubs and RWAs for plantation of 25.80 lakh tree saplings. In addition to this, 6.60 lakh seedlings have been distributed free of cost among public. Government of NCT Delhi has exceeded the target of 15.2 lakh set by the Government of India.

13.1.2 In pursuance of the direction of Hon'ble NGT vide its order dated 15.01.2021 in O.A. No. 58/2013 in the matter of Sonya Ghosh Vs Govt. of NCT of Delhi, the Department of Forest and Wildlife, Govt. of NCT of Delhi has initiated the process of declaration of Reserved Forest under Section 20 of Indian Forest Act, 1927. More than 395.77 Ha of Forest area have been freed from encroachment in last 6 years.

13.1.3 The Department of Forest and Wildlife, Govt. of NCT of Delhi has 14 nurseries from which the Department carries out free distribution of saplings of native plant species every year. About 4,02,187 plant saplings were distributed by the Departmental nurseries in 2020-21 and for 2021-22 the free distribution target is 400,000.

13.1.4 The process of modernization of these nurseries of Forest Department has been initiated recently where construction of polyhouses, greenhouses, pucca beds, mother beds, chambers for vermin compost, leaf compost and installation of water sprinklers etc. are being carried out.

13.1.5 There has been a continuous effort for strengthening of Forest Department to augment its capacity for protection of green cover in Delhi and security of the ridge area. For this purpose, apart from recruitment for various posts, the Department has created many new posts of Forest Ranger, Forest Guard and Wildlife Guard.

13.1.6 Eco-restoration of habitat through Eco-Task Force in Asola Bhatti Wildlife Sanctuary has been done by carrying out plantation of 3 lakh saplings and low-cost engineering structures to improve the soil moisture regime.

14. During 2021-22 (Till December, 2021)

14.1 The tree plantation drive in current year (2021-22) is being conducted by Govt. of NCT of Delhi involving 20 greening agencies, eco-clubs and RWAs. Till December 2021 the Department of Forest and Wildlife, with other greening agencies have planted 21.91 lakh saplings and distributed 6.48 lakh saplings to general public of Delhi.

14.2 In current financial year (2021-22) eco-restoration of habitat is being carried out through Eco-Task Force in Asola Bhatti Wildlife Sanctuary which has planted around 2.83 lakh saplings till December, 2021.

CHART 8.7
FOREST COVER MAP OF DELHI