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.

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 324.44 sq km in 2019 increasing thereby the share of forests in the total area to 21.88 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 of the total geographical area among states. 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 2014 to 2020 is presented in Statement 8.1

Statement 8.1
AMBIENT AIR QUALITY LEVELS IN DELHI: 2014-2020

DPCC CAAQMS Yearly City Average of Various Pollutants 2014 – 2020								
Year	**PM 10 (ug/m3)**	**PM 2.5 (ug/m3)**	**SO2 (ug/m3)**	**NO2 (ug/m3)**	**O3 (ug/m3)**	**NH3 (ug/m3)**	**CO (mg/m3)**	**C6H6 (ug/m3)**
Standard	**60 (ug/m3)**	**40 (ug/m3)**	**50 (ug/m3)**	**40 (ug/m3)**	**100** (ug/m3)**	**100 (ug/m3)**	**2** (mg/m3)**	**5 (ug/m3)**
2014	324	149	15.94	82.45	40.89	46.87	1.58	4.76
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

* City average is calculated from 2014-2017 for 4 stations & from 2018-2020 for 24 stations

** For 8 hrs & for 1 hr O3 is 180 (ug/m3) & CO is 4 (mg/m3)

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**: One way of measuring pollution is by the measure of particulate matter. Particulate matter is basically a mixture of extremely small particles and liquid droplets like acids, chemicals, gas, water, metals, soil dust particles, etc, the measurement of which gives an idea of the pollution of a city. It is also known as particle pollution or PM.

2.4 **Particulate Matter (PM_{10})**: Annual city average of PM_{10} decreased from 324 $\mu g/m^3$ in 2014 to 187 $\mu g/m^3$ in 2020. 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 149 µg/m^3 in 2014 to 101 µg/m^3 in 2020. Annual city average at all the monitoring locations is exceeded the prescribed standard i.e 40 µg/m^3.

2.6 **Sulphur Dioxide (SO_2)**: No significant variation was observed in the annual city average value between 2014 to 2020. Annual city average at all the monitoring locations is within the prescribed standard i.e 50µg/m^3.

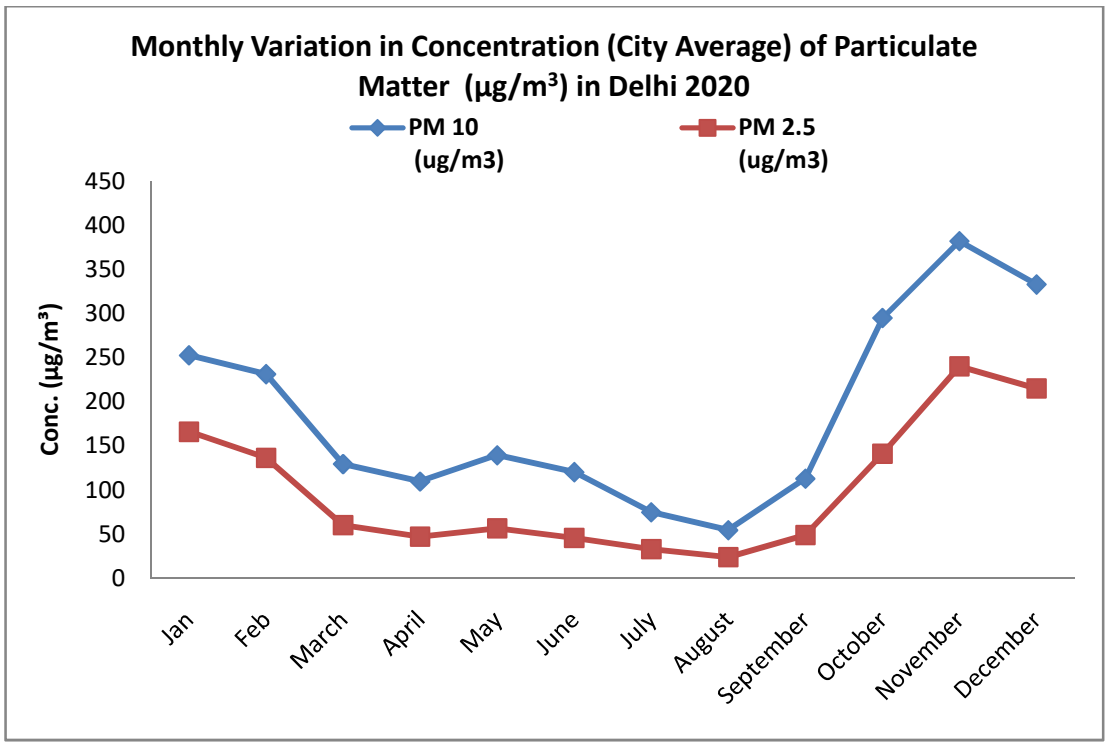
2.7 **Nitrogen Dioxide (NO_2)**: Annual city average of NO_2 concentration has shown the marginal decrease as compared to the year 2014. The highest annual average was observed in 2014 (82.45 µg/m^3). In 2020 the average value was 40.30 µg/m^3. Annual city average at all the monitoring locations is within the prescribed standard i.e 40 µg/m^3.

2.8 **Carbon Monoxide (CO)**: Annual city average of CO concentration has shown the decrease as compared to the year 2014. In 2020, the city average value was 1.27 mg/m^3. Annual city average at all the monitoring locations is within the prescribed standard i.e 2 mg/m^3.

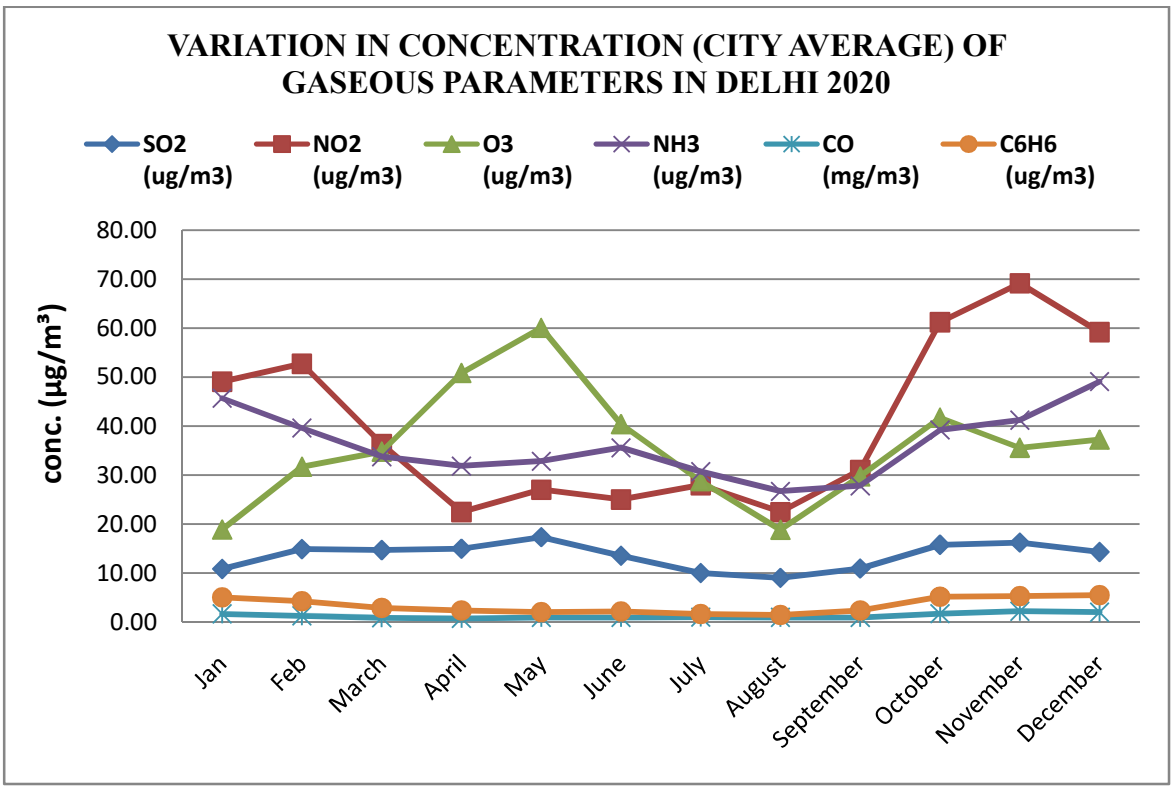
2.9 **Ozone (O_3):** Annual city average of O_3 varied from 2014 to 2020 by 40.89 µg/m^3 to 35.74 µg/m^3. Annual city average at all the monitoring locations is within the prescribed standard i.e 100 mg/m^3.

Chart 8.1

MONTHLY CITY AVERAGE OF CRITICAL POLLUTANTS DELHI 2020



Source: Delhi Pollution Control Committee (DPCC)



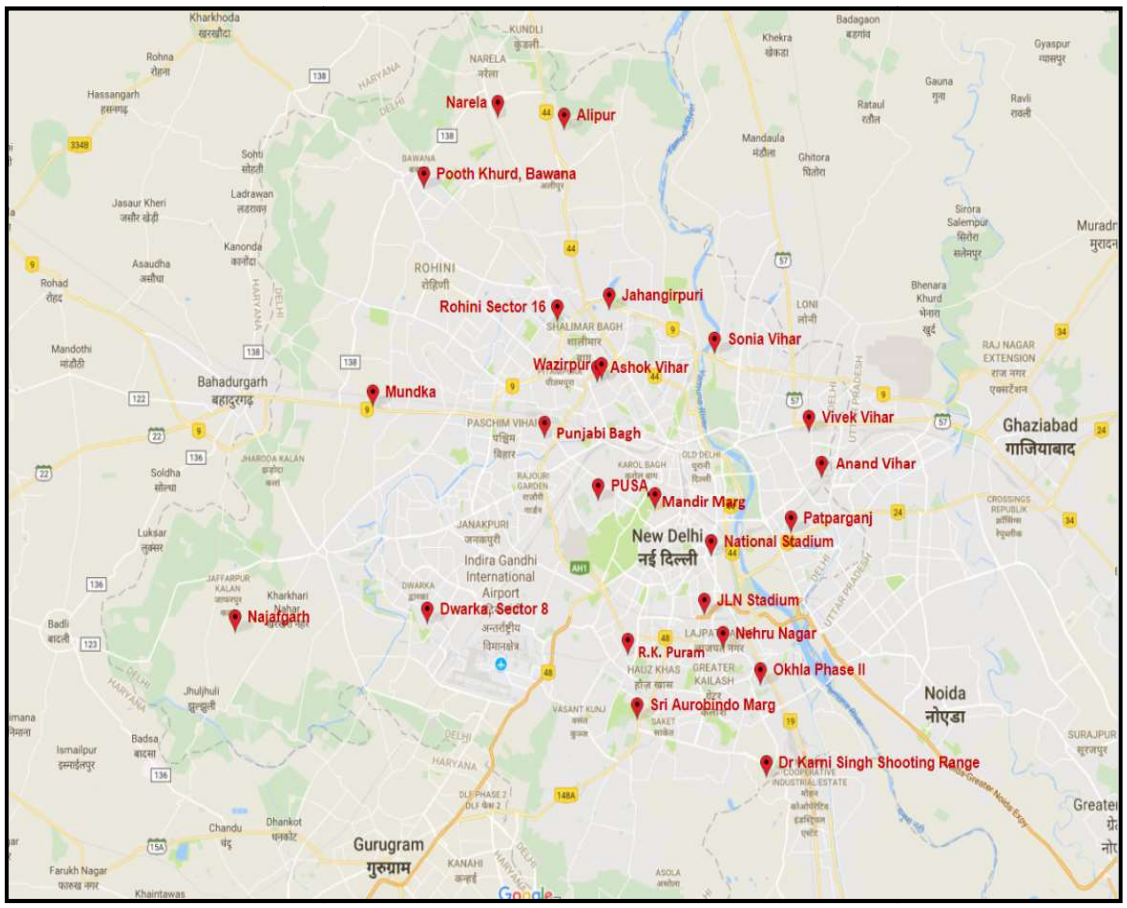
Source: Delhi Pollution Control Committee (DPCC)

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	25	Civil Lines
13	Maharishi Valmiki Hospital,	26	Airport

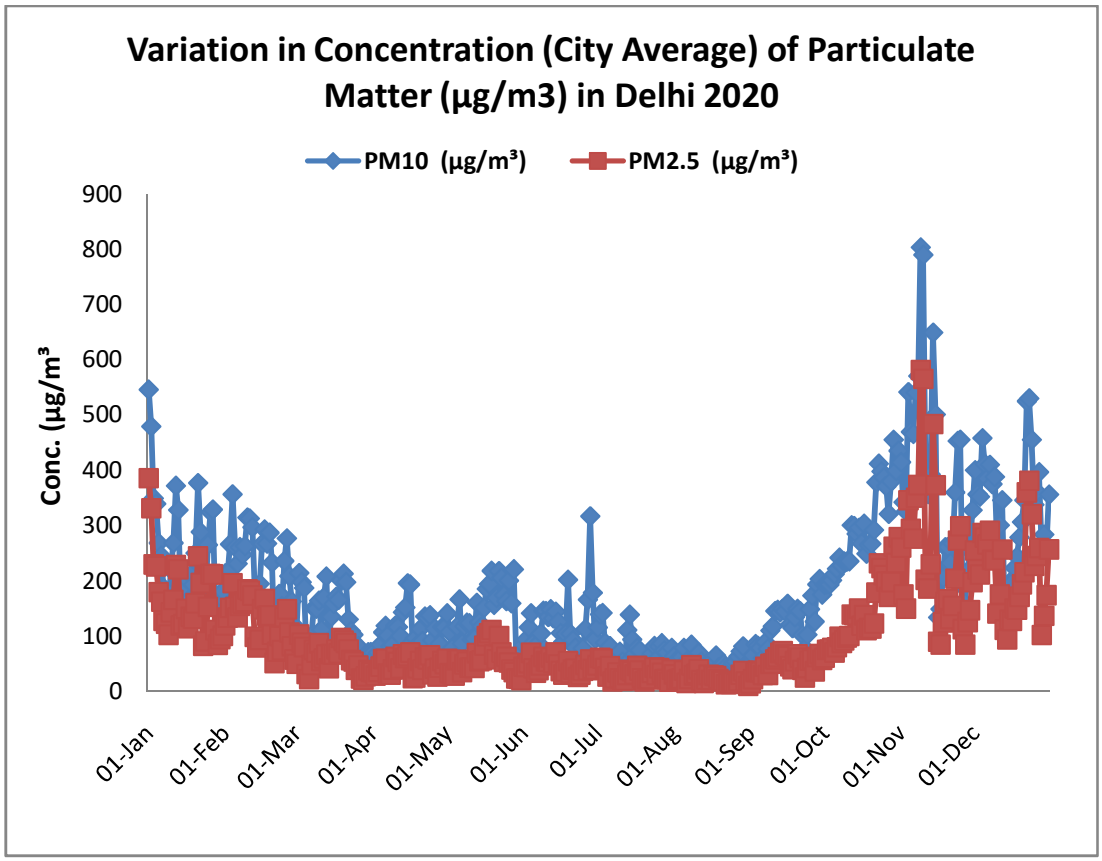


2.11 Air Pollution Control:

During Corona virus pandemic, Delhi Government took the step to declare a state lockdown from 20.3.2020 and subsequently subsumed by the national lockdown ordered by the Central Government which was effective from 24.3.2020. The lockdown period gave a rarest set of data, which, if not a true background value, then indicated what is nearest achievable. This extraordinary time gave the opportunity to understand many aspects of pollution scenario. This set of data can be used to understand background; the current status is of reduced pollution.

Chart 8.2 shows the variation in the concentration of $PM_{2.5}$ and PM_{10} from 1st January to 31st December 2020. The average concentration was 101 µg/m³ and 187 µg/m³ respectively for $PM_{2.5}$ and PM_{10}. The peak of PM_{10} was recorded on 9th November 2020, when the concentration of PM_{10} reached up to 803 µg/m³. However, $PM_{2.5}$ reached up to 581 µg/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 2019-2020 (unaudited) is about: ₹ 19.85 crores

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 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. 681/20108 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 during Covid-19 pandemic 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 2019, the green cover of Delhi has increased to about 324.44 sq km (21.88% 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 2019 involving 19 greening agencies, eco-clubs and RWAs for plantation of 21.15 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.

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 PM2.5&PM10 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 1624 units have been converted into PNG.

12. **Public Awareness:**

Intensive Environment Awareness Campaign against idling of vehicle at intersection traffic from 21st October to 15th November 2020: 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 21st October to 30th November 2020 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.

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 fo 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 have to be installed at Anand Vihar Bus Terminal and Baba Kharak Singh Marg, Connaught Place. Piece of land has been identified at both places. With regard to Smog tower to be installed by GNCTD at Baba Kharak Singh Marg, Connaught Place, work has started on ground.

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:

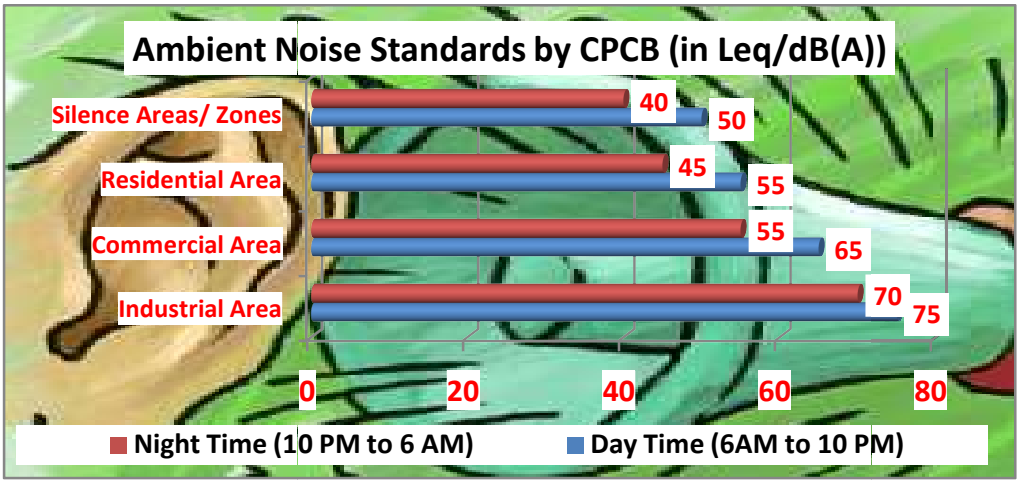
- Air quality monitoring stations to be set up in NCR with an online display of data.
- The neighbouring states must ensure that all the construction sites must undertake the dust suppression methods to control the dust emission from the construction sites.
- Open burning of garbage in Delhi's neighbouring 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 the available fuel, 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. The Yearly data of these stations are as presented in Statement 8.3:

Statement 8.3
YEARLY AVERAGE OF REAL TIME AMBIENT NOISE LEVELS (DAY TIME)

Yearly Average of Real Time Ambient Noise Levels (Day time)						
Stations	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Anand Vihar (db(A))	67.8	67.6	67.8	66.2	65.5	61.4
Civil Lines (db(A))	62.9	62.7	62.4	61	61	59.9
Mandir Marg (db(A))	57.1	58.4	56.8	57.6	57.8	55.3
Punjabi Bagh (db(A))	63.4	59	59	59.3	58.3	56.1
R.K. Puram	60.3	61	60.6	61.1	62.1	61.5
Alipur (S) (dB (A))	NA	NA	NA	NA	NA	51.6
Ashok Vihar (R)(dB (A))	NA	NA	NA	NA	NA	58.1
Connaught Place (C)(dB (A))	NA	NA	NA	NA	NA	63.3
Dr Karni Singh (C)(dB (A))	NA	NA	NA	NA	NA	55.4
Dwarka (C) (dB (A))	NA	NA	NA	NA	NA	64.2
IMD (R)(dB (A))	NA	NA	NA	NA	NA	54.8
Jahangirpuri (R) (dB (A))	NA	NA	NA	NA	NA	58.6
JLN Stadium (C) (dB (A))	NA	NA	NA	NA	NA	57.2
Karol Bagh (C) (dB (A))	NA	NA	NA	NA	NA	71.8
Kashmere Gate (C) (dB (A))	NA	NA	NA	NA	NA	62.8
Lajpat Nagar (C) (dB (A))	NA	NA	NA	NA	NA	63

Stations	2015	2016	2017	2018	2019	2020
Mundka (R) (dB (A))	NA	NA	NA	NA	NA	57.7
Najafgarh (S) (dB (A))	NA	NA	NA	NA	NA	52.2
Narela (I) (dB (A))	NA	NA	NA	NA	NA	62.8
National Stadium (C) (dB (A))	NA	NA	NA	NA	NA	56.9
Nehru Nagar (R) (dB (A))	NA	NA	NA	NA	NA	56
Okhla (I) (dB (A))	NA	NA	NA	NA	NA	56.5
Patparganj (I) (dB (A))	NA	NA	NA	NA	NA	57
Pooth Khurd Bawana (S) (dB (A))	NA	NA	NA	NA	NA	55.7
Pusa (I) (dB (A))	NA	NA	NA	NA	NA	62.3
Rohini (S)(dB (A))	NA	NA	NA	NA	NA	55.7
Shahdara (C) (dB (A))	NA	NA	NA	NA	NA	67.4
Sonia Vihar (R) (dB (A))	NA	NA	NA	NA	NA	56.2
Sri Aurobindo Marg(S) (dB (A))	NA	NA	NA	NA	NA	54.6
Vivek Vihar(R) (dB (A))	NA	NA	NA	NA	NA	59.6
Wazirpur (I) (dB (A))	NA	NA	NA	NA	NA	62.1

YEARLY AVERAGE OF REAL TIME AMBIENT NOISE LEVELS (NIGHT TIME)

Yearly Average of Real Time Ambient Noise Levels (Night time)						
Stations	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Anand Vihar (db(A))	64.9	65.8	65	63.9	62.8	57.2
Civil Lines (db(A))	61.9	61.3	60.3	58.7	58.6	56.9
Mandir Marg (db(A))	50.8	51.5	48.5	51.4	49.4	49.9
Punjabi Bagh (db(A))	58.9	54.8	53.3	52.5	52.2	50.5
R.K. Puram	53.7	56.1	54.4	54.9	56	56.9
Alipur (S) (dB(A))	NA	NA	NA	NA	NA	49.5
Ashok Vihar (R)(dB (A))	NA	NA	NA	NA	NA	54.9
Connaught Place (C)(dB(A))	NA	NA	NA	NA	NA	57.4
Dr Karni Singh (C)(dB(A))	NA	NA	NA	NA	NA	50.1
Dwarka (C)(dB(A))	NA	NA	NA	NA	NA	57.9
IMD (R)(dB (A))	NA	NA	NA	NA	NA	51.3
Jahangirpuri (R)(dB(A))	NA	NA	NA	NA	NA	55.2
JLN Stadium(C)(dB(A))	NA	NA	NA	NA	NA	54.5
Karol Bagh(C) (dB(A))	NA	NA	NA	NA	NA	61
Kashmere Gate (C) (dB(A))	NA	NA	NA	NA	NA	58.9
Lajpat Nagar (C) (dB(A))	NA	NA	NA	NA	NA	55.6
Mundka (R) (dB(A))	NA	NA	NA	NA	NA	55.3
Najafgarh (S) (dB(A))	NA	NA	NA	NA	NA	49.3
Narela (I) (dB(A))	NA	NA	NA	NA	NA	59.3
National Stadium (C) (dB(A))	NA	NA	NA	NA	NA	54.1
Nehru Nagar (R) (dB(A))	NA	NA	NA	NA	NA	53.9
Okhla (I) (dB(A))	NA	NA	NA	NA	NA	52.4
Patparganj (I) (dB (A))	NA	NA	NA	NA	NA	54.1
Pooth Khurd Bawana (S) (dB(A))	NA	NA	NA	NA	NA	52.5
Pusa (I) (dB(A))	NA	NA	NA	NA	NA	57.5
Rohini (S)(dB(A))	NA	NA	NA	NA	NA	52.2
Shahdara (C) (dB(A))	NA	NA	NA	NA	NA	64.6
Sonia Vihar (R) (dB(A))	NA	NA	NA	NA	NA	52.8
Sri Aurobindo Marg (S) (dB (A))	NA	NA	NA	NA	NA	51.7
Vivek Vihar (R) (dB (A))	NA	NA	NA	NA	NA	58.3
Wazirpur (I) (dB (A))	NA	NA	NA	NA	NA	58.5

Source: Delhi Pollution Control Committee (DPCC)

3.3 Noise limiter notification:

In compliance to Hon'ble National Grteen 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.

3.4 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 (Delhi-Haryana border) 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 both by DPCC (at 9 Locations) and CPCB (at 5 Locations) on monthly basis.

- 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 30.27 mg/l at Khajuri- Paltoon Pool and 37.36 mg/l at Okhla 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 Nizamuddin and Okhla.

- Online Monitoring System have been installed at 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 9 locations) and major drains (24 drains) falling into river Yamuna. Statement 8.5 (at 9 locations) and 8.6 (24 drains) indicate annual average water quality of River Yamuna from January-2020 to December-2020. 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 7.19 mg/l at Palla. The average of BOD has ranged from 2.56 mg/l at Palla to 37.36 mg/l at D/S Okhla Barrage (after meeting Shahdara Drain). 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 river water is grossly polluted.

Statement 8.4

ANNUAL AVERAGE WATER QUALITY OF RIVER YAMUNA AT DIFFERENT LOCATIONS: JANUARY 2020 – DECEMBER 2020

S. No.	Locations	pH (mg/l)	COD (mg/l)	BOD (mg/l)	DO (mg/l)
	Water Quality Criteria	**6.5-8.5**	**-**	**3mg/l or less**	**5mg/l or more**
1	Palla	7.73	9.73	2.56	7.19
2	Surghat	7.58	14.36	3.42	5.87
3	Khajori Paltoon Pool	7.31	96.00	30.27	1.40
4	Kudesia Ghat	7.41	77.64	27.45	2.30
5	ITO Bridge	7.49	72.36	24.91	2.00
6	Nizamuddin Bridge	7.42	66.36	21.91	2.08
7	Agra Canal Jaitpur	7.62	75.27	23.64	3.67
8	D/S Okhla Barrage (after meeting Shahdara Drain)	7.80	105.82	37.36	2.60
9	Agra Canal Okhla	7.53	75.27	24.20	1.50

Source: - Delhi Pollution Control Committee

Statement 8.5

ANNUAL AVERAGE WATER QUALITY OF DRAINS AT DIFFERENT LOCATIONS IN DELHI: JANUARY 2020 – DECEMBER 2020

S. No.	Measure/ Drains	pH	TSS	COD	BOD
	Water Quality Criteria	**5.5-9.0 (mg/l)**	**100 (mg/l)**	**250 (mg/l)**	**30 (mg/l)**
1	Najafgarh Drain	7.4	106.0	169.0	59.6
2	Metcalf House Drain	7.0	92.0	148.0	48.0
3	Khyber Pass Drain	7.7	51.2	97.2	28.2
4	Sweeper Colony Drain	7.6	77.8	138.0	44.7
5	Magazine Road Drain	7.6	155.4	242.4	88.3
6	ISBT Drain	7.54	111.4	193.2	66.8
7	Tonga Stand Drain	7.5	92.9	126.2	45.2
8	Moat Drain	No Flow	No Flow	No Flow	No Flow
9	Civil Mill Drain	7.4	140.0	260.8	83.2
10	Power House Drain	7.4	123.4	220.0	73.0
11	Sen Nursing Home Drain	7.4	128.4	213.2	73.3
12	Drain No. 12A	No Flow	No Flow	No Flow	No Flow
13	Drain No. 14	7.5	93.8	144.0	51.2
14	Barapulla Drain	7.4	90.6	166.4	53.6
15	Maharani Bagh Drain	7.4	153.6	255.2	88.2
16	Kalkaji Drain	7.39	144.29	232.29	72.71
17	Sarita Vihar Drain (Mathura Road)	7.5	154.2	258.2	90.9
18	Tehkhand Drain	7.6	179.6	280.6	101.9
19	Tuglakabad Drain	7.6	149.0	265.0	93.3
20	Drain Near LPG Bottling Plant	No Flow	No Flow	No Flow	No Flow
21	Drain Near Sarita Vihar Bridge	7.6	156.2	254.6	95.0
22	Shahdara Drain	7.5	252.4	408.0	147.9
23	Sahibabad Drain	7.5	269.8	413.0	158.8
24	Indrapuri Drain	7.7	286.0	433.6	158.8

Source: Delhi Pollution Control Committee.

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).

4.6 **Status of Sewerage Network in Unauthorised 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 notified in 561 colonies and the work is in progress in 595 colonies. In 512 colonies, sewer network is yet to be laid (as on 30.11.2020).

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

- Sewage Generation – 720 MGD
- Functional Sewage Treatment Plants (STPs) – 35 (at 20 Locations)
- Capacity of 35 Functional STPs – 597 MGD (83% of Sewage generation)
- Treatment of Sewage (as on 31.08.2020) – 530 MGD (88% of Installed Capacity & 74%of Sewage Generation)
- Gap between Sewage Generation & Installed Capacity (as on 31.08.2020) – 123 MGD (17 %)
- Gap between Sewage Generation & Treatment (as on 31.08.2020) – 190 MGD (26 %)
- Sewage Treatment Capacity after completion of Proposed Projects (ISP, Rehabilitation / Upgradation of 12 STPs & New STPs at Coronation Pillar & Okhla) – 707 MGD (By 31.12.2022)

[597 (Existing Capacity) + Additional 40 MGD after construction of New Coronation Pillar STP + Additional 30 MGD after construction of New Okhla STP + Additional 20 MGD at Rithala Phase I + Additional 20 MGD at Nilothi Phase II]

List of 35 Functional Sewage Treatment Plants (STPs) & their capacities are given in statement 8.6:

Statement 8.6

FUNCTIONAL SEWAGE TREATMENT PLANTS (STPS) OF DELHI JAL BOARD IN DELHI

S.No.	Location of STP	Phase wise break up	Capacity in MLD (MGD)
1	Okhla	Phase-II	54.55 (12 MGD)
		Phase- III	168.2 (37 MGD)
4.8		Phase-IV	204.57 (45 MGD)
		Phase-V	72.74 (16 MGD)
		Phase-VI	136.38 (30 MGD)
2.	Rithala	Phase-I	90.92 (20 MGD)
		Phase-II	181.84 (40 MGD)
3.	Kondli	Phase-II	113.65 (25 MGD)
		Phase-IV	204.57 (45 MGD)
4.	Keshopur	Phase -I (New)	54.55 (12 MGD)
		Phase-II	90.92 (20 MGD)
		Phase-III	181.84 (40 MGD)
5.	YamunaVihar	Phase-I	45.46 (10 MGD)
		Phase-II	45.46 (10 MGD)
		Phase-III	113.65 (25 MGD)
6.	Vasant Kunj	Phase-I	10 (2.2 MGD)
		Phase-II	13.64 (3 MGD)
7.	Mehrauli	-	22.73 (5 MGD)
8.	Coronation Pillar	Phase-I & II	90.92 (20 MGD)
		Phase-III	45.46 (10 MGD)
9.	Narela	-	45.46 (10 MGD)
10.	Nilothi	Phase-I	181.84 (40 MGD)
		Phase-II	90.92 (20 MGD
11.	Najafgarh	-	22.73 (5 MGD)
12.	Pappankalan	Phase-I	90.92 (20 MGD)
		Phase-II	90.92 (20 MGD)
13.	Sen Nursing Home Nallah	-	10 (2.2 MGD)
14.	Delhi Gate Nallah	Phase-I	10 (2.2 MGD)
		Phase-II	68.19 (15 MGD)
15.	Rohini	-	68.19 (15 MGD)
16.	Ghitorni	-	22.73 (5 MGD)
17.	Kapashera	-	22.73 (5 MGD)
18	Chilla	-	40.91 (9 MGD)
19.	Common Wealth Games	-	4.55 (1 MGD)
20.	Molar Bandh	-	3 (0.66 MGD)
	Total	**35 STPs at 20 Locations**	**2715.14 MLD (597.26 MGD)**

- 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.

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 8.7

MAJOR DRAINS OUT FALLING IN TO THE RIVER YAMUNA

Major Drains Out 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.eNajafgarh & Shahdara are included in Interceptor Sewer Proj ect & 108 sub drains are to be trapped
b) Individual STPs are proposed at the mouth of Mori Gate (9.51MGD) 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 30.04.2022.

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 8.8

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	March , 2022	Plant has already been mad e operational as per existing parameters.
2.	Kondli STP Phase I, II & III	45 MGD [10+25+10]	Phase–I, December,2021 Phase-II December, 2022 Phase-III December,2021	Contract awarded.
3.	Rithala STP Phase I	40 MGD	December,2022	
Construction of New STPs				
4.	Existing STPs at Coronation Pillar Phase- I, II & III	30 MGD [10+10+10]	March, 2021	A New 70 MGD (318 MLD) Capacity STP at Coronation Pillar is under construction & after commissioning capaci ty will be enhanced by 40 MGD.
5.	Existing STPs at Okhla Phase I , II, III & IV	124 MGD [30+12+37+ 45]	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 (12 STPs)	**249 MGD (1132MLD)**		**Capacity - 289 MGD (By 31.12.2022)**

4.11 In-situ Bioremediation / Phytoremediation of Sewage in Drains

As per the orders of Hon'ble NGT dated 05.03.2020 in OA No. 06/2012 in the matter of Manoj Mishra Vs Union of India & Ors. an Integrated Drain Management Cell (IDMC) has been constituted vide order dated 17.03.2020 under the chairmanship of Chief Secy, Delhi for remediation and management of all drains of Delhi. IDMC is having members from all the Drain Owning Agencies (DOAs) in Delhi and Chief Executive Officer, DJB is the Member Secretary of IDMC. Regular meetings of IDMC are held and Drain Owning Agencies (EDMC & DCB) have submitted their action plan & started implementation. The waste water in Kushak Nala running through NDMC areas is under bio-remediation and the parameters like BOD, TSS, COD are being monitored. Delhi Cantonment Board has already started implementation of bioremediation plan w.e.f. 11.06.2020. Rest of the Drain Owning Agencies have submitted their status of action plan and the same alongwith other issues are being monitored by IDMC.

4.12 Sewage and Fecal Sludge Management (Septage Management) :

For proper collection, treatment and management of the Fecal Sludge (Septage) from the Septic Tanks mainly located in the unsewered areas / un authorized colonies / settlements etc , the Septage Management Regulations have been notified by the Urban Development Department, GNCTD on 12.11.2018. As per the said Notification necessary action is to be taken by Delhi Jal Board, District Magistrates and Local Bodies / Municipal Corporations. As per the information provided by DJB, total 333.6 MLD of septage was received and treated by DJB till 30.11.2020. Total 208 tankers have been authorized by DJB for collection of Septage till 30.11.2020.

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

- As per the orders of Hon'ble NGT there is Environmental Compensation of ₹ 5000 on dumping of Pooja Material/ Flowers etc and ₹ 50,000 on the dumping of Construction Material /Malba in 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 ₹ 50,000.

- 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.
- 155 water bodies have been taken up by Delhi Jal Board for revival/rejuvenation. Works have been awarded in repect of 46 Water Bodies. Work on creation of 04 new lakes at Dwarka WTP, Sector-25, Rohini WWTP and Timarpur oxidation ponds is in progress, where treated effluent will be utilized for ground water recharge.DJB will also be reviving 3 other water bodies namely Satpula Lake,Roshnara Lak and Tihar Lake.

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:

(i) 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 from Wazirabad to Jaitpur on both banks is to be carried out. Work for reinstallation of bollards along with Geo–reference was awarded on 29.08.2019. The flood plains from Wazirabad to ISBT and from Sun Dial to Dhobighat was marked. 90 % work for demarcation of flood plains completed by August, 2020. 100 Nos. bollards for demarcation on Yamuna River Flood area have already been framed. 600 Nos. bollards for the entire stretch from Wazirabad barrage to Okhla barrage have already been installed.

(ii) Engagement of Private Security to Stop Illegal Dumping : Private security has been engaged by DDA to stop illegal dumping & 120 Nos. of Security Guards have been deployed by DDA in this regard.

(iii) Installation of Electronic Surveillance System: The work for installation of 102 Nos. CCTV Cameras at 34 Locations from Wazirabad to Jaitpur to check the illegal dumping of Malba into the Yamuna Flood Plain has already been awarded. 36 No's Cameras have been installed at 12 Locations. CCTV cameras have been installed by DDA from Old Railway

Bridge to Yamuna Bank Metro Station, Khijrabad and MCRs at Geeta Colony, at Golden Jubilee Park and Khijrabad.

(iv) Removal of Encroachment from the Flood Plain: Out of 1026 Jhuggis / Structures existing of nearly 11.0 Acres of land in Okhla, Khijrabad and Jogabai 600 Jhuggis have been removed and 5.00 Acres of land has been reclaimed.

(v) Use of Technology like Artificial Intelligence for Aerial Mapping etc.: Possibility of Using Technology like Artificial Intelligence, Aerial Mapping etc. or Drones to keep a track of quantum and location of debris being dumped is being explored by DDA. An Electronic Surveillance System with patrolling along with a static party has been deployed by DDA. For monitoring of encroachments on vacant land using satellite imageries the subject has been taken up with ISRO and DDA has signed MOU with ISRO
on 6th July, 2018. If successful, will be implemented in monitoring of Yam una River Flood Plain.

(vi) Restoration and Rejuvenation of the Floodplains of River Yamuna :DDA is going ahead with the Restoration and Rejuvenation of the 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 Colony.

4.16 Ban on Idol Immersion :

Public immersion was not allowed during Ganeshotsav 2020 as well as Durga Pooja 2020. Immersion in Yamuna/ Water bodies was banned. Devotees performed idol immersion at home in a bucket. DPCC issued directions on 13.08.2020 regarding Ganeshotsav 2020 and for Durga Pooja on 22.10.2020.

4.17 Effluent Management :

- **Approved Industrial Areas** - **28** [About 28000 Industries/Units & About 1500 ETPs in these Industrial Areas]
- **Waste Water Generation** from Industries/ Units in 28 Approved Industrial Areas - **About 36 MLD**
- **Common Effluent Treatment Plants(CETPs)** - **13** [212.3 MLD (46.7 MGD)] Capacity for 17 Approved Industrial Areas]
- **Waste Water Received at CETPs** - **About 55 MLD**

List of 13 Common Effluent Treatment Plants (CETPs) in Delhi alongwith their capacities is given in statement 8.9 :

Statement 8.9

COMMON EFFLUENT TREATMENT PLANTS (CETPS) IN DELHI

S. No.	Name of CETP	Name of CETP Society/ Operator of CETP	Industrial Areas Connected with CETP	Capacity (in MLD)	Flow (in MLD) (Aug,2020)
1	**Narela CETP**	PNC Delhi Industrial Infra Pvt. Ltd.	Narela Indl. Area	22.5	11
2	**Nangloi CETP**	DSIDC & Udyog Nagar CETP Society	Nangloi & Udyog Nagar Indl Areas	12	2.82
3	**Mayapuri CETP**	Mayapuri Industrial Area CETP Society	Mayapuri Indl Area	12	1.7
4	**Naraina CETP**	Naraina Industrial Area CETP Society	Naraina Indl Area	21.6	4.24
5	**Bawana CETP**	Bawana Infra Development Pvt. Ltd	Bawana Indl.Area	35	20.0
6	**Badli CETP**	Badli Industrial Estate CETP Society	Badli Industrial Estate	12	2.2
7	**Okhla CETP**	Okhla Industrial Area CETP Society	Okhla Indl. Area	24	1.6
8	**SMA CETP**	North West Industrial Area CETP Society	SMA, Rajasthani Udyog Nagar and SSI Industrial Areas	12	1.78
9	**GTK Road CETP**	GTK Road Industrial Estate CETP Society	GTK Road Indl. Area	6	1.5
10	**Wazirpur CETP**	Wazirpur Industrial Pollution Control (CETP) Society	Wazirpur Indl Area	24	2.4
11	**Lawrence Road CETP**	Keshav Puram Industrial Area (KESPIA) CETP Society	Lawrence Road Indl. Area	12	1.5
12	**Jhilmil CETP**	Jhilmil and Friends Colony Industrial Area CETP Society	Jhilmil and Friends Colony Indl. Areas	16.8	2.9
13	**Mangolpuri CETP**	Mangolpuri Industrial Area CETP Society	Mangolpuri Indl. Area	2.4	1.12
		Total		**212.3**	**54.76**

- 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.

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.

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 8.10 :

Statement 8.10

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	272	72	11144
2	Area (in Sq. Km)	636	656.91	105.98	42.67	42.8	1484.36
3	Population(in Lakh)	90	70	50	2.57	1.332	213.902
4	No. of Wards	104	104	64	14 (Circles)	8	294
5	No. of House Holds (in Lakh)	16.5	1.61532	10.5	0.47558	0.10060	29.19150
6	No. of Dhalaos	632	539	304	Nil	Nil	1475
7	Processing of Waste in TPD (in %)	2400* (53%)	1850 (51%)	700 (26%)	272 (100%)	37 (51%)	5259 (47%)
8	Disposal of MSW in Land Fill/Dump Sites	2100 (47%)	1750 (49%)	2000 (74%)	Nil	35 (49%)	5885 (53 %)
9	Operational Engineered Sa nitary Land Fill(SLF)	One (at Bawana)	None (Proposed at Tehkhand)	None	-	-	One Operational & One proposed
10.	Operational Waste to Energy Plant	One (at Bawana - 2000 TPD)	One (at Okhla -1950TPD)	One (at Ghazipur– 1300 TPD)	-	-	3 (5250 TPD)
11	Operational Centralised Compost Plants	One (at Bawana)	One (at Okhla)	-	-	-	2
12	Operational Decentralised Bi omethanation Plant	2 (5TPD each)	3 (5TPD each)	1 (5TPD)	Nil	Nil	6 (Capacity – 30 TPD)
13	Operational Decentralised Composter Plants	3 (1 TPD each)	3 (1 TPD each)	9 (1 TPD each	2 (1TPD each)	2 (0.125 TPD + 0.05 TPD	19 (Capacity – 17.175 TPD)

* Excluding about 400 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 Land Fill. This Integrated Solid Waste Management Facility is being operated by M/s Delhi MSW Solutions Ltd. 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 is proposed to be developed by East Delhi Municipal Corporation (SDMC) in joint venture with NTPC at Ghonda Gujran. Besides other facilities the said facility will be having Waste to Energy Plant (Bio-methanation Plant).There is one Centralised Compost Plant at Okhla with 200 TPD capacity.

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 about 2000 TPD is proposed at Tehkhand and another in the Integrated Waste Complex at Ghonda Gujran. After commissioning of these 2 proposed WTEs capacity of WTE Plants will increase from 4550 TPD to 7750 TPD by December, 2021.

The brief of the existing operational Waste to Energy Plants in Delhi is given in following Table:

Statement 8.11

EXISTING OPERATIONAL WASTE TO ENERGY PLANTS IN DELHI

S. No.	Waste to Energy Plant & Name of Operator	Existing Capacity	
		Waste Processing (inTPD)	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 8.12
PROPOSED WASTE PROCESSING FACILITIES & SANITARY LAND FILL IN DELHI

S. No.	Particulars	Location	Local Body	Capacity	Expected Timeline for Completion
1.	Waste to Energy Plant	Tehkhand	SDMC	2000 TPD	December, 2021
2.	Integrated Waste Management and Energy Generation Facility	Ghonda Gujran	EDMC	2000 TPD	Sept, 2022
3.	Engineered Sanitary Landfill (SLF)	Tehkhand	SDMC	-------	Sept, 2021
4.	Integrated Waste Collection Segregation, Transportation, Processing & Disposal	3 Zones of North DMC (City – SP, Karol Bagh & Narela Zone)	North DMC	2000 TPD	December, 2021

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 away with. The details of the decentralized plants already commissioned and those at different stages of commissioning are as follows:

Statement 8.13
WASTE MANAGEMENT FACILITIES UNDER LOCAL BODIES

DMC's	Operational Plants		To be Commissioned	
	Composter Plants (1 TPD)	Bio-Methanation Plants (5TPD)	Composter Plants (1 TPD)	Bio-Methanation Plants (5TPD)
NORTH DMC	3 (at Bhorgarh Nursery, Rajendra Nagar Nursery and Maurya Enclave at Pitampura)	2(at Roshanara Bagh and MVID Hospital)	3 (at Sector 11 Rohini, Haiderpur Water Treatment Plant and Mori Gate) to be commissioned **by January, 2021**	2 Plants (at Mangolpuri Industrial Area Phase I and Naraina Industrial Area to be commissioned **by January, 2021**
EAST DMC	9	2 (at Geeta Colony & Shastri Park)	1 Plant (at Gokalpur) **by January, 2021**	-
SOUTH DMC	3(at Chirag Delhi, Punjabi Bagh Nursery and Near Lady Sriram College, East of Kailash)	3 (at SaritaVihar, Dwarka Sector 14 and Punjabi Bagh Nursery.)	1 (at Dwarka Sector 14) **by January, 2021**	1(at MasoodPur in Vasant Kunj) **by January, 2021**

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.
- 13 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 27 Tons per day of Bio-Medical Waste is generated and treated in Delhi. 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 mentioned 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 In order to dispose of the e-waste in environment friendly manner, collection centres and recyclers have been identified in NCT of Delhi and NCR regions to whom authorizations have been granted by CPCB. The list of collection centres and recyclers is available on DPCC website.

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 2019-20	
Type of Unit	**Number of units**
Producer (Bags/sheets/Multilayered & Like)	161
Recyclers	315
Plastic Raw Material/ Producers	364
Total	**840**

c. Carry bags made of virgin or re-cycled plastic less than 50 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. In compliance to Hon'ble NGT order dt. 10.08.2017 consolidated status of action taken report in respect of seizure of less than 50 micron till 25.11.2020 shows that 1.94 lakh kg of less than 50 micron plastic carry bags have been seized, 7964 challans have been issued and ₹ 1.996/- crore have been collected as environmental compensation.

- 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.

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 (Jahangirouri-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 7th level of 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 15,794 Complaints have been received on Green Delhi App (as on 26.12.2020) out of which 14,394 has been resolved by 28 Agencies and only 8.9% 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 cover 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 w.e.f. 02/11/2020 financial assistance increased from ₹ 2.00 lakhs per acre to ₹ 2.55 lakhs per acre for parks and gardens maintenance 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 2019-20 and 2020-21**

- During the year 2019-20 financial assistance for maintenance of parks and gardens provided for area measuring 578.38 acres with the participation of 435 RWAs /NGOs covering 1797 No of parks. And for the financial year 2020-2021 up to 12.01.2021 DPGS provided for area measuring 144.63 acres with the participation of 87 RWAs /NGOs covering 406 No of parks.

Target For 2020-21

- During the financial year 2020-21, DPGS intends to cover 2200 parks covering an area of 600 acres with the participation of 550 RWAs /NGOs.

Free Distribution of Plants From DPGS Nursery:-

- During 2019-20; 1,80,528 plants were procured / raised and maintained in DPGS Nursery and distributed for plantation. During the financial year 2020-21 up to December, 2020; 1,98,852 plants were procured / raised and maintained in DPGS Nursery and distributed for plantation

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. During the year 2019-20, only 08 applications seeking financial assistance for this purpose have been received which are under process.
- DPGS also provides technical support to other agencies in the greening activities.

9. FOREST IN DELHI

9.1 The Delhi government is making sustained efforts to enhance the green cover in Delhi with aim to maintain a balance between ecology and development. The vegetation of Delhi is thorny scrub, which is found in the arid and semi-arid zone.

9.2 The green cover of Delhi is increasing year after year on the lines of National Forest Policy, 1988 which stipulates that a minimum of 1/3rd of the total land area of the country should be under forest or tree cover. Taking the above in view, the Govt. of NCT of Delhi is making all endeavors to meet the national goal as set by the Central Govt. 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 8.14

FOREST AND TREE COVER AREA OF DELHI 1997-2019

(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	10.2
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

Source: State Forest Report, 2019

9.3 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 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 324.44 sq km in 2019 increasing thereby the share of forests in the total area to 21.88 per cent. The growth of forests and tree cover has particularly been monumental post-1997. Of the total 324.44 sq km of forest area in NCT of Delhi, nearly 298 sq km has been added during the period 1997 to 2019. Forest and tree cover of Delhi has increased by 6.23% or 19.03 sq km, as compared to the assessments conducted in 2017.

Statement 8.15

FOREST AND TREE COVER IN DELHI in 2019

(Area in Sq Km)

S. No	FOREST AND TREE COVER	*2019 Assessment*
1	Geographical Area	1483
2	Very Dense Forest	6.72
3	Moderate Dense Forest	56.42
4	Open Forest	132.30
5	**Total Forest**	**195.44**
	Per cent of the Geographical Area	**13.18**
6	**Tree cover**	**129**
	Per cent of the Geographical Area	**8.69**

Source: State Forest Report, 2019

9.4 It may be observed from Statement 8.14 that the growth of forest and tree cover area of Delhi increased from 26 Sq. Km in 1997 to 324.44 Sq. Km in 2019. 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 21.88 per cent in 2019..

9.5 The State Forest Report 2019 reveals that Very Dense Forest cover has more than 70% canopy, medium dense forest cover has a canopy of 40% to 70%. These are the actual carbon sinks. Increase or constant form of such dense forests is a good sign as it increases a city's capacity to sequester carbon. It is the open forests with a canopy cover of 10% to 40% covers 132.30 sq. km in Delhi.

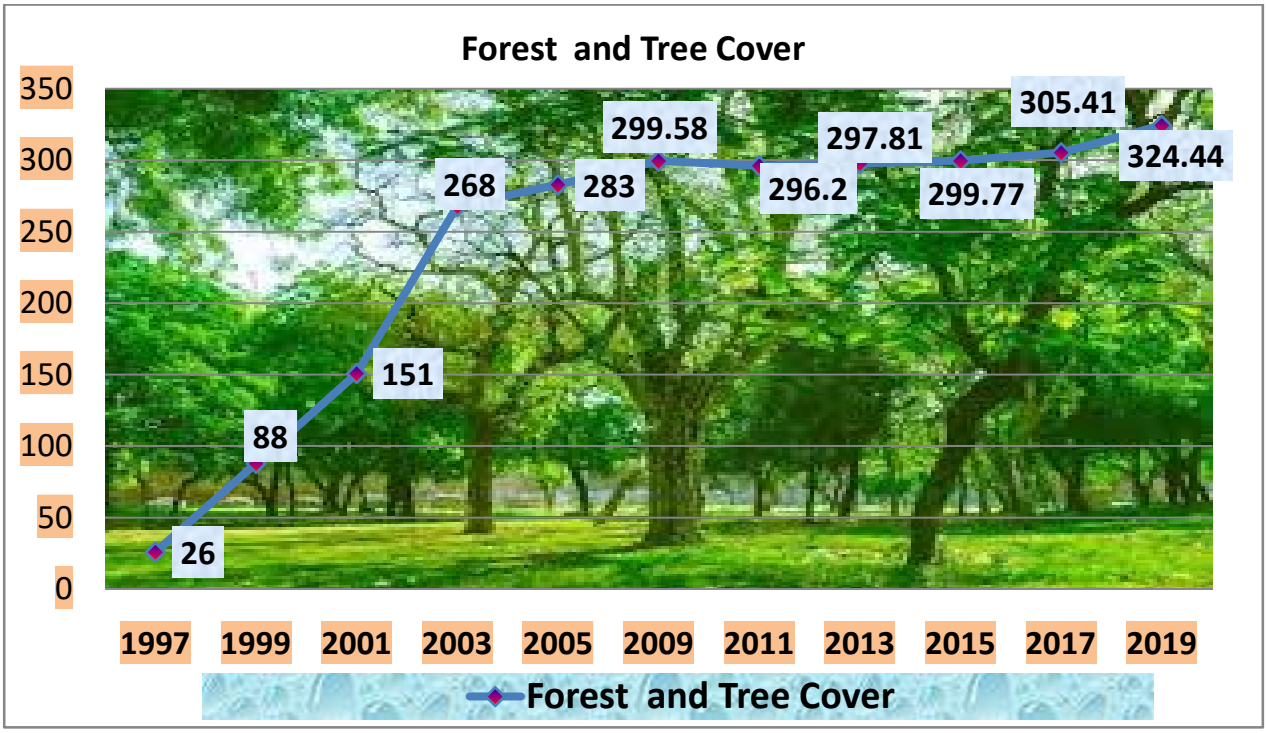
9.6 Some trees had to be felled because of construction projects such as the Dwarka Express(by NHAI), General pool accommodation at Thyagraj Nagar & Mohammadpur, development of STPs at Kondli & Rithala, DMRC projects at Airport & West Delhi,etc . In all the projects cleared during 2019-20, number of trees to be felled/transplanted have been rationalized for minimizing loss of existing green cover in Delhi. Further at the same time, afforestation drives were also undertaken. The new plants have not been accounted for as they are too small to have their canopy. They would only come under the medium dense forest or very dense forest after a period of five to 10 years at least.

9.7 The report says that Delhi’s addition of 3.03 sq km of forest, mostly through open forest cover, is because of plantation and conservation activities.

9.8 As far as tree cover is concerned - sparse vegetation along roads or small-scale plantations - Delhi has the second-highest tree cover as a percentage of the total geographical area among states. The overall increase in Delhi's

green cover is a good sign. Delhi's green cover has increased from around 20.59% from 2017 to 21.88% during 2019.

Chart 8.4
FOREST AND TREE COVER AREA OF DELHI 1997-2019



9.9 The information regarding the district-wise forest cover area and total geographical area of Delhi is presented in Statement 8.16.

Statement 8.16
DISTRICT-WISE FOREST COVER IN DELHI - 2019

(Sq. Km)

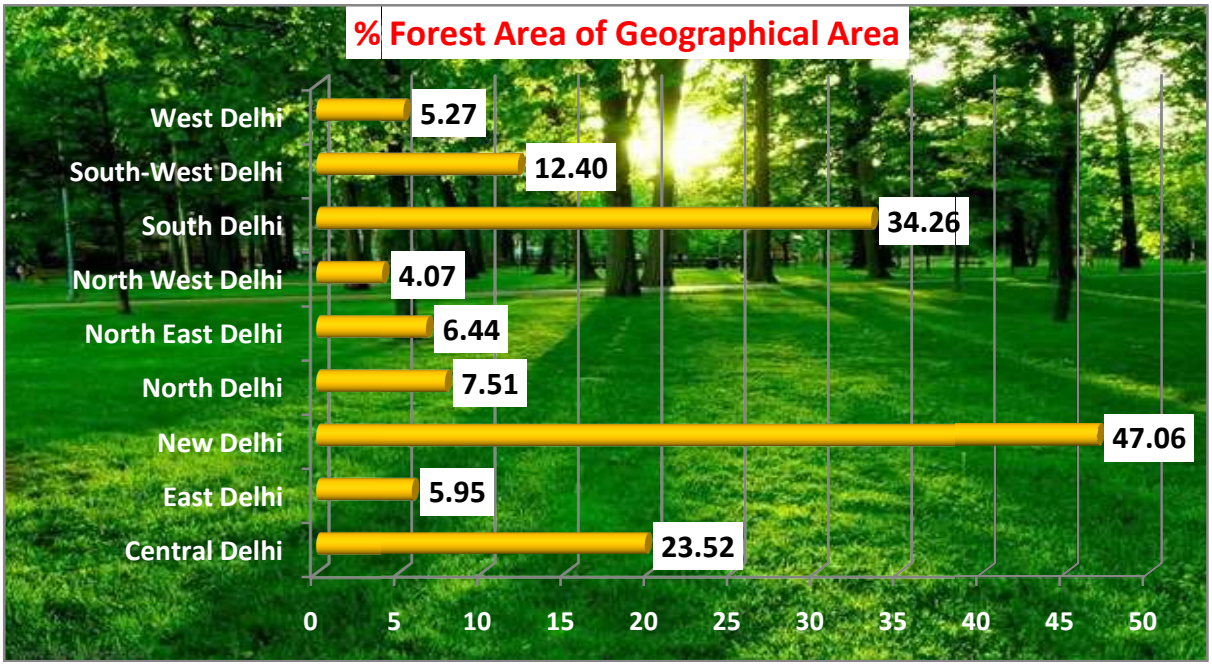
S. No.	Districts	Geographical Area	Forest Cover Area	% of Geographical Area
1.	Central Delhi	21	4.94	23.52
2.	East Delhi	63	3.75	5.95
3.	New Delhi	35	16.47	47.06
4.	North Delhi	61	4.58	7.51
5.	North East Delhi	62	3.99	6.44
6.	North West Delhi	443	18.04	4.07
7.	South Delhi	247	84.63	34.26
8.	South-West Delhi	421	52.19	12.40
9.	West Delhi	130	6.85	5.27
	Total	**1483**	**195.44**	**13.18**

Source: State Forest Report, 2019

9.10 It may be inferred from Statement 8.16 that the forest cover area of Delhi is 195.44 sq. km i.e. 13.18 per cent of the total area of Delhi. South Delhi constitutes the highest forest cover area at 84.63 sq. km, South West Delhi at 52.19 sq. km, North West Delhi at 18.04 sq. km, New Delhi at 16.47 sq. km, respectively. On the contrary, the lowest forest cover observed in East Delhi at 3.75 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 %AGE FOREST COVER OF GEOGRAPHICAL AREA IN DELHI – 2019



Forest Cover within Green Wash:

Very Dense Forest	3.19 sq. km
Moderately Dense Forest	16.05 sq. km
Open Forest	39.83 sq. km
Sub Total	59.07 sq. km

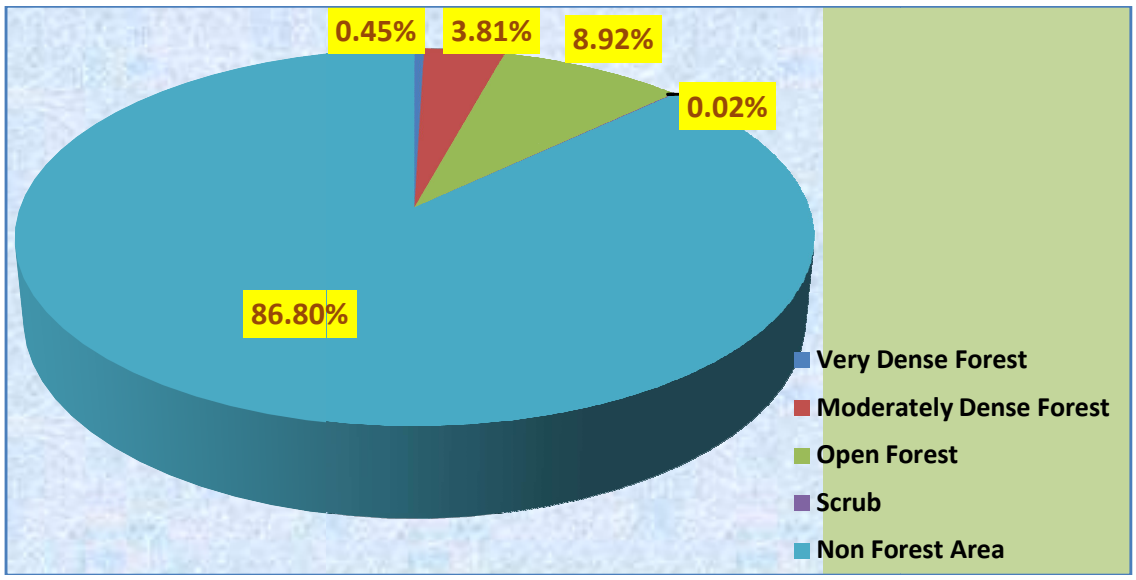
Forest Cover outside Green Wash:

Very Dense Forest	3.53 sq. km
Moderately Dense Forest	40.37 sq. km
Open Forest	92.47 sq. km
Sub Total	136.37 sq. km
Total Forest Cover	195.44 sq. km
Tree Cover	129 sq. km
Total Forest & Tree Cover	324.44sq. km
Of State's Geographical Area	21.88%
Of India's Forest & Tree Cover	0.04%
Per Capita Forest & Tree Cover	0.002 ha

9.11 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 3.81 per cent, an open forest is spread over 8.92 per cent and scrub is spread over 0.02 per cent, which is almost negligible.

Chart 8.6

COMPOSITION OF FOREST COVER (%AGE) IN NCT OF DELHI IN 2019



Source: State Forest Report, 2019

9.12 Tree Outside Forest:

Apart from 188.07 sq km forest and tree cover there are 136 sq km of green cover in the form of Trees Outside Forest with area less than 1 ha. This has come up as the result of plantations in campuses of public institutions, roadside plantation, and plantation by public at large.

9.13 Wetlands within Forest

Statement 8.17

WETLANDS INSIDE THE RECORDED FOREST AREA (OR GREEN WASH) IN DELHI

Wetland Category	No. of Wetlands	Total Wetland Area
Inland Wetlands Natural		
Lake/Pond	1	2
Inland Wetlands -Man-made		
Wetlands (<2.25 ha)	16	16
Total	**17**	**18**

Total Recorded Forest (or Green Wash) Area (in ha)	10,204
% of Wetland area inside Recorded Forest (or Green Wash) Area	**0.18%**

(Analysis based on the National Wetland Atlas: India, 2011)

9.14. Type of Forests and Major Species

9.14.1 Vegetation of Delhi is typical Northern Tropical Thorn Forest Type (Champion & Seth 1968). Among trees Acacias such as A. nilotica, A. leucophloea, A. catechu, A. modesta, Butea monosperma (Dhak), Cassia fistula, Salvadora persica and Anogeissus latifolia with an abundance of Prosopis juliflora.

9.14.2 Shrubs include Capparis sepiaria, Zizyphus mauritiana, Herbaceous flora is Calotropis procera, Withania somnifera, Achyranthes Aspera, Tridax. Main grasses are Cenchrus ciliaris, Aristida, Eragrostis, Saccharum spontaneum, Diehanthium, Cynodondactylon etc.

10. Asola Bhatti Wild Life Sanctuary

10.1 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.

Figure: Creation of Checkdams in Asola Bhati by Department of Forest and Wildlife, GNCTD

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

10.2.1 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.

10.2.2 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

11. Major Achievements :

11.1 During 2019-20

a) Massive tree plantation drive was conducted during 2019 involving 19 greening agencies, eco-clubs and RWAs for plantation of 21.15 lakh tree saplings. In addition to this, 4.57 lakh seedlings have been distributed among public. Government of NCT Delhi has exceeded the target of 10.01 lakh projected by Government of India.

b) City forests at Mitraon Pocket-B, Shashtri Park near Colony and Garhi Mandu Pocket A2 have been developed in 2019-20. City Forests at Taj Enclave and Alipur were improved to increase the awareness for green area among local residents as large numbers of people residing in the area go to these forests for recreation in a clean and green environment. Development of City Forest at Mamoorpur, ITO chungi, Aya Nagar, Jaunapur, Dera Mandi and Chhatterpur are also being developed for opening up for general public.

c) Department of Forest is being strengthened for effective protection of Forest in Delhi:
   i) 147 security guards have been deployed in entire Forest area of NCT, Delhi.
   ii) Recruitment of 215 posts of Rangers, Wildlife Guards and Foresters have been initiated.
   iii) GIS cell has been established for effective monitoring of Forest boundaries and assets of Forest Department.

d) Eco-restoration of habitat through Eco-Task Force in Asola Bhatti Wildlife Sanctuary has been done by carrying out plantation of 2.71 lakh saplings and low-cost engineering structures to improve the soil moisture regime.

e) Ridge Management Board has approved plan for eco restoration of Central Ridge

11.2 During 2020-21 (Till December, 2020)

f) Massive tree plantation drive was conducted during 2020 involving 19 greening agencies, eco-clubs and RWAs for plantation of 30.08 lakh tree saplings which includes 5.57 lakh seedlings that have been distributed among public. In this way, Government of NCT Delhi has exceeded the target of 15.2 lakh projected by Government of India.

g) The Govt. of National Capital Territory of Delhi, has approved the "**Tree Transplantation Policy 2020**" for National Capital Territory of Delhi. The "Tree Transplantation Policy 2020" is aimed to start conservation of existing trees at planning stage of project for minimizing the loss of existing green cover and initiating discussions at early stage of planning of projects for minimizing the felling of trees. Additionally, this policy provides for transplantation of trees found suitable for the same if felling cannot be avoided.

h) Eco-restoration of habitat through Eco-Task Force in Asola Bhatti Wildlife Sanctuary has been done by carrying out plantation of more than 1.2 lakh saplings and low-cost engineering structures to improve the soil moisture regime.

i) 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, Deputy Forest Ranger, Foresters, Forest Guard, Wildlife Guard and other Forestry Staff. More than 41.31 Ha of Forest Area have been retrieved from encroachment in current year.

Chart 8.7

FOREST COVER MAP OF DELHI