CHAPTER 8

ENVIRONMENTAL CONCERNS

The rapid rise in the population and speedy economic development has raised the concern for the environmental degradation in Delhi. Due to unplanned growth, Delhi has become one of the most polluted cities in India in term of air pollution, carrying one of the country's highest volumes of particulate matter pollution in its funnel. Unprecedented scale and speed of urbanization in Delhi and consequent pressure on physical and social infrastructure has created damaging stress on the living environment and resulted in an increased level of pollution. 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 Agriculture burning in the NCR and neighbouring states in the month which does not favour 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.

1.1 To reduce air pollution, Graded Response Action Plan (GRAP) along with Comprehensive Action Plan (CAP) and 41 directions issued by CPCB under Air Act are being implemented by the Civic Agencies, Transport Department., Urban Development Department, Traffic Police and Pollution Control Committee of Delhi. Apart from this, various Court and NGT directions are being complied. Air Pollution Control is being monitored at GNCTD as well as the Government of India level.

1.2 Water pollution contribution is due to the discharge of untreated industrial and municipal wastes in the drains and river. The river is so contaminated that it is classified in the category E which makes its water non-suitable for utilization.

1.3 Excessive ground water exploration has made Recharging of ground water the need of the hour. The Government is emphasizing on rainwater harvesting to compensate for the losses incurred due to the exploration of water necessary guidelines in this regard are issued from time to time.

1.4 Besides Air and Water Pollution, Hazardous Waste, Bio-medical Waste, Construction & Demolition and Electronic Waste are other upcoming serious threat to the environment. These are increasing with urbanization and economic development in the city. To mitigate environmental degradation, the Government took steps to increase the Green cover of the state by promoting Green buildings for the conservation of water and reduction in the generation of solid and liquid waste. This chapter dwells upon the various dimension of pollution including sources, past and present status and efforts made to reduce the pollution level in Delhi.

1.5 Strict enforcement of various environmental norms by the Central Pollution Control Board and Delhi Pollution Control Committee led to virtual closure of large factories in Delhi and shifting of the number of smaller industrial units in neighbouring states. It is evident that garbage collection remains the most

disappointing area of housing services. Garbage collection and disposal is vital to the concept of an inclusive city as it threatens the living environment with acute health hazard possibilities. It goes without saying that the poor and other vulnerable sections bear the maximum brunt of an unhealthy environment.

1.6 This chapter dwells upon the various dimension of pollution including sources, past and present status and efforts made to reduce the pollution level in Delhi.

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. There are several prominent sources within and outside Delhi contributing to PM_{10}, $PM_{2.5}$ and NO_2 in ambient air; these pollutants can be taken as a surrogate of other pollutants also, as most of the pollutants coexist and have common sources. Year-wise annual mean ambient air quality levels in Delhi during 2001 to 2018 (Till November) is presented in Statement 8.1.

Statement 8.1

AMBIENT AIR QUALITY LEVELS IN DELHI: 2001-2018 (Till November, 2018)

S. No	Years	Ambient Air Quality (µg/m^3)			
		SO_2	NO_2	CO	RSPM (PM_{10})
1.	2001	14.1	41.8	4183	150
2.	2002	11.3	50.8	3258	192
3.	2003	9.5	55.8	2831	170
4.	2004	9.3	57.4	2581	160
5.	2005	8.8	55.9	2541	168
6.	2006	8.8	55.9	2541	168
7.	2007	4	38	2460	161
8.	2008	5	43.1	2461	201
9.	2009	5	47.3	1768	248
10.	2010	5	46	1937	249
11.	2011	15	66	2020	281
12.	2012	18.2	82.4	2020	293
13.	2013	20.1	77.5	2100	282
14.	2014	16.9	79	1700	318
15.	2015	17.6	73	1618	268
16.	2016	19.9	70.2	2090	290
17.	2017	23.36	73.55	2130	263
18.	2018 (Till Nov.)	17.66	64.06	1880	314
	Standard	**50**	**40**	**2000**	**60**

Source: - Department of Environment, GNCTD/CPCB & DPCC

2.2 The values for 2001 to 2010 are of the monitoring stations of CPCB while the values of 2011 to 2018 are of the monitoring station network developed by Delhi Pollution Control Committee. Presently, 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 / controlling the pollution level since the past few years.

2.3 **Sulphur Dioxide (SO_2)**: No significant variation was observed in the annual city average value between 2011 to 2018 (till Nov.). The values monitored were always within the prescribed limits of 50µg/m^3 at all stations.

2.4 **Nitrogen Dioxide (NO_2)**: Annual city average of NO_2 concentration has shown the marginal decrease as compared to the year 2011. The highest annual average was observed in 2012 (82.4 µg/m^3). In 2018 (till Nov.), the average value was 64.06 µg/m^3. At all the monitoring locations annual city average exceeded the prescribed standard of 40 µg/m^3.

2.5 **Carbon Monoxide (CO)**: Annual city average of CO concentration has shown the decrease as compared to the year 2011. In 2018 (till Nov.), the city average value was 1.88 mg/m^3. At all the monitoring locations annual city average is within the prescribed standard of 2 mg/m^3 except Anand Vihar.

2.6 **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.

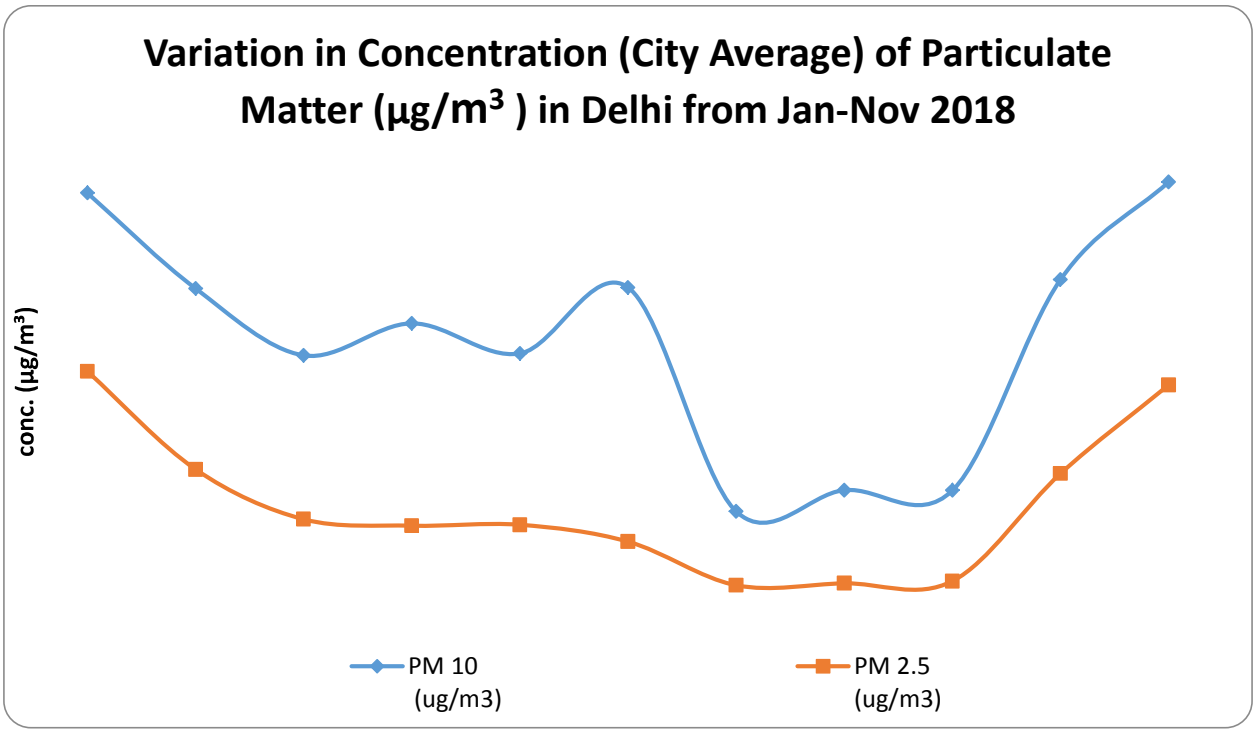
2.7 **Particulate Matter (PM_{10})**: Annual city average of PM_{10} varied from 2011 to 2018 (till Nov.) by 281 µg/m^3 to 314 µg/m^3. At all the monitoring locations annual city average exceeded the prescribed standard of 60 µg/m^3.

2.8 **Particulate Matter ($PM_{2.5}$):** Annual city average of $PM_{2.5}$ varied from 2011 to 2018 (till Nov) by 130 µg/m^3 to 140 µg/m^3. At all the monitoring locations annual city average exceeded the prescribed standard of 40 µg/m^3.

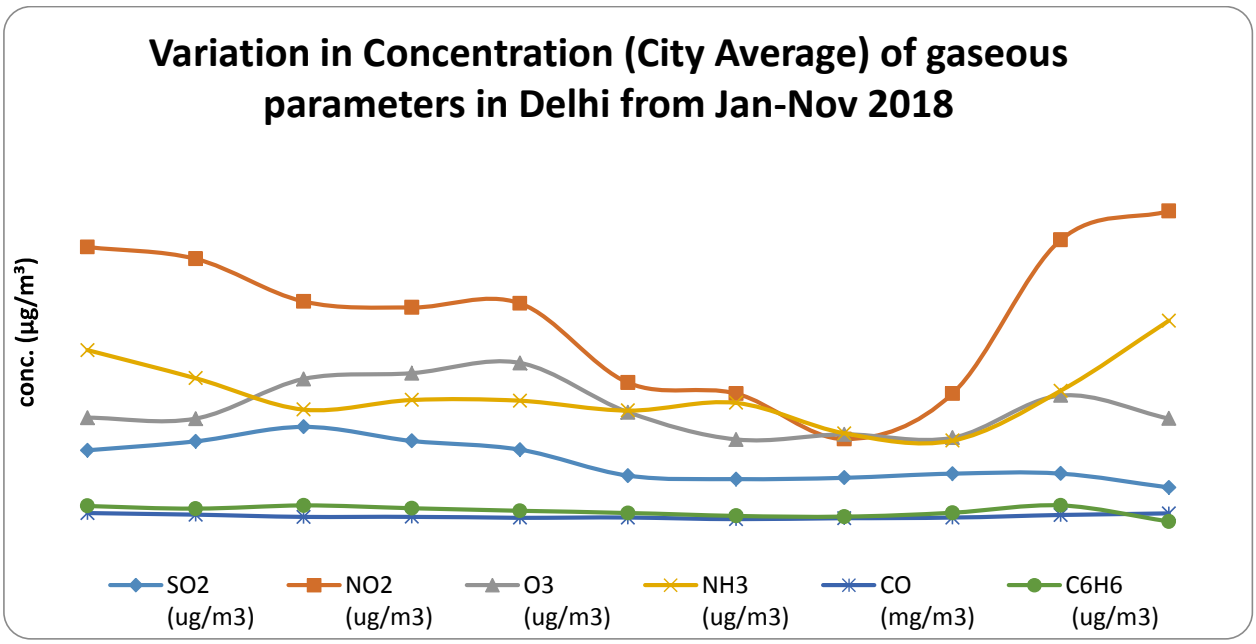
2.9 **Ozone (O_3):** Annual city average of O_3 varied from 2011 to 2018 (till Nov.) by 57 µg/m^3 to 35 µg/m^3.

Chart 8.1

VARIATION IN CITY AVERAGE OF CRITICAL POLLUTANTS AT FOUR STATIONS IN DELHI (µg/m^3) FOR THE YEAR 2018 (Till Nov)



Source: Delhi Pollution Control Committee (DPCC)
* Till Nov 2018



Source: Delhi Pollution Control Committee (DPCC)
* Till -Nov, 2018

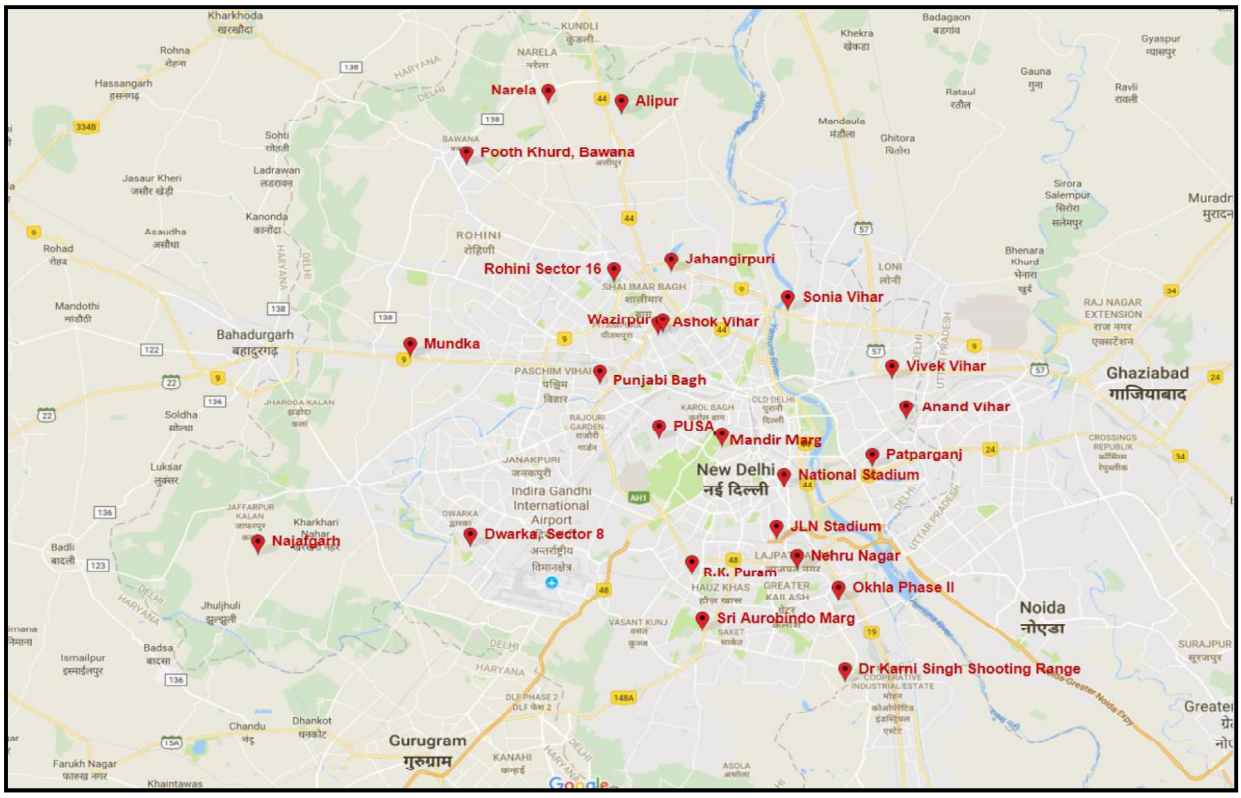
2.10 Keeping in view deteriorating ambient air quality in Delhi and need to implement area specific interventions, Government has decided to augment

the Ambient Air Quality monitoring infrastructure by installing 20 new state-of-the-art Continuous Ambient Air Quality Monitoring Stations in Delhi. The old network has only six stations of DPCC and by this addition, Delhi has a network of 26 stations operated by DPCC. 20 Continuous Ambient Air Quality Monitoring Stations (CAAQMS) were inaugurated on 09.11.2017:

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, Bakoli
2	Jawahar Lal National Stadium.	15	NIT&RD, Mehrauli
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	AnandVihar
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	Mahrshi Valmiki Hospital,PoothKhurd	26	Airport



2.11 National Ambient Air Quality Standards fixed by the Central Pollution Control Board are presented in Statement 8.3

Statement 8.3
NEW NATIONAL AMBIENT AIR QUALITY STANDARDS

S. No	Pollutant	Residential, Industrial, Rural & Other Areas		Ecologically Sensitive Areas	
		24 Hourly Standard * ($\mu g/m^3$)	Annual Standard * ($\mu g/m^3$)	24 Hourly Standard* ($\mu g/m^3$)	Annual Standard* ($\mu g/m^3$)
1.	SO_2	80	50	80	20
2.	NO_2	80	40	80	30
3.	PM_{10}	100	60	100	60
4.	$PM_{2.5}$	60	40	60	40
5.	Ozone	$180^{\#}$	$100^{\#\#}$	$180^{\#}$	$100^{\#\#}$
6.	Lead	1.0	0.50	1.0	0.50
7.	NH_3	400	100	400	100
8.	CO	$04^{\#}$	$02^{\#\#}$	$04^{\#}$	$02^{\#\#}$
9.	As	-	06	-	06
10.	Benzene	-	05	-	05
11.	BaP Particulate phase only	-	01	-	01
12.	Ni	-	20	-	20

Source: Delhi Pollution Control Committee (DPCC)

* Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at a uniform interval.

** 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be compiled with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

$^{\#}$ 1 Hourly, $^{\#\#}$8 Hourly.

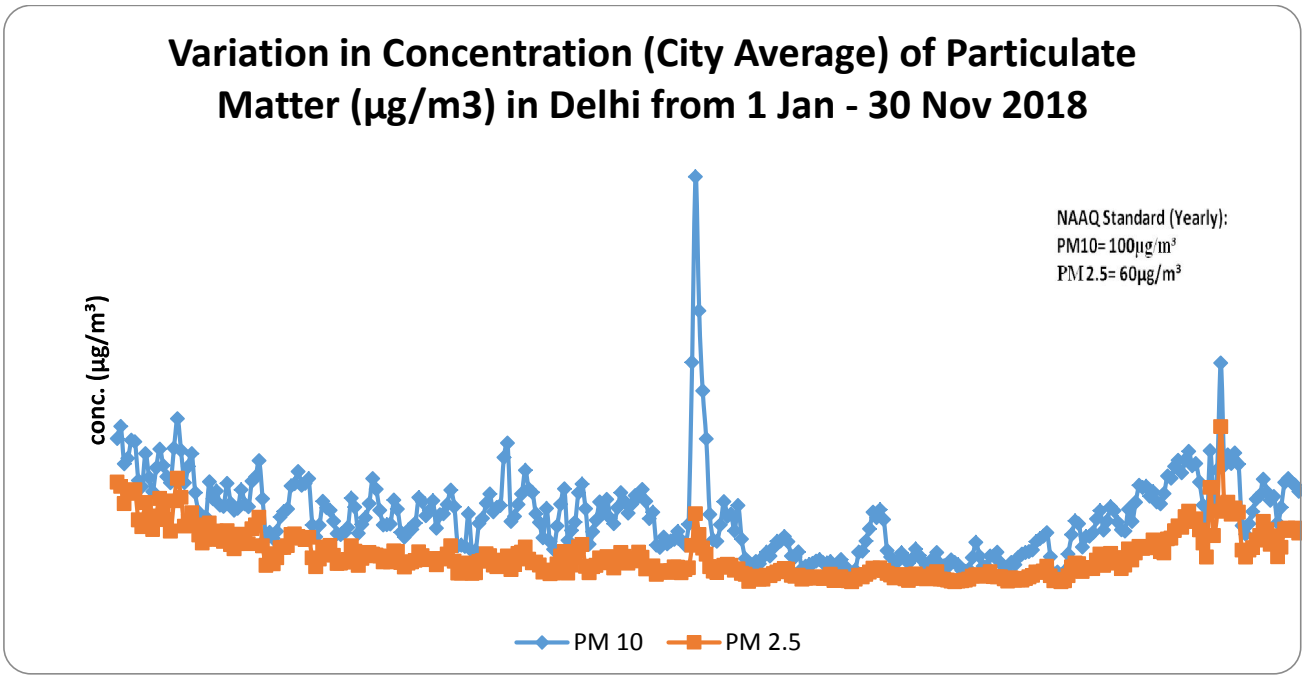
2.12 **Comprehensive study on Air Pollution:** A study entitled "Comprehensive study on Air Pollution and Green House Gases in Delhi" was got concluded through IIT Kanpur by Department of Environment, GNCTD, & DPCC for studying various measures to improve the quality of air.

2.13 **Air Pollution Control:**

The city of Delhi faced dust storms between 12th June till 17th June 2018. Chart 8.2 shows the variation in the concentration of $PM_{2.5}$ and PM_{10} from 1st January to 30th Nov 2018. The average concentration was 116 µg/m³ and 264 µg/m³ respectively for $PM_{2.5}$ and PM_{10}. This period consists of winter and summer in Delhi. $PM_{2.5}$ and PM_{10} both recorded a declining trend though isolated peaks were observed. The 1st peak of PM10 was recorded from 12th June to 16th June when the concentration of PM_{10} reached up to 1511 µg/m³ on the 13th of June. However, $PM_{2.5}$ reached up to 271 µg/m³ on the same day. When Delhi faced severe Dust storm like conditions from 12th June to 17th June 2018. It may be attributed to the windblown dust from the Rajasthan.

The 2nd peak was observed on 8th Nov due to Diwali, when the concentration of PM_{10} reached up to 825 µg/m³. However, $PM_{2.5}$ reached up to 591 µg/m³ on the same day. The higher values in January and February can be attributed to lower mixing height and other meteorological conditions like calm condition, low temperature etc.

CHART 8.2



Source: Delhi Pollution Control Committee (DPCC)
* Till Nov

2.14 In view of the importance and magnitude of the problem, the issue of Air Pollution Control was reviewed at different levels both in Govt. of India and Govt. of NCT of Delhi.At Govt. of India, Principal Secretary to Prime Minister, Hon'ble Minister and Secretary, Ministry of Environment Forests and Climate Change, Govt. of India, Chairman (EPCA), Chairman (CPCB) have been reviewing the Air Pollution Control measures to be taken at short, medium and long term measures. At Govt. of Delhi level, periodical meetings have been held at the level of Office of Hon'ble Lt. Governor, Hon'ble Minister (Environment), Chief Secretary, Delhi and Secretary (Environment), Govt. of Delhi.

2.15 **Implementation of Graded Response Action Plan (GRAP) In Delhi:** So far, due to the bad Air Quality, three times GRAP provisions of severe plus category had been invoked on 8.11.2017, 14.6.2018 and 01.11.2018.

2.16 **GRAP under Very poor category was invoked from 15.10.2018 till 15.03.2019 with following directions:**

- Increasing bus and metro services by augmenting contract buses and increasing frequency of service.
- Increase the frequency of mechanized cleaning of road and sprinkling of water on roads. Identify road stretches with high dust generation.
- Residential Welfare Associations and individual house owners to provide electric heaters during winter to security staff to avoid open burning by them.
- Alert in newspaper/TV//Radio to advise people with respiratory and cardiac patients to avoid polluted areas and restrict outdoor movement
- Stop use of diesel generators sets.
- Shut down Badarpur Power Plant as of October 15, 2018.
- Take steps to maximize the generation of power from existing natural gas-based plants to reduce the operation of coal-based power plants in the NCR.

2.17 **Further following Directions of EPCA issued with effect from 1st Nov 2018:**

- All construction activities involving excavation, civil construction (excluding internal finishing/work where no construction material is used) to remain closed in Delhi and other NCR districts from November 1-10, 2018.
- All stone crushers, hot mix plants generating dust pollution to remain closed in Delhi and other NCR districts from November 1-10, 2018.
- All industries using coal and biomass as fuel(excluding thermal and Waste to Energy Plants) to remain closed in Delhi and other NCR districts from November 4-10, 2018. Industries that use natural gas as fuel can continue to operate.
- Direct transport department/traffic police to intensify checking of polluting vehicles and control traffic congestion in Delhi and other NCR districts during November 1-10, 2018. There should be no tolerance for visibly pollution vehicles. This will require stringent monitoring and on-spot fines for visibly polluting vehicles.
- Intensify patrolling, including night patrolling in industrial areas and other 'hot spots' in the city so that there is complete control on waste burning as well as industrial emissions. EPCA has already brought to your attention that it has found many cases of waste burning and industrial emissions, which is a gross violation of GRAP conditions.
- Intensity efforts for interrupted power supply in NCR towns to avoid the requirement of operating DG sets and inconvenience to the public.

- Publish in newspapers and disseminate widely the following information for the general public:
- The need for the public to minimize exposure and also advice people to minimize their travel using private vehicles as much as possible.
- Enumerate and list all actions that have to be taken under GRAP, so that people are informed and can act as stakeholders in the efforts to control pollution.
- Publish a list of penalties that have been imposed and actions were taken against people/industries found polluting. This information will provide deterrence and help improve enforcement.

EPCA also directed for stoppage of Trucks from 8th Nov to 12th Nov 2018. EPCA in agreement with CPCB task force on 12th Nov 2018 allowed construction activity only during day time between 6 am to 6 pm.

2.18 **This was followed by EPCA directions on 24.12.2018**:

1. Industries located in hotspot industrial areas (Wazirpur, Mundka, Narela, Bawana, Sahibabad, Faridabad) to remain closed until December 26, 2018.
2. Construction activities in Delhi, Faridabad, Gurugram, Ghaziabad and Noida to remain closed till December 26, 2018.
3. Traffic Police to deploy special teams and ensure congestion free traffic flow particularly in identified high traffic corridors.
4. Concerned police department to strictly ensure that non-destined heavy duty vehicles travel through eastern and western peripheral expressways.
5. Concerned agencies to ensure strict action against illegal industries.
6. Agencies must intensify ground actions and make all efforts to control polluting activities, particularly waste burning.

2.19 **To control air pollution, the following Order was issued by DPCC on 31.12.2018**:

1. Appeal to be issued to all parents by the Education Department for avoiding outdoor activities by the children.
2. DTC and Transport Department to intensify public transport services.
3. DMRC to increase the frequency of service of Delhi Metro.
4. Municipal Corporations and PWD to intensify mechanical road sweepings and the sprinkling of water.
5. Municipal Corporations to stop the use of fire wood and coal in hotels and eateries. However, wood charcoal is allowed, as wood charcoal is approved fuel in NCT of Delhi for use in tandoors and grills of Hotels/ Restaurants/ Banquet Halls/ Eating Houses having emission channelization/ control system

as per Gazette Notification no. F. No. DPCC/RDPC/141/2017/3692 dated 29.06.2018.

6. Municipal Corporations, DPCC and Industries Department to enforce a ban on the use of unauthorized fuel like pet coke and furnace oil.
7. DPCC, SDMs, Municipal Corporations and Industries Department to strictly enforce a ban on the use of electricity generator sets with exceptions as defined by DPCC for essential services.
8. Municipal Corporations, DDA and SDMs to strictly enforce the prohibition on open burning.
9. Municipal Corporations, DPCC and PWD to impose fine/penalties on all road construction agencies/contractors, where there are inadequate dust control measures.

2.20 **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**: Government has undertaken special drive of inspections to prevent air pollution due to the burning of leaves/garbage in open areas.

i. To receive the public complaints in order to stop the burning of Garbage/ Waste material/ Leaves, Delhi Pollution Control Committee (DPCC) has opened "whatsapp account with mobile number 9717593574" and "9717593501". Complaints received on WhatsApp Nos. 9717593501 & 9717593574 of DPCC (including complaints of CPCB Teams) received as on October 2018 – 1833.

ii. 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.

iii. For prohibition of the burning of dry leaves/garbage/plastic, etc. Municipal Corporation of Delhi (MCDs)/ Delhi Development Authority (DDA) has been asked that if any violation found, concerned S.O. (Horticulture) and Sanitation Inspection will be held responsible personally and action will be taken against them.

iv. Other civic agencies also have imposed fines in respect of violations found at sites.

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. SDMs alongwith Tehsildars (Executive Magistrate), Department of Revenue, Govt. of NCT of Delhi and Assistant Engineer of Public Works department (PWD) have been authorized to take action against violations. The penalty is being imposed in accordance with the directions of Hon'ble National Green Tribunal.

ii. All local bodies and DDA have also been asked to apprise public in general and owners and builders in particular who have got their building plans sanctioned for following dust control measures.

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

iv. DPCC has so far since Jan 2018 has imposed fine to the tune of ₹ 3,55,50,000/- in respect of dust control violation in the year 2018.

Review meetings have been convened with stakeholder departments/ Agencies for the prohibition of burning of leaves, garbage, plastic, rubber etc in open and for taking dust control measures at construction sites.

3. **NGT Orders/Judgments in O.A. No 21/2014** regarding air pollution control are being complied in coordination with concerned departments. As per NGT order dated 18.12.2017, three monthly comprehensive reports in compliance to NGT directions is being filed as per Hon'ble NGT Order dated 27.07.2018 in OA 44/2018 (Earlier OA 21/2014) in the matter of Vardhman Kaushik Vs Union of India.

4. **Air Quality Monitoring Committee (AQMC)**: 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. As per direction contained in the order, said action plan has been prepared by AQMC, Delhi and submitted to CPCB.

5. **Promotion of Battery Operated Vehicles**:- With the view to promote non-polluting e-vehicles, Govt. has announced subsidy schemes for adopting various kinds of e-vehicles such as Two-Wheeler, Four-Wheelers and also e-rickshaws. Owners of newly purchased battery operated 4 wheelers and 2 wheelers are given subsidy by GNCTD, in addition to a subsidy by Govt. of India @ ₹ 2000-5500 for two-wheelers and ₹ 30000/- to 1,50,000/- for four wheelers. One time fixed subsidy of ₹ 30,000/- is given to Battery Operated e-

rickshaw owner, authorized by Transport Department and registered in the NCT of Delhi.

6. **Prohibition on bursting of Firecrackers:** Direction U/S 31(A) of Air (Prevention & Control of Pollution) Act, 1981 read along with Rule 20 A of Air (Prevention & Control of Pollution) (Union Territories) rules, 1983 to ban bursting of fire crackers/ fire works at all times except on religious occasions has been issued on 08.12.2016. Hon'ble Supreme Court issued directions via order dated 23.10.2018 in Writ Petition (Civil) No. 728 of 2015 regarding bursting of Fire crackers. DPCC has printed leaflets containing Supreme Court directions in brief for awareness of the type of firecrackers allowed and harmful effects of the bursting of Firecrackers.

7. **Imposition of Change 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 2017, the green cover of Delhi has increased to about 305.41 sq km from 26 Sq. Km in 1997. The increased green cover also acts as a carbon sink. The 2018-19 target for plantation is set at 32.18 lakh saplings by all greening agencies. Massive Plantation Drive was conducted by the Department of Environment and Forests, GNCTD on 08.09.2018 at Garhi Mandu.

9. **Environmental Marshalls:**

- Environment Department of Delhi Govt. has deployed Home Guard (HG) volunteers as Environmental Marshals. 83 home guards have been deployed in wards of three Municipal Corporations. They have been instructed to act as eyes of Environment Dept./DPCC and report the instances of violations. Environmental Marshals have been deployed for night patrolling also.

Total Cases Reported Dec' 17- Nov' 18	
Total Violation	13528
Cases Resolved at site	12398
Not Resolved	1130

10. **Public Awareness:-**

- Organized workshops for areas under Jurisdiction of North MCD, South MCD and East MCD on "Prohibition on open burning of any kind of material – A Small Step Targeting Big Impact" on 14.06.2017, 14.09.2017 and on 01.02.2018 respectively at Delhi Secretariat. The workshop was for public awareness and interaction with implementing authorities. The officials from North MCD and South MCD i.e. SI/ASI and horticulture wing participated in the workshop along with RWAs, School/Colleges from the areas under the jurisdiction of North and South MCD.

- Every year the Anti-Fire Cracker Campaign is being organised with Eco-Club Schools/Colleges. Noise pollution control workshop is held on 11th July 2018.

- Public notices have been issued on the prohibition on open burning of leaves, waste, garbage, etc.

- Organized workshop for the area under Jurisdiction of North MCD on "Dust Control Measures at construction sites to Control Air pollution" on 09.10.2018.

- An organized awareness workshop on "Beat Plastic Pollution-Phasing out Single Use Disposable Plastics" on 15.10.2018.

2.21 New Initiatives by Delhi Government:

I. Green Budget Implementation:

The Government of Delhi has passed a Green Budget wherein provisions have been made for providing a subsidy to the following:

- Conversion of industries to PNG – Cabinet has approved the policy to offer an incentive to industries in approved industrial areas of upto ₹ 1 lakh to switch over to piped natural gas from existing polluting fuels on 04.09.2018 and DPCC issued office order for implementation.

- Conversion of coal based Tandoors to Gas based - Cabinet has approved the policy to offer a subsidy of upto ₹ 5,000/- per Tandoor to Resturant to replace coal Tandoor with electricity or gas based tandoors on 04.09.2018 and DPCC issued office order for implementation.

Also, a real-time source apportionment study in partnership with the University of Washington is proposed and it will carry out near-continuations analysis of factors causing pollution on a regular basis.

A draft RFP is being prepared to provide a dedicated information system showing current levels of pollution by installing 1000 indoor display panels inside all Governments building that are dealing with the public.

II. Notification issued on Approved Fuel:

The Delhi Pollution Control Committee (DPCC) has issued approved fuel notification on 29.6.2018. As per the notification only approved fuels are permitted to be used which as follows:

1. Petrol (BS VI with 10 ppm Sulphur) as per the Notification of Government of India as amended from time to time.
2. Diesel (BS VI with 10 ppm Sulphur) as per the Notification of Government of India as amended from time to time.
3. Liquid Petroleum Gas (LPG)
4. Natural Gas/Compressed Natural Gas (CNG)
5. Aviation turbine fuel
6. (a) Firewood for crematoriums and for other religious purposes.
   (b)Wood Charcoal for Tandoors and Grills of Hotels/ Restaurant/ Banquet Halls/ Eating Houses having emission channelization/control system.
   (c)Wood Charcoal for use in clothes ironing.
7. Biogas
8. Refuse Derived Fuel (only for Waste-to-Energy Plants)
9. Any other clean fuel notified by the Govt. of NCT of Delhi / Govt. of India, subsequent to this notification.

***Note**:*

1. Besides above, Coal with low Sulphur (less than 0.4%) permitted for use in Thermal Power Plant only.
2. All other fuels will be deemed "unapproved" and so disallowed for use in NCT of Delhi.
3. Existing Industries / Units shall convert/switch over from their existing fuels to the above mentioned Approved Fuels within 90 days from the date of issue of this Notification.

III. Conversion of industries to Piped Natural Gas (PNG):

Total number of industries identified for conversion to PNG from other fuels	**1467**
Total number of industries converted to PNG on 30.11.2018	**1150**
Total number of industries closed for non-conversion to PNG	**317**

2.22 **Future Action Plan of Delhi Government to Tackle the Air Pollution Situation in Delhi:**

I. Augmentation of Solid Waste processing facilities by MCDs:

- By increasing the capacity of Waste to Energy Plant from existing 5100 TPD to 10,300 TPD to take care of the entire waste by establishing new units /capacity addition.
- By increasing the capacity of C & D waste recycling from existing 2650 TPD to 4650 TPD, to take care of the entire C& D waste by establishing new units.
- By establishing smaller facilities to process Bio-degradable waste at decentralized locations of capacity ranging from 1 TPD to 200 TPD.

II. Greening of an unpaved area:

- MCDs, NDMC and PWD have proposed for Greening/paving of central verges/road berms / unpaved.

III. Water Sprinkling on roads:

- MCDs, NDMC and PWD have proposed to augment regular water sprinkling on roads before sweeping by deploying a sufficient number of water tanker with sprinklers.

IV. Public Transport:

- Procurement of 2000 CNG buses
- Procurement of 1000 electric buses
- Last mile connectivity by DMRC - The DMRC has contributed a subsidiary company and procuring feeder buses to serve as last mile connectivity in an organized way.
- DMRC is in process of acquiring additional metro coaches.

2.23 **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:

- The feasibility of providing U-Turn and underpass near borders to turn back the non-destined vehicles trying to enter the city needs to be explored.

- Air quality monitoring stations to be set up in NCR with an online display of data.

- Local bodies and major construction agencies in Delhi have already been directed to use dust suppression methods on the construction sites to reduce the dust emissions. Delhi Police and Department of Transport have been

directed to allow transportation of construction material and demolition waste only in closed and properly covered trucks. 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. Further, it is also requested that any construction material or construction waste carried to Delhi must be transported in closed or properly covered trucks.

- Open burning of garbage in Delhi's neighbouring areas should be strongly discouraged.

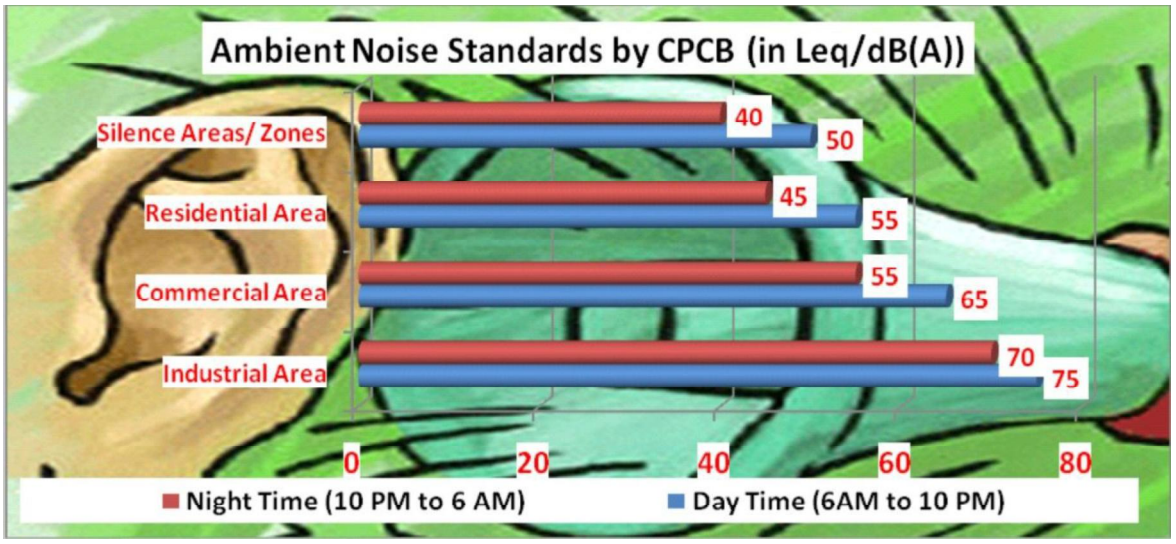
- The practice of burning of paddy stubs in the agricultural zones adjoining Delhi needs to be stopped. Agriculture burning in the NCR and neighbouring states is another major contributor of the particulate and other gaseous pollutants in Ambient Air of Delhi. It is pertinent to mention here that from October to January are crucial months for Delhi, as with onset of winter, the concentration of particulate and gaseous pollutants increase significantly. Agricultural fire in Punjab &Haryana is a major cause, the Aqua satellite of NASA taken the image and shared it in public domain. The images show the cloud of ash spreading almost in the northern belt and especially on Delhi.

2.24 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. Therefore, a strategy needs to be worked out on similar lines by NCR states.

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 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 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 is declared as such by the competent authority.

3.2 A Continuous Noise Monitoring is undertaken at R.K. Puram, Mandir Marg, Punjabi Bagh, Civil Lines and AnandVihar.

Statement 8.4

Monthly Average of Real Time Ambient Noise Levels (Day Time) of January-2018 to October-2018

Month	AnandVihar (dB (A))	Civil Lines (dB (A))	Mandir Marg (dB (A))	Punjabi Bagh (db(A))	R.K.Puram (dB (A))
Jan-18	66.4	61.0	55.0	58.6	59.7
Feb-18	67.1	60.8	56.9	59.7	60.7
Mar-18	67.3	61.0	55.8	59.0	59.3
Apr-18	67.6	60.6	65.0	60.0	61.5
May-18	67.7	60.3	56.3	59.6	60.0
Jun-18	67.4	61.2	56.4	60.7	60.5
Jul-18	66.2	61.8	56.9	60.1	61.5
Aug-18	64.4	61.3	56.5	59.6	61.5
Sep-18	64.8	61.8	56.1	59.8	61.6
Oct-18	64.4	60.9	64.2	58.1	60.3

Monthly Average of Real Time Ambient Noise Levels (Night Time) of January-2018 to October-2018

Month	Anand Vihar (dB (A))	Civil Lines (dB (A))	Mandir Marg (dB (A))	Punjabi Bagh (db(A))	R.K.Puram (dB (A))
Jan-18	63.2	58.1	46.8	51.0	53.1
Feb-18	64.5	58.2	48.2	52.0	54.7
Mar-18	64.3	59.0	49.6	51.2	53.6
Apr-18	65.2	59.0	49.7	53.4	55.3
May-18	64.7	58.8	49.4	54.7	55.2
Jun-18	64.3	59.6	49.5	54.9	55.5
Jul-18	63.4	59.8	52.7	53.1	55.7
Aug-18	61.9	58.6	54.1	51.8	57.0
Sep-18	61.9	58.4	48.5	52.3	54.3
Oct-18	62.0	58.7	67.7	51.4	54.0

Source: Delhi Pollution Control Committee (DPCC)

Yearly Average of Real Time Ambient Noise Levels (Day time)					
Year	**AnandVihar (dB (A))**	**Civil Lines (dB (A))**	**Mandir Marg (dB (A))**	**Punjabi Bagh (db(A))**	**R.K.Puram (dB (A))**
2015	67.8	62.9	57.1	63.4	60.3
2016	67.6	62.7	58.4	59.0	61.0
2017	67.8	62.4	56.8	59.0	60.6
2018 (till Oct)	66.3	61.1	57.9	59.5	60.7

Yearly Average of Real Time Ambient Noise Levels (Night Time)					
Year	**AnandVihar (dB (A))**	**Civil Lines (dB (A))**	**Mandir Marg (dB (A))**	**Punjabi Bagh (db(A))**	**R.K.Puram (dB (A))**
2015	64.9	61.9	50.8	58.9	53.7
2016	65.8	61.3	51.5	54.8	56.1
2017	65.0	60.3	48.5	53.3	54.4
2018 (till Oct)	63.5	58.8	51.6	52.6	54.8

Source: Delhi Pollution Control Committee (DPCC)

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.

4.2 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 April 2017 till March 2018. Recent water quality monitoring reports of river Yamuna indicate that the water quality parameters, BOD & DO, are in the desirable/prescribed norms, with respect to Water Quality criteria of "C" class, at Palla, which is upstream of Wazirabad Barrage. However, the water quality of River Yamuna at the downstream of Wazirabad barrage after the confluence of Najafgarh Drain is not meeting the desirable/prescribed norms.

4.3 The highest annual average of DO is 7.49 mg/l at Palla. The annual average of BOD has ranged from 1.95 mg/l at Palla to 32.45 g/l at Khajuri Pantool Pool. The water quality standards for DO and BOD as per CPCB norms are 4 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 8.5

ANNUAL AVERAGE WATER QUALITY OF RIVER YAMUNA AT DIFFERENT LOCATIONS: JANUARY 2018 – DECEMBER 2018

S.	Locations	pH	COD	BOD	DO
	Water Quality Criteria	6.0-9.0	-	3mg/l	4mg/l
1	Palla	7.51	7.63	1.95	7.49
2	Surghat	7.46	13.81	3.35	6.86
3	KhajuriPaltoon Pool	7.32	97.45	32.45	0.55
4	KudesiaGhat	7.26	84.90	27.63	3
5	ITO Bridge	7.41	76.54	24.45	0.2
6	Nizamuddin Bridge	7.4	77.09	24.36	1.5
7	Agra Canal Okhla	7.4	75.63	24.45	NIL
8	Shahdara (Down Stream)	7.3	96	29.63	0.92
9	Agra Canal Jaitpur	7.39	81.45	25.54	NIL

Source: - Delhi Pollution Control Committee.

Statement 8.6

ANNUAL AVERAGE WATER QUALITY OF DRAINS AT DIFFERENT LOCATIONS IN DELHI: JANUARY 2018 – DECEMBER 2018

S. No.	Measure/Drains	pH	TSS	COD	BOD
	Water Quality Criteria	**5.5-9.0**	**100 (mg/l)**	**250 (mg/l)**	**30 (mg/l)**
1	Najafgarh Drain	7.40	118.36	133.45	44.54
2	Metcalf House Drain	7.33	79.27	79.27	25.27
3	Khyber Pass Drain	7.33	70.90	84.18	26.36
4	Sweeper Colony Drain	7.39	70.72	78	24.90
5	Magazine Road Drain	7.3	127	114.8	37.4
6	ISBT Drain	7.46	96.90	112.36	36.09
7	Tonga Stand Drain	7.43	146	130.18	41.72
8	Moat Drain	No flow	No flow	No flow	No flow
9	Civil Mill Drain	7.33	105.09	125.27	43.09
10	Power House Drain	7.30	110.36	134.90	44.63
11	Sen Nursing Home Drain	7.28	196.72	261.81	89.81
12	Drain No. 12A	No flow	No flow	No flow	No flow
13	Drain No. 14	7.41	76.18	83.81	26.36
14	Barapulla Drain	7.40	129.63	140.72	45.36
15	Maharani Bagh Drain	7.39	224.90	330.18	107.36
16	Kalkaji Drain	No flow	No flow	No flow	No flow
17	SaritaVihar Drain (Mathura Road)	7.50	145.81	129.45	42.18
18	Tehkhand Drain	7.34	169.81	287.09	93.63
19	Tuglakabad Drain	7.49	238.54	261.81	97.54
20	Drain Near LPG Bottling Plant	No flow	No flow	No flow	No flow
21	Drain Near SaritaVihar Bridge	7.32	127.63	155.09	51.09
22	Shahdara Drain	7.36	316.18	389.81	128.68
23	Sahibabad Drain	7.43	326.54	495.27	164.54
24	Indrapuri Drain	7.35	229.45	348.72	113.63

Source: Delhi Pollution Control Committee.

4.4 Water quality monitoring results of the drains indicate that most of the drains are not meeting the standards with respect to Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Total Suspended Solids (TSS).

4.5 As the sewerage system is not provided in unplanned habitats, the wastewater generated in the unplanned area is discharged into drains. Non-utilization of installed capacity of Sewage Treatment Plants is another important issue. Delhi Jal Board has prepared a plan to provide sewerage facilities in unauthorized colonies.

4.6 Delhi Jal Board initiated the process of laying of interceptor sewers along 3 major drains (Najafgarh Drain, Supplementary Drain and Shahdara Drain). Sewage generated from the colonies will be trapped before reaching the major drains and the same would be diverted to the existing unutilized STPs/new STPs.

4.7 Delhi Pollution Control Committee, being pollution control statutory agency and regulator, collects samples of treated effluents from all operational STPs on monthly basis. Deficiencies and analysis reports are sent to the Delhi Jal Board (DJB) for rectification so as to meet the norms stipulated. Effluent Analysis Reports of STPs are also placed on the website of DPCC. Directions have been given to Delhi Jal Board to install an online monitoring system on their STPs.

4.8 Mandatory provision of installation of on-site decentralizes wastewater treatment system (ETP) by Industries, Hotels, Construction Projects etc with treated wastewater reuse in flushing, cooling, horticulture etc. More than 1800 ETPs have been installed so far. Five/four Star Hotels and Hospitals having more than 50 beds have been directed to install Sewage Treatment Plants and most of them have already installed.

4.9 One of the main sources of water pollution is the waste material discharged by industrial units. Waste materials like acids, alkalis, toxic metals, oil, grease, dyes, pesticides etc. are poured into the drains by many industrial units. Some other important pollutants include polychlorinated biphenyl (PCB) compounds, lubricants, etc. The pollutants unloaded into the drains usually dissolve or remain suspended in water. Sometimes, they also accumulate on the bottom of the drains.The industrial wastewater generated in Delhi is more than 40 MGD. All industrial units located in the Industrial Areas having CETPs have been directed to ensure linkage to the conveyance system in Common Effluent Treatment Plants (CETPs). There are 13 functional CETPs for 17 industrial areas in Delhi. Name of CETP along with its capacity is given at statement 8.7.

Statement 8.7

List of Common Effluent Treatment Plants (CETPs) in NCT of Delhi

S. No.	Name of CETP	Capacity of CETP (in MLD)
1.	Jhilmil& Friends Colony Industrial Area CETP	16.8
2	Badli Industrial Estate CETP	12
3	Mayapuri Industrial Area CETP	12
4	Mangolpuri Industrial Area CETP	2.4
5	Wazirpur Industrial Area CETP	24
6	DSIDC Nangloi&Udyog Nagar Industrial Area	12
7	SMA Industrial Area CETP	12
8	Okhla Industrial Area CETP	24
9	Narela Industrial Area CETP	22.5
10	UdyogVihar (Bawana) Industrial Area CETP	35
11	GTK Road Industrial Area, CETP	6
12	Naraina Industrial Area, CETP	21.6
13	Lawrence Road Industrial Area CETP	12
	Total	**212.3 MLD (46.70 MGD)**

4.10 Delhi Pollution Control Committee collects samples of treated effluents from all 13 CETPs on monthly basis. Deficiencies are communicated to the CETPs Societies for rectification so as to meet the norms stipulated. Effluent Analysis Report of CETPs is also placed on the website of DPCC. Directions have been given to CETP Societies/DSIIDC to install an online monitoring system on their CETPs and 9 CETPs have already installed an online monitoring system.

4.11 On-Line Monitoring Of CETPs:

DPCC has issued directions u/s 33(A) of the Water Act, 1974 to all CETPs to install online monitoring system and transmission of information simultaneously to CPCB & DPCC server. Out of 13 CETPs, 09 have installed OLMS. DPCC has been provided URL, Username and Password in respect of 09 CETPs. Remaining 04 CETPs are being pursued to install the same as soon as possible. All the CETPs are monitored regularly by DPCC. Analysis reports are placed on the website of DPCC in public view.

4.12 Industries in Non-Conforming / Residential:

As per Hon'ble Supreme Court judgment dated 7.5.2004 in [WP (C) No. 4677/ 1995 M.C. Mehta Vs UOI & Others] regarding closure/ shifting of the unauthorized/ illegal/ non-conforming industries in Non-conforming/ Residential areas of Delhi and as per the decision taken in meeting of Monitoring Committee on 13.09.2018, necessary closure action in entire non-conforming/ residential area is to be taken by concerned land owing agency i.e. Municipal Corporations of Delhi, DDA as case may be.

4.13 Regulation and Management of Ground Water

Hon'ble Lt. Governor issued directions under section 5 of Environment (Protection) Act, 1986 which were notified on 12 July 2010 and as amended to date, for regulation and management of groundwater drawl from new and existing borewells/ tubewells in the entire City. Delhi Jal Board and NDMC have been given respective area wise powers for granting permission based on the recommendation of Advisory Committees headed by Deputy Commissioner (Revenue) of the concerned district.

4.14 River Rejuvenation Committee:

Hon'ble National Green Tribunal in its order dt. 20.09.2018 passed in OA No. 673/2018 IN THE MATTER OF: NEWS ITEM PUBLISHED IN 'THE HINDU' AUTHORED BY SHRI. JACOB KOSHY Titled "More river stretches are now critically polluted: CPCB" had issued specific directions for the constitution of a River Rejuvenation Committee (RRC).

RRC has to make an action plan will include components like identification of polluting sources including the functioning/status of STPs/ETPs/CETP and solid waste management and processing facilities, quantification and

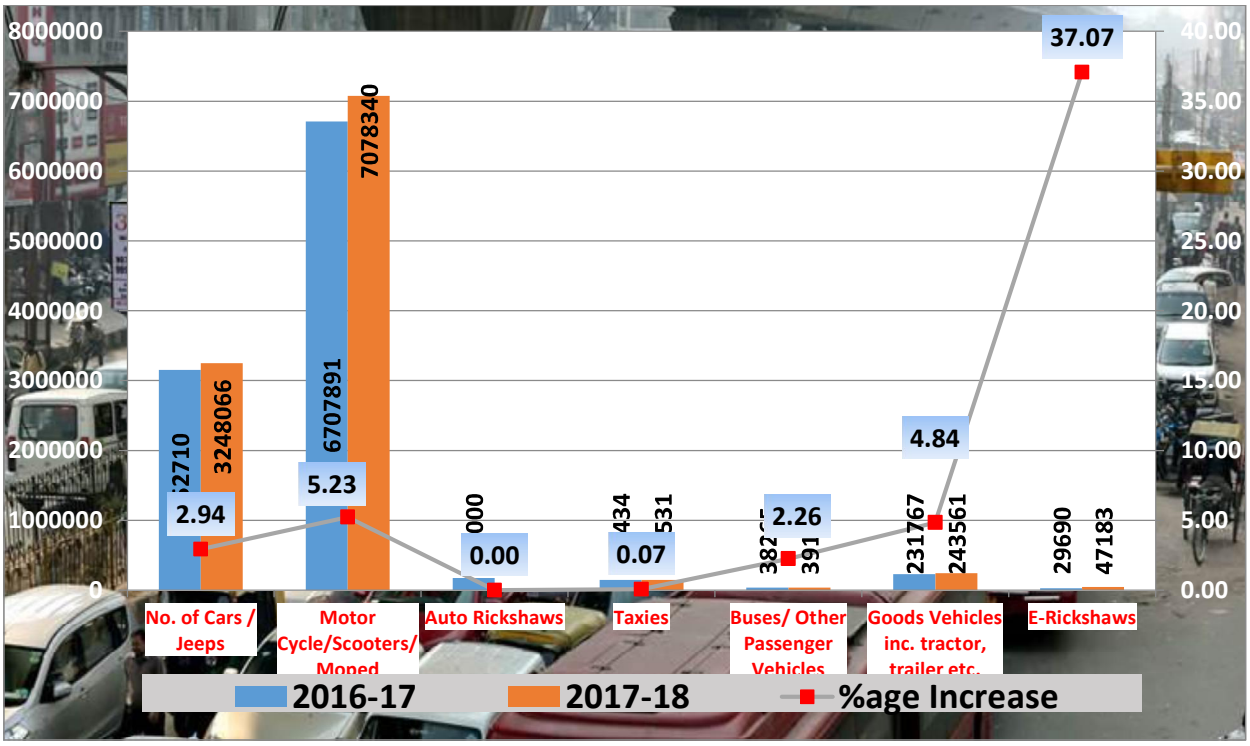
characterisation of solid waste, trade and sewage generated in the catchment area of polluted river stretch. The action plan will address issues relating to groundwater extraction, adopting good irrigation practices, protection and management of Flood Plain Zones (FPZ), rainwater harvesting, groundwater charging, maintaining the minimum environmental flow of river and plantation on both sides of the river. Setting up of biodiversity parks on flood plains by removing encroachment shall also be considered as an important component for river rejuvenation. The action plan should focus on proper interception and diversion of sewage carrying drains to the Sewage Treatment Plant (STP) and emphasis should be on utilization of treated sewage so as to minimize extraction of ground or surface water.

5. Vehicular Pollution

5.1 The vehicle emission and their contribution to ambient air concentration is significant to PM_{10} and $PM_{2.5}$ both in winter and summer. The number of vehicles registered in Delhi has increased from 31.64 lakh in 1999-2000 to 109.86 lakh in 2017-18. During the same period, the percentage of increase was observed in all categories of vehicles i.e. cars & jeeps; motorcycles & scooters, auto-rickshaws, buses and goods vehicles. This has automatically enhanced the pollution levels of Delhi by the emission of pollutants by these vehicles. There were 103.83 lakh registered vehicles in Delhi in 2016-17 which increased to 109.86 lakh in 2017-18. The increase in various Vehicles in Delhi in 2017-18 as compared to 2016-17 is shown in chart 8.4

Chart 8.4

REGISTERED VEHICLES IN DELHI 2016-17 AND 2017-18



5.2 Govt. of NCT of Delhi through Delhi Pollution Control Committee provides following financial subsidy on newly purchased Battery Operated Four Wheelers and Two wheelers due to which e-Rickshaws were introduced in 2016-17:

S. No.	Type of Vehicles	Cost of Vehicles (base price)	Subsidy is given by Govt. of Delhi (in ₹)
1.	4 Wheeler	Up to 5 lakhs	30,000/-
2.	4 Wheeler	More than 5 lakhs	1,50,000/-
3.	2 Wheeler	Up to 20,000/-	1,000/-
4.	2 Wheeler	More than 20,000/- but less than 25,000/-	2,000/-
5.	2 Wheeler	More than 25,000/-	5,500/-

5.3 Financial subsidy is provided from the Air Ambient fund, created by levying 25 paise per litre of Diesel (Diesel Case) with the objective of utilizing the collect amount towards clean environment movement including promotion of environment-friendly vehicles/non-polluting vehicles in Delhi. One time fixed subsidy of ₹ 30,000/- is also provided to battery operated e-rickshaw owners, authorized by Transport Department and registered in NCT of Delhi w.e.f. 01.04.2016. Initially the subsidy amount w.e.f. 01.04.2015 was ₹ 15,000/-. An individual can claim subsidy only on one e-rickshaw. On subsequent purchase by the same individual, no subsidy is allowed. The subsidy is given by DPCC from Air Ambience Fund.

5.4 12,609 number of beneficiaries have been provided with a subsidy for Battery operated vehicles during 2017-18.

6. Waste Management

6.1 Municipal Solid Waste

6.1.1 In Delhi, 5 Municipal Authorities are responsible for Municipal Solid Waste Management in the respective areas of their jurisdiction. Ministry of Environment, Forests and Climate Change, GOI has notified the revised Solid Waste Management Rules 2016. The responsibility of the management of Municipal Solid Waste has been entrusted with the Urban Development Department and Urban Local Bodies.

6.1.2 There are 4 landfill sites namely Bhalaswa landfill site (since 1993), Ghazipur landfill site (since 1984), Okhla landfill site (1994) and Bawana landfill site (Developed as Engineering Landfill Site and operating since 2011). In the

absence of availability of landfill sites, all the 5 Municipal Bodies are also using the first 3 sites for disposal of Municipal Solid Waste though these are not Engineering Landfill Site.

6.1.3 There are 2 Compost Plants in Delhi one at Okhla (operated by M/s IL & FS, Capacity 200 Tons per day) and another one at Bawana (operated by M/s Delhi MSW Solutions Ltd., Capacity 1500 Tons per day)

6.1.4 In addition, there are 3 Waste to Energy Plants in Delhi as per the details:

Existing/ proposed Waste to Energy Plant	3 Nos. Existing (5100 TPD Capacity) 2 Nos. New + 2 nos. Expansion (5200 TPD proposed Capacity) **North DMC** 2000 TPD at Bawana + 1500 TPD New at Bhalaswa (by 31.08.2020) **South DMC** 1800 TPD at Okhla + 500 TPD expansion at Okhla (by October, 2019) + 2000 TPD New at Tehkhand (by October, 2019). 6 TPD as a decentralized plant by 30.11.2018. 02 Nos of 200 TPD Biogas plants at Nangli Dairy and Goyla Dairy colony Najafgarh have been conceived by SDMC. **East DMC** 1300 TPD at Ghazipur + 1200 TPD expansion at Ghazipur (by 31.12.2018) 245 TPD as decentralized plant by 31.03.2019.

6.1.5 Ministry of Environment, Forests and Climate Change, GOI has notified the revised Solid Waste Management Rules 2016 on 08.04.2016. The responsibility of the management of Municipal Solid Waste has been entrusted with the Urban Development Department and Urban Local Bodies. All Municipal Corporations have been directed to prepare a Solid Waste Management Plan with activity timelines ranging from 8-16 months.

6.2 Biomedical Waste

6.2.1 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 25 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.

6.2.2 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.

6.3 Electronic Waste

6.3.1 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.

6.3.2 CPCB has issued Guidelines on e-waste management also in 2016. These are available at http://cpcb.nic.in/displaypdf.php. 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.

6.4 Plastic Waste

6.4.1 Plastic waste especially carry bags has been creating nuisance in Delhi despite over 12 years of massive awareness campaign "Say No To Plastic Bags". Hon'ble High Court of Delhi had passed a judgment in August 2008 for imposing a ban on plastic carry bags in main markets, local shopping centers, etc. subsequent to which Government of Delhi had issued a notification on 07.01.2009, but the situation continued to worsen even after three years of issue of this notification. In light of this, Government of Delhi has imposed a ban on manufacture, sale, storage, usage, import and transport of plastic carry bags in NCT of Delhi vide Notification dated 23.10.2012.

6.4.2 This notification has been challenged in the Hon'ble High Court of Delhi by All India Plastic Industries Association and on 05-12-2016; Hon'ble High Court of Delhi has transferred this matter to the Hon'ble NGT for further decision. Besides, Ministry of Environment, Forests and Climate Change, GOI has notified revised Plastic Waste Management Rules 2016 on 18-03-2016. These rules entrust the responsibility of plastic waste management with the Urban Development Department and the Urban Local Bodies.

6.4.3 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. And as per order dated 01.08.2018, in OA

4(THC)/2017, Hon'ble NGT has adjourned the matter sine die since some issues are pending with the Hon'ble Supreme Court to decide.

6.5 Construction and Demolition Waste

6.5.1 There are following two operational Construction and Demolition Waste Processing Plants of M/s IL&FS in Delhi

(i) Construction and Demolition Waste Processing Plant at Burari (Capacity – 2000 tons/day).
(ii) Construction and Demolition Waste Processing Plant at Shastri Park (Capacity – 500 tons/day). The unit is enhancing its capacity from 500 tons/day to 1000 tons/day.

Construction and Demolition waste details:

Existing Waste Generation	= 3900 TPD (North DMC= 2000 TPD, South MCD= 1000 TPD, East MCD = 700 TPD, NDMC= 150 TPD, DCB= 50 TPD)
Existing Processing Facility	3 Nos. (2650 TPD Capacity) (2000 TPD at Burari - by North DMC, 500 TPD at ShastriPark by EDMC, 150 TPD at Ranikhera - by DMRC)
New/ expansion Processing Facility	3 Nos. (3000 TPD Capacity) (500 TPD at Bakarwala and 1000 TPD at Maidangarhi by South DMC, **1000 TPD at Ranikhera by North MCD,** 500 TPD at Shastri Park by EDMC & 500 TPD at Libaspur by PWD.) **South DMC:** • Work in progress for 500 TPD (Expandable up to 1000 TPD) at Bakarwala. This plant is expected to be commissioned by March 2019. • Another plant at Maidangarhi of 1000 TPD has been planned. The matter is being pursued with DDA for early allotment of land. **North DMC :** Another C&D Waste Recycling Plant of minimum capacity 1000 MT/day is proposed at Ranikhera on BOT basis for which concessionaire had been appointed. DPCC had issued Consent to Establish (CTE) on 19-04-2018 but work at plant site could not be taken up due to stiff resistance from local residents in-spite of several requests made to Police authorities and various inspections made by senior officers of North DMC.

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

6.5.3 Ministry of Environment, Forests and Climate Change, GOI has notified the Construction and Demolition Waste Management Rules, 2016 on 29.03.2016. As per these Rules, the Secretary in-charge of Urban Development shall prepare their policy document with respect to management of construction and demolition of waste in accordance with the provisions of these rules within one year from date of final notification of these rules.

6.6 Hazardous Waste

6.6.1 There are about 1100 units (Excluding S.S. Pickling Units) generating Hazardous waste in Delhi as per the report submitted by M/s Aecadics India Pvt. Ltd., i.e. consultant engaged by DSIIDC for development of TSDF at Bawana. An estimated amount of 4197.76 T/Annum of Hazardous waste is generated from these units along with 13 CETPs.

6.6.2 A site for setting up of TSDF for disposal of hazardous waste of Delhi has been identified in Bawana Area and its development is under process by DSIIDC.

7. Climate Change Mitigation Measures

7.1 On the issue of Combating Climate Change, Delhi is the first city in the country to set a mandate and brought out a detailed Climate Change Agenda for 2009-2012, on the lines of National Action Plan for Climate Change released by the Government of India.

7.2 A climate change agenda with 65 important points has been identified for the city of Delhi under the following sectors:

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

7.3 Delhi State Action Plan on Climate Change (SAPCC) is being prepared on the lines of the National Action Plan on Climate Change (NAPCC).

8. Rain-Water Harvesting Structure

8.1 The demand of water in Delhi is increasing day by day with the rapid urbanization and the availability of potable water is not adequate to meet the growing requirements of Delhi. Main water source in the city is the water share from neighbouring basin states like Haryana, Himachal Pradesh, Uttar Pradesh etc. Thus, there is a limitation to augment the water supply. Due to this, the burden on groundwater extraction is, increasing and unexpected

withdrawal of groundwater has resulted in depletion in water level and deterioration in the quality of groundwater. Rainwater harvesting is an ideal solution to areas where there is insufficient ground water or surface water resources are lacking. It helps in using the groundwater and furthermore keeps the overflow from going into the sewer or storm water drains.

8.2 Installation of the Rain-Water Harvesting System has been made mandatory for plots having an area of 100 Sq. Meters and above. The financial assistance of the 50 per cent of the project cost or 1 lakh whichever is less, is provided by Delhi Government / Delhi Jal Board to the Resident Welfare Associations or Schools for this purpose.

8.3 For Hotels / Malls / Construction Projects etc, installation of the Rain Water Harvesting System has been made mandatory through contract mechanism.

9. How can the citizens of Delhi help in reducing pollution?

9.1 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.

9.2 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.

10. DELHI PARKS AND GARDENS SOCIETY (DPGS)

10.1 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 for maintenance and development of parks and gardens and one-time financial assistance for setting up of decentralised STPs in Delhi based on NOC from the concerned Land Owning Agency and the Area MLA.

10.2 Performance of DPGS during 2017-18 and 2018-19

- During the year 2017-18, DPGS implemented the Joint Park Management Scheme of DPGS under Department of Environment, Govt. of NCT of Delhi, including new areas measuring almost 370.11 Acres with the participation of 261 RWA/NGO, covering 1164 Nos. of parks. During, 2018-19, financial assistance for maintenance of parks and gardens provided for areas measuring almost 418.38 acres with the participation of 299 RWAs/NGOs, covering 1337 number of parks till 30th November 2018. Till March 2019, DPGS intends to provide assistance to additional parks covering 5000 acres @ ₹ 2 lakh per acre (10% to be borne by RWA/NGO)
- The Society is motivating RWA's/NGO's in the greening activities, by organizing meetings, distribution of plants to RWAs' for plantation in parks, technical advice and coordinating with other agencies. During 2017-18, 1,04,568 plants raised & maintained in DPGS Nursery, were distributed to RWAs'/NGOs', greening agencies, corporation etc. and got the same planted. During 2018-19, till 15th November 2018, 96,387 plants procured/raised and maintained in DPGS Nursery were distributed to RWAs/NGOs, greening agencies, corporates etc., for plantation.
- DPGS is providing one-time financial assistance to RWAs/NGOs for setting up of decentralized STPs @ ₹ 2 Lakh per Acre after receiving NOC from the concerned land owning agency and area MLA.
- DPGS is taking up greening projects in poorly maintained parks, semi-vacant spaces and also in open spaces.
- DPGS is providing advice to other agencies in the greening activities. Thereby motivating greening by various agencies in Delhi.

10.3 Achievements 2017-18 & 2018-19

Financial Year	No. of RWAs/ NGOs	No. of Parks	Covering Area (in Acres)
2017-18	261	1164	370.11
2018-19(up to 30th Nov 2018)	299	1337	418.38

11. FOREST IN DELHI

11.1 The Delhi government is committed to increasing the green cover of the city. Activities carried, out by the State Government, Forest Department and greening agencies have helped a lot in striking a balance between ecology and development. The vegetation of Delhi is thorny scrub, which is found in the arid and semi-arid zone.

11.2 The National Forest Policy, 1988 provides 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 endeavours 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 8.8

FOREST AND TREE COVER AREA OF DELHI 1993-2017

(Sq. Km)

S. No.	Year	Forest and Tree Cover	Absolute Increase In Area	% of Total Area
1.	1993	22	--	1.48
2.	1995	26	4	1.75
3.	1997	26	--	1.75
4.	1999	88	62	5.93
5.	2001	151	63	10.2
6.	2003	268	117	18.07
7.	2005	283	15	19.09
8.	2009	299.58	16.58	20.20
9.	2011	296.20	-3.38	19.97
10.	2013	297.81	1.61	20.08
11.	2015	299.77	1.96	20.22
12.	2017	305.41	5.64	20.59

Source: State Forest Report, 2017

11.3 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 1993.The forest and tree cover area increased to 305.41 sq km in 2017 increasing thereby the share of forests in the total area to 20.59 per cent. The growth of forests and tree cover has particularly been monumental post 1999. Of the total 305.41 sq km of forest area in NCT of Delhi, nearly 279 sq km has been added during the period 1997 to 2017.

Statement 8.9

CHANGE IN FOREST AND TREE COVER IN DELHI BETWEEN 2015 AND 2017

(Area in Sq Km)

Change in Forest Cover in Delhi			
	2015 Assessment	***2017 Assessment***	***Change***
Geographical Area	1483		
Very Dense Forest	6.94	6.72	-0.22
Moderate Dense Forest	57.15	56.24	-0.91
Open Forest	124.68	129.45	4.77
Total Forest	**188.77**	**192.41**	**3.64**
Per cent of the Geographical Area	**12.72**	**12.97**	**0.25**
Change in Tree Cover in Delhi			
	2015 Assessment	***2017 Assessment***	***Change***
Total Tree cover	**111**	**113**	**2**
Per cent of the Geographical Area	**7.48**	**7.62**	**0.14**

Source: State Forest Report, 2017

11.4 It may be observed from Statement 8.8 that the growth of forest and tree cover area of Delhi increased from 22 Sq. Km in 1993 to 305.41 Sq. Km in 2017. The percentage of forest and tree cover area to the total area of Delhi has increased manifold from a mere level of 1.48 per cent in 1993 to 20.59 per cent in 2017. Delhi's forest cover has increased by 0.25% or 3.64 sq km, compared to the assessments conducted in 2015, according to the State of the Forest report 2017.

11.5 The State Forest Report 2017 reveals that both 'Very dense forest' cover and 'Medium dense forest' cover in Delhi has declined over the past two years. The very dense forest cover has declined from 6.94 sq.km in 2015 to 6.72 sq. km in 2017, the medium dense forest cover has dropped from 57.1 sq. km to 56.2 sq. km at the same time. 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. Losing out such dense forests is not a good sign as it reduces a city's capacity to sequester carbon. It is the open forests with a canopy cover of 10% to 40% which has increased from 124 sq. km to 129 sq. km in Delhi, leading to an overall increase in forest cover.

11.6 Some trees had to be felled because of construction projects such as the Metro and road widening. But at the same time, afforestation drives were also undertaken. The new plants have not been accounted for as they are too small. They would only come under the medium dense forest or very dense forest after a period of five to 10 years at least.

11.7 The report says that Delhi's addition of 3.64 sq km of forest, mostly through open forest cover, is because of plantation and conservation activities. The decrease in forest cover has been attributed to civil construction.

11.8 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 20.2% from 2015 to 20.6% during 2017.

Chart 8.5

Tree Cover as % of Total Area; 2017

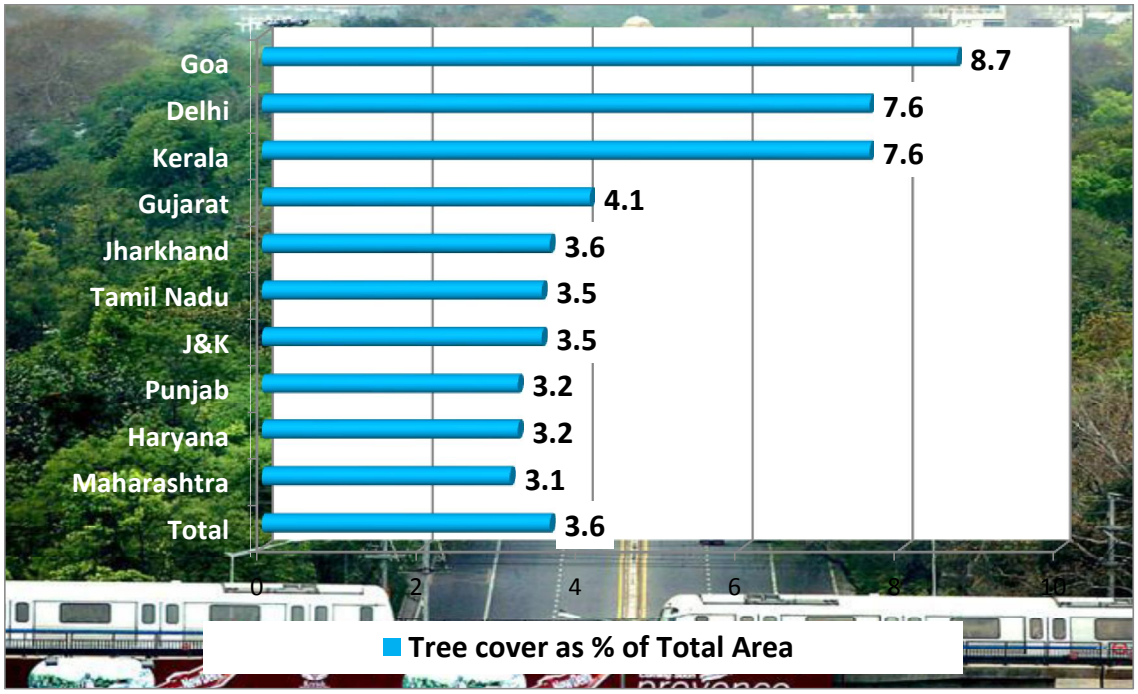
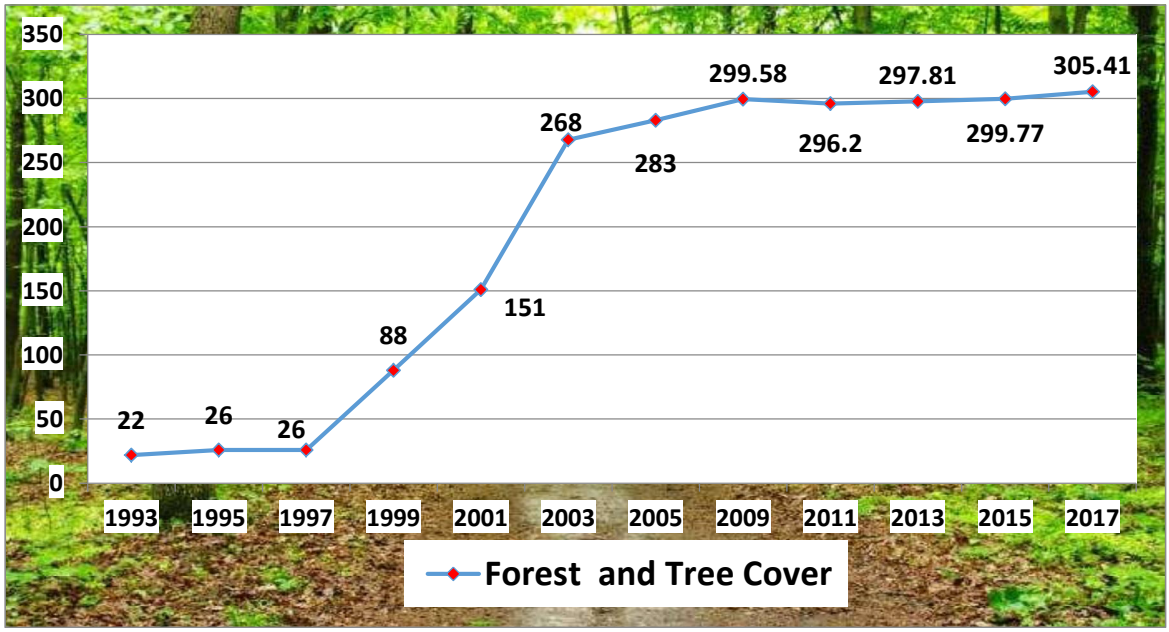


Chart 8.6

FOREST AND TREE COVER AREA OF DELHI 1993-2017



11.9 The information regarding the district-wise forest cover area and total geographical area of Delhi is presented in Statement 8.10.

Statement 8.10

DISTRICT-WISE FOREST COVER IN DELHI - 2017

(Sq. Km)

S. No.	Districts	Geographical Area	Forest Cover Area	% of Geographical Area
1.	Central Delhi	25	4.94	19.76
2.	East Delhi	64	3.70	5.78
3.	New Delhi	35	16.41	46.89
4.	North Delhi	59	4.58	7.76
5.	North East Delhi	60	3.98	6.63
6.	North West Delhi	440	17.55	3.99
7.	South Delhi	250	83.35	33.34
8.	South-West Delhi	421	51.10	12.14
9.	West Delhi	129	6.80	5.27
	Total	**1483**	**192.41**	**12.97**

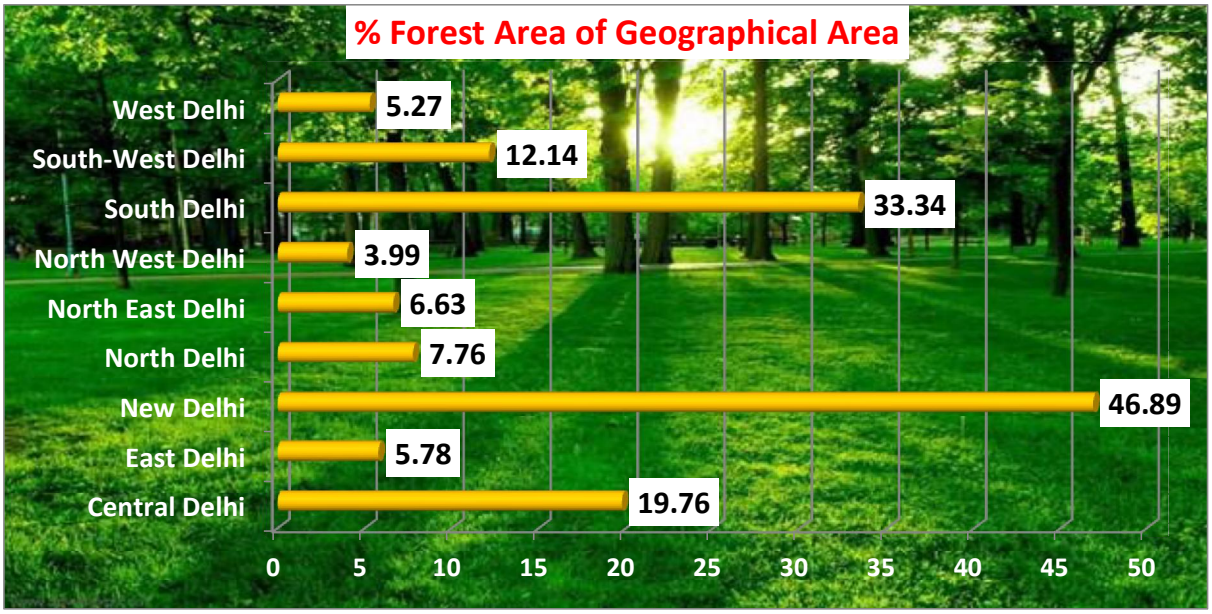
Source: State Forest Report, 2017

11.10 It may be inferred from Statement 8.10 that the forest cover area of Delhi is 192.41 sq. km i.e. 12.97 per cent of the total area of Delhi. South Delhi constitutes the highest forest cover area at 83.35 sq. km, South West Delhi at 51.10 sq. km, North West Delhi at 17.55 sq. km, New Delhi at 16.41 sq. km,

respectively. On the contrary, the lowest forest cover observed in East Delhi at 3.70 sq. Km. The information regarding district-wise percentage forest cover of the geographical area in Delhi is also depicted in Chart 8.7.

Chart 8.7

DISTRICT-WISE %AGE FOREST COVER OF GEOGRAPHICAL AREA IN DELHI - 2017



Forest Cover within Green Wash:

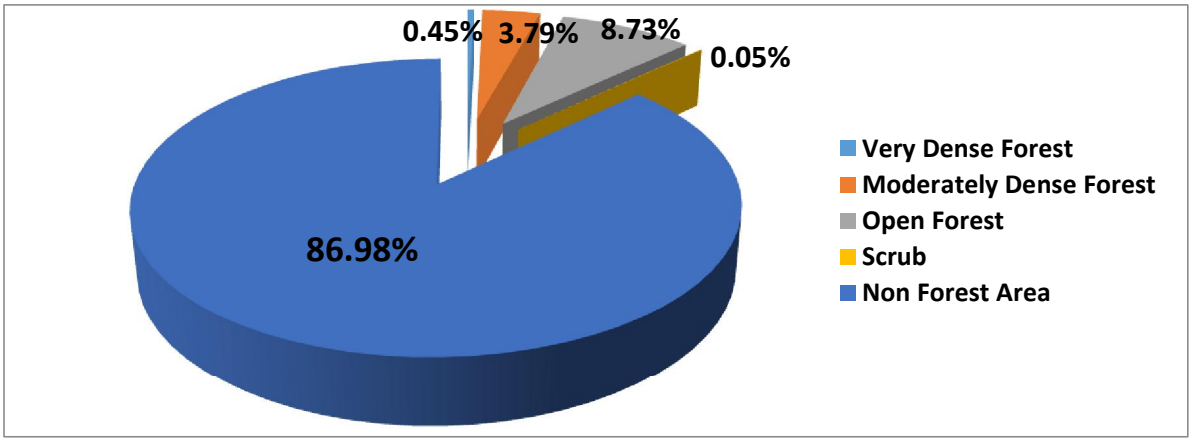
Very Dense Forest	1.40 sq. km
Moderately Dense Forest	6.85 sq. km
Open Forest	1.94 sq. km
Sub Total	10.19 sq. km

Forest Cover outside Green Wash:

Very Dense Forest	5.32 sq. km
Moderately Dense Forest	49.39 sq. km
Open Forest	127.51 sq. km
Sub Total	182.22 sq. km
Total Forest Cover	192.41 sq. km
Tree Cover	113 sq. km
Total Forest & Tree Cover	305.41 sq. km
Of State's Geographical Area	20.59%
Of India's Forest & Tree Cover	0.04%
Per Capita Forest & Tree Cover	0.002 ha

11.11 Composition of forests in terms of its density is shown in Chart 8.8. 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 3.79 per cent, an open forest is spread over 8.73 per cent and scrub is spread over 0.05 per cent, which is almost negligible.

Chart 8.8
COMPOSITION OF FOREST COVER (%AGE) IN NCT OF DELHI IN 2017



Source: State Forest Report, 2017

12 Decadal Change in Water Bodies within Forest

12.1 An increase of 0.55 sq. km has been observed in the year 2015 in the water body coverage within Forests compared to the year 2005.

12.2 Water Bodies within Forest for the years 2005 and 2015

Area/ Coverage	***2005***	***2015***
The extent of Water Bodies (sq. km.) within Forest	*3.77*	*4.32*
%age of Water Bodies to Forest Cover	*2.13*	*2.25*

Source: State Forest Report, 2017

13. Type of Forests And Major Species

13.1 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, Salvadorapersica and Anogeissuslatifolia with an abundance of Prosopisjuliflora.

13.2 Shrubs include Capparissepiaria, Zizyphusmauritiana, Herbaceous flora is Calotropisprocera, Withaniasomnifera, Achyranthes Aspera, Tridax. Main grasses are Cenchrusciliaris, Aristida, Eragrostis, Saccharumspontaneum, Diehanthium, Cynodondactylon etc.

14. Asola Bhatti Wild Life Sanctuary

14.1 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 Asola Bhatti wildlife sanctuary actually lies in South Delhi District, all along Delhi Haryana Border along Faridabad and Gurgaon.

14.2 The sanctuary is located on the Southern Ridge which is part of the northern terminal of Aravalli Hills (the Aravallis are one of the oldest mountain ranges in the world). The reason for the biodiversity significance of the Ridge lies in its merger with Indo-Gangetic Plains. 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. Few Check dams have been constructed at Asola Wild Life Sanctuary as a conservation measure for soil and water. These check dams have proved to be very effective for groundwater recharge and creation of water bodies for the sustenance of Wild Life in the Sanctuary.

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

15.3.1 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, was extended further for a period of 3 years up to 8.10.2008 with an additional cost of ₹ 4.93 crore. The project was extended for a period of two years from 2008-2010 at an estimated cost of ₹ 13.04 crores. Further the project was extended till 31st March 2012 with the total revised estimated cost of ₹ 40.89 crore of the project. The project period for Rehabilitation of degraded forest land in Asola Bhatti Wildlife Sanctuary and DeraMandi area through Eco-Task Force was again extended for the period 01.04.2012 to 31.03.2017 with the cost of ₹ 44.82 crore (₹ 31.39 crore for Establishment cost of ETF and ₹ 13.43 crore for Project Stores cost which includes plantation work & its maintenance for five years). In all, 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.

15.3.2 EFC has 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

16. Major Achievements during 2018-19

a) The Department of Forests and Wildlife regulates the removal of trees as per provisions under Delhi (Preservation) of Trees Act, 1994. Online solution e-forest has been introduced for tree felling permission to User Agency and individuals with the provision of e-payment gateway. This will facilitate time bound permission of tree felling by the Forest Department in a transparent manner.

b) Massive tree plantation drive was conducted on 8th September 2018 involving 19 greening agencies, eco-clubs and RWAs for plantation of 5 lakh tree saplings. In addition to this, an annual target for plantation of 17,82,120 tree saplings and 10,20,500 shrubs has been allotted for the year 2018-19. Against this target, till December 2018, the achievement is 13,94,849 tree sapling and 9,23,900 shrubs.

c) City forests at Mitraon, Nasirpur, Gahri Mandu, Taj Enclave, Hauz Rani 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.

d) Eco-restoration of habitat through Eco-Task Force in Asola Bhatti Wildlife Sanctuary has been done by carrying out plantation of 2.5 lakh saplings and low-cost engineering structures to improve the soil moisture regime.

Chart 8.9

FOREST COVER MAP OF DELHI