

## CHAPTER 8

### ENVIRONMENTAL CONCERNS

The rapid urbanization of Delhi along with the level of growth in economic activities in the city and its surrounding areas stressed the natural environment significantly. Among the environmental problems, air pollution, water pollution, loss of biodiversity, municipal waste and noise pollution are major environmental challenges that the city is facing. The city suffers from air pollution caused by transportation, road dust, industries and pollutant emissions. Noise pollution comes mainly from industries, transportation, aircraft etc. Water pollution and lack of adequate solid waste treatment facilities have caused serious damage to the river Yamuna on whose banks Delhi grew. Several steps have been taken in the recent past to improve the environment condition which includes massive focus on afforestation, universal use of CNG by commercial vehicles, ban on plastic use, better management of solid waste, treatment of waste water and improvement of sewage system etc. But still many challenges remain to contain the environmental pollution.

- 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 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. Government has undertaken special drive of inspections to prevent air pollution due to the burning of leaves/garbage in open areas.
- 1.3 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.
- 1.4 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 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. Delhi's green cover

has increased from around 20.59% from 2017 to 21.88% during 2019. During the period from 2017 onwards, Delhi has gone ahead of Kerala and Goa in percentage of tree cover.

- 1.5 This Chapter summarizes the major environmental concerns and the present status of pollution in Delhi 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<sub>10</sub>, PM<sub>2.5</sub> and NO<sub>2</sub>. There are several prominent sources within and outside Delhi contributing to PM<sub>10</sub>, PM<sub>2.5</sub> and NO<sub>2</sub> 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 2014 to 2019 is presented in Statement 8.1.

### Statement 8.1

#### AMBIENT AIR QUALITY LEVELS IN DELHI: 2014-2019

Yearly City Average* of Various Pollutants of DPCC CAAQMS (2014 - 2019)								
Years	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )
Standard	60 (µg/m <sup>3</sup> )	40 (µg/m <sup>3</sup> )	50 (µg/m <sup>3</sup> )	40 (µg/m <sup>3</sup> )	100 (µg/m <sup>3</sup> )	100 (µg/m <sup>3</sup> )	2 (mg/m <sup>3</sup> )	5 (µg/m <sup>3</sup> )
2014	318	149	16.9	79	40.89	46.87	1.70	4.76
2015	268	133	17.6	73	45.11	43.97	1.62	4.41
2016	290	137	19.9	70.2	39.78	43.16	2.09	6.28
2017	263	130	23.36	73.55	43.60	37.99	2.13	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

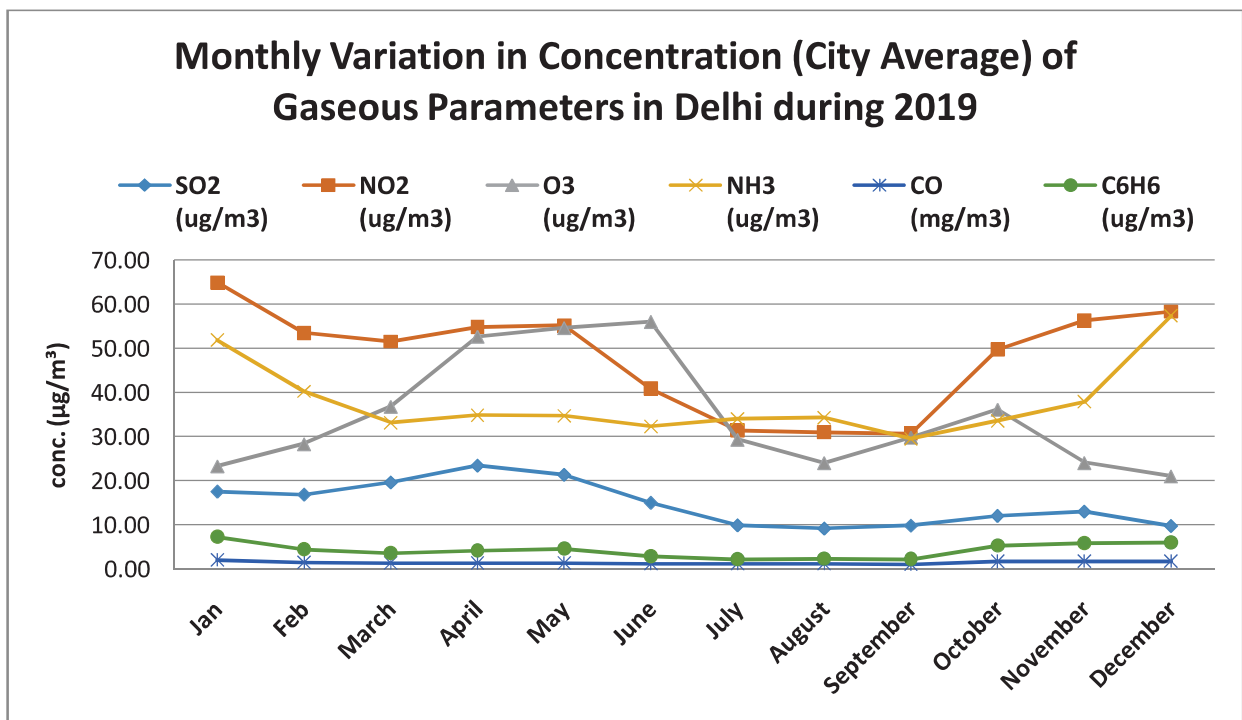
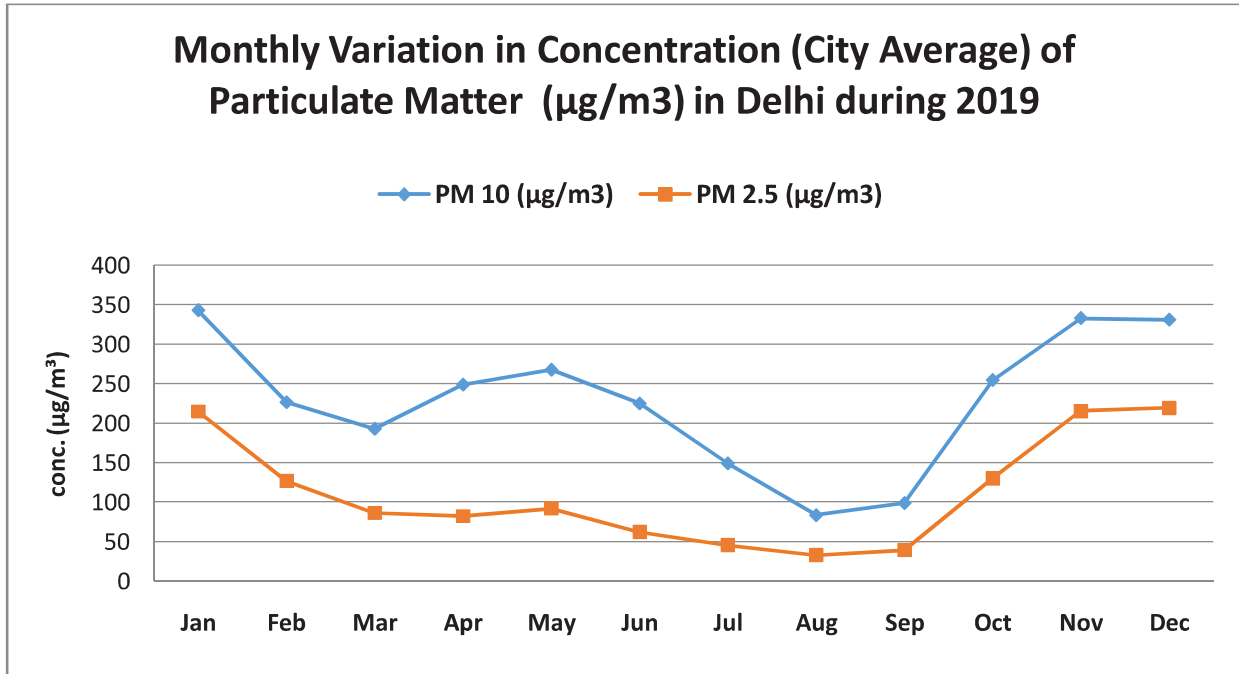
\*City Average is calculated from 2014 to 2017 for 4 stations & from 2018-2019 for 24 stations  
Source: - DPCC

- 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 / controlling the pollution level since the past few years.

- 2.3 **Sulphur Dioxide (SO<sub>2</sub>):** No significant variation was observed in the annual city average value between 2014 to 2019. The values monitored were always within the prescribed limits of 50µg/m<sup>3</sup> at all stations.
- 2.4 **Nitrogen Dioxide (NO<sub>2</sub>):** Annual city average of NO<sub>2</sub> concentration has shown the decrease as compared to the year 2014. The highest annual average was observed in 2014 (79 µg/m<sup>3</sup>). In 2019, the average value was 48.18 µg/m<sup>3</sup>. At all the monitoring locations annual city average exceeded the prescribed standard of 40 µg/m<sup>3</sup>.
- 2.5 **Carbon Monoxide (CO):** Annual city average of CO concentration has shown the decrease as compared to the year 2014. In 2019, the city average value was 1.44 mg/m<sup>3</sup>. At all the monitoring locations annual city average is within the prescribed standard of 2 mg/m<sup>3</sup> except in year 2016 & 2017.
- 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<sub>10</sub>):** Annual city average of PM<sub>10</sub> varied from 2014 to 2019 by 318 µg/m<sup>3</sup> to 230 µg/m<sup>3</sup>. At all the monitoring locations annual city average exceeded the prescribed standard of 60 µg/m<sup>3</sup>.
- 2.8 **Particulate Matter (PM<sub>2.5</sub>):** Annual city average of PM<sub>2.5</sub> varied from 2014 to 2019 by 149 µg/m<sup>3</sup> to 112 µg/m<sup>3</sup>. At all the monitoring locations annual city average exceeded the prescribed standard of 40 µg/m<sup>3</sup>.
- 2.9 **Ozone (O<sub>3</sub>):** Annual city average of O<sub>3</sub> varied from 2014 to 2019 by 45.11 µg/m<sup>3</sup> to 34.69 µg/m<sup>3</sup>.

**Chart 8.1**

**VARIATION IN CITY AVERAGE OF CRITICAL POLLUTANTS IN DELHI ( $\mu\text{g}/\text{m}^3$ ) FOR THE YEAR 2019**



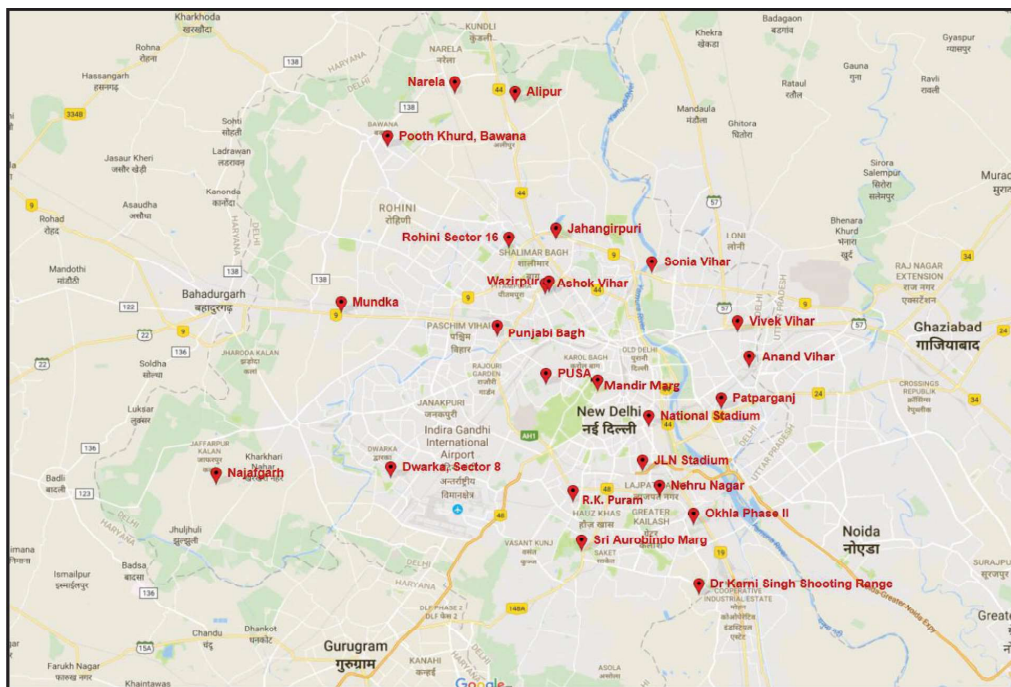
Source: Delhi Pollution Control Committee (DPCC)

2.10 Delhi has a network of 26 Ambient Air Quality Monitoring Stations operated by DPCC out of which 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, Srinivaspuri	17	IARI, PUSA
5	Mother Dairy Plant, Patparganj	18	NIMR, Sector-8, Dwarka
6	Satyawati College	19	DITE, Wazirpur
7	Mundka Metro Residential Colony	20	ITI, Shahadra
8	S.S.College of Business Studies, Rohini	21	Anand Vihar
9	ITI, Narela	22	Mandir Marg
10	WTP (DJB), Sonia Vihar	23	Punjabi Bagh
11	DITE Okhla	24	R.K. Puram
12	Ch. Brahm Prakash Ayurvedic Hospital	25	Civil Lines
13	Mahrshi Valmiki Hospital,Pooth Khurd	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 * ( $\mu\text{g}/\text{m}^3$ )	Annual Standard * ( $\mu\text{g}/\text{m}^3$ )	24 Hourly Standard* ( $\mu\text{g}/\text{m}^3$ )	Annual Standard* ( $\mu\text{g}/\text{m}^3$ )
1.	SO <sub>2</sub>	80	50	80	20
2.	NO <sub>2</sub>	80	40	80	30
3.	PM <sub>10</sub>	100	60	100	60
4.	PM <sub>2.5</sub>	60	40	60	40
5.	Ozone	180 <sup>#</sup>	100 <sup>##</sup>	180 <sup>#</sup>	100 <sup>##</sup>
6.	Lead	1.0	0.50	1.0	0.50
7.	NH <sub>3</sub>	400	100	400	100
8.	CO	04 <sup>#</sup>	02 <sup>##</sup>	04 <sup>#</sup>	02 <sup>##</sup>
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.

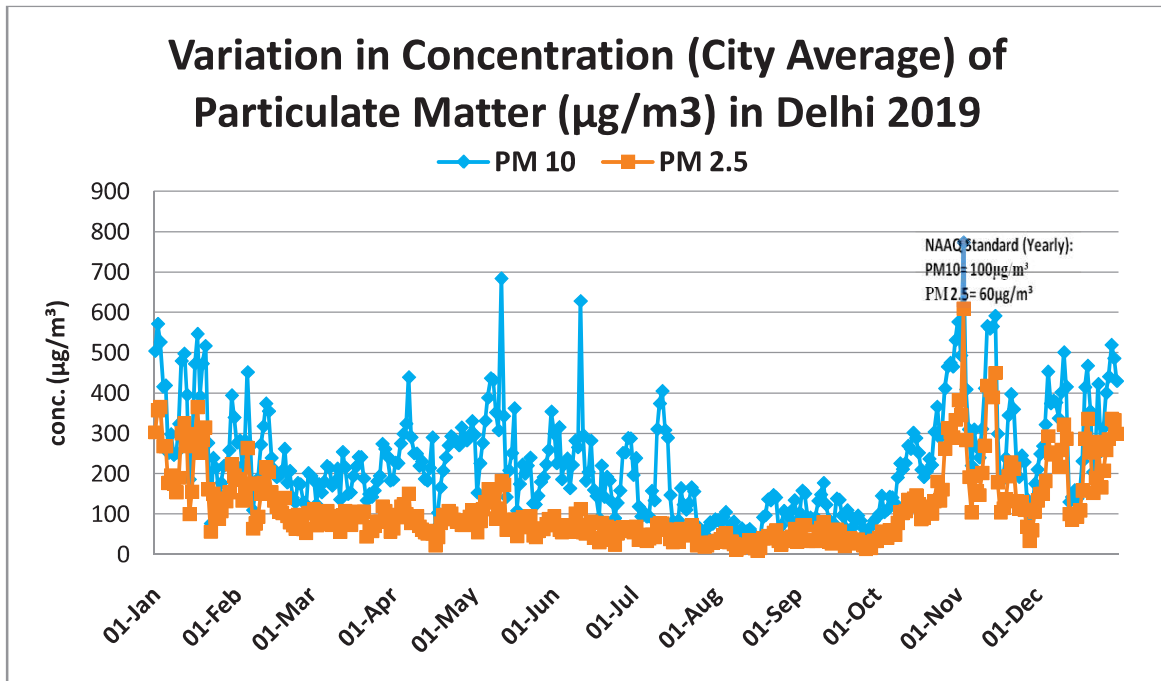
\*\* 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be compiled with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

# 1 Hourly, ##8 Hourly.

### 2.12 Air Pollution Control:

The city of Delhi faced dust storm on 12<sup>th</sup> May, 2019. Chart 8.2 shows the variation in the concentration of PM<sub>2.5</sub> and PM<sub>10</sub> from 1<sup>st</sup> January to 31<sup>st</sup> Dec 2019. The average concentration was 112  $\mu\text{g}/\text{m}^3$  and 230  $\mu\text{g}/\text{m}^3$  respectively for PM<sub>2.5</sub> and PM<sub>10</sub>. The 1<sup>st</sup> peak of PM<sub>10</sub> was recorded on 12<sup>th</sup> May, when the concentration of PM<sub>10</sub> reached up to 684  $\mu\text{g}/\text{m}^3$ . However, PM<sub>2.5</sub> reached up to 181  $\mu\text{g}/\text{m}^3$  on the same day. The 2<sup>nd</sup> peak was observed on 3<sup>rd</sup> November due to stubble burning, when the concentration of PM<sub>10</sub> reached up to 774  $\mu\text{g}/\text{m}^3$ . However, PM<sub>2.5</sub> reached up to 610  $\mu\text{g}/\text{m}^3$  on the same day.

**CHART 8.2**



Source: Delhi Pollution Control Committee (DPCC)

**2.13 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 etc. Delhi Pollution Control Committee (DPCC) has opened "WhatsApp account with mobile number "9717593501". 137 Complaints received on WhatsApp No. 9717593501 in the year 2019
  - 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. Environmental Compensation collected by Delhi Pollution Control Committee Upto 01.01.2019 to 31.12.2019 (unaudited): ₹ 17.38 crore
  - v. 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. 681/20108 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. 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 @ ₹ 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.

**Brief regarding Subsidy granted by DPCC in respect of Battery Operated Vehicles (2016 to 2019)**

S. No.	Vehicle	Year 2016	Year 2017	Year 2018	Year 2019	Total
1	2 Wheeler	08	904	2252	1507	4671
2	4 Wheeler	12	116	110	204	442
	<b>Total</b>	20	1020	2362	1711	5113

- 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 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. Hotspots:**

13 hotspots had been identified in Delhi in consultation with EPCA and CPCB as the spots having higher air pollution levels in comparison to other areas. Specific action plans have been drawn up for identifying and mitigating the local sources of air pollution 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. The Monitoring Committee had also visited these hotspots from 08.11.2019 to 11.11.2019 to monitor the implementation of the action plan. Pursuant to the observations made by the Monitoring Committee while visiting the hotspots such as Wazirpur, Ashok Vihar, Punjabi Bagh, Dwarka, R.K.Puram, Jahangirpuri, Narela, Mundka, AnandVihar, VivekVihar and Okhla actions have been taken on the directions of the Monitoring Committee and the Chief Secretary by the respective agencies so as to remove the deficiencies observed by the Monitoring Committee.

## **10. Public Awareness:-**

Workshop on “Implementation of the Noise Pollution (Regulation & Control) Rules” organized on 16.04.2019 with participation of Eco-Club Schools/ Colleges, and Designated authorities under the Noise Rules i.e. Traffic Police, DCs/ SDMs and Delhi Police.

Workshop on “Implementation of the Noise Pollution (Regulation & Control) Rules” organized on 13.11.2019 with participation of Designated authorities under the Noise Rules.

### **2.14 New Initiatives by Delhi Government:**

#### **I. Real Time Source Apportionment Study:**

DPCC has assigned a project to Washington University to carry out a Real Time Source Apportionment Study to in Delhi. The objectives of the project are:

- i. Real-time monitoring and sampling of the particulate matter - PM 1, 2.5 and 10.
- ii. Identification of the sources of the respective particulate matter based on a real time algorithm that will be developed.
- iii. Data analyses and algorithm development for identifying major source categories and approaches to minimize and improve the Air Quality.

- The data collected will be used in developing a model to predict the real time source apportionment to know the exact sources of the pollutants and their concentration. The collection of data started in April 2019 and it will continue till March 2020 and the report will be submitted in June 2020.
- The Sample source apportionment study for the months of September to November 2019 shows that major contributors are biomass burning 38%, waste burning 6%, Coal & industrial source 38% and contribution from traffic is 14%.

## II. Implementation of Notification issued on Approved Fuel:

### Conversion of industries to Piped Natural Gas (PNG):

1	Total number of industries identified for conversion to PNG from other fuels (2+5+6)	<b>1512</b>
2	Number of units who have facility to run on PNG (3+4)	<b>1340</b>
3	Out of which number of industries running on PNG	<b>1230</b>
4	Number of units having meter installed but not Consuming PNG	<b>110</b>
5	Number of units registered with IGL to whom connection is yet to be provided by IGL	<b>116</b>
6	number of units which are not interested using PNG	<b>56</b>

## III. Greening of an unpaved area:

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

## IV. 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.

## 2.15 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.

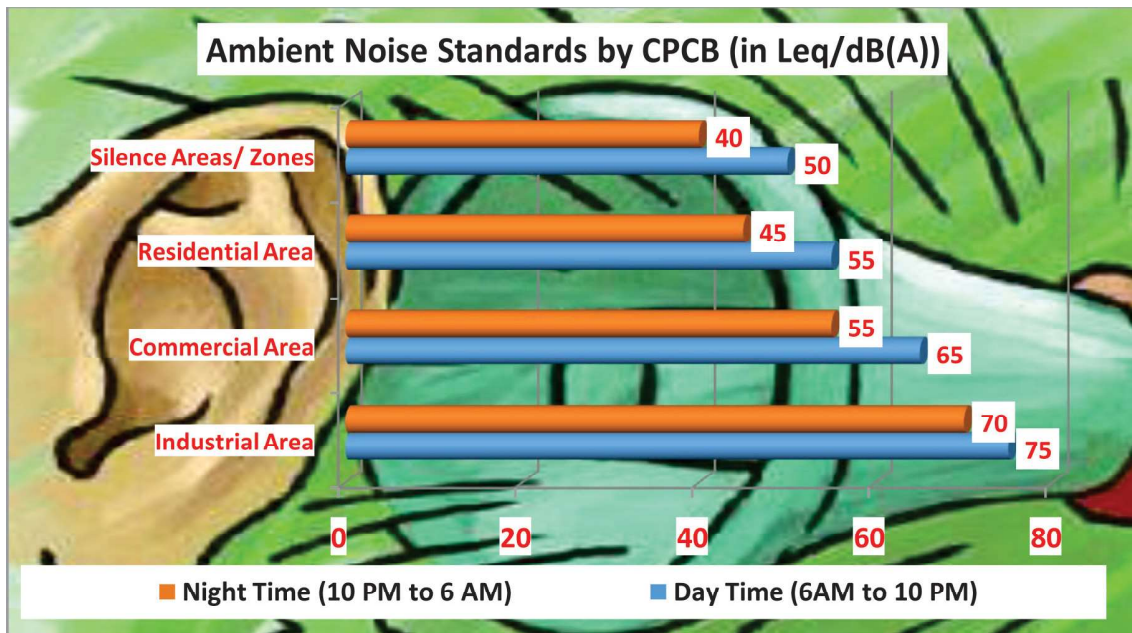
- Air quality monitoring stations to be set up in NCR with an online display of data.
  - Local bodies and major construction agencies in Delhi have already been directed to use dust suppression methods on the construction sites to reduce the dust emissions. Delhi Police and Department of Transport have 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.
- 2.16 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, M/o 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 A Continuous Noise Monitoring is undertaken at R.K. Puram, Mandir Marg, Punjabi Bagh, Civil Lines and Anand Vihar.

**Statement 8.4**

**Monthly Average of Real Time Ambient Noise Levels (Day Time) During Year 2019**

Month	Anand Vihar (dB (A))	Civil Lines (dB (A))	Mandir Marg (dB (A))	Punjabi Bagh (db(A))	R.K. Puram (dB (A))
Jan-19	66.2	61.7	51.8	58.3	71.6
Feb-19	65.6	62.4	60.1	59.9	61.9
Mar-19	65.8	61.4	62.1	58.9	59.2
Apr-19	64.9	61.0	61.2	59.4	61.2
May-19	64.7	61.1	56.8	59.6	59.4
Jun-19	65.0	59.8	62.0	55.0	59.9

Month	Anand Vihar (dB (A))	Civil Lines (dB (A))	Mandir Marg (dB (A))	Punjabi Bagh (db(A))	R.K. Puram (dB (A))
Jul-19	65.8	62.7	58.9	59.9	62.4
Aug-19	65.6	61.6	56.7	59.5	62.5
Sep-19	65.2	61.6	55.4	59.3	63.9
Oct-19	65.7	57.1	61.1	55.3	60.3
Nov-19	65.7	61.0	54.3	57.6	60.3
Dec-19	65.4	61.0	53.4	57.1	62.1
<b>Average</b>	<b>65.5</b>	<b>61.0</b>	<b>57.8</b>	<b>58.3</b>	<b>62.1</b>

**Monthly Average of Real Time Ambient Noise Levels (Night Time)  
During Year 2019**

Month	Anand Vihar (dB (A))	Civil Lines (dB (A))	Mandir Marg (dB (A))	Punjabi Bagh (db(A))	R.K. Puram (dB (A))
Jan-19	64.5	58.0	46.6	52.2	61.4
Feb-19	62.8	58.6	46.9	52.5	54.7
Mar-19	63.5	58.6	50.3	51.7	53.7
Apr-19	62.7	59.3	52.5	52.7	54.4
May-19	62.4	59.2	49.7	52.7	54.4
Jun-19	62.5	59.2	49.1	55.1	54.6
Jul-19	62.5	58.2	49.7	52.9	55.7
Aug-19	62.6	57.9	53.7	51.8	55.2
Sep-19	62.0	58.0	49.8	51.9	62.2
Oct-19	62.6	58.5	49.7	50.4	54.4
Nov-19	63.0	58.9	47.6	51.4	53.8
Dec-19	62.4	58.4	46.9	50.7	57.2
<b>Average</b>	<b>62.8</b>	<b>58.6</b>	<b>49.4</b>	<b>52.2</b>	<b>56.0</b>

Source: Delhi Pollution Control Committee (DPCC)

Yearly Average of Real Time Ambient Noise Levels (Day time)					
Year	Anand Vihar (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	66.2	61.0	57.6	59.3	61.1
2019	65.5	61.0	57.8	58.3	62.1

Yearly Average of Real Time Ambient Noise Levels (Night Time)					
Year	Anand Vihar (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	63.9	58.7	51.4	52.5	54.9
2019	62.8	58.6	49.4	52.2	56.0

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.

- 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 >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 98 mg/l at Khajuri-Paltoon Pool and 97 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-2019 to December-2019. 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 annual average of DO is 7.84 mg/l at Palla. The annual average of BOD has ranged from 1.87 mg/l at Palla to 23.32 mg/l at Khajuri Pantool Pool. 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 8.5****ANNUAL AVERAGE WATER QUALITY OF RIVER YAMUNA AT DIFFERENT LOCATIONS: JANUARY 2019 – DECEMBER 2019**

S. No.	Locations	pH (mg/l)	COD (mg/l)	BOD (mg/l)	DO (mg/l)
	<b>Water Quality Criteria</b>	6.5-8.5	-	3mg/l or less	5mg/l or more
1	Palla	8.14	7.67	1.87	7.84
2	Surghat	7.85	13.67	3.23	6.18
3	Khajori Paltoon Pool	7.79	74.55	23.32	1.20
4	Kudesia Ghat	7.68	68.83	21.43	2.20
5	ITO Bridge	7.80	67.00	21.38	1.95
6	Nizamuddin Bridge	7.63	65.33	19.63	2.13
7	Agra Canal Jaitpur	7.76	75.67	22.83	2.80
8	D/S Okhla Barrage (after meeting Shahdara Drain)	7.66	94.33	29.33	3.20
9	Agra Canal Okhla	7.66	77.33	24.25	3.20

Source: - Delhi Pollution Control Committee.

**Statement 8.6****ANNUAL AVERAGE WATER QUALITY OF DRAINS AT DIFFERENT LOCATIONS IN DELHI: JANUARY 2019 – DECEMBER 2019**

S. No.	Measure/ Drains	pH	TSS	COD	BOD
	<b>Water Quality Criteria</b>	<b>5.5-9.0 (mg/l)</b>	<b>100 (mg/l)</b>	<b>250 (mg/l)</b>	<b>30 (mg/l)</b>
1	Najafgarh Drain	7.7	111.8	115.3	38.3
2	Metcalf House Drain	7.6	54.9	68.0	22.4
3	Khyber Pass Drain	7.8	72.0	85.0	26.7
4	Sweeper Colony Drain	7.8	57.2	61.7	18.6
5	Magazine Road Drain	7.7	221.0	220.3	71.1
6	ISBT Drain	7.7	128.7	164.7	58.3
7	Tonga Stand Drain	7.8	122.3	177.0	56.6
8	Moat Drain	NO FLOW	NO FLOW	NO FLOW	NO FLOW
9	Civil Mill Drain	7.7	259.5	245.7	79.5
10	Power House Drain	7.7	132.3	165.2	53.2
11	Sen Nursing Home Drain	7.7	255.7	263.3	87.2
12	Drain No. 12A	NO FLOW	NO FLOW	NO FLOW	NO FLOW
13	Drain No. 14	7.8	48.5	50.5	15.0
14	Barapulla Drain	7.7	133.7	237.0	76.6
15	Maharani Bagh Drain	7.6	156.5	276.3	89.6

S. No.	Measure/ Drains	pH	TSS	COD	BOD
16	Kalkaji Drain	7.65	218.5	209.5	64.875
17	SaritaVihar Drain (Mathura Road)	7.7	228.3	312.3	110.3
18	Tehkhand Drain	7.8	176.5	257.7	84.7
19	Tuglakabad Drain	7.8	239.3	293.0	92.4
20	Drain Near LPG Bottling Plant	NO FLOW	NO FLOW	NO FLOW	NO FLOW
21	Drain Near SaritaVihar Bridge	7.7	116.9	174.0	57.8
22	Shahdara Drain	7.7	241.8	283.0	90.5
23	Sahibabad Drain	7.7	419.3	553.5	186.6
24	Indrapuri Drain	7.6	180.8	305.7	128.5

Source: Delhi Pollution Control Committee.

- 4.5 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).
- 4.6 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.
- 4.7 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.

#### 4.8 Requirement of Minimum Environmental Flow in River Yamuna

Minimum Environmental Flow for the dilution of the polluted water in river Yamuna in Delhi is required to meet the desired water quality levels in river Yamuna for bathing purpose i.e. BOD < 3 mg/l & DO  $\geq$  5 mg/l. To assess the minimum required environmental flow of river Yamuna for stretch between Hathinikund to Okhla, a comprehensive study has been assigned by National Mission for Clean Ganga to National Institute of Hydrology (NIH), Roorkee on 24.12.2018. Interim Report of the

NIH has been received and Final Report is to be submitted by March,2020 as per the orders of Hon'ble NGT Dated 11.09.2019.

#### **4.9 Measures taken for Control of Pollution in River Yamuna**

- 720 MGD of Sewage is generated in Delhi (80 % of the water supply by DJB).
- 35 Functional Sewage Treatment Plants (STPs) of Delhi Jal Board [ Installed Capacity – 597 MGD and Treatment of Sewage – about 500 MGD (84% of installed capacity )]
- 13 Common Effluent Treatment Plants (CETPs)for the treatment of waste water generated from the 17 approved industrial areas [ Installed Capacity – 212.3 MLD and Treatment – about 55 MLD (25% of installed capacity )]
- All the 35 functional STPs and 13 CETPs have installed Online Monitoring System (OLMS) and the same are being regularly calibrated by DPCC.
- Monitoring of the STPs and CETPs are being carried out regularly by DPCC on monthly basis and Analysis Results are uploaded on the website of DPCC.

#### **I 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 /Malbain 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.

#### **II. 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.

### **III Ban on Idol Immersion :**

- This year, as per directions of the Hon'ble NGT appointed YPMC, idol immersion was performed by devotees in artificial ponds constructed all across Delhi by Revenue Department. Environment Department had launched mass awareness drive regarding idol immersion. Awareness Advertisements were published in 11 National Dailies (English, Hindi, Urdu, Punjabi) every week for about 1 ½ month. Advertisements will also be put on DTC buses and bus queue shelters. Around 50 no.s of Hoardings regarding idol immersion during were put up at important places across Delhi. Department conducted awareness workshop for Eco-Club school teachers on idol immersion on 29.08.2019.
- As per report from Revenue Department, 116 artificial ponds were constructed during Ganeshotsav and 89 artificial ponds were constructed during Durga Pooja. Around 10500 idols were immersed during both the festivals.
- Further, water quality of river Yamuna was found to be improved (in post immersion) during this year, as per DPCC reports for both the festivals of Ganeshotsav and Durga Pooja.

### **IV Orders of Hon'ble Supreme Court & Hon'ble National Green Tribunal for control of Pollution and Rejuvenation of River Yamuna**

Hon'ble Supreme Court and Hon'ble National Green Tribunal have passed various orders for control of pollution in river Yamuna and its rejuvenation.

Hon'ble National Green Tribunal vide judgment dated 13.01.2015 in the matter of Manoj Mishra Vs Union of India and Ors. has passed detailed orders giving various directions to all the concerned Agencies for control of pollution in river Yamuna and also constituted a Monitoring Committee (known as Yamuna Monitoring Committee) for monitoring the compliance of its directions given in various orders.

Yamuna Monitoring Committee has submitted its Action Plan dated 22.10.2018 for rejuvenation of River Yamuna to Hon'ble NGT and also submitted its 3 interim reports to Hon'ble NGT after taking various meetings and monitoring the issues / action points with concerning Departments. DJB, DDA,DMCs , DSIIDC , IFCD etc are the main Departments which are required to take action in time bound manner to complete the works / projects in given time frame of December, 2020 given by the Hon'ble NGT.

As per the timelines given by DJB in the Action Plan in respect of No. of STPs (Commissioning/ Rehabilitation/ Upgradation etc.) the projects shall be completed by 31.12.2022 whereas as per the orders of Hon'ble NGT in OA No. 06/2012 in the matter of Manoj Mishra Vs. U.O.I & Ors., all the projects are to be completed by 31.12.2020.

#### **V. River Rejuvenation Committee (RRC):**

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

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.

In compliance to directions of the Hon'ble NGT in OA 673/2018 titled, "More river stretches are now critically polluted: CPCB", a committee has been constituted to prepare an Action Plan for bringing the 22km stretch of River Yamuna flowing through Delhi, i.e., Wazirabad to Village Asgarpur to be fit at least for bathing purposes (i.e BOD < 3 mg/L and FC < 500 MPN/100 ml). Action Plan and subsequent revisions as desired by CPCB have been submitted by DPCC to CPCB for approval.

#### **4.10 Awareness Activities regarding Yamuna Pollution and Water Conservation**

- The Department of Environment, Govt. of NCT of Delhi conducted various awareness activities on river Yamuna and Idol Immersion

- **Awareness activities through Eco-Clubs:-**

- All the Eco-Club Schools and Colleges were made to perform certain activities focusing to generate awareness regarding the Idol Immersion and Yamuna Water conservation.
  - The instructions/guidelines on Idol Immersion issued by Delhi Pollution Control Committee (DPCC) were circulated to all the Eco-clubs in Schools and Colleges of Delhi through E-mails.
  - The same guidelines were disseminated among the students of the Eco-clubs in the form of message during prayer class/Nukkad Natak/workshop/rally/Quiz/Poster etc.
  - An action taken report was submitted by many Eco-club schools/colleges to the Department of Environment.
  - Information regarding the Do's and Don'ts for the Idol Immersion of Ganesh Visarjan and Durga Puja Visarjan was circulated to all the Eco-Clubs in Schools/Colleges.
  - school level activities including Idol making with natural clay, Nukkad Nataks, poster making, awareness during morning assembly sessions. School house activities may be oriented in respect of Green Idol Immersion. It was suggested that Padyatra around the school neighbourhood and dissemination of information to the neighbourhood temples as part of awareness on Idol immersion can be taken up.
- **Nukkad Natak by NGO was conducted by Department.**
  - **Meetings with ULBs and Religious heads of all religions.**

#### **4.11 Awareness of Farmers cultivating in the belt of river Yamuna through Development Department:-**

- Development department has conducted awareness workshops for farmers not to use plastic/not to burn crop residue and also sensitize farmers not to pollute river Yamuna, adopt good irrigation practices and not to use chemical fertilizers and pesticides indiscriminately.

- More than 30 such awareness programs have been conducted for the farmers.

#### **4.12 Awareness through PWD:-**

- PWD has also submitted documents with photographs regarding put up of hoardings on over bridges of Yamuna with a message not to throw garbage in Yamuna river and not to use single use of plastic and also intimated regarding IRC Fabric Jali which has been placed both side of the bridge, so that no one could throw flowers/garbage in River Yamuna. The flex board has been provided on the Yudhister Setu, Wazirabad Bridge, Lok Nayak Setu, Geeta Colony Yamuna Bridge and Signature Bridge. IRC fabric jail has been provided on Wazirabad Bridge and Yudhister Setu.

#### **4.13 Awareness in the Industrial Areas (DSIIDC)**

##### **Bawana and Narela Industrial areas**

- Bulk SMSs have been sent/are being sent to all the allottee/occupiers by respective concessionaire, appealing not to throw or burn or dump any type of waste in open areas/drains.
- Hoardings in both the areas have been displayed/are being displayed by the concessionaires at appropriate locations to sensitize unit holders/visitors of the area for preventing burning/dumping.
- Meeting with associations have been convened/are being convened by concerned Estate Managers to seek their assistance in this matter and sensitizing unit holders.
- Advertisements were also published in newspapers for creating awareness.
- Always release treated effluent into drains/ sewer lines.

#### **4.14 Efforts Made by DSIIDC in Other Industrial Areas :**

- Flex Boards were displayed at prominent location in different industrial areas under heading "Go green to Breath Clean".
- Do not burn industrial waste/solid waste.

- Do not dump waste in open drain.
- Always put wet waste in Green Dustbin & Dry waste in Blue Dustbin.
- Say no to plastic bags.
- Pamphlets have been circulated among all entrepreneurs of different industrial areas to aware them about the sources of pollution with Do's & don'ts.
- Meetings have been convened with the associations of industrial areas to make an agreement with concessioners for door to door collection and disposal of MSW/ Industrial wastes up to approved disposal facility.
- Awareness programmes have been organized in industrial areas for prevention and control of Air/water Pollution.
- Awareness Advertisement regarding Yamuna was published in the National Dailies in November 2019.

#### **4.15 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.

**Awareness Workshops on River Yamuna were also conducted by Department of Environment**

## **5. Waste Management**

### **5.1 Municipal Solid Waste**

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. A meeting-cum



–Training Programme for the implementing agencies and the District Magistrates was conducted by Department of Environment on 04.06. 2019

## **5.2 Solid Waste Management:**

- i. Daily solid waste generation in Delhi is about 10,512 TPD.
- ii. Solid waste of 5250 TPD which is about 50% of the total solid waste generated is being processed in a scientific manner in 3 Waste to Energy (WTE) Plants at Okhla, Ghazipur and Bawana with electricity generation of 16,12 and 24 MW respectively.
- iii. Government has taken necessary steps to augment the processing capacity by adding new Waste to Energy Plant of 2000 TPD at Tehkhand and an Integrated Solid Waste Management facility of 2000 TPD at GhondaGujran. One engineered sanitary landfill has been proposed to treat 2000 TPD of waste at Tehkhand.
- iv. In addition to the above, the Government is in the process of installation of decentralized Waste Management Facilities (Compost Plants / Bio- Methanation Plants) and facilities having capacity of 44 TPD have been commissioned and more such facilities are under commissioning for processing 26 TPD of waste.
- v. Legacy Waste:
  - Large quantities of waste dumped in 3 large sites at Ghazipur, Bhalswa and Okhla which are not engineered sanitary landfill sites.
  - The implementation of the project for processing legacy waste has already started w.e.f. 01.10.2019 and about 20 trommel have already been installed and more than 1 lakh MT of legacy waste has already been processed till December, 2019.
  - On the directions of Hon'ble NGT, the Government has created dedicated Escrow Accounts for the 3 Municipal Corporations managing the respective dump sites in which the contributions have been made by various agencies totaling ` 250 crores.

## **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 Waste 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**

5.5.1 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.

5.5.2 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.

5.5.3 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.

Status of Plastic Waste generation : 700 Tons/day (approx)

## 5.6 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 Carrybags, 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.

**A meeting –cum training Programme on Implementation of Plastic Waste Management Rules, 2016, as amended 2018 was conducted by Department of Environment, GNCTD on 2<sup>nd</sup> August, 2019 for District Magistrates, ULBs and other concerned agencies.**

## 5.7 Plastic Waste Management Bye-Laws are in the process of Notification by ULBs/ UD Department

Draft Bylaws under Plastic Waste Management Rules, 2016 have been prepared for setting-up of system for plastic waste management and associated functions as setting-up of infrastructure for segregation/collection/storage/transportation, processing and disposal of plastic waste by the Urban Local Bodies and the same is under finalization.

## **5.8 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. Letters have been written to all road construction agencies to use plastic waste in road construction as per IRC specifications and the technology developed by CRRI.
- b. Registration under the Plastic Waste Management (Amendment) Rules, 2018, is granted to 240 no.s units engaged in the manufacturing of plastic bags, multilayered packaging etc. Registration has been granted to 23 no.s Recyclers.
- 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. Action has been taken against 6902 violators, banned plastic of 159237 kgs have been seized and Environmental Compensation/penalty of ₹ 1,44,56,000/- have been realized from the violators upto 31.12.2019 since the direction of the Hon'ble NGT issued on 10.08.2017.
- d. Environmental Compensation of ₹ 50,000/- each was also imposed on 236 units, which were found engaged in burning/dumping of plastic waste in Bawana and Narela Industrial Areas. These 236 units have deposited the Environmental Compensation in total ₹ 1,18,00,000/-.
- e. Environmental Compensation of ₹ 10,00,000/- (₹ Ten Lakh) each was imposed on M/s. PNC Delhi Industrial Infra Private Limited and M/s. Bawana Infra Development Private Limited, both concessionaires of Delhi State Industrial and Infrastructure Development Corporation (DSIIDC) engaged for maintenance of Industrial Estates as they failed to discharge their assigned duties of proper solid (plastic) waste management of Narela and Bawana Industrial Areas respectively. Both the concessionaires have deposited Rs, 20,00,000/-
- f. Surprise raids were conducted in the main trading centres of plastic bags to check violations. During this exercise, total 28656 kg of banned plastic carry bags were

seized from 17 persons/units and about ₹ 1,00,000,00/- (₹ One Crore Only) penalty have also been imposed as Environmental Compensation.

- g. Inspections were carried out in Bawana and Narela Industrial areas, during which approximate 29400 kg of banned (less than 50 microns) Plastic Bags/ Packaging materials were seized and EDC was also imposed on these units.
- h. A special joint drive was carried out by the enforcement agencies for removal of plastic waste from the Govt. land near Prayas Child Home, Jahangir Puri, Delhi in the month of August, 2019. During this drive, about 950 Metric Ton of Plastic Waste was removed which was lying on land allotted to defense establishments, PWD. Environmental Compensation of ₹ 3,33,00,000/- (₹ Three Crores Thirty Three Lakh only) has been imposed on the land owing agencies.
- i. A major drive was carried out to remove the illegal activities of handling of plastic waste/scrap on the agricultural land & other areas in the West district of NCT of Delhi, during which 1003 bighas of agricultural land were cleared, 10766 MT of plastic waste were lifted and sent to waste to energy plant at Bawana for safe disposal.
- j. Night Patrolling was carried out by teams of Delhi Pollution Control Committee in various Industrial Areas, during which plastic reprocessing units found violating the norms were identified and Environmental damages of ₹ 7,37,500/- (₹ Seven Lakh Thirty Seven Thousand Five Hundred Only) was imposed on the defaulters.
- k. In the month of November, 2019, units engaged in the activity of manufacturing of plastic carry bags were inspected and Environmental damages of ₹ 35,00,000 (₹ Thirty Five lakhs) was imposed on the units found manufacturing carry bags of thickness less than 50 micron. EDC imposed has been deposited by these defaulting units.
- l. Show Cause Notices issued to 1694 units under Plastic Waste Management Rules, 2016 on 26.11.2019. Till date 1076 applications have been received for registration under Plastic Waste Management Rules, 2016.

## **5.9 Ban on Single-Use Plastics**

- On 09.01.2020, Department of Environment had written to all HODs of Delhi Govt. Departments/ Autonomous Bodies/ PSUs urging them to curb single-use plastics (SUPs) in their offices.

- Notification regarding ban on Single-Use Plastics

Department of Environment is in the process of issuing Notification u/s 5 of Environment (Protection) Act, 1986 as per the advisory issued by MoEF&CC with the following directions:

*“No person including a manufacturer, shopkeeper, vendor, whole seller or retailer, trader, hawker or rehriwala etc. shall manufacture, store, import, sell, transport, supply or use listed plastic/ thermocol/ styrofoam items from the date of issuance of Notification:*

1. *Single use plastic cutlery (plates, cups, glass, bowls, forks, knives, spoons, stirrer and straw).*
2. *Thermocol/ Styrofoam cutlery (Plates, cups, glasses and bowls etc.).*
3. *Single use plastic containers (dish, bowl, trays, glasses, lids) less than 250 micros used for packing/covering of food/liquid items and all types of such styrofoam/ thermocol containers*
4. *Drinking water sealed plastic glasses / pouches.*
5. *Single-time use (Use and throw) razors.*
6. *Single-time use (Use and throw) pens.*
7. *Use of thermocol for decoration purpose.*
8. *Use of plastic material for decoration purpose such as wrapping/packing sheets, frills, garland, confetti, party bloopers, plastic ribbons etc.*
9. *Non-woven polypropylene bags*
10. *Polythene/Plastic carry bags made of virgin or re-cycled plastic (with or without handle) irrespective of thickness (excluding bags permissible under Bio-Medical Waste Management Rules, 2016 and MSW Rules, 2016).*
11. *Plastic sachets with packaging capacity of 50 ml/50 gm. and less.*
12. *Plastic sticks for ear buds, balloons, flags and candies.*
13. *Plastic refill pouch having quantity less than 500 ml.*
14. *Straws attached with tetra packs.*
15. *Polyethylene terephthalate (PET)/Polyethylene terephthalate esters (PETE) bottle having holding capacity of less than 500 ml used for packing or storing liquid or semi*

*liquid food/drink including water.*

16. *Plastic sheet or like, which is not an integral part of multilayered packaging and cover made of plastic sheet used for packing, wrapping the commodity shall not be less than fifty microns in thickness except the where the thickness of such plastic sheets impair the functionality of product.”*

These cover the single-use plastic items outlined in advisory by MOEF&CC, GOI.

## **5.10 Construction and Demolition Waste**

- I. Construction and Demolition Waste Management:
  - i. Approximate total C&D waste generation in Delhi- 3900 TPD
  - ii. 3 Construction and Demolition Waste Processing / Recycling plants are functioning at present with installed capacity of 2650 TPD (Jahangirouri-2000 TPD, Shastri Park-500TPD,Rani Khera-150 TPD).Additional 3500 TPD facilities proposed at Bakkarwala (500 TPD expandable up to 1000 TPD), Maidangarhi (1000 TPD), Ranikhera (1000 TPD), Libaspur (500 TPD).
  - iii. 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.
- III. 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.

## **5.11 Hazardous Waste**

M/s Arcadis India Pvt. Ltd engaged by DSIIDC as consultant has submitted report in December, 2016. As per the report, the total Hazardous Waste generated in Delhi is Approx. 4197.76 TPA, Out of which, 2318 TPA is generated from the industrial units

and 1880.4 is generated from CETPs in Delhi.(13 CETPs), 20456 MT of hazardous waste is stockpiled in 13 CETPs, which is ever increasing.

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.

## **6. Climate Change Mitigation Measures**

6.1 In order to address the challenges of climate change Delhi Government has 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. How can the citizens of Delhi help in reducing pollution?**

7.1 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.

7.2 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.

## **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 @ ₹ 2.00 lakhs per acre per year for maintenance and development of parks and gardens and one time financial assistance for setting up of decentralized STPs 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 2017-18, 2018-19 and 2019-20**

- In the year 2017-18, DPGS provided financial assistance for maintenance of parks and gardens for an area measuring 370.11 acres with the participation of 261 RWAs/ NGOs covering 1164 No. of parks. During 2018-19, financial assistance for maintenance of parks and gardens provided for areas measuring almost 471.55 acres with the participation of 352 RWAs/ NGOs covering 1554 No of parks. During the year 2019-20 up to 17<sup>th</sup> February 2020, financial assistance for maintenance of parks and gardens provided for area measuring 566.46 acres with the participation of 421 RWAs /NGOs covering 1754 No of parks.

## TARGET FOR 2019-20

- During the financial year 2019-20, DPGS intends to cover 2000 parks covering an area of 600 acres with the participation of 500 RWAs /NGOs.

## FREE DISTRIBUTION OF PLANTS FROM DPGS NURSERY:-

- The Society encourages RWAs/NGOs in the greening activities by organizing meetings, distribution of plants to RWAs/NGOs/ Schools for plantation in parks, technical advice and coordination with other greening agencies. During 2017-18, 1,04,568 plants raised and maintained in DPGS Nursery were distributed to RWAs/NGOs, Schools, Universities, general public, greening agencies and corporations etc.
- During 2018-19, 1,18,946 plants were procured /raised and maintained in DPGS Nursery and distributed for plantation.
- During 2019-20 till February 2020; 1,64,957 plants were procured / raised and maintained in DPGS Nursery and distributed for plantation.

## FINANCIAL ASSISTANCE OF SETTING UP TO DECENTRALIZED STP:-

- DPGS also provides one time financial assistance to RWAs/ NGOs for setting-up of decentralized STPs @ ₹ 2.00 lakhs per acre, on receipt of NOC from 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.

### Statement 8.7

#### ACHEIVEMENTS DURING 2017-18, 2018-19 AND 2019-20:-

FINANCIAL YEAR	NO. OF RWAs/ NGOs	No. OF PARKS	COVERING AREA IN ACRE
2017-18	261	1164	370.11
2018-19	352	1554	471.55
2019-20 (upto 17 <sup>th</sup> . Feb.2020)	421	1754	566.46

## 9. FOREST IN DELHI

- 9.1 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.
- 9.2 The National Forest Policy, 1988 provides that a minimum of 1/3<sup>rd</sup> 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 1993-2019

(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
13.	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 1993. 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.

### Statement 8.9

#### CHANGE IN FOREST AND TREE COVER IN DELHI BETWEEN 2017 AND 2019

(Area in Sq Km)

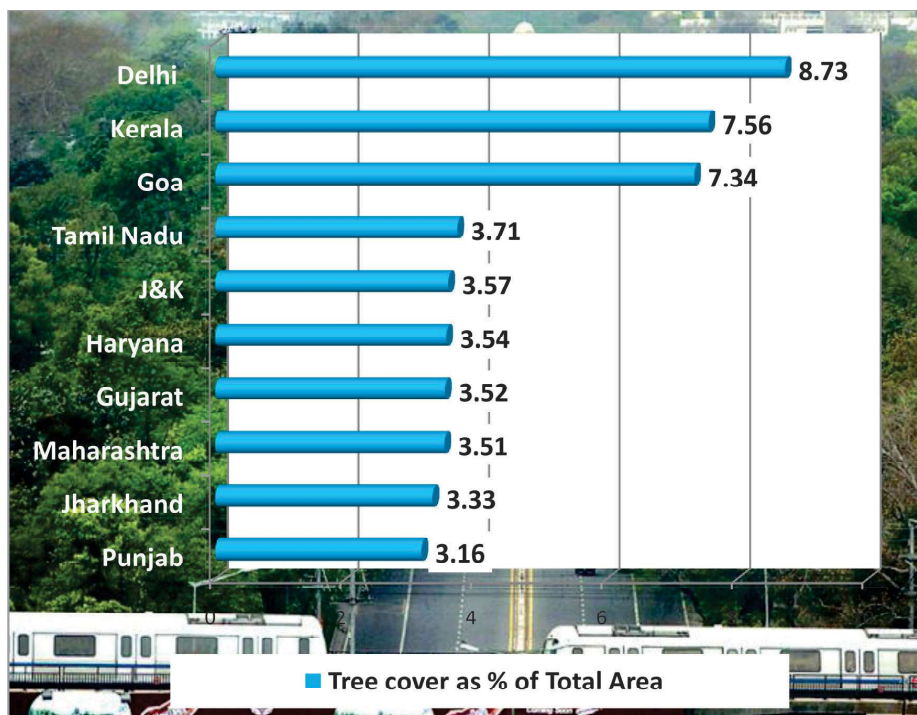
<b>Change in Forest Cover in Delhi</b>			
	<b>2017 Assessment</b>	<b>2019 Assessment</b>	<b>Change</b>
Geographical Area	1483		
Very Dense Forest	6.72	6.72	0
Moderate Dense Forest	56.24	56.42	0.18
Open Forest	129.45	132.30	2.85
<b>Total Forest</b>	<b>192.41</b>	<b>195.44</b>	<b>3.03</b>
<b>Per cent of the Geographical Area</b>	<b>12.97</b>	<b>13.18</b>	<b>0.21</b>
<b>Change in Tree Cover in Delhi</b>			
	<b>2017 Assessment</b>	<b>2019 Assessment</b>	<b>Change</b>
<b>Total Tree cover</b>	<b>113</b>	<b>129</b>	<b>16</b>
<b>Per cent of the Geographical Area</b>	<b>7.62</b>	<b>8.69</b>	<b>1.07</b>

Source: State Forest Report, 2019

- 9.4 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 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 1.48 per cent in 1993 to 21.88 per cent in 2019. Delhi's forest cover has increased by 0.21% or 3.03 sq km, compared to the assessments conducted in 2017, according to the State of the Forest report 2019.
- 9.5 The State Forest Report 2019 reveals that 'Very dense forest' cover remains constant and 'Medium dense forest' cover in Delhi has increased over the past two years. The very dense forest cover records as 6.72 sq. km in 2019 which is similar with the record of 2017, while, the medium dense forest cover has increased from 56.24 sq. km to 56.42 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. 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% which has increased from 129.45 sq. km to 132.30 sq. km in Delhi, leading to an overall increase in forest cover.

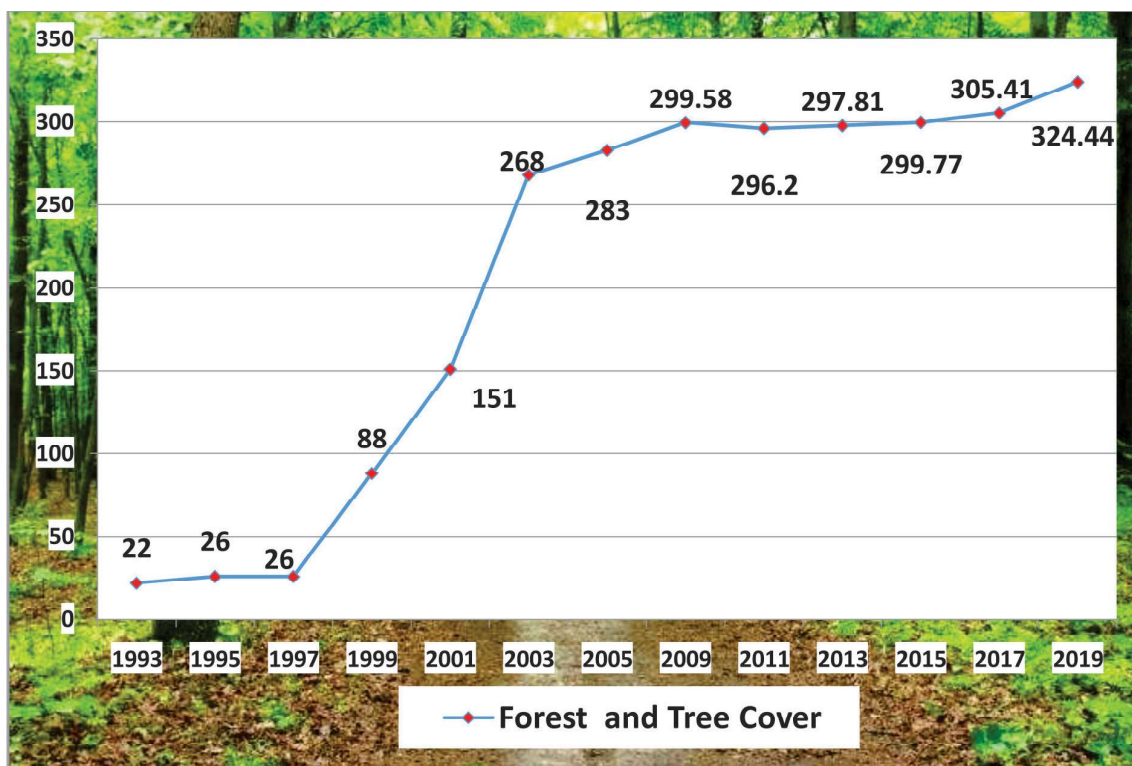
- 9.6 Some trees had to be felled because of construction projects such as the Dwarka Express (by NHAI), General pool accommodation at Thyagraj Nagar & Mohammadpur, development of STPs at Kondli & Rithala, DMRC projects at Airport & West Delhi, etc. In all the projects cleared during 2019-20, number 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. During the period from 2017 onwards, Delhi has gone ahead of Kerala and Goa in percentage of tree cover.

**Chart 8.4**  
**Tree Cover as % of Total Area; 2019**



**Chart 8.5**

**FOREST AND TREE COVER AREA OF DELHI 1993-2019**



9.9 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 - 2019**

(Sq. Km)

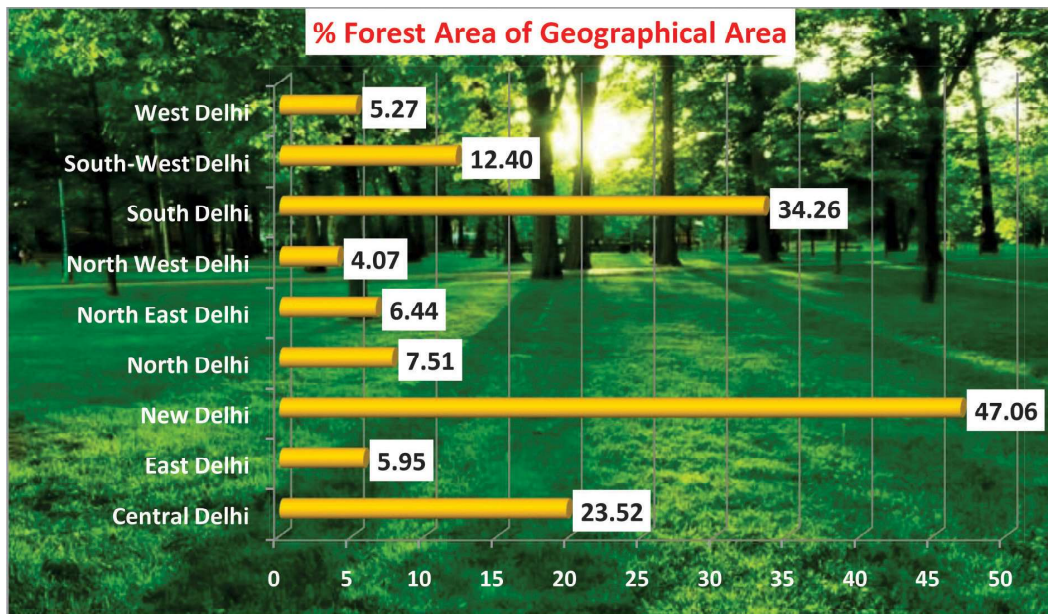
S. No.	Districts	Geographical Area	Forest Cover Area	% of Geographical Area
1.	Central Delhi	21	4.94	23.52
2.	East Delhi	63	3.75	5.95
3.	New Delhi	35	16.47	47.06
4.	North Delhi	61	4.58	7.51
5.	North East Delhi	62	3.99	6.44
6.	North West Delhi	443	18.04	4.07
7.	South Delhi	247	84.63	34.26
8.	South-West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

Source: State Forest Report, 2019

9.10 It may be inferred from Statement 8.10 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 8.6.

**Chart 8.6**

**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	<u>39.83 sq. km</u>
Sub Total	<u>59.07 sq. km</u>

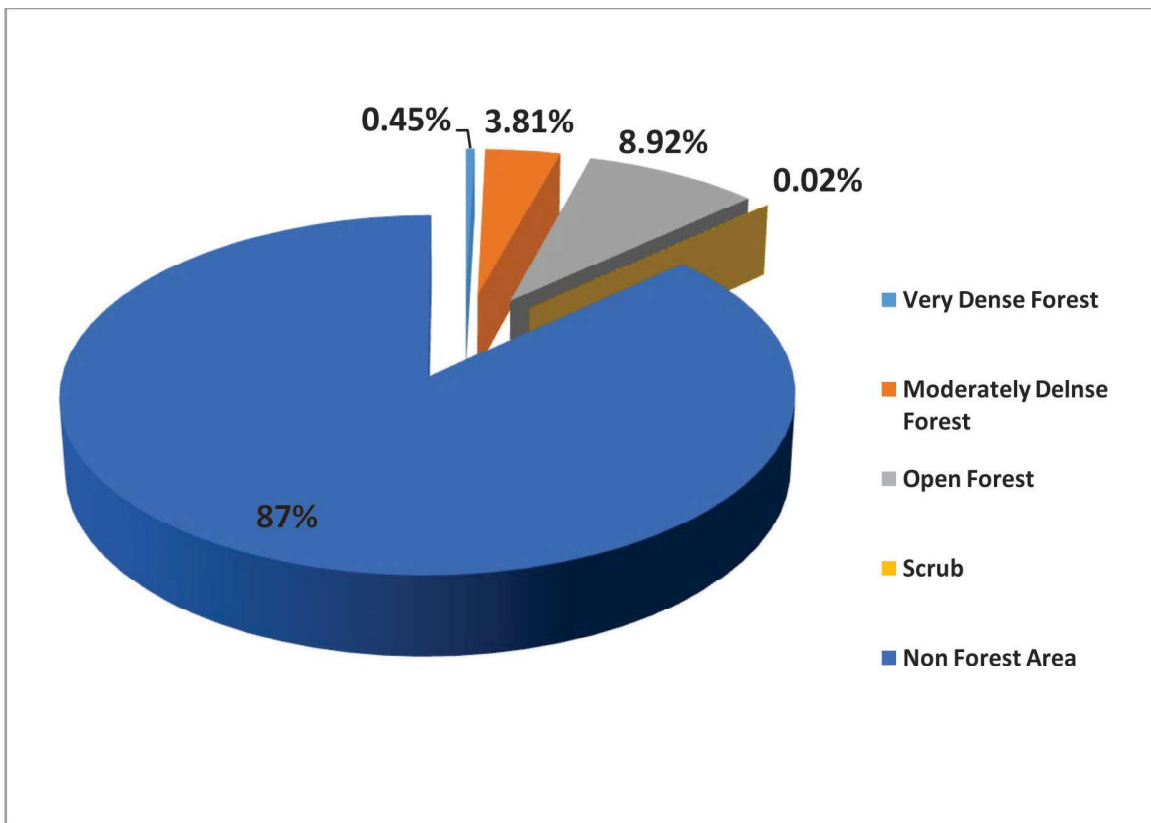
**Forest Cover outside Green Wash:**

Very Dense Forest	3.53 sq. km
Moderately Dense Forest	40.37 sq. km
Open Forest	<u>92.47 sq. km</u>
Sub Total	<u>136.37 sq. km</u>
Total Forest Cover	195.44 sq. km
Tree Cover	<u>129 sq. km</u>
Total Forest & Tree Cover	<u>324.44sq. km</u>
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 8.7. 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 8.7**

**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 8.11

#### Wetlands inside the Recorded Forest Area (or Green Wash) in Delhi

Wetland Category	No. of Wetlands	Total Wetland Area (in Ha)
Inland Wetlands - Natural		
Lake/Pond	1	2
Riverine wetland	0	0
Waterlogged	0	0
River/Stream	0	0
<b>Sub - Total</b>	<b>1</b>	<b>2</b>
Inland Wetlands -Man-made		
Reservoir/Barrage	0	0
Tank/Pond	0	0
Waterlogged	0	0
<b>Sub - Total</b>	<b>0</b>	<b>0</b>
Wetlands (<2.25 ha)	16	16
<b>Total</b>	<b>17</b>	<b>18</b>

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

*(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*, *Salvadorapersica* and *Anogeissuslatifolia* with an abundance of *Prosopisjuliflora*.

9.14.2 Shrubs include *Capparissepia*, *Zizyphusmauritiana*, Herbaceous flora is *Calotropisprocera*, *Withaniasomnifera*, *AchyranthesAspera*, *Tridax*. Main grasses

are *Cenchrusciliaris*, *Aristida*, *Eragrostis*, *Saccharumspontaneum*, *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 Asola Bhatti wildlife sanctuary actually lies in South Delhi District, all along Delhi Haryana Border along Faridabad and Gurgaon.

10.2 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.

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

10.3.1 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 31<sup>st</sup> 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.

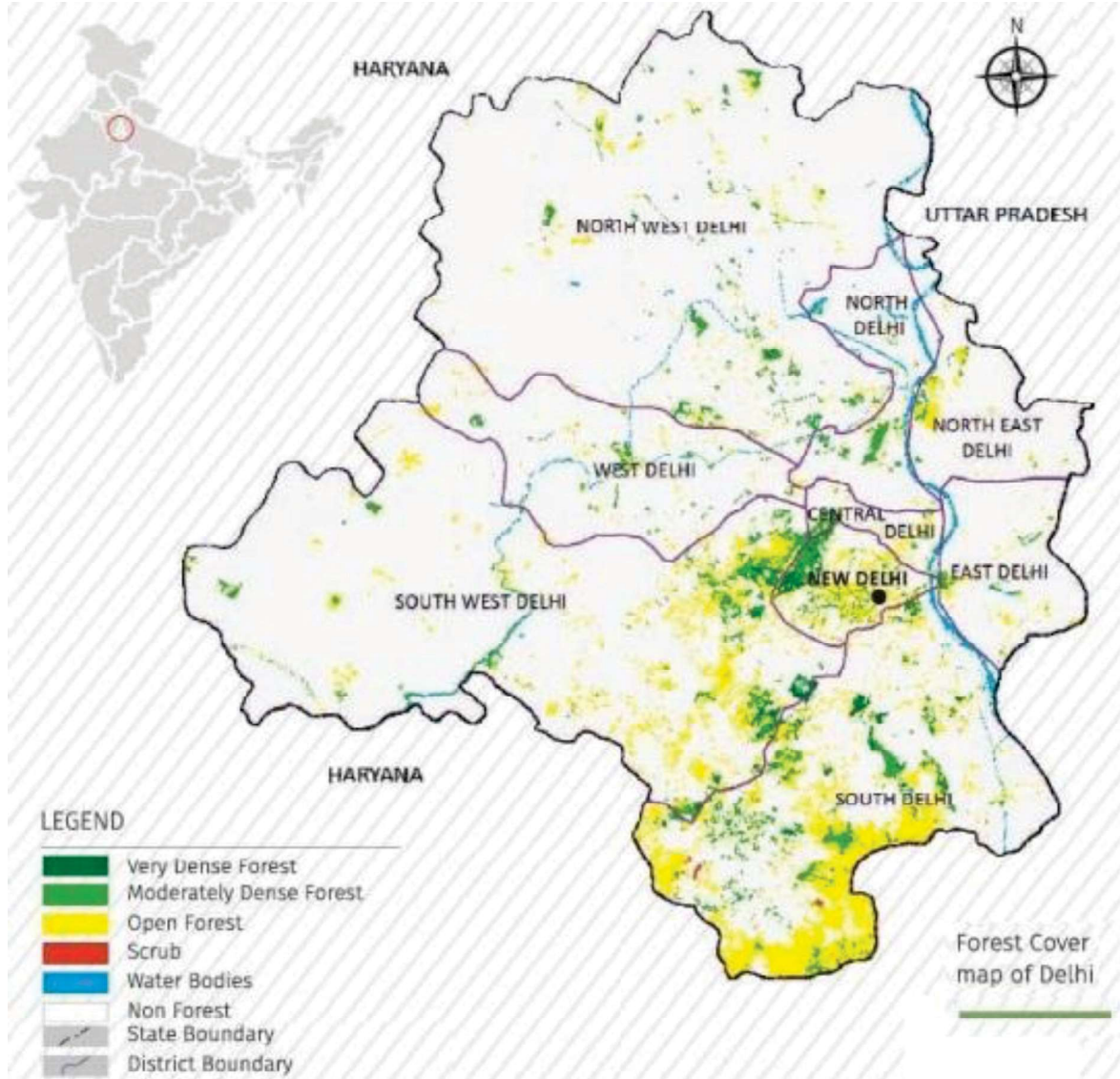
10.3.2 EFC has approved the extension of the project period for rehabilitation of degraded forest land in the Southern Ridge area of Asola Bhatti, Dera Mandi, Maidangarhi, Ghittorni and Rajokri through Eco-Task Force from 01.01.2017 to 31.03.2022 at an estimated cost of ₹ 90.25 crore (₹ 48.75 crore for 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

## 11. Major Achievements 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

**Chart 8.8**

**FOREST COVER MAP OF DELHI**



## CHAPTER 9

# INDUSTRIAL DEVELOPMENT

The major drivers of economic growth in Delhi are industry and trade. The state has largely the service-led economy. Consistently rapid economic growth and a diversified economic structure of Delhi makes it a progressive economy with very strong economic fundamentals. Industrial development provides a secure basis for a rapid growth of income and made Delhi's per capita income to grow at a higher pace in last many years. It is a major trading hub in the country and has excellent public Infrastructure & communication facility for promotion of Business. Service sector contribution is the highest to Delhi's economy and major contribution comes from professional services & real estates, Transport, storage & Communication, hotels & restaurants, Trade & Repair services etc.

2. Delhi ranked on the top in the country in SDG-9 i.e. ***“Inclusive Sustainable Industrialization, Foster Innovation”*** as per the assessment made by NITI Aayog in its report on SDG India Index 2.0 released on 30<sup>th</sup> December 2019. Delhi has a score of 100 against all India score of 65.
3. Higher economic growth, promotion of inclusive and sustainable industrialisation and employment are the focus areas of the Government for the economic development of the state. Some of the key challenges in this sector are development of industrial infrastructure, redevelopment and decongestion of dilapidated industrial clusters etc. Setting up of industrial clusters for knowledge-based industries, business services, electronics, high-tech industries, biotechnology industries, R&D activities, health services etc. with job-creating avenues are given priority.
4. The Industrial Policy for Delhi 2010-21 aims to promote a transparent and business-friendly environment, promotion of non-polluting and clean industries, promotion of high-technology and skill industries to keep in-migration of unskilled labour to minimum, to develop world-class infrastructure within planned industrial estates and regularised industrial clusters, promotion of cluster approach and walk to work concept, wherever possible, to facilitate business through procedural simplifications and e-governance measures.
5. Following are the areas which are in focus by the Government and simplification of process requirement for promotion of Business: