

## CHAPTER 8

### ENVIRONMENTAL CONCERNS

1. The metro city of Delhi, which had a dubious distinction of being one of the most polluted cities of world, has now been witnessing a discernable change in its ambient air quality for the last few years. This could be achieved through persistent efforts of Govt. of Delhi by introduction of unleaded petrol, phasing out of old commercial vehicles, conversion of entire city bus fleet into CNG mode, shifting of polluting industries out of Delhi, vigorous environmental awareness programmes and simultaneously increasing green cover by planting more trees.

#### POLLUTION LEVELS:

#### 2. AMBIENT AIR QUALITY STATUS:

Concentration of various pollutants in the ambient air is showing a declining trend, which is evident from the following statement:

#### Statement-1

#### YEAR WISE ANNUAL MEAN AMBIENT AIR QUALITY LEVELS IN DELHI

Year	Concentration in ambient air(In $\mu\text{g}/\text{m}^3$ )				
	SO <sub>2</sub>	NO <sub>x</sub>	*CO	SPM	RSPM
1997	18.68	44.85	4810	362.58	-
1998	20.37	42.17	5450	377.92	-
1999	19.46	40.11	4241	374.92	-
2000	18.03	41.83	4686	430.83	191.00
2001	14.10	41.75	4183	381.67	150.08
2002	11.33	47.28	3258	455.92	192.25
2003	9.49	45.00	2831	352.30	148.86

Source: Department of Environment, GNCTD

\* At ITO intersection only.

## Statement-2

### NATIONAL AMBIENT AIR QUALITY STANDARDS

POLLUT- ANT	SULPHUR DIOXIDE (SO <sub>2</sub> )	NITROGEN DIOXIDE (NO <sub>2</sub> )	SUSPENDED PARTICULATE MATTER (SPM)	RESPIRABLE PERTICULATE MATTER (RSPM)	CARBON MONOXIDE (CO)	LEAD
Time Weighted Average	Annual Average	Annual Average	Annual Average	Annual Average	8 hours Average	Annual Average
Industrial Area	80 µg/m <sup>3</sup>	80 µg/m <sup>3</sup>	360 µg/m <sup>3</sup>	120 µg/m <sup>3</sup>	5000 µg/m <sup>3</sup>	1.0µg/m <sup>3</sup>
Residential and Rural Area	60 µg/m <sup>3</sup>	60 µg/m <sup>3</sup>	140 µg/m <sup>3</sup>	60µg/m <sup>3</sup>	2000 µg/m <sup>3</sup>	0.75 µg/m <sup>3</sup>
Sensitive Area	15 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>	70 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>	1000 µg/m <sup>3</sup>	0.50 µg/m <sup>3</sup>

**Source:** Central Pollution Control Board

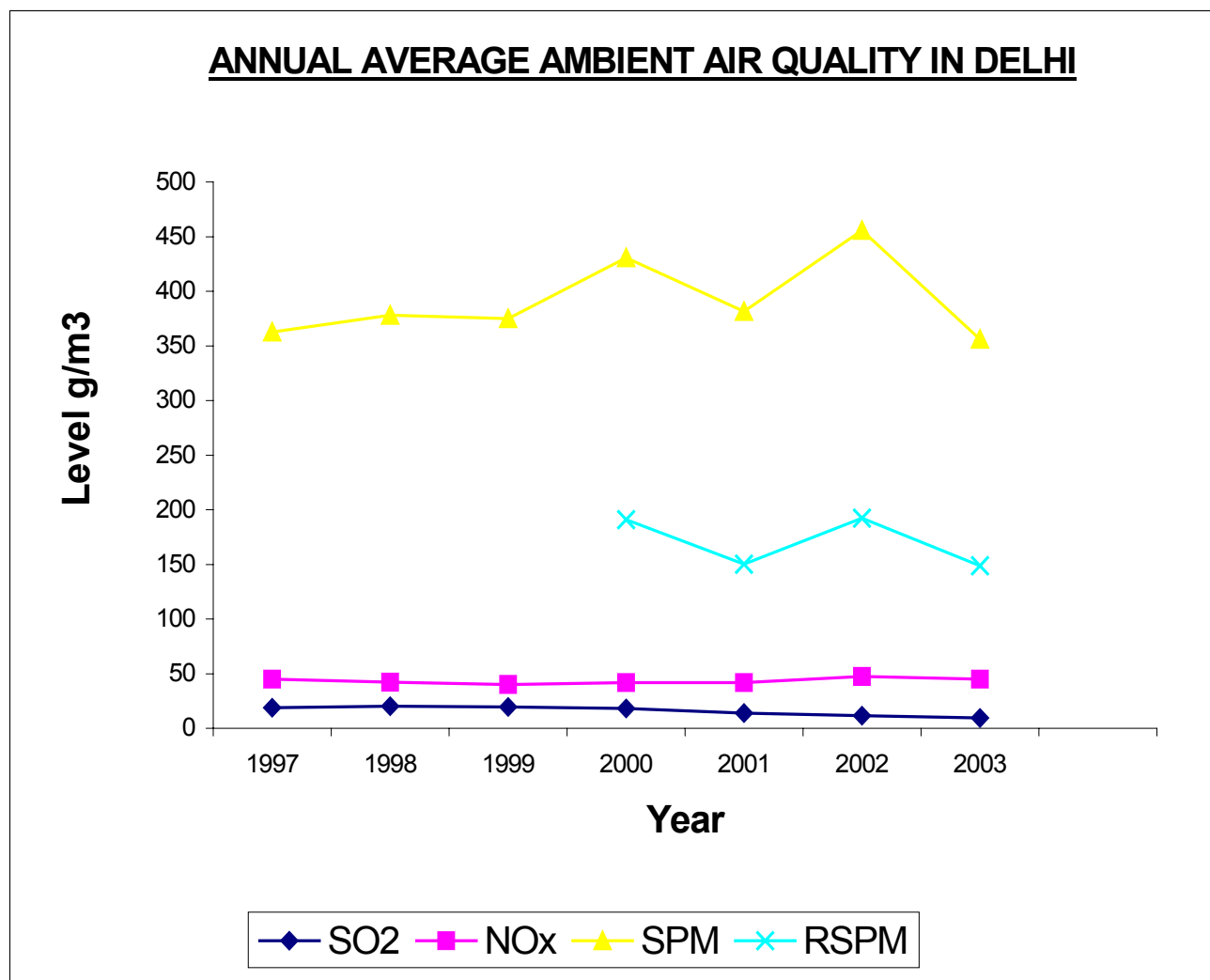
2.1 **Sulphur Dioxide (SO<sub>2</sub>):** Statement 1 shows that level of SO<sub>2</sub> has drastically come down in the ambient air. Annual mean SO<sub>2</sub> level was observed as 18.03 µg/m<sup>3</sup>, 14.10 µg/ m<sup>3</sup>, 11.33 µg/ m<sup>3</sup> and 9.49 µg/ m<sup>3</sup> in the year 2000, 2001, 2002, & 2003. As such SO<sub>2</sub> level has decreased by 53.39% in 2003 as compared to 1998 (i.e. year of CNG initiative). This shows tremendous achievement after conversion of all buses/Taxis/Autos in CNG mode. The annual mean of SO<sub>2</sub> level in Delhi satisfy the annual average of National Ambient Air quality standard for residential areas which is 60µg/m<sup>3</sup> (Statement-2)

2.2 **Nitrogen Dioxide (NO<sub>2</sub>)** Annual average value of NO<sub>2</sub> has decreased significantly (4.82%) in 2003 as compared to previous year. It was 45 µg/ m<sup>3</sup> in 2003 as against 47.28

$\mu\text{g}/\text{m}^3$  2002. The annual mean of  $\text{NO}_2$  level in Delhi is well within the annual average of National Ambient Air quality standards for residential areas which is  $60 \mu\text{g}/\text{m}^3$

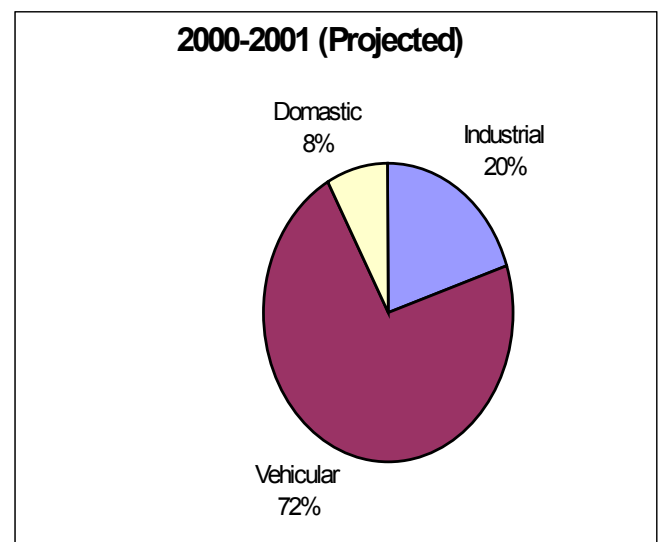
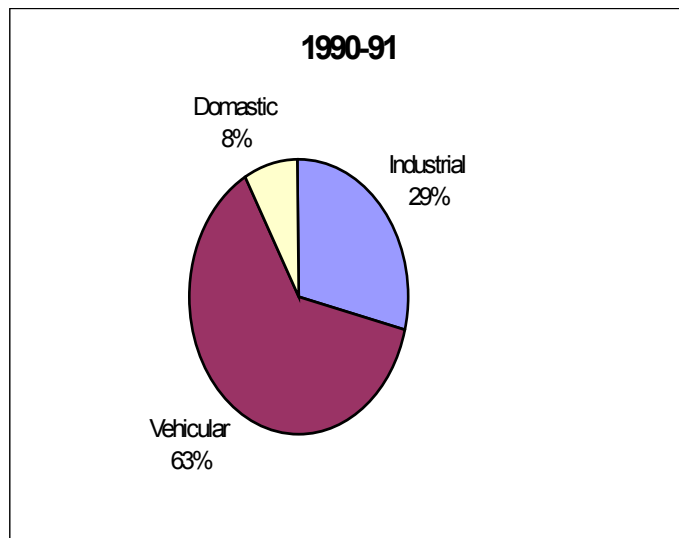
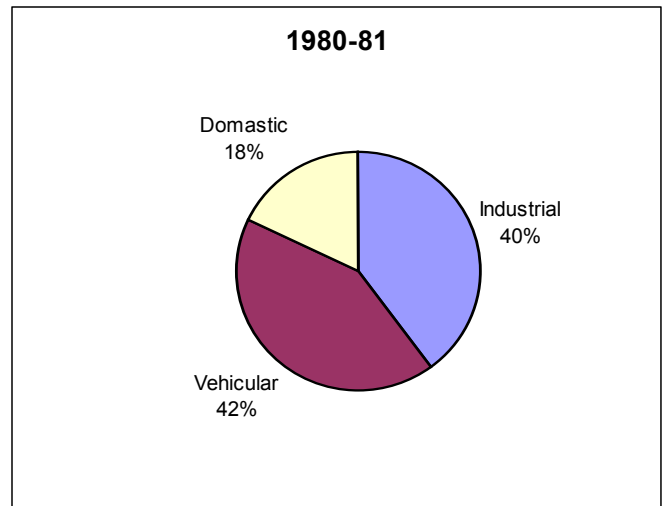
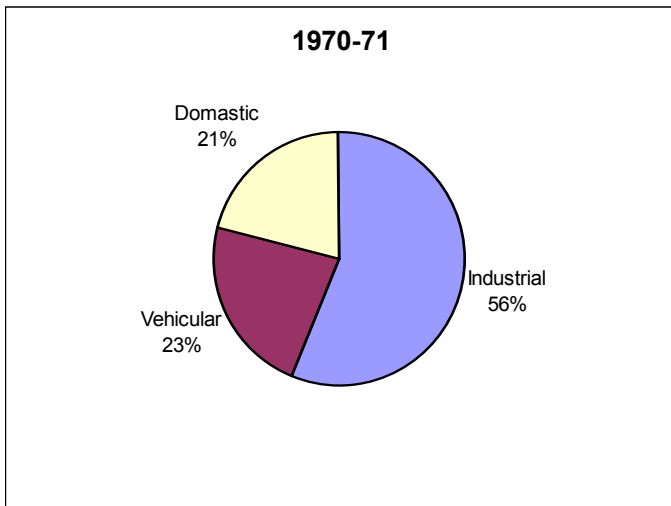
- 2.3 **Carbon Monoxide (CO):** As is evident from Statement -1, annual average CO level has gradually been reducing since 1999 at ITO intersection. It was  $4183 \mu\text{g}/\text{m}^3$  in 2001 whereas in 2002 and 2003 it came down to  $3258 \mu\text{g}/\text{m}^3$  and  $2831 \mu\text{g}/\text{m}^3$  respectively. This could be attributed to the stringent vehicular emission norms, fuel quality up-gradation and better maintenance of engines.
- 2.4 **Suspended Particulate Matter (SPM):** As may be seen in Statement -1, annual average SPM level has drastically come down from  $455.92 \mu\text{g}/\text{m}^3$  in 2002 to  $352.3 \mu\text{g}/\text{m}^3$  in 2003 (22.72%). Though no definite trend was observed in case of SPM yet the situation improved remarkably in 2003.
- 2.5 **Respirable Particulate Matter (RSPM):** Annual average of RSPM level has reduced by 22.47% in 2003 as compared to 2002. It was only  $148.86 \mu\text{g}/\text{m}^3$  in 2003 as against  $192 \mu\text{g}/\text{m}^3$  in 2002.
- 2.6 **Lead:** Annual average level of lead has significantly reduced after 1996. In 1996, the lead concentration in petrol was brought down from 0.56 g/l to 0.15 g/l. In 1998, lead was totally phased out from petrol. Consequently, this resulted in reduction of lead level in the ambient air.
- 2.7 Thus ambient air quality has improved significantly which can be gauged from the fact that as compared to 1997 the concentration of Carbon Monoxide has fallen by 41.14%. Sulphur Dioxide level has reduced by 49.20%. However, not much change was observed in case of  $\text{NO}_2$ . There was tremendous improvement in concentration of particulate matters (SPM & RSPM) in the ambient air in 2003 as compared to 2002. This is the root cause of respiratory problems affecting thousands of people in Delhi every year. The concentration of other pollutants like Lead & Benzene have also registered marked decline.

Chart - 1



**Chart - 2**

**AIR POLLUTION BY SECTOR OF ORIGIN**



**Source:** White paper on pollution in Delhi with an action Plan, 1997

**Box-8.1**

**CRITICAL POLICY LINKS FOR URBAN ENVIRONMENTAL MANAGEMENT**

Urban Environmental Management Issue	Underlying causes	Relevant policy reforms
Access to basic environmental Infrastructure and services:		
Serviced land shelter	Poor functioning urban land and housing markets; Highly regulated prices; Lack of affordable housing for the poor	Reforms property rights; Develop mortgage financing; Introduce affordable standards and target subsidies to the poor; Reduce unneeded regulations, government interventions and subsidies
Water supply, sanitation, drainage, solid waste collection/transport.	Supply side dominated by government monopoly; Prices heavily regulated; Heavy subsidies.	Introduce pricing and demand Management; Reconsider subsidies; Move toward decentralisation, privatisation, and participation.
Pollution from urban wastes and emissions:		
Water pollution	Uncontrolled municipal and industrial discharges; Excessive water use and waste generation; Failure to link water quantity and quality issues	Introduce water pricing and effluent charges; Subsidise sewage treatment; Strengthen regulations and capacity for monitoring and enforcement; Prepare comprehensive basin plans
Energy use and air pollution - Ambient air pollution - Indoor air pollution	Increased motorization and transportation congestion; Energy supply side dominated by government monopoly; Heavy energy subsidies; Household and cottage industry Use of low - quality fuels	Introduce energy and fuel pricing, road charges emission charges; Reduce automobile subsidies, fuel subsidies; Integrate transport and land use planning; Promote clean technologies, fuel substitution, and vehicle maintenance.
Solid and Hazardous waste Management.	Poor municipal management; Lack of disposal facilities; Inadequate regulation and Enforcement.	Introduce regulations, licensing and charges; Stimulate waste minimisation; strengthen operations; privatise disposal operations.
Resources losses:		
Ground water depletion	Unsustainable extraction linked to unclear property rights and treatment as free resources.	Clarify property rights; Introduce extraction charges; Rain water harvesting.
Land and ecosystem degradation	Low - income settlements "pushed" onto fragile lands by lack of access to affordable serviced lands ( see above ) Lack of controls over damaging Economic activities.	Co ordinate land development; Remove artificial shortages of land; Develop sustainable uses of sensitive areas; Monitor and enforce land use controls.
Loss of cultural and historic property	Lack of property rights, regulations, enforcement, maintenance; Failure to reflect social values in land prices.	Introduce tax incentives for preservation; Use redevelopment planning, zoning and building codes; Develop property rights.
Environment hazards		
Natural hazards	Poorly functioning land marks. Ineffective land policies; Poor construction practices.	Enable land markets ( see above ) Provide disincentives to construction practices occupation of high- risks areas, incentives for using disaster - resistant construction technique; Disaster preparation plans.
Man made hazards	Inadequate regulation and enforcement; Low - income settlements alongside hazardous activities.	Introduce and enforce environmental zoning; formulate urban disaster preparedness plans and strengthen response capacity. Disaster mitigation plans.

Source : DUEIIP-2021

### 3. NOISE POLLUTION

The other important polluter of the environment (air) of Delhi is excessive noise. The major contributors to noise pollution are industries, vehicular traffic, festivals, construction activities, Diesel generating sets etc. Noise levels in Delhi exceed permissible levels in all areas except industrial areas according to a study by Delhi Pollution Control Committee in 1996. Following table indicates the ambient noise levels permitted by Central Pollution Control Board for different areas: -

#### PRESCRIBED AMBIENT NOISE STANDARDS

S.No.	Area	Leq/dB (A)	
		Day Time *	Night Time **
1.	Industrial Area	75	70
2.	Commercial Area	65	55
3.	Residential Area	55	45
4.	Silence Zone***	50	40

#### Notes:

\* Day time - 0600 hour to 2100 hour (15 hours)

\*\* Night Time - 2100 hour to 0600 hour (09 hours)

\*\*\* Areas up to 100 meter around certain premises like hospitals, education institutions and courts may be declared as silence Zones by the competent authority; honking of vehicle horns, use of loudspeaker, bursting of cracker, hawkers' noise should be banned in these zones.

**Source:** State of the Environment 1995, Ministry of Environment and Forest

### 4. WATER POLLUTION

- 4.1 The 48-km stretch of the Yamuna River in Delhi is heavily polluted by domestic factors and partly by industrial wastewater. The river water upstream of Wazirabad is fit for drinking after treatment but after the confluence of the Najafgarh drain and 18 other major drains, the water quality becomes heavily degraded and is unfit even for animal consumption and irrigation (Table 8.5 & 8.6).

## **DOMESTIC WASTE WATER POLLUTION**

- 4.2 The increase in population has resulted in a corresponding increase in the volume of domestic wastewater that is generated. Water Supply capacity of DJB is about 650 MGD while the present Sewage Treatment Capacity is about 512.40 MGD. However waste water being discharged in major drains (Table 8.5) is more than water supplied by DJB indicating water consumption through other sources also in Delhi as well as waste water generated in unplanned area and discharged into drains.

## **INDUSTRIAL WASTE WATER**

- 4.3 The industrial wastewater generated in Delhi is about 40 MGD. Although some industrial units have installed ETP to treat wastewater, most of the small-scale industries have not installed such facilities

## **5. VEHICULAR POLLUTION**

Vehicle population has increased from 22.39 lac in 1993-94 to 41.84 lac in 2003-04. Thus, an increase of about 87% has been registered in a period of 10 years. Highest increase was in the category of car / jeeps (142.92%) & scooter / motorcycle (77.61%). This has resulted in a corresponding increase in pollutants emitted by vehicles. Petrol consumption has increased from 133 thousand tons in 1980-81 to 570 thousand tons in 2001-02, Diesel (HSDO) consumption has increased from 377 thousand tons to 1048 thousand tons. As such, petrol consumption has increased by about 329% and Diesel consumption by about 178% in the last two decades.

## **6. SOLID WASTE**

Latest estimates indicate that about 6400 M. Tones of Solid waste is being generated each day in Delhi at present. In addition, industrial hazardous and non-hazardous waste, such as fly ash from power plants, is also generated. MCD and NDMC could manage to clear about 5500 M. Tones of garbage each day resulting in accumulation of garbage in the city area.



## 7. **BIO MEDICAL WASTE**

With the increase in the number of hospitals and nursing homes in Delhi, hospital waste has become another area of concern. Many private nursing homes and small hospitals do not have arrangement to treat hospital waste. Installing incinerators to burn hospital waste is not an ideal solution since these incinerators add to air pollution.

## 8. **MEASURES TO COMBAT POLLUTION**

8.1 Major environmental laws & regulations to control the pollution can be seen in Box 8.2

### **Box 8.2**

#### **LIST OF MAJOR ENVIRONMENTAL LAWS AND REGULATIONS**

1. The Water (Prevention and Control of Pollution) Rules, 1975
2. The Air (Prevention and Control of Pollution) Rules, 1982
3. The Water (Prevention and Control of Pollution) Cess Act, 1977/1991 and Rules, 1978
4. The Environment Protection Act, 1986
5. Notification on Emission Standards of Pollutants from various industries, 1989
6. Hazardous Wastes (Management and Handling) Rules, 1989
7. Manufacture, Storage and Import of Hazardous Chemical Rules, 1989.
8. Manufacture, Use, Import, Export and Storage of Hazardous Micro- Organisms Genetically Engineered Organisms or Cells Rules, 1989
9. The Public Liability Insurance Act and Rules, 1991
10. The Notification on Environment Impact Assessment of Development Projects, 1994
11. The Chemical Accidents (Emergency, Planning, Preparedness and Response) Rules, 1996
12. The Bio-Medical Waste (Management and Handling) Rules, 1998
13. The Recycled Plastics (Manufacture and usage) Rules, 1999
14. The Hazardous Waste (Management and Handling) Amendment Rules, 2000
15. The Delhi Plastic Bag (Manufacture, Sales and usage) and Non-Biodegradable Garbage (control) Act, 2000
16. Municipal Solid waste (Management & handling) Rules, 2000
17. The Noise pollution (Regulation & Control) Rules, 2000
18. The recycled Plastics manufacture and usage (amendment) Rules 2003

**Source :** DUEIIP-2021 & Environment Department, Govt. of Delhi.

## 8.2 VEHICULAR POLLUTION

The main source of air pollution is vehicular exhaust. Therefore, a strategy for use of cleaner fuel, reduction in fuel consumption, efficient maintenance of engines and installation of pollution control devices was adopted. Govt. of Delhi initiated the following steps in this direction:

- Mandatory fitting of catalytic converters -April, 1995
- Introduction of Low Sulphur Diesel – April, 1996.
- Introduction of CNG buses – April, 1998.
- Complete removal of unleaded petrol – September, 1998.
- Restriction on plying of goods vehicles during day time-December, 1998
- Mandatory premixing of lubricant oil in petrol and ban on sale of loose lubricant Oil-December, 1998
- Amendment of Motor vehicle Act to bring CNG vehicle under permit & Tariff jurisdiction of government – September, 1999.
- Registration of private vehicles only conforming to Euro-II norms – April, 2000.
- Phasing out of Commercial vehicles older than eight years – April, 2000.
- Stricter emission norms (Bharat Stage – II ) for registration of new taxis – October, 2001.
- Conversion of entire fleet of buses into CNG – November, 2002.

## 8.3 INDUSTRIAL AIR POLLUTION

It is estimated that air pollution generated from industrial activity in Delhi is about 20% of total air pollution. Although several steps have been taken, industrial pollution needs to be reduced further. More than 1,300 industrial units, that should not have been operating as per the MPD-2001 norms, have been closed. A scheme has been prepared to relocate industrial units that currently operate in residential areas. About 1,300 acres of land have been acquired and new industrial estates are being developed at Bawana, Holumbi Kalan and Holumbi Khurd. Land available within existing industrial estates is also being used to accommodate such industrial units. Anand Parbat, Shahdara and Samaipur Badli area are being developed as industrial estates. All Industries in Delhi using Coal Fired Boilers have been asked to change over to Oil or Gas Fired Boilers in

order to reduce air pollution generated from industrial activities. This will also reduce the Fly Ash generated by the approximate 4000-5000 coal fired boilers in the City. All industries are also being advised to control pollution from diesel generating sets. They have been asked to increase the stack height to a level of 2-3 meters above their building height and also take acoustic measures to reduce the noise level from diesel generating sets.

- 8.4 The main pollutants from coal based thermal power plant are stack emissions, fly ash generation and fugitive emission in coal handling. There are five power plants in Delhi, out of which, two are gas based and three are coal based. All three coal based thermal power plants located in Delhi have installed pollution control systems and are adhering to the national standard of 150 mg/Nm<sup>3</sup>. However, DPCC has given new stringent norms for particulate matter emission as 50 mg/ Nm<sup>3</sup> for which all the three Thermal Power Plants are in the process of upgrading their pollution control system.
- 8.5 As per notification of MOEF, Govt. of India dated 27<sup>th</sup> August 2003 relating to utilization of fly ash within a radius of fifty Kilometers from coal or lignite based Thermal Power Plants, it is proposed to restrict the excavation of top soil for manufacturing the bricks; and promote the utilization of fly ash in the manufacture of building materials and in construction activity. The notification direct that 25% construction material mainly bricks/ blocks will be from fly ash use by 31-8-2004 and 100% by August, 2007 within such area. In Delhi about 5000 M.Tones of Fly ash is generated each day in 3 power plants. Of which, about 57% is being utilized for land fill, road embankment and brick making. Now in addition to Badarpur Plant, land is being allotted to 3 more units for brick manufacturing at I.P. and Rajghat Thermal power stations

## **8.6 INDUSTRIAL WASTE WATER POLLUTION**

There are 31 industrial areas in Delhi. Most of the small and tiny industries do not have individual facilities to treat liquid waste. Each unit has been asked to install an Effluent Treatment Plant to ensure neutralization of acidity, removal of oil and grease and removal of total suspended solids to the levels specified for each industry by the Central Pollution Control Board or up to sewage standards wherever specific standards have not been laid down. For management of industrial effluent, 15 CETPs have been proposed to cater the treatment of effluent generated from the various Industrial units at Delhi. 10 CETPs have been constructed so far and four are expected to be completed shortly. Besides 15

CETPs, additional 02 CETPs are proposed at Narela Industrial Area and Bawana Industrial Area.

**Map 8.1**

**LOCATION OF PROPOSED INDUSTRIAL COMMON EFFLUENT TREATMENT  
PLANTS (CETPs)**

## 8.7 DOMESTIC WASTE WATER POLLUTION

The present water supply capacity of DJB is approximately 650 MGD and the sewage treatment capacity is 512.4 MGD. 16 new sewage treatment plants have already been commissioned. However, since unauthorized colonies and JJ clusters may not be provided with sewerage systems, wastewater from these areas will continue to be discharged through drains. In such areas, about 1000 public toilets have been constructed with JBIC funds in addition to public toilets being constructed by slum wing under their plan scheme.

## 8.8 YAMUNA ACTION PLAN (PHASE - II)

The Yamuna Action plan (YAP) Phase - I, focused on the treatment of partial wastewater discharge from 15 towns till the year 1998 and the pollution from Delhi was not fully addressed. Hence, the schemes of this project did not contribute fully in improvement of water quality of river Yamuna. Therefore, YAP - II has been formulated by M/o Environment & Forest, Govt. of India to achieve the desired water quality standards for Yamuna River and to improve the sanitary and hygienic conditions of the low - income population. The total cost is Rs. 387.17 crore for the schemes under "Yamuna Action Plan Phase - II" in Delhi. The cost of the schemes is to be shared on 85:15 basis between the Govt. of India and Govt. of Delhi. A few study projects are also included in YAP - II, which will be implemented under YAP (Phase-III)

### Projects under Yamuna Action Plan Phase -II (YAP-II)

Projects finalized by MOEF	Cost (Rs. in Crore)
324 MLD (72 MGD) Keshopur, STP rehabilitation, Pumping station and rising main in Keshopur STP pilot plant for electricity generation from biogas	66.36
Okhla STP augmentation with electricity generation plant for 170 MGD STP	85.27
Ring Road trunk sewer rehabilitation	90.07
Wazirabad road trunk sewer settlement	64.20
Bela Road trunk sewer rehabilitation	17.47
DPR Preparation including Pilot Plant implementation for YAP III	35.00
Misc. e.g. Slum Rehabilitation, Public Participation and Awareness and Capacity Building/PR	28.80
<b>Total</b>	<b>387.17</b>

Implementation of these projects of YAP -Phase-II was to commence in 2003-04 but due to delay in appointment of PMC by GOI for approval of these projects, now implementation will start in the current year.

## **8.9 HAZARDOUS WASTE MANAGEMENT**

Hazardous Waste (Management & Handling) Amendment Rules, 2000, specifies 36 types of hazardous waste generating processes as well as type of hazardous waste. Under the rules, it is the responsibility of all the industrial units who generate specified hazardous waste to ensure that the hazardous waste is properly collected, treated, stored, transported and disposed of in environmentally sound manner.

Delhi Pollution Control Committee, undertook a general census of industrial units, located in all the 31 approved industrial areas of Delhi through NCAER and NPC, during the year 2001. According to survey report, the number of hazardous waste generating units was reported to be 2,611. The quantity of the hazardous waste expected to be generated from 31 approved industrial areas in Delhi is reported to be 50,000 MT per annum. The National Productivity Council, New Delhi conducted a Environment Impact Assessment study of 3 probable sites to select a site for the disposal of hazardous waste. Effort are being made to develop a common site for disposal of hazardous waste in NCR area for Delhi. Govt. of India is requested to take the lead in this matter in coordination with NCRPB.

## **8.10 SOLID WASTE MANAGEMENT**

The management of solid waste in Delhi is being improved through measures adopted by concerned agencies. The measures include the following :

- I) Construction of dalaos/dustbins & Purchase of Steel frame large Size dustbins
- II) Purchase of additional front-end loaders, refuse collectors, mechanical sweepers, tipper trucks, dumper placers, etc;
- III) Minimising garbage through segregation.
- IV) Development of new sanitary land-fill sites;
- V) Disposal of garbage at the local area level through vermi-composting/compost making.

- VI) Involvement of NGOs and Resident Welfare Association in segregation and collection of garbage from houses.
- VII) Implementation of Municipal Solid Waste Disposal Rules-2000.
- VIII) The Govt. of India has notified Municipal Solid Waste (Management & Handling) Rules, 2000 with the objective of collection, segregation, storage, transportation and processing and disposal of Municipal Solid Waste (Management & Handling) Rules, 2000.

Besides the above, the Municipal Corporation of Delhi, which is managing the solid waste, has taken the following policy level decision to improve the management system:

- (i) Private Sector participation in management of Solid Waste in six zones.
- (ii) Setting up of processing facilities through private entrepreneurs.
- (iii) Infrastructure development at the local level collection and at the terminal processing level for segregation of wastes.

## **8.11 BIO MEDICAL WASTE MANAGEMENT**

About 8.5 M.T. Bio-Medical wastes is generated each daly in Delhi (2003). For the centralized common disposal of Bio-Medical Wastes, the work of setting up of such a facility has been awarded to a private firm in September 2003. The proposed facility is expected to be commissioned within 6 months time. Delhi Pollution Control Committee has authorized two operators for collecting the waste from the individual generators and disposing it of at their facilities. With the commencement of facility from two operators, a number of major hospitals who had installed incinerators had closed down their incinerators and started availing the services of the operators.

As on date (2003), 28 incinerators, 19 autoclaves and 2 microwaves are in place for effective management of the Bio-Medical Waste (Management & Handling) Rules, 1998. Besides, more than 2000, individual Health Care establishments have made an agreement with the operators who have the facility for the management of Bio-Medical Waste.

About 1000 authorizations, both fresh and renewed have been issued till date. Extensive training programmes for different hospitals have been conducted by D.P.C.C. with the involvement of NGOs and experts in the field. About 1000 Health Care workers have been trained during the programme organized in April-June, 2002.

## **8.12 NOISE POLLUTION**

### **Standards/Guidelines for control of Noise Pollution from Stationary Diesel Generator (DG) Sets.**

#### **8.12.1 Noise Standards for DG Sets (15-500 KVA)**

The total sound power level,  $L_w$ , of a DG set should be less than,  $94+10 \log_{10} (\text{KVA})$ , dB(A), at the manufacturing stage, where, KVA is the nominal power rating of a DG set. This level should fall by 5 dB(A) every five years, till 2007, i.e. in 2002 and then in 2007.

#### **8.12.2 Guidelines for the manufactures/users of DG sets (5 KVA and above)**

- 1) The manufacturer should offer to the user a standard acoustic enclosure of 25 dB(A) Insertion Loss and also a suitable exhaust muffler with Insertion Loss of 25 dB(A).
- 2) The user should make efforts to bring down the noise levels due to the DG set, outside his premises, within the ambient noise requirements by proper setting and control measures.
- 3) The manufacturer should furnish noise power levels of the unlicensed DG sets as per standards prescribed under 8.12.1.
- 4) The total sound power level of a DG set, at the user's end, shall be within 2 dB(A) of the total sound power level of the DG set, at the manufacturing stage, as prescribed under 8.12.1.
- 5) Installation of a DG set must be strictly in compliance with the recommendation for the DG set manufacturer.
- 6) A proper routine and preventive maintenance procedure for the DG set should be set and followed in consultation with the DG set manufacturer which would help prevent noise levels of the DG set from deteriorating with use.

#### **8.12.3 Order of the Lt. Governor of Delhi in respect of D.G. sets**

- 1) Generator sets above the capacity of 5 KVA shall not be operated in residential areas between the hours of 10.00 PM to 6.00 AM;



- 2) Generator sets above the capacity of 5 KVA in all areas residential/commercial/industrial shall operate only with the mandatory acoustic enclosures and other standards prescribed in the Environment (Protection) Rules, 1986;
- 3) Mobile generator sets used in social gathering and public functions shall be permitted only if they have installed mandatory acoustic enclosures and adhere to the prescribed standards for noise and emission as laid down in the Environment (Protection) Rules, 1986.

### **8.13 PUBLIC AWARENESS CAMPAIGNS**

Sustained and concerted efforts of the Government on the environmental issues yielded fruitful results on many fronts. Public participation specially Students, Resident Welfare Associations, Market Traders Associations in the Campaigns on "**Say 'NO' to Plastic Bags,**" "**Say 'NO' to Crackers**", "**Yamuna Safai Abhiyaan**", "**Khelo Holi Naturally**" and "**Tree Plantation**". A Brief on the Environment Awareness Campaigns is as follows:

#### **8.13.1 Anti-fire Crackers Campaign**

To combat the pollution menace due to bursting of fire-crackers on Diwali festival, '**Anti-Fire Crackers Campaign**' with the theme '**Say 'NO' to Crackers**' was launched in Delhi by adopting a multi-dimensional strategy. Due to enthusiastic participation of students, Resident Welfare Associations, Market Traders Associations and Citizens of Delhi, this has resulted in substantial reduction in air and noise pollution in Diwali.

#### **8.13.2 Introducing Eco-clubs in new Schools / Colleges**

To motivate & educate the children about the importance of healthy environment, about 1404 Eco-Clubs have been established in various schools / colleges of Delhi. More Eco-Clubs are expected in addition to the existing Eco-Clubs in near future.

#### **8.13.3 Khelo Holi Naturally Campaign**

Department of Environment undertakes a campaign "Khelo Holi Naturally" for motivating citizens of Delhi to play Holi with environmental and human friendly natural colours. The

Department supports to put up stalls of Natural Colours at various outlets like Delhi Haat, Markets, Schools etc. with the help of Natural colour manufacturing agencies.

#### **8.13.4 'Say No To Plastic Bags' - A Sustained Campaign**

A sustained campaign "Say 'NO' to Plastic Bags - Yes to Jute, Cloth or Paper Bags" has been launched by the Department to educate public about harmful effects of plastic bags. By devising a multi-faceted approach using innovative methods, the campaign has resulted in creating mass awareness among public of Delhi for saying 'NO' to plastic bags and for adopting healthier alternatives like jute, cloth or paper bags.

#### **8.13.5 Safai Abhiyaan**

For the last three years, on the occasion of World Environment Day, the Government of NCT of Delhi Conducts Yamuna Safai Abhiyaan. Various Departments / Autonomous Bodies / Undertakings of Government of NCT of Delhi, MCD, DDA, Police, NCC, Civil Defence, RWAs, NGOs, Student Groups participated in this drive for Shramdaan to clean the banks of River Yamuna, and the event has been found to be extremely successful.

#### **8.13.6 Clean City Campaign**

Delhi Government launched the Clean City Campaign on 23<sup>rd</sup> September 2003 in order to raise the civic consciousness in Delhi. The main slogans & messages were as follows: -

Do not litter.

Do not deface the walls of city / public property.

Do not spit in public places.

Do not urinate in public places.

Plant trees.

Segregate the garbage into biodegradable and recyclable bins.

Use jute and cloth bags instead of plastic bags.

### **8.14 FOREST**

Delhi forest cover has increased to 111 sq. Kms. in 2001 from 88 sq. Kms. in 1999. Thus, jumping from 5.9 per cent forest cover to total area in 1999 to 7.5 per cent in 2001, the

expansion of forest cover remains a remarkable achievement in afforestation of Delhi. The tree cover that exists along the roadsides, streams, and vacant lands falling outside the forest cover in Delhi constitutes 40 sq. Km. The total tree cover & forest cover is now 151 sq. Kms, which is 10.2 percent of the total geographical area.

#### **8.14.1 Plantation drive**

Due to a well coordinated system, efforts of the Nodal Officers and cooperation of the RWAs, plantation programme in last monsoon has been quite successful and more than 3 lakh saplings were distributed free of cost to RWAs, NGOs, Schools and General public etc. In addition to this, more than 3 lakhs saplings were planted by the Department.

#### **8.15 OTHER MEASURES**

Several other measures are being taken to control pollution and improve the environment, which are as follows: -

- (i) Reuse of treated wastewater for gardening and cooling purposes, which is discharged from Sewage Treatment Plant.
- (ii) Making use of bio-degradable kitchen solid waste for Vermi-composting at community level and utilizing compost for gardening purpose.
- (iii) The Department of Environment has supported various schools for putting up paper recycling equipment.
- (iv) Development and protection of the Ridge area.
- (v) Development of wild life sanctuary at Bhatti, Asola.
- (vi) Development and preservation of old lakes and other water bodies.