CHAPTER-8

ENVIRONMENTAL CONCERNS

1. The Phenomenal growth of Unauthorised Colonies and JJ Clusters, industries in non-conforming areas and vehicular traffic has resulted in a severe adverse impact on the environment of Delhi. Among the various contributing sources of air pollution, vehicular traffic is a major contributor (about 72%). Delhi is heavily dependent on road transport and there has been a tremendous increase in vehicle population in Delhi from 2.0 lakh in 1971 to 34.6 lakh in 2001 (more that sixteen times) which has led to corresponding increase in vehicles exhaust and air pollution levels. Industrial sector is second highest contributor (about 20%) of air pollution, especially those industries located in residential & commercial areas. Domestic sector contributes about 8% air pollution level of Delhi.

Statement 8.1

AIR POLLUTION BY SECTOR OF ORIGIN

	1970-71	1980-81	1990-91	1999-2000*	2000-2001*
Industrial (including thermal power)	56%	40%	29%	25%	20%
Vehicular	23%	42%	63%	70%	72%
Domestic	21%	18%	8%	5%	8%

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

***Estimated**

2. **ENVIRONMENTAL ISSUES**

2.1 The increasing pollution level has serious adverse effects on the health of human beings. It is estimated that air pollution is responsible for 40% of the emergency hospital admission of patients with breathing & heart problems.

2.2 Environmental issues, underlying causes and relevant policy suggested by DUEIIP-2021 are depicted in Box 8.1.

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	Reform 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.
Resource losses:		
Ground water depletion	Unsustainable extraction linked to unclear property rights and treatment as free resource.	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. **POLLUTION LEVELS**

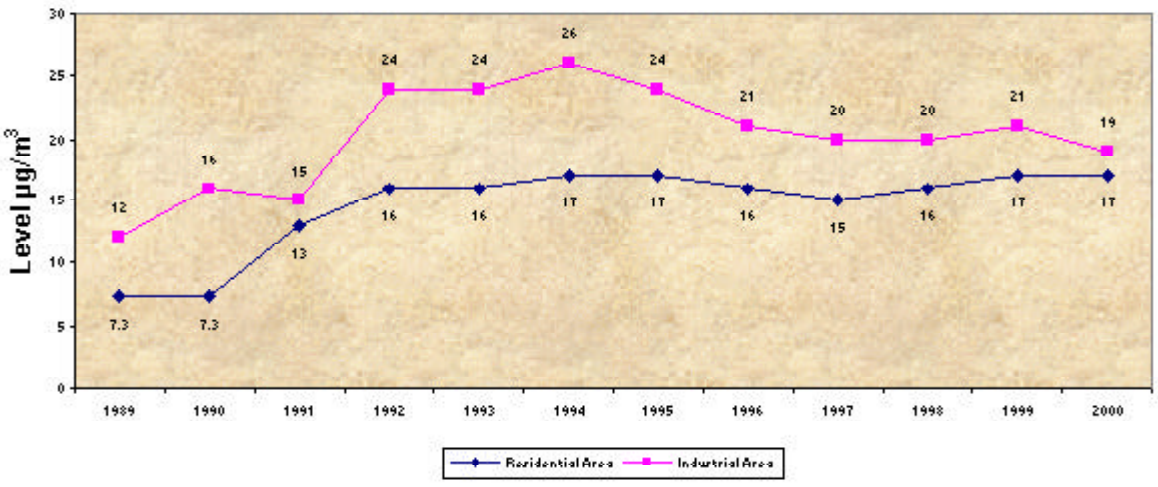
3.1 Ambient Air Quality Status :

National Ambient Air Quality Standards may be seen at Table No.8.1. The status and trends of Air pollutants measured under National Ambient Air Quality Monitoring Programme in Delhi are as under:

Sulphur Di-Oxide (SO_2)

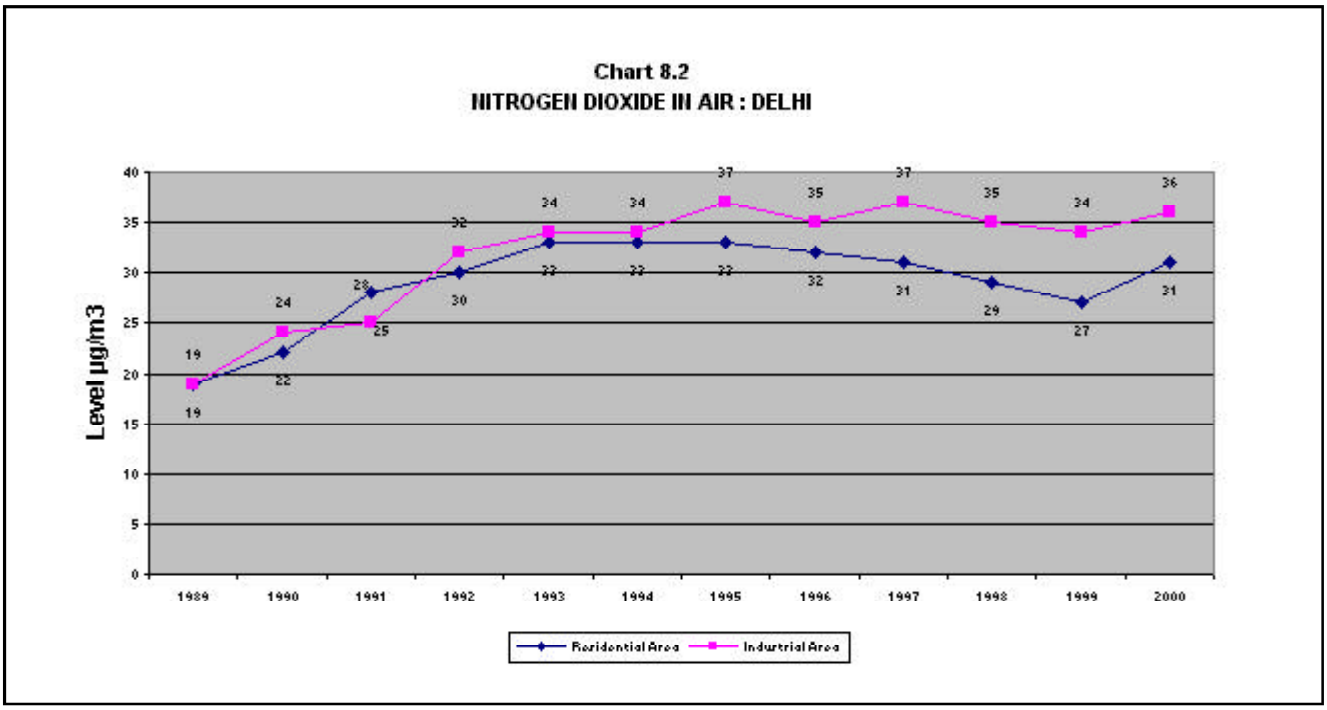
3.2 The Annual average measurement of SO_2 carried out in Delhi is given in Table 8.2. The annual average concentration in industrial areas is higher than the annual average concentrations in residential areas because fossil fuel burning is more in industrial areas. Annual average concentration of SO_2 was well within the National Ambient Air Quality Standards (NAAQS)

Chart 8.1
SULPHUR DIOXIDE IN AIR : DELHI



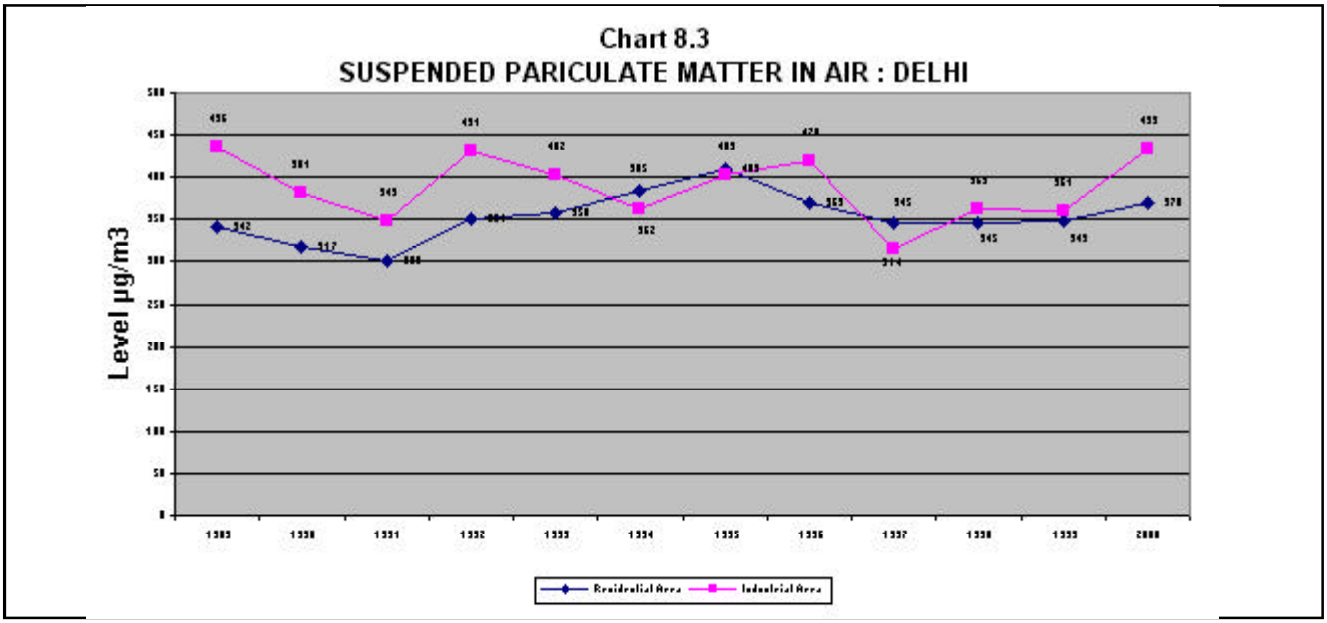
Nitrogen- Dioxide (NO_2)

3.3 The annual average of NO_2 as measured in residential and industrial areas is given in Table 8.3. Here also the annual average concentration in industrial areas was higher as compared to residential areas. But, the annual average concentrations both in industrial and residential areas were below the National Ambient Air Quality Standards (annual average) during all the years.



Suspended Particulate Matter (SPM)

3.4 The annual average concentration of SPM is given in Table 8.4. The annual average concentration ranged between 255 µg/m³ and 443 µg/m³ at locations in residential areas and between 282 µg/m³ and 510 µg/m³ at locations in industrial areas during 1989-2000. The annual average concentrations exceeded the NAAQS in all the years at all the monitoring locations located in residential areas and also in industrial areas except during 1991 and 1997.



Benzo (a) Pyrene (B(a)P)

3.5 Measurements were conducted of Benzo (a) Pyrene in ambient air particulate samples collected at six stations (Ashok Vihar, Siri Fort, Nizamuddin, Janakpuri, Shahdara, Shahzada Bagh in Delhi). Results obtained during the period 1997-99 are shown in Table 8.5. The annual average concentrations ranged between 1.0ng/m3 to 5.3 ng/m3. The recommended standard for concentration of B (a) P in ambient air is 10 ng/m3. The concentrations of B (a) P during the winter months were observed to be higher compared to monsoon and summer months. Low concentrations of B (a) P was recorded during summer possibly due to photo oxidation of B (a) P and metrological conditions favoring the disposal of B (a) P. During the monsoon, rain out and wash out are possible reasons of the low B (a)P.

3.6 There has been a considerable improvement in the Ambient Air Quality of Delhi in terms of Suspended Particulate Matter (SPM), Sulphur Dioxide (SO_2) Oxides of Nitrogen and lead. As per the Central Pollution Control Board's latest report, there has been a reduction of concentrations in the levels of RSPM, CO, SO_2 by 15%, 34%, and 11% respectively in the year 2001 as compared to the year 2000 values.

4. **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. Following table indicates the ambient noise levels permitted by Central Pollution Control Board for different areas :-

Statement 8.2

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

5. WATER POLLUTION

5.1 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 8.6 & 8.7).

DOMESTIC WASTEWATER POLLUTION

5.2 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 402 MGD. Thus, average current shortfall is about 118 MGD. This untreated wastewater is the main source of pollution.

INDUSTRIAL WASTEWATER

5.3 The industrial wastewater generated in Delhi is about 70 MGD. Although some industrial units have installed ETP to treat wastewater, most of the small-scale industries have not installed such facilities

6. VEHICULAR POLLUTION

The steep increase in vehicle population has resulted in a corresponding increase in pollutants emitted by vehicles. Petrol consumption has increased from 133 thousand tons in 1980-81 to 535 thousand tons in 1999-2000, Diesel (HSDO) consumption has increased from 377 thousand tons to 1237 thousand tons. As such, petrol consumption has increased by about 400% and Diesel consumption by 300% in the last two decades.

7. SOLID WASTE

NEERI estimates indicate that about 7000-8000 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 mange to clear about 5500-6000 M. Tones of garbage each day resulting in accumulation of garbage in the city area.

8. 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.

9. MEASURES TO COMBAT POLLUTION

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

Source : DUEIIP-2021

VEHICULAR POLLUTION

9.1 The campaign for vehicular pollution control gained momentum in the year 2000 with the introduction of Euro-II equivalent emission norms for passenger cars and Euro-I norms for other vehicles. Introduction of low smoke 2-T oil, reduction of diesel sulphur to 0.05% and gasoline benzene reduction to 1% are some of the major steps taken in this year. Phasing out of eight year old buses from Delhi, replacement of pre-1990 autos/taxis with vehicles on clean fuels and conversion of post 1990 autos to CNG mode are also among the initiatives taken in the same year.

9.2 The first half of the year 2001 was marked by the Supreme Court's order of replacing passenger commercial vehicles (buses, autos, and taxis) in Delhi with CNG. Presently, 875 private cars and 4323 taxies, 35649 autos, 4160 buses, 2101 Mini Buses (RTV) are running either on converted or dedicated CNG engines.

POLLUTION FROM THERMAL POWER PLANTS

9.3 It is estimated that thermal power plants contribute approximately 13% of air pollution. The main pollutants from thermal power plant are stack emissions, fly ash generation and fugitive emission in coal handling. All three thermal power plants located in Delhi need more effluent emission control devices as well as better utilization fly ash that they generate. There is an immediate need to use beneficiated/washed coal which has a maximum ash content of 30% which will reduce fly ash generation by about 25%. Thermal Power Stations may also examine the possibility of installing Bag House Filters in order to control emission of particles between the size of PPM-2.5 to PPM-10.

INDUSTRIAL AIR POLLUTION

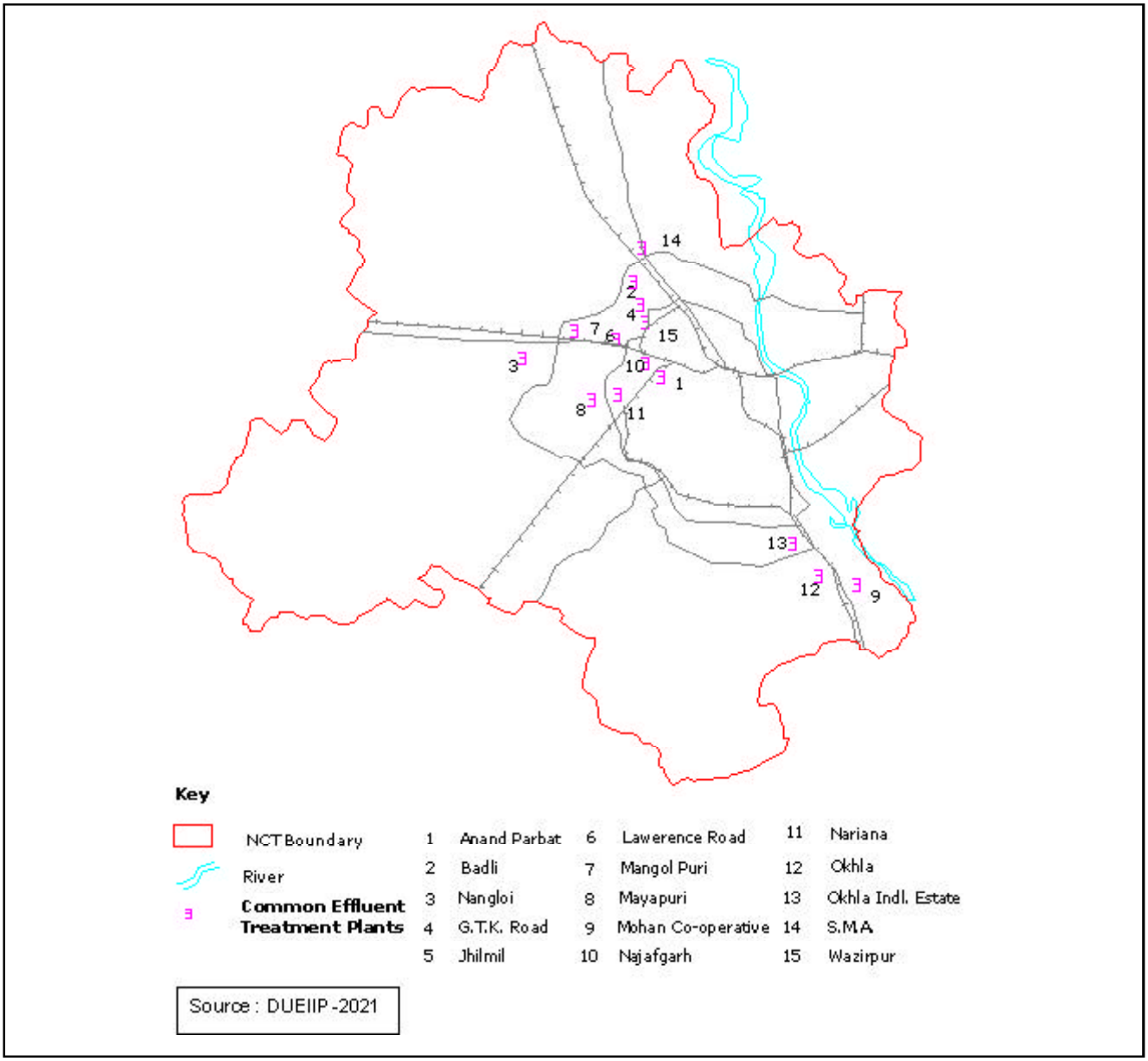
9.4 It is estimated that air pollution generated from industrial activity in Delhi is about 12% of total air pollution. Although several steps have been taken, industrial pollution needs to be reduced further. More than 1,300 industrial units, that should not have been operating as per the MPD-2001 norms, 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.

INDUSTRIAL WASTEWATER POLLUTION

9.5 There are 28 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. CETP at Wazirpur has already started functioning and CETP at Mayapuri and Mangolpuri are under trial run. Work on other 7 CETPs is in progress (Also see Map 8.1).

Map 8.1

LO(:ETPs)



DOMESTIC WASTEWATER POLLUTION

9.6 The present water supply capacity of DJB is approximately 650 MGD and the sewage treatment capacity is 402.4 MGD. 16 new sewage treatment plants are at various stages of commissioning and construction. 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. A massive programme for construction of 1160 public toilets in such areas is in progress with JBIC funds.

HAZARDOUS WASTE MANAGEMENT

9.7 The National Productivity Council, New Delhi is conducting Environment Impact Assessment study of 3 sites to select a site for the disposal of hazardous waste.

SOLID WASTE MANAGEMENT

9.8 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;

II) Purchase of additional front-end loaders, refuse collectors, mechanical sweepers, tipper trucks, dumper placers, etc;

III) Minimising garbage through the participation of the private sector;

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.

BIO MEDICAL WASTE MANAGEMENT

9.9 So far more than 1000 authorizations have been issued under the Bio-Medical Waste (Management and Handling) Rule 1998. The Centre For Occupational And Environmental Health (COEH) in the LNJP hospital has conducted several training courses for doctors and para-medical staff of both GNCTD and private hospitals.

PUBLIC AWARENESS CAMPAIGNS

9.10 (i) Public awareness campaigns have been launched to create the awareness about the ill-effect of crackers with the slogan 'Say No to Crackers' since 1998 which resulted in substantial reduction in air-noise pollution during Diwali.

(ii) For restricting the use of plastic bags in NCT of Delhi, Delhi Plastic Bags (Manufacture, Sale & Usage) and Non-Bio-degradable Garbage (control) Act, 2000 has been enacted. To popularize this act, a restrained campaign 'Say No to Plastic Bags-Yes to Jute, Cloth or paper bags' has been launched to educate public about harmful effects of plastic bags.

(iii) To motivate & educate the children about the importance of healthy environment, Eco-Clubs are functioning in 1200 schools in Delhi.

OTHER MEASURES

9.11 Several other measures are being taken to control pollution and improve the environment. This include:

(i) Development and protection of the Ridge area;

(ii) Development of wild life sanctuary at Bhati-Asola;

(iii) Development & preservation of old lakes and other water bodies;

(iv) Plantation of trees under the Green Delhi Programme;

(v) Development of city forests.

BOX 8.3

Good Environmental Governance Principles

Stability:	Framework is set by durable, suitably empowered and visible agencies.
Transparency:	Policy making and implementation are open to public scrutiny.
Effectiveness:	Policy is implemented by properly resourced responsible institutions.
Accountability:	Policy implementation is revealed by public financial and impact information systems.

Source DUEIIP-2001