

## **Delhi Air Pollution- “Breath in Death”**

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### **Abstract:**

Among all kinds of pollutions the most dangerous is air pollution, one breath equals to a little amount of poison. Delhi is witnessing its worst air quality. According to WHO report (2014) on ambient air pollution levels shows that with very high levels of particulate matter measuring 10 microns or less, Delhi is among the most polluted cities in the world. This paper deals with the current scenario of air pollution in Delhi, its effect and the various control policies adopted by the government. This paper also highlights the role of courts and PIL (public interest litigation) for emphasizing the air condition.

### **Keyword:**

Air pollution, Delhi, government policies, Public interest litigation

### **Introduction:**

The term environmental pollution as defined in the environment protection act (EPA), 1986 as “the undesirable change in physical, chemical, or biological characteristics of air, water and land. As the economies of the two Asian giant, India and China, have been booming for the past decade resulting in an increased burden of the environmental pollutants and recent environmental intrusions are drawing public attention. Recently, capital city of both countries have witnessed a severe smog condition and to counter the poor air quality Beijing and Delhi have adopted radical measures for improving air quality.

The urban air database released by the World Health Organization in September 2011 reported that Delhi has exceeded the maximum PM10 limit by almost 10-times at 198  $\mu\text{g}/\text{m}^3$ . Vehicular emissions and industrial activities were found to be associated with indoor as well as outdoor air pollution in Delhi. Studies on air pollution and mortality from Delhi found that all-natural-cause mortality and morbidity increased with increased air pollution.

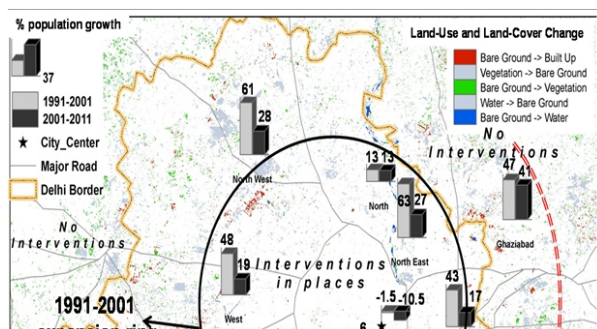
### **Reasons for Environmental Deterioration in Delhi:**

According to MoEF (Ministry of Environment and Forests), India, in 1997, the environmental situation in Delhi over concerns of deteriorating conditions. Air pollution was one of the areas of concern identified in this study. It was estimated that about 3000 metric tons of air pollutants were emitted every day in Delhi, with a major contribution from vehicular pollution (67%), followed by coal-based thermal power plants (12%). There was a rising trend from 1989 to 1997 as monitored by the Central Pollution Control Board (CPCB).

The concentrations of carbon monoxide from vehicular emissions in 1996 showed an increase of 92% over the values observed in 1989, consequent upon the increase in vehicular population. The particulate lead concentrations appeared to be in control; this was attributable to the de-leading of petrol and restrictions on lead-handling industrial units.

Delhi has the highest bunch of small-scale industries in India that contribute to 12% of air pollutants along with other industrial units. The important contributor to air pollution in Delhi is Vehicular pollution. According to the Department of Transport, Government of National Capital Territory of Delhi, vehicular population is estimated at more than 3.4 million, reaching here at a growth rate of 7% per annum.

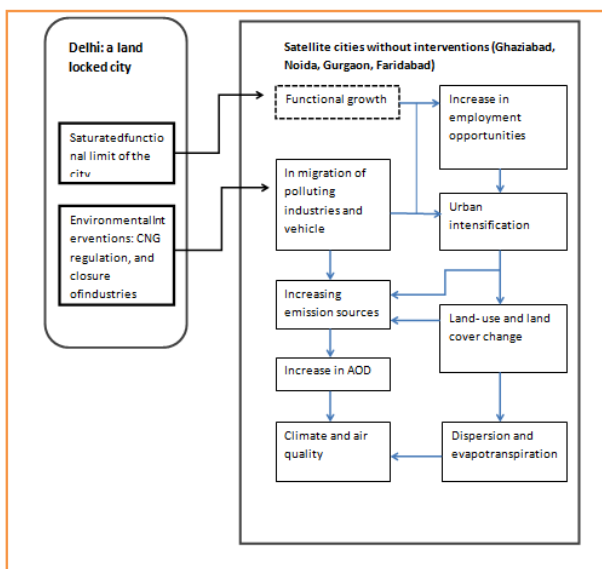
Although this segment contributes to two-thirds of the air pollution, there has been a palpable decline compared to the 1995-1996 levels. According to census 2011, Delhi is home to 1.6 million people and its functional growth has continued unabated beyond its jurisdictional boundaries, especially in the southern and eastern sectors (bordering-Ghaziabad, Noida, Faridabad and Gurgaon) (Fig. 1).



(Source: Kumar et al 2014)

**Fig 1: Delhi and its adjacent areas, population growth between 1991-2001 and 2001-2011, and land-use and land-cover changes at the background.**

Districts bordering Delhi has experienced 1.5 to 3 times higher population growth between 2001 and 2011 than Delhi itself. For example, Population growth in Gurgaon, located to the southwest of Delhi border, was 73% as compared to 20% in Delhi. The physical constraint on Delhi’s further functional growth seems to have produced trickle down effects in the areas outside Delhi (Fig. 2).



Source: kumar et al 2014

**Fig. 2: Environmental interventions, land-use and land-cover changes, and air pollution (re)distribution in and around Delhi**

These factors, in turn, have triggered land-use and land-cover changes. Delhi has been subjected to a series of air quality interventions since the 2000. As a result of these interventions in Delhi, a large number of polluting vehicles and industries migrated to areas outside Delhi.

With the in-migration of industries and foreign direct investment (including establishment of many call centres), employment opportunities have been booming and urban 3 processes are intensifying in the satellite cities around Delhi, such as Gurgaon, Noida and Ghaziabad. These satellite cities have also witnessed unprecedented population growth between 2001 and 2011 (Census of India 2011). Delhi has become an archetypal city by enforcing both the conversion of commercial and public transport vehicles to compressed natural gas (CNG) and the closure of polluting industries, and by fostering the construction of the country’s first modern metro rail system, Delhi Metro. At present about 100,000 CNG based vehicles are registered in Delhi and more than 25,000 industries previously located in residential (or non-conforming) areas were displaced to the peripheral areas in three industrial estates or areas outside the city.

**Health effects of air pollution**

Particulate matter in air pollution can cause a number of health problems and has been linked with illnesses and deaths from heart and lung disease. These effects have been associated with both short-term exposures (usually over 24 hours, but possibly as short as one hour) and long-term exposures (years). Groups particularly sensitive to particle pollution include people with heart or lung disease, older adults and children. Long-term exposures such as those experienced by people living for many years in areas with high particle levels have been associated with problems such as reduced lung function and the development of chronic bronchitis and even premature death. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may also increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated. The prevalence of hypertension was 36% in Delhi against 9.5% in the controls, which was found to be positively correlated with respiratory suspended particulate matter (PM10) level in ambient air. Delhi had significantly higher levels of chronic headache, eye irritation and skin irritation. Several researchers have found that air pollution is associated with respiratory morbidity. Numerous studies have reported an association between indoor air pollution and respiratory morbidity.

Some of these studies have concentrated on children's respiratory morbidity. Other studies in children have found similar correlations between particulate matter in ambient air and attention-deficit hyperactivity disorder between vehicular air pollution and increased blood levels of lead (a potential risk factor for abnormal mental development in children) and between decreased serum concentration of vitamin D metabolites and lower mean haze score (a proxy measure for ultraviolet-B radiation reaching the ground). Studies that have examined the compounding effect of meteorological conditions on air pollution found that winter worsened the air quality of both indoor air and outdoor air. They also found a positive correlation between the winter weather and rise in the number of patients with chronic obstructive airway disease in hospitals. According to report of WHO, 2 lakh people die annually in Delhi because of air pollution.

### **Government's policies to control air pollution**

Control measures so far instituted include introduction of unleaded petrol (1998), catalytic converter in passenger cars (1995), reduction of sulfur content in diesel (2000) and reduction of benzene content in fuels (2000). Others include construction of flyovers and subways for smooth traffic flow, introduction of Metro rail and CNG for commercial transport vehicles (buses, taxis, auto rickshaws), phasing out of very old commercial vehicles, introduction of mandatory "Pollution Under Control" certificate with 3-month validity and stringent enforcement of emission norms complying with Bharat Stage II/Euro-II or higher emission norms. Introduction of The Air Ambience Fund levied from diesel sales and setting up of stringent emission norms for industries and thermal power stations are the other measures. Environmental awareness campaigns are also carried out at regular intervals. The Delhi Pollution Control Board conducts monthly Ambient Air Quality Monitoring at 40 locations in Delhi, and takes corrective action wherever necessary. In the second Industrial policy issued by department of Industries, Government of Delhi in 2010-2021 included "develop clean and non-polluting industries", as one of the mandates and described details of steps to be undertaken in this direction. The Centre for Science and Environment and The Energy and Resources Institute, and the Indian Association for Air Pollution Control, these organisations work synergistically with the government efforts to reduce air pollution. Representatives of the industries include Confederation of Indian Industry and Society of Indian Automobile Manufacturers. Government agencies like Factories Inspectorate are also involved in the control of pollution.

Research and academic institutions include National Environmental Engineering Research Institute, Indian Institute of Technology, Council of Scientific and Industrial Research institutions, Indian Agricultural Research Institute and various other academic institutions in and around Delhi. Professional organizations like the Indian National Science Academy, the Indian Institute of Chemical Engineers and the Indian Institute of Engineers are also involved in pollution control. The introduction of odd even formula was also an initiative taken by the government. But how successful was it, remained a question mark. Pollution varies with time and weather conditions. Introduction of metro has limited the level of air pollution; it has absorbed a large number of traffic. The policy that led to the conversion of all buses to CNG, for example, appears to have helped reduce PM10, CO, and SO2 concentrations, and, contrary to the common wisdom, has not contributed to the emerging threat of NO2 in Delhi but at the same time, the CNG-switching gains, which are apparent in the case of buses, are not being seen in the case of three-wheelers. Possibly because of poorer technology, CNG three-wheelers are leading to an increase, rather than a decrease, in levels of PM10. CNG three-wheelers also are leading to an increase in NO2.

### **Courts Public interest litigation**

A major obstacle in the way of litigation relating to public issues was the narrow and rigid construction of the doctrine of locus standi. Locus standi refers to the standing enjoyed by a litigant, as one's standing is required for the court to hear one's case. An increasing number of problems related to the environment have been addressed, with apparent success, through the institution of Public Interest Litigation (PIL) by "public spirited" citizens. The role played by PIL is particularly important in that it provides a cost effective and viable alternative to empower citizens in the developing countries. In addition to this since PILs are filed in the high and apex courts of the country, court directives capture the attention of media thus making the information public. Ideally in a democracy if environmental issues become a political platform through which governments attract votes then carrying out the party manifesto would minimize enforcement related problems.

### **Conclusion**

It is the most appropriate time that the people of Delhi should realize the condition of Delhi's air quality and start pressurizing the state to explore long-term strategic options of controlling and managing air pollution.

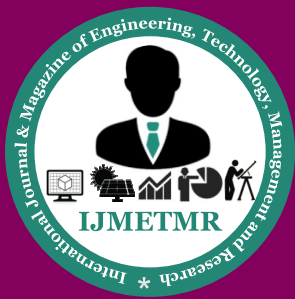
Unless the government try to block the real and deadlier sources of air pollution, an improvement on the air quality cannot be achieve in the city. Unfortunately, most of the lethal sources of air pollution such as trucks (even if plying through the city during nights), motorbikes, road dust, waste burning, concrete batching and industrial point sources will remain active. Besides there are a large number of rural traffic vehicles and non-CNG larger three wheelers which run on kerosene and thus contribute profusely toward deteriorating air quality. Many times, vehicles of municipal corporations are seen emitting excessive deadly smoke. The multiple interventions and strategies are needed to ensure that people have clean air to breathe in the city. First of all, people need to be educated and sensitized about the whole issue.

Currently people are getting aware of the matter thanks to media reports. Education and sensitization will ensure that they commit themselves to the cause of clean air by never violating any norms out of their own volition and without any fear of punitive action. Second, law enforcement should be made flawless –consistent, transparent and difficult to bypass. Third, enhance vigilantism of the community and citizens in general so as to achieve total compliance. Fourth, leverage technologies to beat the devil called air pollution. For this purpose, the government needs to adopt automobile emission norms at par with Euro VI norms. At the same time the government must also help reduce the constraints faced by automobile manufacturers so as to facilitate emission technology up gradation without much delay. So long as we are stuck in odd-even conundrum, we cannot have a long term view the issue of clean air will remain unresolved –much to the peril of unsuspecting citizens of Delhi.

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