8. Developing sustainable Cities:
Major initiatives and experiments in Urban India

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Abstract:

Urbanization is generally seen as a symbol of development and progress. But, the unplanned and unregulated expansions of urban areas in India have proved disastrous to both man and nature. Keeping in mind the severity of the problem policy-makers from time to time have formulated and experimented a numbers of measures to control environmental pollution. Delhi has been one of the biggest victims of environmental pollution. The Government of Delhi has tried to protect the environment of the city by implementing measures like, closures of polluted industries, introduction of CNG as a clean fuel, ban on crackers, and experiment of odd-even scheme to control vehicular pollution. This paper will primarily highlight such actions and initiatives undertaken by the Government of Delhi to combat the menace of pollution in Delhi.

Keywords:

Pollution, Environmental Protection, Judicial Activism, Urban Environment, Sustainable Cities

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Developing sustainable Cities:
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The rapid population growth along with high rate of urbanization, industrialization and an unregulated motorized transport in Delhi has resulted in an increase in the levels of various air pollutants in the Capital city. Studies show that due to air pollution Delhi has become the most vulnerable cities in India in terms of diseases like, lung cancer, asthma, heart diseases and ailments like new born babies having premature and poor mental growth. Delhi's inhabitants inhale the most polluted air in the country. And in terms of air pollution, Delhi has been ranked fourth among the 41 most polluted cities in the world by the World Health Organization (WHO).

The direct impact of deteriorated air quality on human health can be assessed by the fact that everyday 23 people die in Delhi due to the polluted air (The Hindu, 2015,p.3).The associated increase in industrial activity and vehicular traffic led the city to an environmental ecological crisis that peaked in 1996 when Delhi ranked as 4th among the 41 most polluted cities in the world.

Campaign for a sustainable city

A people's movement to Green Delhi that started in 1996 was Delhi's response to this wake-up call. Recognizing that polluted air is just a symptom and not the cause, a variety of mitigation measures have been initiated viz., introduction of cleaner fuel, CNG based public transport system, introduction of raid Mass transport System i.e. Delhi metro rail, construction of Flyovers for free flow of traffic and to make congestion free crossings, and phasing out of old commercial vehicles, establishment of emission norms of vehicles i.e. Bharat Stage-II and III (equivalent to Euro II and III). Only vehicles complying with BS III emission norms are being registered from April 2005.

In order to control pollution caused by industries, polluting industries have been closed and relocated from Delhi. 22749 industries have been given allotment of alternative industrial plots in conforming industrial areas. To minimizing the water pollution caused by industries, 10 common

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effluent treatment plants have been constructed. Noise pollution has only recently taken seriously. It all began with the anti-cracker campaign launched in the early 2000's and became a huge success with school children. The Supreme Court has set the limits for noise and loud speakers are banned between 10pm and 6am. The use of noiseless generators was also mandated by environmental laws. The Delhi Plastic Bag (Manufacture, sales and usage) and non-biodegradable garbage (control) (Amendment) Act, 2004 has been notified and enforced. Use of plastic in markets is banned, plastics below 40 microns are banned, and use of degradable plastics in being encouraged. The following section will discuss some of such initiatives in details.

Image 1Low visibility due to Smog at New Delhi railway station 31st Dec 2017 9:20AM Source: Wikipedia

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Addressing the problem of industrial pollution

Industrial development is central to the economics of the modern societies and an indispensable motor of growth. Many essential human needs can be met only through goods and services provided by industry. The production of food requires increasing amounts of agrochemicals and machinery. Beyond this, the products of industry form the material basis of contemporary standards of living. Thus all nations require and rightly aspire to efficient industrial bases to meet changing needs. However, industries extract material from the natural resource base and insert both products and pollution into the human environment. It has the power to enhance or to degrade the environment; it invariably does both (WCED, 1987, p. 173).

The negative environmental impacts of industrial activity were perceived as localized problems of air, water and land pollution. However, with the industrial growth and urbanization these problems have also multiplied. During the recent years, in Delhi there has been growing awareness of environmental degradation and the people as well as the courts have shown their anxiety over the situation arising out of industrial growth and pollution. The Supreme Court especially has played a pivotal role in protecting the environment of Delhi. The following section examines the growth of industrial sector in Delhi, different plans and provisions for a planned development of the industrial sector and how the non-implementation of these plans led the judiciary to intervene to correct the situation.

Growth of Industries in Delhi

Delhi, officially the National Capital Territory of Delhi (NCT), is a city and a union territory of India. In the last couple of decades there has been a tremendous expansion of industrial and commercial growth in the city, transforming it from a beautiful historical city to a sprawling industrial and commercial mega metropolis. From merely 8,160 industries in 1951, it grew to 1, 29,363 in 1998 (18-fold increase)(Government of NCT of Delhi, 2001,1).Though this number drastically reduced to 1 lakhs in 2010 due to a number of reasons, like, closure and shift of polluting industrial units and increase in the service sector in Delhi. However, there has been an increase of 11.54 per cent in the

persons employed in the industrial units in Delhi during the period 1951-2010 because of the overall growth of Delhi in terms of population, urban area and entrepreneurship, especially in small scale manufacturing. The industrial policy for Delhi 2010-2021 shows that these units provide employment to 6 lakh people (Government of NCT of Delhi, 2010, p.1). These units have attracted cumulated investment worth Rs. 25.24 billion and their contribution to the gross state domestic product in 1997-98 was 18–20 per cent which is more or less at par with the national average (TERI, 2001, p.25) .

The rate of increase in Delhi's workforce as per the provisional results of the census report-2001 during 1991-2001 was 51.91 per cent compared to 28.14 per cent at the national level, primarily due to very high growth of small-scale sector attracting large in-migration of unemployed youth from neighboring states(Government of NCT of Delhi, 2002,p.53-54). The fact that 42 per cent of unemployed youth in Delhi come from the neighboring states also confirms the availability of cheaper industrial laborers (TERI, 2001, p.49). The industrial sector plays a vital role in the economic development of the National Capital Territory of Delhi.

The manufacturing sectors in Delhi still contribute about 12% in Gross State Domestic Product in Delhi. The manufacturing sector also acts as a growth engine in other related activities, i.e. transport, trade, commerce and construction, etc. However this growth has been unregulated. According to a survey by the Delhi government, 98,000 (78 per cent of the total) industrial units in Delhi were located in the non-conforming areas, operating outside the 28 industrial zones of Delhi (Government of India, 1997, p.38). The unregulated growth of this sector has resulted in major environmental pressures. This has even necessitated the unprecedented action of shifting all environmentally hazardous production activities and polluting units from non-confirming zones.

Role of the Judiciary in controlling industrial pollution

Following the failure of the government to implement the Master Plan of Delhi-1985, a Public Interest Petition was filed by M.C. Mehta, a lawyer and environmentalist in the Supreme Court in

1985. The Supreme Court accepted the inviolability of the MPD-1985 regarding hazardous, noxious heavy and large industries and in a landmark judgment on July 8, 1996 directed that the polluting and hazardous industries particularly industries categorized in schedule H (a) and H (b) in the Master Plan of Delhi-1985 should be shifted from Delhi in a time bound manner. The court directed that these industries could not be permitted to operate in Delhi. They should relocate/shift themselves to any other industrial estate in the National Capital Region (NCR). The Supreme Court in its order of July 8, 1996 spells out its rational behind industrial closure/relocation in Delhi, which is as follows:-

"Delhi is recording heavy population growth since 1951. As the city grows, its problems of land, housing, transportation and management of essential infrastructure like water supply and sewage have become more acute. Delhi is one of the most polluted cities in the world. The quality of ambient air is so hazardous that lung and respiratory diseases are on the increase. The city has become a vast and unmanageable conglomeration of commercial, industrial, unauthorized colonies, resettlement colonies and unplanned housing. There is total lack of open spaces and green areas. Once a beautiful city, Delhi now presents a chaotic picture. The only way to relieve the capital city from the huge additional burden and pressures, is to deconcentrate the population, industries and economic activities in the city and relocate the same in various priority towns in the National Capital Region (NCR)''(SCC, 1996,p.752).

The Supreme Court mentioned two major categories of industries to be shifted from the city of Delhi. They were: (i) Group H (a) i.e. Hazardous and Noxious Industries (ii) Group H (b) i.e. Heavy and large industries. Regarding the Group (a) i.e. Hazardous and noxious industries the Supreme court in its order of 8 July, 1996 maintained, "It is obvious that under the mandatory provision of the Master Plan the hazardous and noxious industrial units [H(a) industries] are not permitted to operate in Delhi. So far as the existing H (a) industries are concerned, they were required to be shifted within a maximum prescribed period of three years.

The Master Plan came into force in August 1990. H (a) industries should have been shifted by the end of 1993. It is unfortunate that no action in this respect was taken by the authorities concerned. The industries were required to prepare and submit the project reports to effectuate shifting. This was to be done within one year of the coming into force of the Master Plan. None of the H (a) industries submitted the required project reports within the statutory period of one year. We have no hesitation in holding that the H (a) industries are operating in Delhi illegally and in utter violation of the mandatory provisions of the Master Plan. Delhi Administration was under a statutory obligation to prepare a list of H (a) industries. No such list was prepared within the statutory period of three years. It was only under the directions of this court that the necessary lists were prepared (SCC, 1996,p.753)." It further maintained that there is no doubt that the H(a) industries have been operating in Delhi illegally during the last three years. They must stop operating in Delhi and relocate themselves to some other industrial estate in the NCR.

Regarding the heavy and large industries the Supreme Court said "the Master plan provides that no new heavy and large industrial units shall be permitted in Delhi." Heavy and large industries have been categorized as H (b) under the Master Plan. It is further provided that the existing H (b) industries shall shift to Delhi Metropolitan Area (DMA) and the NCR keeping in view the Regional Plan and the National Industrial Policy of the Government of India. Although no period has been prescribed for the shifting of these industries but in the absence of any such provision the shifting has to be done within a reasonable time. Period of six years from August, 1990 when the Master Plan came into force is more than reasonable period for these industries to shift from Delhi. Some of these industries have, during the course of arguments, offered for modernization and also for conversion from polluting to non-polluting industries. The offers are simple ipse dixit with no material. We are not impressed by the offers made by these industries at this late stage. They should have modernized or changed the process of manufacture during the six years they have been operating in violation of the Master Plan. We, therefore, reject these offers (SCC, 1996,p.753)."The Supreme Court in its order dated 8 July, 1996 said that it has been monitoring the matter since January 1995 and several opportunities have been given to the identified H (a) and H (b) industries to represent and file

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objections against their categorization. The industries which are being finally dealt with by us have been heard more than once and after thorough investigation and scrutiny they have been categorized as H (a) and H (b).

The Supreme Court involved the Central Pollution Control Board (CPCB) and Delhi Pollution Control Committee (DPCC) in its positioning against the polluting industries. In the initial order, the court asked the CPCB to issue notices to the polluting industries and those which have been operating in non-confirming zones. On 25 August, 1995, it directed DPCC to serve notices to 'H' category industries indicating that they have to be relocated. The Supreme Court, at various stages, also sought assistance from various Government departments, National Capital Region Planning Board, Delhi Development Authority, Ministry of Urban Development, Government of India, Department of Land and Buildings, National Capital Territory, Delhi Administration, etc. to decide on the land available for relocation and also the use of land that would be made available in the event of relocation of polluting and non-conforming industries. The CPCB issued notices to 9,164 industries in Delhi to show cause why they not be directed to shift from Delhi. In response to the notices 2,225 objections were filed before the committee. After considering the objections and affording opportunity of hearing, 171 units were categorized as 'H' industries under the Master Plan. Subsequently, under the orders of the court 24 more industries were permitted to file their objections out of which six were declared as 'H' industries. 341 more industries were identified by the committee as 'H' industries. Yet another 708 industries were identified as 'H' category by the committee. It is thus obvious that 1226 (171+6+341+708) industries were identified as 'H' category industries. Under the directions of the court, a public notice mentioning all the 1226 industries was published in the Indian Express, *Jansatta, Navbharat* Times and The Times of India dated 19-11-1995, 20-11-1995 and 21-11-1995. Although most of the industries had earlier been given individual notices and were heard, but despite that in the interest of justice fresh notices by publication was given to all the 1226 industries (Chand, P.2018a, p.202).

Out of 171 industries (part of 1226 industries) which were identified as 'H' category, 59 did not file further objection in response to the public notice. They were earlier heard by the committee and after full investigation were categorized as 'H' industries. These 59 industries, in terms, accepted their categorization as 'H' industries. In response to the public notice 433 objections were received. The objections were considered and the industries were heard by the Board. Finally, the Board identified 104 units as 'H' category industries.

The board considered objections of five more industries operating in non-confirming areas and came to the conclusion that they were 'H' category industries. The picture which emerges is that 104 units identified by the Board, 59 units earlier identified by the committee and 5 units which were operating in non-confirming areas – totaling 168 (104 + 59 + 5) – have been, as at present, categorized as 'H' i.e. Hazardous and Noxious industries (SCC, 1996,p.764).

The Supreme Court Judgment on Industrial Pollution

After identifying 168 industries as hazardous and noxious categorized as 'H,' the Supreme Court delivered its historic judgment on July 8, 1996 as:

> "We therefore, hold that 168 industries (listed in the order) are hazardous/noxious/heavy/large industries and fall in H (a) and H (b) categories under the Master Plan." It further says, "Having held the above-mentioned 168 industries as 'H' category industries, we have no hesitation in holding that these industries cannot operate in the city of Delhi"(SCC, 1996,p.764).

The major features of the judgment are as under:

1. The identified 168 industries cannot be permitted to operate and function in Delhi. These industries may relocate/shift themselves to any other industrial estate in the NCR. It directed that these industries shall stop functioning and operating in the city of Delhi with effect from November 30, 1996. These industries shall close down and stop functioning in Delhi with effect from the said date,
2. The National Capital Region Planning Board shall render all assistance to the industries in the process of relocation. This direction shall go to the Board through its Secretary. The National Capital Territory, Delhi Administration, through its Chief Secretary and Secretary, Industries, State of Haryana through its Chief Secretary and Secretary, Industries, State of Rajasthan through its Chief Secretary, and Secretary Industries and the state of Uttar Pradesh through its Chief Secretary and Secretary, Industries shall provide all assistance, help and necessary facilities to the industries which intend to relocate themselves in the industrial estates situated in their respective territories,
3. In order to facilitate shifting of industries from Delhi, all the four States constituting the NCR shall set up unified single agency consisting of all the participating States to act as a nodal agency to sort out all the problems of such industries. The single window facility shall be set up by the four States within one month from today,
4. The use of the land which would become available on account of shifting/relocation of the industries shall be permitted in terms of the orders of this Court dated 10 May,1996 in M.C Mehta Case,
5. The shifting industries on their relocation in the new industrial estates shall be given incentives in terms of the provisions of the Master Plan and also the incentives which are normally extended to new industries in new industrial estates,
6. The closure order with effect from 30 November, 1996 shall be unconditional. Even if the relocation of industries is not complete they shall stop functioning in Delhi with effect from 30 November, 1996.

Thus, on July 8, 1996, Justice Kuldeep Singh and Justice FaizanUddin passed the order for closing of 168 noxious and hazardous units operating within the metropolis of Delhi and asked them to relocate in some industrial estate in the National Capital Region (NCR). The judgment was only the first phase of a long-term exercise in which more than one lakh units were expected to be shifted out of Delhi. The court directed that the 168 units shall stop functioning and operating in the city of Delhi with effect from November 30, 1996. The directive affected some of the major industrial houses, such as the Delhi Cloth Mill, Birla Textile Mill and the Shri Ram Group and covered a wide variety of activities from manufacturing chemicals to stone crushing as well as processes involving leather, steel and paper. The judges in their verdict said that the closure order effective from November 30, 1996 shall be un-conditional. Even if relocation of the industries was not completed, they shall stop functioning in Delhi with effect from November 30, 1996(SCC, 1996,p.769). As per the reporting of the CPCB, immediately after the court order, all the 168 units were closed down.

The Court has laid down very clear guidelines to protect the rights of workers regardless of whether the owners of the affected units chose to relocate the units or not. Para 28 of the judgment (SCC, 1996,p.769) relates to the workers of 168 hazardous industries, which were asked by the Government to cease operations by November 30, 1996. The judgment says that workers shall continue to enjoy all the rights that they enjoyed before relocation of industries and continuity of their service would be ensured. It adds that during the period between shifting and restarting of the industries, workers will be considered to be in active employment and will get all the due wages. The judgment further says that the conditions of service of workers shall not suffer any alteration due to shifting. It says, in addition, one year's wages will be paid to workers as shifting bonus to help them settle at the new location. Moreover, in case of those industries which close down or in cases where workers do not want to shift, the workers will be deemed to have been retrenched and they will be treated under the provisions in section 25F (B) of the Industrial Disputes Act, 1947. However, these workers will be given gratuity and also one year's wages as additional compensation (SCC, 1996, p.770).So, the Court made all the provisions to protect the rights of the workers employed in these industries.

Thus, the process of managing the hap hazardous industrial growth in Delhi began with the formulation of the first master plan of Delhi in 1962 and reinforced by the second master plan in 1985. The non-implementation of these master plans led M.C. Mehta, a lawyer and environmentalist to appeal in the Supreme Court in 1985. As a result, the Supreme Court, by its order of July 8, 1996, directed 168 hazardous industries to either close down or shift from Delhi. These industries were closed / relocated by November 30, 1996. In another judgment of 7th May, 2004, the Supreme Court directed to shift all industries functioning in non-conforming area, which have been shifted to Bawana and Narela industrial areas in Delhi.

Introduction of CNG as a cleaner fuel

These days we frequently heard of cricket players suffering due to air pollution during their matches in Delhi. But, do you know, who is the first person in the world who spotted a connection between air pollution in India and the international cricket. The answer is England captain Ted Dexter. In 1993, during the English cricket tour of India, when the visitors lost a match, they attributed part of their loss to the air pollution in Delhi – the capital city of India. After England lost the first Test of the 1992-93 series in Kolkata, Dexter, then chairman of selectors announced grandly that he had "commissioned a report into the impact of air pollution in Indian cities."Perhaps they were bad losers, but we must admit that the pollution levels were dangerously high enough for it to be listed amongst the world's most polluted cities. Vehicular emissions, which accounted for 70% of the air pollution, would morph into deadly smog during the foggy winters resulting in an increase in respiratory illnesses, with children and senior citizens being the worst affected. With the economy shifting gears around the same time amidst increasing middle class aspirations, with about 500 new vehicles being added

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every day, a turnaround seemed highly improbable(Arsalan, 2010).However, the Supreme Court of India came forward in response to people's concern about deteriorating air quality in the Capital City.

The Supreme Court has shown its serious concern regarding the air pollution in Delhi, even before the above incident. On 14 November, 1990, the union ministry of environment acknowledged an affidavit that air pollution in Delhi was chiefly caused by vehicular emissions. The court directed the city administration to place before it a complete list of prosecution launched against defaulting vehicles and noted that heavy vehicles such as buses and trucks were the main contributing factor to pollution and ought to receive more attention from the authorities. In 1996 the Centre for Science and Environment published a report titled Slow Murder, which documented the deadly story of air pollution caused by vehicles.

The report pointed out that Vehicular pollution is no longer just an intangible threat in India - it contributes to a shocking 64 per cent of the total pollution in Delhi, 52 per cent in Mumbai and 30 per cent in Kolkata. Soon after, the Supreme Court issued a suo moto notice to the Delhi Government to submit an action plan to control the city's air pollution. In response, the Government outlined a multi-pronged approach, including giving priority to mass transit systems, better technology for new vehicles, improved fuel quality, efforts to increase public awareness, and the use of propane and CNG as alternative fuels(Mathur, 2013,p.116).In 1997,the Central Government issued the White Paper on Pollution in Delhi with an action plan, dividing the measures for controlling vehicular pollution into three categories: those for in-use vehicles, for traffic management and for fuel quality(Sharan, 2014,p.228).

Subsequently, the Supreme Court directed the Central Government to constitute a statutory committee, named as the Environmental Pollution (Prevention and Control) authority (EPA), tasked with monitoring the progress of the White Paper, to deal with environmental issues pertaining to the NCT, and to serve as a fact-finding body for the Supreme Court. The EPA was constituted on 7 January, 1998 under the chairmanship of Shri Bhurelal. The count by its order dated 26 March, 2001 directed the EPA to take measures to control vehicular pollution and submit a report about the action

taken by it. In its response EPA submitted a 'Report on Clean Fuels' in July, 2001 and stated that CNG is a cleaner fuel option. The committee, besides proposing a number of measures to improve the air quality, also proposed the following three measures regarding introduction of a cleaner fuel in the city.

- No 8 year old buses to ply except on CNG or other clean fuels after 1st April,2001
- to convert steadily the entire city bus fleet (DTC & Private) to single fuel mode on CNG by 31st March, 2001
- GAIL to expedite and expand from 9 to 80 CNG supply outlets by 31st March, 2000(Chand, 2018, p.208).

The most crucial part of the Bhure Lal Committee Report was the conversion of public and private transport vehicles to single fuel mode on CNG and phasing out of vehicles that were more than eight years old. After listening to the opinion of different experts, business and environmental groups the Supreme Court considered the Committee report on clean fuel and passed orders on 5th April, 2002.This was a landmark judgment for the court chose to comment upon various facets of public life apart from upholding the case of CNG as single mode of fuel for the National Capital Region of Delhi. In this case the Supreme Court fought a direct battle with the Government agencies which were either not interested in environmental issues or were prompted by other interests to take up cudgels on behalf of groups that saw the status quo as a profit-making enterprise (Mathur, 2013a, p. 205).The Court reemphasized its concern for the environment and health of the people in Delhi and advocated the Government of their constitutional responsibilities. By 1st December 2002, the last diesel bus had disappeared from Delhi's roads, as part of a programme to improve public transport by offering more busses, and only busses running on CNG.

In another significant move aimed at reducing air pollution that is choking the Capital, the Supreme Court made it mandatory in December 2015 for diesel and petrol taxis to shift to CNG by 1 March 2016, which was later extended up to 30 April,2016 and also directed the Central Government to set up 104 gas stations in ten districts of NCR.

The introduction of CNG is a revolutionary step to purify the air in Delhi. It has helped in reducing PM10, CO, and SO2 concentrations in the city (Narain & Krupnick, 2007, p.1) CNG is mainly comprised of methane, which upon combustion mainly emits CO2 and H2O and being lighter disperses very quickly, whereas gasoline and diesel being more complex, emit more harmful emissions such as NOX and SOX. Owing to the recent volatility in the oil prices and continued patronage of CNG by the government by way of subsidies, the general public has begun to increasingly incorporate CNG kits in their private vehicles, which facilitates them to run on dual fuel mode (Joshi, 2015).

Introduction of CNG in Delhi is one of the largest ever CNG programme in the world. It has helped to stabilize particulates and substantially lower sulfur dioxide and carbon monoxide levels in Delhi's air. Today, Delhi is a story of inspiration as the world's cleanest public bus system running on CNG

Odd-Even Experiment to control Air Pollution

Image 2 FYI: India has topped the list of countries with pollution-related deaths in 2015

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The air quality in Delhi became deadly for the health of the people by the end of 2015. The Delhi High Court referred to the city as a "gas chamber" and a study found that up to 43.5% of schoolchildren suffered breathing difficulties (Chaudhary, 2016). It came to notice that cities like Beijing successfully cut air pollution by up to 40% in Beijing by introducing the odd-even experiment just before the 2008 Olympics. Similar road-rationing rules are imposed in many places around the world like Paris, Mexico and Bogota to curb road jams and pollution. The Government of Delhi also thought to start odd-even experiment to control the problem of air pollution in the air of the Capital City. Vehicular pollution is said to be the main cause for PM2.5 levels. PM 2.5 are fine particles that can cause respiratory problems. Thus, it was considered to regulate the vehicles first as that Delhi had 2.8 million private cars and jeeps, in 2015,with a 1,400 new cars being added to its roads each day.

The experiment was started from 1st to 15th January, 2016. On odd numbered days private cars with odd numbered license plates were allowed on the roads, and on even days, those with even numbered license plates. A fine of INR 2,000 was also imposed on violators. Sundays were open for all. Children stayed at home as all schools stayed closed in order to let their buses be used as additional public transport. People of Delhi gave their full support to the campaign. Many people stepped out of their comfort zone and ditched cars to opt for public transport. The Arvind Kejriwal-led Delhi government also made special arrangements to increase the frequency of metro trains and buses to encourage people to use public transport. Several ministers were seen cycling, or using buses to go to work to raise awareness and set an example for the public. Even judges of the Supreme Court carpooled to work. With close to 40% vehicles off the roads, the city was mostly congestion free. On social media many citizens reported that they had significantly shorter commutes.

The 15-day test was a drastic measure to help free the choking city. The Delhi Pollution Control Committee showed a continuing declining trend in vehicular pollution since odd-even experiment began. Data from 17 locations collected between 1st to 5th January,2016 showed that average level of PM2.5 particles was 353 (ug/m3), less by a margin of 130 as compared to same days in previous years. The analysis also said wind-blown dust and construction dust were the factors behind PM10 pollution at this point of time.

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Large sections of the national and international media, citizens and the state government claimed that the plan was a great success, with a 30% drop in vehicular pollution. However, experts suggest that while the roads have indeed been decongested it might be too early to predict pollution levels. Even though the Government of Delhi had declared both phases of the odd-even rule successful, a report submitted by a six member panel, appointed by the government, suggests that the move did not really help in reducing air pollution or unclogging Delhi. The panel said the second round fell way short of expectations. The reason, the report said, was that there were an additional 4 lakh cars and 1.3 lakh two-wheelers on the roads in the second round as compared with the maiden edition. One of the reasons for this was that the first edition was enforced from January 1 to January 15, 2016, when schools were shut for winter vacations, and the second was enforced in the peak traffic season from April 15 to 30(Goswami, 2017).

The first week of the odd-even scheme has not made a significant impact on air pollution. Experts say changing wind speeds have led to the fluctuation, making it difficult to assess the impact of the odd-even scheme on air quality. During the experiment TERI was collecting data from four DPCC monitoring stations daily. It was also monitoring five other locations for air quality. This data showed that from April 15 (day 1 of odd-even scheme) to April 22 (day 8), PM 2.5 had gone up and down. PM 2.5 are fine particles that can cause respiratory problems (Halder, 2016). "Wind speeds have been lower during the odd-even week in comparison to a week before.

This is one of the reasons why pollutant concentrations were higher this week," said TERI's Sumit Sharma, who led the monitoring team. A study conducted by the School of Planning and Architecture showed that the share of private vehicles in the city has risen by almost 50% during odd-even phase two compared to the first round. During a hearing at the National Green Tribunal in April, 2016 even the CPCB submitted that there was no data to suggest that the odd-even scheme had brought down vehicular pollution in Delhi. "Fluctuations in PM 10 and PM 2.5 are due to the weather and change in wind patterns. Prima facie, there is no data to suggest the odd-even scheme has decreased vehicular pollution," it said.

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The experiment with even-odd cars to combat pollution is a good initiative. It shows that pollution is being taken seriously by all in the Capital city. It was India's first, and biggest, experiment to decongest roads and reduce vehicular pollution.

It will take time and expertise to assess the odd-even experiment in Delhi, but there is no doubt that it was educative. It taught the government that the public is now ready to support radical measures on air pollution. The public learnt that cynicism is not the only response to a hopeless situation. The odd-even fortnight is now a pleasant memory, but will it also be an inspiring one? The answer according the Krishna Kumar, an educationist, depends on the so-called aspirational classes. More specifically, it depends on their willingness to engage in a deeper debate on the meaning of development (Kumar, 2016).

Ban on firecracker sale in Delhi

Diwali is a Hindu festival of light, sweet and joy. But due to excessive burring of crackers it has posed a health concern for the people. An acid smog forced authorities to close schools and ban construction activities after Diwali in November, 2016. The city of more than 20 million people struggled with its worst air pollution for two decades, shrouded in smoke from millions of fireworks lit during the festival, burning of crop residue in neighboring states before winter, vehicle exhaust and construction dust (Sinha, 2017). Every year, in the days following the festival, city hospitals report a spike in respiratory and asthma cases and many people find it difficult to breathe. The onset of winter usually worsens the situation as cooler temperatures trap the pollutants, exacerbated by farm burning. The case has been brought forth in the Supreme Court of India since 2015, by way of a petition seeking a ban on firecrackers in the NCR. The Supreme Court first turned down the request to ban, then allowed limited sale of firecrackers, before finally banning them in light of alarming pollution levels in 2016. The case has seen active involvement of both the CPCB and the civil society at large.

During the course of the proceedings on 21st September, 2017, it was noted that the CPCB had 20 years prior, in 1996-97 in the case Sagun Kaushik v Lt. Governor of Delhi &Ors, had stated to the Delhi High Court that on Deewali day, the sulphur content in the air remains dangerously high. *Sulphur on combustion produces sulphur-dioxide and the same is extremely harmful to health.*

While acknowledging that air quality has alarmingly deteriorated in Delhi over the last few years, a Supreme Court bench in 12th September, 2017 remarked that the need of the hour was to correlate air pollution with the sale and bursting of fireworks in Delhi and the NCR. "There is no doubt that the air we breathe gets polluted with the bursting of fireworks. The extent of air pollution caused by bursting fireworks is not clear in the absence of empirical data. It could be severe or it could be marginal, but it is there," the court observed (Rajagopal, 2017).

Thus, on October 9, another Supreme Court bench banned the sale of crackers in Delhi NCR. Bursting of firecrackers during Diwali in 2016 had resulted in particulate matter (PM) levels shooting up by three times, making Delhi the worst city in the world, the bench remarked. Thus, the court observed that direct and immediate cause thereof was burning of crackers during Diwali festival.

Concluding Observations

Delhi, the Capital City of India, is a witness of the havoc being created by the process of rapid urbanization. As shown in the paper, there has been a tremendous expansion of socio-economic growth in the capital city in the last couple of decades. However this growth has been unregulated, thereby resulting into major environmental pressures. Though various plans and policies were framed for a planned development of these industries, they could not be implemented in their true spirit. In the last couple of years a number of steps have been taken to protect the environment of Delhi, viz. introduction of CNG, Odd-Even experiment, industrial closures, ban on firecrackers, etc. As a result of efforts over the past two decades the pollution level in Delhi has started to come down and the quality of air has improved to some extent. But keeping in mind the rapid population growth along with high rate of urbanization as well as industrialization and an increase in personalized vehicles, these gains are likely to be negated.

However, the experiments and initiatives undertaken in Delhi are good efforts for developing Delhi as a sustainable city. In the wake of use in CNG as an alternate fuel, the contribution on vehicular sector towards air pollution has been reduced in the subsequent years. Though, environmental pollution is still a big challenge, but in the last two decades there has been more awareness and consciousness among the people as well as the Government to address the issue, which is the bright side of the story. In this drive the Supreme Court also delivered its judgment of closure/relocation of 168 noxious and hazardous units from Delhi in 1996. Through the instrument of Public Interest Litigations, the judiciary has become a forum to challenge Governmental lawlessness. It provides transparency and a choice of improvement. It is strengthening the spirit of publicness by forcing Government agencies to become involved in serious discourse with citizens. In the absence of executive effectiveness, Judiciary has become a very powerful instrument in developing sustainable cities in India.

Notes: This paper is primarily based on a research work conducted by the author as part of his Major Research Project (2017-18) sponsored by ICSSR.

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