

Ecologies of Urbanism in India

Metropolitan Civility and Sustainability

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One Air, Two Interventions: Delhi in the Age of Environment

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Introduction

September 2010. Delhi slowly creeps towards hosting the Commonwealth Games in October, which will announce its arrival as a world city. China did it with the Olympics in 2008 and now it is Delhi's turn, albeit on a smaller scale. But not all is well. India's premier newspaper *The Times Of India*, which had once run the famous campaign "From Walled City to World City," has been opposing the Games for some time now, citing various corrupt deals that have led the city to be half-prepared at best. Stadiums with leaky roofs, widespread dengue and other diseases, and inadequately addressed security concerns do not quite make a world-class city. And there is something else worrying the government. A large advertisement in the prominent newspapers of the city seeks to draw the attention of industrial units to something more elusive:

In order to reduce the air pollution in city of Delhi in view of forthcoming Common Wealth [sic] Games, Delhi Pollution Control Committee has decided to strictly regulate the operation of Emission Control System by Air Polluting Units.

All the industrial units operating in conforming Industrial Areas and Notified Areas for Redevelopment as per MPD 2021 are hereby directed to install/operate air pollution control devices/emission control systems with immediate effect and ensure compliance with the standards stipulated under Environmental Acts/Laws. (Delhi Pollution Control Authority (DPCC) Public Notice, *The Indian Express*, September 12, 2010)

Delhi has been an Air Pollution Control Area since 1987. This advertisement, nearly quarter of a century later, must speak rather poorly of the policy measures that have evolved over this period to clean the city's air. But

industries are not alone; indeed, they are not even the most significant air polluters, that ignominy being reserved for vehicular pollution, which contributes to nearly two-thirds of the city's pollution. Much has been done in regard to that too, though critics point to the sheer growth in numbers of vehicles on the roads and the persistent use of diesel in private vehicles which have successfully negated any gains (Rajamani 2007). Implementation failures have been the bane of India, argue the planners and, even more significantly, the Supreme Court (hereafter the court), resulting in this sad state of affairs (Rai and Shafi 1975; Verma 2002). Policies, in this view, have been correct but their impact has been distorted by poor executive action. Political economists, by contrast, point to the new wave of environmentalism as being at the expense of the urban poor, the constitutional imperative for clean air being exclusionary in practice rather than an expression of a politics of care. "For the bourgeois environmentalist," Amita Baviskar writes, "the ugliness of production must be removed from the city. Smokestack industries, effluent-producing manufacturing units and other aesthetically unpleasant sites that make the city a place of work for millions, should be discreetly tucked away out of sight, polluting some remote rural wasteland. So must workers who labour in these industries be banished out of sight" (Baviskar 2002, 41). Ghertner (this volume) draws attention to cultural politics and aesthetics in the making of the contemporary urban in which the evaluation of a desirable urban environment is framed within a 'world class city' fantasy. Gururani (also in this volume) points to the 'flexible' regime of planning which makes possible the simultaneous articulation of Delhi's suburban zone as a frontier zone of neoliberal capitalism and a classic example of 'problem' urbanization, that is, low on public infrastructure, high on crime. This is a city, in other words, being made by the middle class in its own image or in the image of a 'shining' other—London, New York, Paris, or (increasingly) Shanghai—in which the worlds of the poor have little legal recognition. Rene Vernon (2006), writing specifically about vehicular pollution, echoes their views. Delhi's vehicular air pollution measures, he suggests, may not have led to human displacements but have certainly led to the displacement of pollution, as those vehicles considered unsuitable for the country's capital increasingly find their place in the smaller cities. India's professional middle class, which is engaged in environmental and judicial activism, he suggests, have successfully pressured an oftentimes sluggish state to adopt and

implement more rigorous urban environmental and planning policies, most of which reflect their class bias.

This chapter suggests a different reading of the contemporary city, one in which 'environment' has emerged as the new constitutive element of urban modernity, much as 'society' once was. Indeed there may be little exaggeration in suggesting that environmental safety is to the twenty-first-century city what welfare was to the twentieth. How do we understand this transformation, in which earlier concerns of waste and externalities (pollution) are conjoined with the challenges of global warming and climate change? How do we trace the pathways that will lead to a 'desirable' state of the environment? The 'walled city to world-class city' framing is one way of setting out to answer these questions. And yet, this may not entirely suffice for apprehending the risks and uncertainties that inform contemporary urbanism and anticipate its future. Much that we took for granted over two centuries of modernist rule—science, safety, justice—has come unstuck and offers little consolation in imagining the creation of more livable cities. We need a new vocabulary to describe and address both the risks and desires through which we seek to fashion the contemporary urban, one that permits the coming together of the social and the epistemological.

The cleaning of Delhi's air, I suggest, is a good instance of the unfolding of this new vocabulary, suggestive of two entirely different strategies for the production of the contemporary urban, one addressed to law (and illegality) and the other oriented towards precaution (and risk mitigation). Together, these strategies address the same problem, through the same court and through similar civic groups, but they do so in ways that suggest divergent paths for Delhi's urban and environmental future. Studying them is to underline not only the social relations of power in the city but also the epistemic frameworks that permit the articulation of notions of environmental risk and danger, safety and precaution, in the present and the near future.

Zoning and Expulsion

Only those industrial processes which are almost non-polluting should be reserved for the small-scale sector or which have very cheap pollution control technologies available. The existing polluting units will just have to close down . . . Take all polluting processes to the large-scale sector,

which are relatively easier to control, and let them wipe out the polluting small-scale sector. The faster we do this, the less blood will be spilled later. (Agarwal 2007, 68)

In the mid-1980s, the lawyer-activist M. C. Mehta filed several petitions before the Supreme Court of India arguing that local authorities had failed to take necessary steps to protect the residents of the city from the harmful effects of pollution.¹ The dimensions of the problem were large and the language suitably apocalyptic—"the people living in Delhi were sitting on a volcano without knowing when it would erupt," Mehta petitioned.² The remedies sought were immediate and encompassing; the court was petitioned to pass necessary orders to ensure that hazardous units were shifted away from the city and that air pollution from stone crushing was stopped. *

The history of hazardous/polluting industries and their location within and outside the city dates from the 1960s, when the first master plan of the city was drawn up. The key challenge facing the planners of Delhi was of urban chaos and haphazard developments in the wake of partition and the flow of refugees from across the newly minted borders of Pakistan and India (Datta 1986). Accordingly, the opening declaration of the Master Plan defined its purpose as "[t]o check the haphazard and unplanned growth of Delhi . . ." (DDA 1962a; DDA 1962b Vol. i, 1). Industry, characterized by fragmentation and dispersal, presented an equally chaotic picture. Many establishments, having rapidly grown over the course of just one decade, operated under conditions of overcrowding; several industries "though not excessively insanitary or unsafe" were not considered suitable for "well-rationalized and modern manufacturing activity" (DDA 1962a; DDA 1962b Vol. ii, 138). The problem, as the planners posed it to themselves, was to gather up the various industries, which varied in size from the huge Delhi Cloth Mills to the individual potter, and put them somewhere where they could function more efficiently while being less of a nuisance to the commercial and domestic life around them.³

The key to achieving this was the idea of zoning and a presumed distinction between noxious and non-noxious industries and conforming/non-conforming ones. Approximately 500 firms employing roughly 45,000 people were surveyed. Of the total land under small-scale industries, about 40 percent was reported to produce nuisance; the comparative figures for medium size and large-scale industry were 52 percent and 63 percent respectively.⁴ Based on these figures, it was decided that certain

industries—namely those associated with stench, smoke, fumes, etc., and posing hazards to those residing in their neighborhoods—were to be totally prohibited within the city (DDA1962a, 85). Large industries and those designated as rural were also considered to be best located outside the city (DDA1962a, 75, 83; DDA1962b Vol. i, 188). For those left behind, proper zoning was recommended. Tempered by the economic realities of Delhi, the locations being recommended were of an intermediate type, breaking substantially with existing mixed land-uses and sub-standard factory conditions without resulting in the relocation of all factory establishments to areas distant from the central city (DDA 1962a, 44). Several different types of industrial establishments were proposed. First among these were flatted factories, multistoried buildings with high-density employment which could house many of the small industries that operated in commercial areas. These were to be located in the central area of Delhi. Corresponding to these, but located in the outlying areas and with lesser intensity of use, was a proposal for industrial-cum-work centers (DDA 1962a, 17–18). No nuisance industries were to be allowed in these zones, and each industry to be permitted was to be subject to performance requirements concerning noise, vibration, smoke, dust, odor, effluent, and general nuisance (DDA 1962a, 76). By contrast, some exceptions were to be made in areas earmarked for extensive industrial development, where all the noxious industries that had been located in the residential areas were to be relocated, even if they were small, so long as they met performance standards to keep disruption to a minimum (DDA 1962a, 20–21). Those that conformed to these location policies were also to be distinguished from the non-conforming industries, the latter being defined as those in contravention of the proposed regulations in a particular use zone, i.e. those that would not be permitted in the particular location after the Plan had come into effect. Once again there was an exception—uses of lands and buildings that were lawfully established prior to the enactment of the zoning regulations but which were ‘non-conforming’ would not be prohibited outright. In the absence of strong incentives to move out and adequate provision of new space, the Plan proposed, “the vigorous enforcement of regulations alone would have large adverse effects in curtailing industrial employment” (DDA 1962a; DDA 1962b Vol. ii, 138).

In sum, non-conforming industries, with the possible exception of some industries listed under the extensive industrial zone, could not be conflated with noxious industries. Nuisance implied expulsion from the city;

non-confirmation implied their gradual move towards appropriate location within the city through fiscal and other incentives, guided by the need to retain significant industrial employment in the city (DDA 1962a, 44). The key in Delhi, as had happened elsewhere, would be to distinguish between traditional industries (dyeing, dairy, etc.) that could be more easily expelled, and modern industry, for which the bar of being a nuisance was raised much higher and therefore the possibility of remaining within the city was much higher!¹⁵

The city, however, refused to yield to this fiction of an absolute distinction between non-conforming and noxious industries. Syed Shafi (1965), writing soon after the Plan came into effect, upheld the basic principle of land-use planning, but then went on to point out that according to a survey of noxious industries carried out by the Delhi Development Authority (DDA), it was found that out of the 9,860 licensed firms, 5,345 or 54.2 percent were non-noxious or non-nuisance types. Moreover, a large number of the noxious industries were in fact so-called 'industrial shops,' and could not be considered, given their small size and the service nature of their operation, to be manufacturing units. Many of them also had very small turnovers and in most cases their workers lived in the immediate vicinity. In most cases, the 'industrial shops' were also located within the housing premises of the owners, sourcing raw materials locally and also selling their products in nearby wholesale markets. For all these reasons, until a satisfactory solution was devised for these units, it "would be virtually impossible to clear the blighted areas" (Shafi 1965, 144).

The mid-term review of the plan, conducted roughly a decade later, observed that though the situation was better than in the pre-plan period, significant difficulties still remained. Shifting of non-conforming industries or trades had not made much headway nor had a single flatted factory been built, leading to a further deterioration of conditions in living areas. The most debilitating fate was that of the old city where there continued to be "the percolation of all kinds of noxious activities and trades in areas once meant for noble and graceful living" (Government of India (GoI), Town and Country Planning Organisation (TCPO) 1973/1995, 9). Even more radically, the review suggested that some of the assumptions of the plan were out of sync with the realities of the city, suggesting that a substantial proportion of economic activities in the city were in the unorganized sector and were being carried out in a manner that was not amenable to the typically Western

planning approach based on complete functional segregation. It would be long before this segment of the economy was completely eliminated, if at all, and it was only reasonable, the review suggested, that appropriate adjustments in land uses be made, consistent with felt needs (GoI, TCPO 1973/1995, 33–34).

Master Plans, however, are not necessarily the most reflexive documents. The next plan for the city, notified in 1990, made appropriate noises about taking into consideration just such an altered reality, pointing to the massive growth of the industrial sector since 1975, especially in electrical goods and electronics, and in rubber, plastic, and petroleum products (DDA 1990/96, 9). It recognized too that according to existing regulations, “a large number of existing industrial units would be non-conforming” (DDA 1990/96, 9). But none of this stood in the way of its replication of the recommendations of the previous plan. Expulsion of the especially noxious industries as well as some measures for the containment of pollution in the industrial units left behind in the city once again formed the backbone of the twin strategy. Hazardous and noxious industries, together with heavy and large industries were not to be permitted in the city. Extensive industries were to be permitted only in already identified industrial areas, with existing non-conforming industries to be relocated to these within three years. Light and service industries were also to be permitted, with the non-conforming industries of this type being relocated to appropriate industrial zones within three to five years. Household industries could only comprise non-polluting industries (DDA 1990/96, 9–11).

The plan was not intended to be a document about how pollution, inside or outside the city, was to actually be curbed, nor did it suggest anything beyond appropriate location policies. There was one exception though. There were reportedly eighty-two water polluting industrial units in Delhi, about which the plan recommended that “these units should make individual/joint arrangements for treatment of the effluent. About 30 percent of these units which are located in other than industrial areas should be immediately shifted to the industrial areas” (DDA 1990, 16). For official planners, and indeed for some independent observers, it was not the plan that was in error, but those who sought exception from it (Verma 2002). In its response to Mehta’s petition, the court made reference to these planning guidelines. In March 1995 it directed the Central Pollution Control Committee to issue individual notices to 8,378 industries indicating that they were “polluting

industries and . . . operating in non-conforming areas in violation of the Delhi Master Plan.”⁶ To this, more were added bringing the number to 9,164. In August, an affidavit filed by the government of India stated that out of these industries, 1,557 were operating in non-conforming use zones, out of which 170 industries were in category H (highly polluting) and needed to be relocated out of Delhi, while 1,387 belonged to groups which required relocation within the city, in conforming use zones. In September that same year the justices granted six weeks to the Delhi Pollution Control Committee (DPCC) to “adopt any method to complete the necessary survey and place before this Court a complete list of hazardous industries.”⁷ The DPCC duly filed the list of H (a) and H (b) industries in November, which was subject to instant dispute by the units concerned. In the meantime, the immediate list of H-category industries was arrived at, numbering 168, which were directed to stop functioning and operating in Delhi with effect from November 30, 1996 and were to relocate themselves to any other industrial estate in the National Capital Region (NCR).

These were not the only numbers in play, a survey conducted by the Delhi government stating that there were 93,000 industries operating in non-conforming use zones, located in unauthorized colonies, urban villages, resettlement colonies, the walled city, and other residential pockets (GoI, Ministry of Environment and Forests [MoEF] 1997, Ch. 6).⁸ In December 1995 a note prepared by the National Capital Regional Planning Board was placed before the court making a clear distinction between hazardous/polluting and non-confirming industries and their spatial relocation:

- (i) If the industries were non-polluting, they would be accommodated in the regular planned industrial areas/estates/zones already developed or under development in the NCR by the concerned authorities of the respective state.
- (ii) In case of industries currently listed as polluting/hazardous:
When these industries are set up at their new location and they improve their technology and if they no longer remain polluting or hazardous, they can be located in regular planned areas. If such industries continue to remain polluting special industries zones could be created so that they do not adversely affect the living environment in the vicinity and such industrial zones to have special infrastructure facilities to take care of the pollutants and provide protective belts around them to mitigate the effect of polluting effluents, smoke, gases, noises etc.; and any accidental release thereof.
(WP 4677, August 7, 1996)

More followed over the next few months and years. In September 1996 the court ordered the closing down of 513 industries and their relocation outside Delhi by January 31, 1997 (Lok Sabha 1996). The next month it ordered the closure of forty-six hot-mix plants. A month later brick kilns were added to the list of H-category industries (SCI WP 4677, November 26, 1996). Things were in a lull for a while thereafter, before the court intervened again, citing the tardy implementation of its orders on the part of the local administration. In September 1999, it ordered that if industries in residential areas could not be shifted or relocated for any reason by December of that year, then these must cease to function (SCI WP 4677, May 7, 2004). The state government asked for an extension of the deadline on the plea that a large number of industrial units, and with them the workers and their families, stood to be affected (SCI WP 4677, May 7, 2004).⁹ However, this was declined. Twenty-seven polluting industries that included those listed in category F—acids and chemicals, dyeing and bleaching, electroplating, etc.—were asked to stop operations by January 4, 2001, while December 31, 2001 was fixed as the date by which all non-conforming industries would have to cease operations in the city.¹⁰ However, the numbers were yet uncertain, the court itself observing, in the context of the demand for *in situ* regularization (below):

... regarding the total number of industrial units functioning in residential/ non-conforming areas, different surveys have given different figures ... the nature of survey that had been conducted resulting in the proposal of INSITU regularization ... is neither scientific nor precise nor reliable. It does not even contain detailed particulars of industries—whether they are polluting or non-polluting, licensed or unlicensed. (SCI WP 4677, May 7, 2004)

The closure of industries, it followed, was also the cause of insecurity for workers. The political significance of this was not lost on the major political parties. The opposition party accused the Delhi government of having failed to develop the necessary infrastructure and, more critically, of having misrepresented the court's order and created panic by confusing polluting industries with non-conforming ones. Both the local ruling and opposition party took issue with the attitude of the urban development minister of the central government who believed that acting in a manner which ran contrary to the Master Plan was a recipe for disaster.¹¹ For both, the political strategy behind simultaneously obeying the court's orders and ensuring that industry

did not suffer was to make a case for redesignating those residential units which had 70 percent or more housing industrial units as industrial areas.¹² The court worried about the 32,000 industries which would not be covered by *in situ* regularization, not to mention the 30 percent of residents who were legal and would suffer for no fault of their own (SCI WP 4677, May 7, 2004).¹³ In a famous echo of the judgment which had ruled that giving land to squatters was like rewarding pickpockets, the case of non-conforming industries also drew the court's ire: "The changes in the Master Plan or its norms to accommodate illegal activities not only amount to giving reward for illegal activities but also results in punishing the law abiding citizens" (SCI WP 4677, May 7, 2004).

Mehta, the original petitioner, returned to defend his case in public. Environmental security, he argued, was not the cause of economic and livelihood insecurity; on the other hand to permit the functioning of polluting and non-conforming industries was a call to lawlessness, in no less a place than the nation's capital (*Rashtriya Sahara* 2000).¹⁴ And on the all-important question of pollution and new health burdens elsewhere, he argued that "indeed there will be dangers there too [in Bawana, Narela, and other areas where industries were to be relocated]. Therefore while relocating these industries adequate means to tackle the pollution caused by them should be developed" (*Rashtriya Sahara* 2000). The government periodically responded by pointing to the facilities at the new industrial estates to tackle pollution, industrialists periodically bemoaned the absence of adequate facilities, and critics raised serious doubts as to whether common effluent treatment plants and other such measures had the necessary technical and regulatory capacities to tackle pollution from mixed wastes flowing from multiple sources.

Taming Pollution

At least theoretically, controlling pollution from industry is easier. There are numerous technologies . . . that can help reduce factory pollution . . . If that is not possible, pollution controllers can simply insist on relocating the plant . . . *But a city is stuck with its vehicles. They stay with the city and the city lives with them. Thus, they have to be tamed to cut down on the pollution.* (CSE 1996, 8, emphasis in original)

In addition to the failure of the government to regulate hazardous and noxious industries, Mehta's petitions had also mentioned the problems associated with vehicular pollution. There were reportedly 800,000 motor vehicles operating in the city, with a further 80,000 new ones being registered each year. More than 70,000 vehicles entered the capital every day from the neighboring state. Additionally, there were over 1 million bicycles, 60,000 cycle rickshaws, and 4,000 handcarts that plied in the city, all of which contaminated the air. Consequently permissible limits were exceeded for carbon monoxide, hydro-carbons, nitrogen oxide, sulfur dioxide, and suspended particulate matter, which were often toxic in character and carried the possibility of causing brain diseases and respiratory ailments. Almost all diesel power trucks and tempos were reported to have smoke densities far above the permissible limit. In light of this, the petitioner prayed that the Delhi Administration and the Delhi Transport Corporation (DTC) be directed to take action against owners of vehicles that emitted noxious gases and smoke.

Things moved rather slowly at first. An Air (Prevention and Pollution) Act had been legislated in 1981 that defined an air pollutant as "any solid, liquid or gaseous substance present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment" (GoI MoEF 1981). The authorisation for dealing with such pollution was also clearly laid out, with the Central Pollution Control Board (CPCB) being asked to advise, plan, and help execute plans for the prevention and control of air pollution. For this purpose, the CPCB was to collect, compile, and publish data relating to air pollution and the measures devised for its effective prevention; prepare manuals, codes or guides for the same; and lay down standards for the quality of air. The CPCB responded with a National Ambient Air Quality Monitoring (NAAQM) Network, to measure pollutants such as suspended particulate matter (SPM), respirable suspended particulate matter (RSPM), sulfur dioxide (SO₂), nitrogen oxide (NO_x), and carbon monoxide (CO). Such "measuring and understanding air pollution provid[ing]," in its own words, "a sound scientific basis for its management and control" (CPCB 2009).

In 1987, the Air Act was amended, strengthening the enforcement machinery, imposing stiffer fines on violators and introducing a citizen's initiative provision (Divan 2000). Around the same time, the Delhi administration began an education drive to encourage owners to have their

vehicles voluntarily checked for emissions. There were also major crackdowns on vehicles emitting excessive exhaust.¹⁵ Ambient air quality standards for Delhi were introduced, even as the World Health Organization declared Delhi to be the fourth most polluted city in the world in terms of SPM. Soon thereafter, a monitoring committee on ambient and automotive emission levels was set up to examine the impact of surface transport on the state of air in Delhi (SCI WP 13029, March 14, 1991). The court also set up a special committee under the chairmanship of retired Justice Saikia to examine the issue in detail. Among the recommendations of the Saikia Committee was the use of compressed natural gas (CNG) as an alternative fuel, on the grounds that it polluted less, cost less, and was more widely available in the country than petrol or diesel.

Once again, there was a lull until the Supreme Court directed the central government to set up a new statutory committee to be called the Environment Pollution (Prevention and Control) Authority (EPCA) under the provisions of the Environment Protection Act, 1986. The committee was duly established in April 1998 and tasked with monitoring the progress of the *White Paper on Pollution in Delhi*, that dealt with environmental issues pertaining to the NCR, and also to serve as a fact-finding body for the court. Specifically with respect to vehicular pollution the government mandated that the EPCA would “take all necessary steps to ensure compliance of specified emission standards by vehicles including proper calibration of the equipment for testing of vehicular pollution, ensuring compliance of fuel quality standards, monitoring and coordinating action for traffic management and planning” (GoI, MoEF 1998). In its very first progress report, the EPCA suggested additional pollution policies for Delhi that built on the action plans of the Delhi administration and the central government, but were possibly bolder and more specific (Bell et al. 2004). Whereas the other plans had talked about encouraging the use of clean fuels in public transportation, the EPCA proposed switching all taxis and autorickshaws to a clean fuel, banning all eight-year-old buses except those on clean fuel, and gradually moving the entire bus fleet to a single clean fuel—CNG. Its recommendations gained immediate legal backing with the court ruling on July 28, 1998 that no bus more than eight years old could operate in the city except on CNG or other clean fuels after April 1, 2000, and that the entire fleet of city buses, public and private, be converted to single fuel mode on CNG by March 31, 2001.¹⁶

The court's order elicited some compliance and much foot dragging. The transport minister of Delhi reportedly assured the residents of the city that all buses would soon operate on either CNG or propane.¹⁷ On the other hand, the chief minister, while flagging the first 'non-polluting' CNG bus on June 24, 1999, also expressed some reservations about the possibility of meeting the court's imposed deadline.¹⁸ And as the deadline of March 31, 2001 drew nearer, the protests of those who stood to be affected grew sharper. Once again Delhi faced the prospect of chaos and violence (Rajalakshmi 2001). But the court was not in the mood to oblige or condone. All the reasons placed before it seeking further postponement, it reasoned, were mere excuses designed to frustrate its efforts with no satisfactory explanation offered by either the administration or the private transporters as to why they had not pointed to their difficulties earlier. Not surprisingly, the court refused to give a blanket extension, though it did hold out some exceptions for those who had made demonstrable efforts to convert (SCI WP 13029, March 26, 2001). Those in favor of diesel, however, continued to make pleas before the court and outside it. In a bid to bring a closure to this simmering dispute, the court, in its order dated March 26, 2001, issued the following directions to the Bhure Lal Committee:

During the course of the argument, it was contended before us that low sulphur diesel should be regarded as a clean fuel and buses be permitted to run on that. It was submitted that in some other countries ultra low sulphur diesel which has sulphur content of not more than 0.001 per cent is now available. We direct the Bhure Lal Committee to examine this question . . . The Committee may submit a report to this Court in that behalf as also indicate as to which fuel can be regarded as "clean fuel", which does not cause pollution or is otherwise injurious to health. (SCI WP 13029, March 26, 2001)

Several parties presented their views before the Bhure Lal Committee, almost unanimously in favor of low sulfur diesel and against the adoption of a single fuel (EPCA 2001, 26–37). Specters of high costs, unreliable and insecure supply, and technology lock-in were raised. Simultaneously, positive improvements in the quality of diesel and petrol since the original order of July 1998 were pointed to, within an overall argument that advocated mixed fleets and the setting up of emission standards based on available or anticipated technologies, rather than the use of specific fuels. The committee rebutted each of these, once again making a strong case for CNG, as part of a

fifteen-point integrated approach for tackling vehicular pollution in the city.¹⁹ The most critical factor, it argued, was the public health burden on account of air pollution in Delhi, especially the presence of RSPM that was less than 10 micron in size in the ambient air. Any cost-benefit analysis, in its view, had to take into account not only the future costs of CNG but also the countervailing health costs of air pollution, for which unfortunately no estimates were yet available.²⁰ The committee also felt that there were no major problems regarding CNG distribution infrastructure or the security of CNG supply that could not be speedily redressed. And on the specific issue of the relative merits of petrol, diesel, CNG, and other fuels, the report suggested that the definition of "clean fuel" needed to be addressed in the context of the quality of fuels available, availability of emission control technologies, prevailing environmental considerations, and existing knowledge of health pollutants. Taking these into account, it observed that "among the hydrocarbon fuels, which were commonly used for automobiles, it was not possible to specify a 'clean fuel' which did not cause pollution or was not otherwise injurious to health . . . [though] fuels like CNG, LPG and propane . . . were less polluting" (EPCA 2001, 10–13). In the process, the committee also changed the terminology from 'clean fuel' to 'environmentally acceptable fuel,' which itself became an issue of debate. More critically, the single fuel approach was opposed at other levels.

In September 2001 the government of India constituted a committee of experts of national repute headed by R. A. Mashelkar, director general of the Council of Scientific and Industrial Research (CSIR) to:

Recommend an Auto Fuel Policy for major cities and rest of the country, to devise a roadmap for its implementation, and recommend suitable auto fuels, automobile technologies and fiscal measures for ensuring minimization of the social cost of meeting environmental quality and institutional mechanisms for certification of vehicles, fuels as also monitoring and enforcement measures. (GoI MoEF 2001, 1)

The committee's guiding principles were not very different from those of the ECPA, with public health being cited as a prime concern at the very outset. Air quality, the Mashelkar Committee opined, again perhaps not very differently from the ECPA, depended upon several factors, of which vehicular pollution was one important component. Vehicular pollution, in turn, depended upon several factors, of which the specific choice of fuels was one. From here however, the paths diverged significantly, with the Mashelkar Committee

suggesting that "evidence based analysis backed up by scientifically backed data, especially under Indian conditions, ought to be the cornerstone of any sound policy" and went on to add that "rather than a rigid and prescriptive policy, a flexible policy, which allows a multi-fuel and multi-technology option for reaching prescribed emission norms, was considered desirable" (GoI MoEF 2001, 2). In the absence of adequate data related to emission source apportionment, emission inventory etc., the committee suggested it was not possible to set vehicular emission norms based on air quality targets alone (GoI MoEF 2001, 4). And with regard to auto fuels, it was of the view that tailpipe emissions, and not the fuel per se, affected the ambient air quality. Therefore any combination of engine technology and fuel that gave the prescribed vehicular emission norms needed to be considered acceptable from the environmental angle (GoI MoEF 2001, 5). In a clear difference from the ECPA's recommendations, the interim report concluded:

In the developed world and elsewhere, vehicular emission standards and auto fuel quality necessary to meet the standards alone are prescribed, giving choice to the public, manufacturers, owners and operators of motor vehicles to choose the vehicle type and the fuel. The Committee recommends that the same policy be adopted for India. (GoI MoEF 2001, 11)

The CNG saga had begun in the fond hope of an eventual consensus, with the court's request to the counsels being to look at the problem "not as an adversarial litigation but to come forward with useful deliberations so that something concrete could finally emerge for easing the situation" (SCI WP 13029, March 14, 1991). But by the next decade, it was quite evident that policy on the basis of scientific consensus was near impossible to achieve. The Mashelkar report was immediately accepted by the government but drew quick criticisms too.²¹ The court too was far from being satisfied. It not only suspected the motives for setting up this committee but also observed, notwithstanding the long list of experts, "the composition of the Mashelkar Committee was such that none of its members was either a doctor, or an expert, in public health. The said committee submitted its report which does not show any serious concern with the health of the people" (SCI WP 13029, April 5, 2002). Disputations no longer remained confined to court-rooms either, with scientific experts and non-specialists alike engaging in intense media debates on the nature of evidence in favor of one or the other

technology, economic costs and practical futures, technological capacities, patterns of mobility, funding and interests and challenges of public health, all of which made evident the many-fold nature of the differences that underpinned this debate.²² Disputes in print and on television were not enough either, the very bodies of the buses becoming a medium for defining a "clean fuel" with the adjective "pollution free" painted before CNG on the new bus fleet of the capital being wiped out, on the argument that no fuel was 100 per cent pollution free!²³

'Thin,' uncertain data, as evident in the contending viewpoints, eventually led the court to the articulation of a different mode of reasoning, marshaling health-based evidence of the perils of pollution while simultaneously taking recourse in the 'precautionary principle.' As explained by the court, the 'precautionary' and 'polluter pays' principles were both necessary components of ecologically sustainable development and within the ambit of Indian laws. What this implied was that the government and the statutory authorities must anticipate, prevent, and attack the causes of environmental degradation and where there were threats of serious and irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the specific case of automobiles, where environmental implications were bound to be present in any auto policy, it was even more imperative that even in the absence of adequate information, they lean in favor of cleaner technologies and refuse rather than permit activities likely to be detrimental to human health. Emission norms had been in place for a very long time without any appreciable record of compliance. Under the circumstances, for the Mashelkar Committee and those inclined to its point of view, to recommend that the role of the government be limited to specifying norms was naïve at best and a "clear abdication of the constitutional and statutory duty cast upon the Government to protect and preserve the environment," at worst (SCI WP 13029, April 5, 2002). So far as the court was concerned "it is clear that the alternative fuel of CNG, LPG and electricity is a preferred technology which critically polluted cities like Delhi need as a leapfrogging technological option" (SCI WP 13029, April 5, 2002). It therefore had no hesitation in reconfirming that "our order dated 28.7.1998 with regard to conversion of entire city bus fleet (DTC and private) to single fuel mode of CNG does not require any modification or change. That direction stands" (SCI WP 13029, April 5, 2002).

This was a fairly new line of approach, drawing upon international customary law. As a guide to policy and action, it offered a different orientation to the more familiar assimilative capacity approach that had guided development for much of the twentieth century. Simply stated, the assimilative capacity approach assumed that science could accurately predict threats to the environment; it could provide technical solutions to mitigate such threats once they had been accurately predicted, and there would be sufficient time to act while making the most efficient utilization of scarce financial resources (McIntyre and Mosedale 1997, 222). Failures of this approach, with conclusive scientific proof of the detrimental effects of activities or substances coming too late, the argument runs, have led, on a sector by sector basis, to the adoption of a precautionary approach, a bias in favor of safety and caution. The 1992 Rio Declaration on Environment and Development, among other international conventions, formalized the principle. "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."²⁴ The adoption of the precautionary principle, however, was not the abandonment of credible information or scientific data, with every major statement on it continuing to argue that states must continue to cooperate in research and act in a manner so as to obtain and share the best possible scientific evidence available, thereby leading to better decision-making (McIntyre and Mosedale 1997, 239–241). More science, John Adams (1997) writes, would not harm. However, and this is what a precautionary approach brought in its wake, far more important were the inferences based on what we do know. And it is in drawing our attention towards this perspective—being biased in favor of health impacts, even if greater harms from particular substances (diesel) could not be fully established vis-à-vis others (CNG), rather than sound policy backed by credible evidence, as suggested by the Mashelkar Committee—that the court offered a new and innovative mechanism for taming air pollution in Delhi.

Conclusion

Exile and taming, I have argued, have been two different modalities of dealing with air pollution. In the case of industrial pollution, the court has favored the

former, while drawing a distinction between non-conforming and polluting units, and within these, between 'rural' and 'modern' industries. This strategy, I suggest, is addressed more to law than to environment and the confusion of the two categories, non-conforming/polluting, I have argued, has led to enormous socio-political conflict without necessarily yielding a cleaner or safer environment. Developing detailed strategies of pollution control was neither the purpose of the plan nor does it seem to be the most useful in this regard. And even if the plan were to be followed in letter and spirit, I argue, it remains to be asked whether it is still desirable to manage work and life in our cities through zoning (and exile), given the additional energy burdens it entails, while serving no greater purpose than to merely redistribute locally sourced risks of industrial production (Gleeson 2000).

In the instance of vehicular pollution, the question is configured differently. It is one of our relationships with an expert-led science-for-society mode of thinking, in times of radical uncertainty: the "skilled scientific distillation" of environmental problems, such as impacts of air pollution on health, "for non-specialist users, such as policy makers and public audience" to act upon (Scott and Barnett 2009). This is not simply to rehearse the old question of the relationship between technical experts and political/bureaucratic power (MacLeod 1988). Rather, it is to ask new questions about the manner in which we make democratic choices in an increasingly complex and conflicted technological world, one in which the scientific disputes are not easily contained/resolved within committee rooms and court chambers but are possibly magnified even further through mediatization and articulation in the public domain (Leiss 2001). Many commentators, who have otherwise differed on their assessments of CNG and diesel as the preferred fuel, have echoed each other in upholding the banner of science. However, what the court's intervention has suggested is not the certainty and prestige of science but the articulation of another principle—the precautionary principle—through which we may anticipate and prevent irreversible damage and thereby hope to create a safer and more sustainable future.

Notes

1. On the career of public interest litigation in India, see Sathe (2002).

2. M. C. Mehta V. Government of India and Others, Writ Petition (Civil) 4677, Supreme Court of India, 1985.
3. A. Aptay and Jhabvala, Why a Master Plan for Delhi. *Hindustan Times*, August 21, 1960.
4. Weekly Report, Sept. 30–Oct. 12, 1957, Albert Mayer (AM) Papers, Box 23, Folder 11, University of Chicago, Special Collections.
5. On this distinction between modern and traditional industries when considered as nuisance, see Christine Rosen (2003).
6. Supreme Court of India (SCI). Writ Petition (Civil) (WP) 4677, August 7, 1996.
7. SCI. Writ Petition (Civil) (WP) 4677, August 7, 1996.
8. There is some inconsistency in the official numbers, as reported from time to time. The court's judgment of May 2004 mentions that the survey conducted by the DPCC in 1995–96 showed that there were approximately 126,000 industrial units in Delhi, of which 101,000 were in non-conforming areas. Supreme Court of India (SCI). Writ Petition (Civil) (WP) 4677, May 7, 2004.
9. The argument offered by the government was that close to 700,000 workers stood to be affected if these industries were closed. SCI WP 4677, May 7, 2004.
10. A monitoring committee was appointed to oversee that these orders were executed and that illegal industrial activity in Delhi was stopped.
11. Factories Near Homes to go by Dec 31. *Hindustan Times*, December 4, 2002.
12. DDA Decides Not to Close Industries. *Hindustan Times*, December 21, 2002; Small Units to Stay in Colonies. *Hindustan Times*, January 29, 2003; Panel to Study Change of Land Use in 24 Areas. *Times of India*, February 4, 2003.
13. The court also drew attention to the fact that the plea for *in situ* regularization did not even exclude industries such as electroplating, dyeing, pickling, anodizing, forging, and casting that were polluting in nature. SCI WP 4677, May 7, 2004.
14. *Mauzuda Sthiti ke Liye Prashashan va Sarkar Doshi* [Government and Administration Responsible for Current Situation]. *Rashtriya Sahara*, November 28, 2000.
15. SCI. Writ Petition (Civil) (WP) 13029, November 14, 1990.
16. There were several other recommendations which did not witness as much controversy. See, SCI WP 13029, order dated July 28, 1998.
17. *Parivahan mantri ne kaha, dilli mein propane busein chaliyi jayengi* [Transport minister says that Delhi will introduce propane run buses].
18. *Pradushan mukt bus ka chalna shuru* [Pollution free buses start plying]. *Hindustan Times*, June 25, 1999.
19. For the comprehensive list of suggestions, see *Report on Clean Fuels* (EPCA 2001, 9–10).
20. The only available estimation was one arrived at by the World Bank in 1991–92 that estimated it to be to the tune of Rs. 10 billion per annum for Delhi. See *Report on Clean Fuels* (EPCA 2001, 5).

21. Mashelkar Report Accepted by the Ministry, Says Ram Naik. *Asian Age*, January 7, 2002; More Flak for Mashelkar, Report Goes to Cabinet. *Times of India*, January 8, 2002.
22. Acrimonious debates among scientific experts, Anthony Giddens and others have argued, are a major reason for the distrust of official scientific institutions in contemporary Western societies. The view is contested by Brian Wynne who argues instead that even in the earlier stage of "simple modernity" there was a culture of distrust and alienation with respect to scientific and technological interventions. See Wynne (2004).
23. CNG and "Pollution Free" Can't Go Hand-in-Hand. *The Statesman*, September 5, 2001.
24. Rio Declaration, cited in Lesley McAllister (2005, 154).

References

- Adams, J. 1997. *Risk*. London: Routledge.
- Agarwal, A. 2007. Delhi's Latest Environmental Fix. In *Anil Agarwal Reader 03*. 67–68. Delhi: Centre for Science and Environment.
- Baviskar, A. 2002. The Politics of the City. *Seminar*, 516: 40–42.
- Bell, R. G., K. Mathur, U. Narain, and D. Simpson. 2004. Clearing the Air: How Delhi Broke the Logjam on Air Quality Reforms. *Environment*, 46 (3): 22–39.
- Central Pollution Control Board (CPCB). 2009. *National Ambient Air Quality Status 2008*.
- Centre for Science and Environment (CSE). 1996. *Slow Murder. The Deadly Story of Vehicular Pollution in India*. Delhi: CSE.
- Datta, V. N. 1986. Punjabi Refugees and Greater Delhi. In *Delhi Through the Ages. Essays in Urban History, Culture and Society*, ed. R. E. Frykenberg. 442–462. Delhi: Oxford University Press.
- Delhi Development Authority (DDA). 1962a. *Master Plan of Delhi*. Delhi: DDA
- . 1962b. *Master Plan of Delhi 1962. Work Studies*, Vol. i and ii. Delhi: DDA.
- . 1990 (Reprint 1996). *Master Plan of Delhi, 2001*. Delhi: DDA.
- Delhi Pollution Control Authority (DPCC). Public Notice. *The Indian Express*, September 12, 2010.
- Divan, S. 2000. Legislative Framework and Judicial Craftsmanship. *Seminar* 492: 67–74.
- Environment Pollution (Prevention and Control) Authority for the National Capital Region (EPCA). 2001. *Report on Clean Fuels*. http://cpcb.nic.in/divisionsofhead-office/pci3/02_Clean_fuels_report.pdf, accessed January 24, 2012.
- Gleeson, B. 2000. Reflexive Modernization. The Re-Enlightenment of Planning? *International Planning Studies*, 5 (1): 117–135.

- Government of India (GoI), Town and Country Planning Organisation (TCPO). 1973/1995. *Review of the Master Plan of Delhi*, Delhi: TCPO.
- Government of India (GoI), Ministry of Environment and Forests (MoEF). 1997. *White Paper on Pollution in Delhi with an Action Plan*. Delhi: GoI. <http://moef.nic.in/divisions/cpoll/delpolln.html>, accessed January 24, 2012.
- . 1998. *Constitution of the Environment Pollution (Prevention and Control) Authority for the Ncr*. Delhi: GoI. <http://envfor.nic.in/legis/ncr/ncrauthority.pdf>, accessed January 24, 2012.
- . 2001. *Interim Report of the Expert Committee on Auto Fuel Policy*. Delhi: GoI.
- Leiss, W. 2001. *In the Chamber of Risks: Understanding Risk Controversies*. Montreal, QC: McGill-Queen's University Press.
- Lok Sabha. 1996. *Lok Sabha Debates*, November 28.
- MacLeod, R. 1988. Introduction. In *Government and Expertise: Specialists, Administrators and Professionals, 1860–1919*, ed. R. MacLeod. 1–24. Cambridge: Cambridge University Press.
- McAllister, L. 2005. Judging GMOs: Judicial Application of the Precautionary Principle in Brazil. *Ecology Law Quarterly*, 32: 149–174.
- McIntyre, O. and T. Mosedale. 1997. The Precautionary Principle as a Norm of Customary International Law. *Journal of Environmental Law*, 9 (2): 221–241.
- Rai, P. B. D., and S. S. Shafi. 1977. The Planned Development of Delhi. Innovations and Action. In *City Development Plans and their Implementation*. 142–156. Delhi: Centre for Urban Studies, Indian Institute for Planning and Administration.
- Rajalakshmi, T. K. 2001. The CNG Conundrum, *Frontline*, 18 (18): 1–14.
- Rajamani, L. 2007. Public Interest Environmental Litigation in India: Exploring Issues of Access, Participation, Equity, Effectiveness and Sustainability. *Journal of Environmental Law*, 19 (3): 293–321.
- Rosen, C. 2003. "Knowing" Industrial Pollution: Nuisance Law and the Power of Tradition in a Time of Rapid Economic Change, 1840–1864. *Environmental History*, 8 (4): 565–597.
- Sathe, S. P. 2002. *Judicial Activism in India: Transgressing Borders and Enforcing Limits*. New Delhi: Oxford University Press.
- Scott, D. S., and C. Barnett. 2009. Something in the Air. Civic Science and Contentious Environmental Politics in Post-Apartheid South Africa. *Geoforum*, 40: 373–382.
- Shafi, S. S. 1965. Non-Conforming Industrial Uses and the Role of "Flatted Factories in Urban Renewal. *Journal of the Institute of Town Planners of India*, 42 & 43 (March–June): 140–144.
- Verma, G. D. 2002. *Slumming India: A Chronicle of Slums and Their Saviours*. Delhi: Penguin.
- Vernon, R. 2006. Remaking Urban Environments. The Political Ecology of Air Pollution in Delhi. *Environment and Planning A*, 38: 2093–2109.
- Wynne, B. 2004. May the Sheep Safely Graze? A Reflexive View of the Expert-Lay Knowledge Divide. In *Risk, Environment and Modernity: Towards a New Ecology*, ed. S. Lash, B. Szerszynski, and B. Wynne. 45–80. Newbury Park: Sage.