

PURSUING A CLEAN AIR AGENDA IN INDIA DURING THE COVID CRISIS

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REPORT

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Executive Summary

Air quality was gradually gaining political salience in India in the last few years, but COVID-19 and the deepening economic recession may now change the speed, and possibly the direction, of progress. The aim of this report is to begin the process, even amidst uncertainties, of understanding the effects of the COVID crisis on the air quality discourse in the country, and on the mitigation efforts already underway.

We begin with a brief overview of the air quality improvements observed during the lockdown, and then identify some likely implications of the pandemic on how we frame the air quality problem. In view of state actions and public response during the COVID crisis, how should we, if at all, adapt our current framing of air pollution as a public health crisis? In the next section, we discuss broad financial, regulatory and institutional implications: in particular, the need to engage with the available funding channels to initiate and sustain measures to improve air quality amid significant fiscal constraints. There is a worrying erosion of environmental safeguards, which may – in part – be justified as a prerequisite to restarting the economy, and facilitating “ease of doing business”. Given that air quality management in India needs a multi-pronged approach across disparate sources, we then reflect on how the disruptions affect each of the major sources, and the resultant opportunities and challenges.

Our analysis reveals that the disruptions caused by the pandemic, or actions taken in response to the disruptions, are likely to result in three sets of outcomes. In the **first** set are opportunities to set a new agenda or provide impetus to existing policy measures. These opportunities, when harnessed, will allow us to lock-in infrastructure or accelerate behavioral changes that are well-aligned with improved environmental and health outcomes, particularly air quality. We identify five such opportunities -

- Provide increased, better targeted subsidies as part of a social protection package to allow poor households to use LPG as their primary cooking fuel.
- Sustain the increased rate of shifting away from paddy cultivation in Punjab and Haryana, and ensure that the alternatives (e.g. maize, cotton) are truly viable for farmers.
- Channel the demand for vehicle scrappage policies towards the replacement of old, heavily polluting vehicles, especially trucks.
- Sustain gains made in the form of increased acceptability and experience with work-from-home and online meetings to reduce commuting, especially by private vehicles and cabs.
- Retire old coal power plants so that newer or less polluting plants can meet a larger fraction of the demand.

However, the government response to the disruptions may lead to environmental safeguards getting diluted, formally or informally, citing the need for urgent economic recovery and improving the “ease of doing business”. In the **second** set lie such potentially regressive outcomes, which need to be firmly contested by civil society, and here we identify four such outcomes and the actions needed against them -

- Push back against the dilution of environmental safeguards, especially through the Draft Environmental Impact Assessment Notification 2020.
- Stress on the unacceptable delays in compliance with power plant emission norms issued in 2015, and demand urgent enforcement actions.
- Push for greater transparency in monitoring, inspection and enforcement data from the pollution control boards to ensure dilutions in day-to-day regulation do not go unnoticed.
- Dissuade investments in projects like flyovers and road-widening that tend to further reinforce reliance on private transport, at the cost of more sustainable mobility infrastructure.

Finally, in the **third** set are areas that we believe will not be directly affected by the pandemic, but where we need to actively sustain the discourse, develop ideas and make progress on longer term process improvements.

- Continue developing the National Clean Air Programme (NCAP) framework, in particular on developing uniform processes for identifying non-attainment cities and tracking inter-year air quality improvements.
- Among the currently identified non-attainment cities, invest in knowledge base (source apportionment studies, monitoring networks), and complement it with efforts at identifying priorities at the city-level to develop more informed city action plans.
- Advance airshed level management as a foundational principle, deliberate on ways to delineate airshed boundaries and institutionalise planning and coordination efforts.
- Engage with urban local bodies to effectively utilise new grants from the 15th Finance Commission for 2020-21 in building capacity, investing in sustainable infrastructure, and improving public services, while anticipating substantial constraints in capacity this year.
- Develop a robust framework for assessing performance under the 15th Finance Commission grants, and sustain the grants over the 2021-26 period.

Introduction

The COVID-19 pandemic has been historically disruptive. It is a global public health crisis that continues to spread, causing death and suffering across the world, with seemingly no end in sight. The disruptions wrought by it have plunged the world into an economic crisis of a scale not seen since the Great Depression ([Gopinath 2020](#)). For the first time in 40 years, India's economy is expected to contract in 2020-21. The lockdown has also become a humanitarian crisis in India, with crores losing their livelihoods during the lockdown, and many being stranded far from their homes. The timeline for recovery from the crisis remains uncertain, and the next few months, perhaps years, may witness recurring waves of infection and disruption.

Air pollution is a public health crisis of a different stripe. It has an enormous toll: 1.2 million premature deaths a year in India ([Health Effects Institute 2019](#)), impacts on nearly every organ in the body, and lifelong consequences of early childhood exposure ([WHO 2018](#)). But governance in India, with limited resources and state capacity, often involves prioritising among crises. Air quality was gradually gaining political salience in the last few years, but COVID-19 and the deepening economic recession may now change the speed, and possibly the direction, of progress. The aim of this report is to begin the process, even amidst uncertainties, of understanding the effects of the COVID crisis¹ on the air quality debate.

Our starting point is a discussion of the ways in which the COVID crisis might require re-thinking how we frame the air quality problem, in particular, the narrative of air quality as a public health challenge that has been gaining strength. We then examine the financial, regulatory and institutional implications of the crisis, including the effect of declining fiscal health of governments, particularly at the state and local body level. As a result, air quality-related measures may get reduced or delayed

citing paucity of funds and competing urgent needs. More worryingly, regulatory measures that impose costs on polluters may be diluted, formally or informally, citing the need for urgent economic recovery and improving the “ease of doing business”; several signs point to this unfolding already. On the other hand, some opportunities may open to lock-in infrastructure or accelerate behavioral changes that are salutary for the environment and public health.

We then turn to the multiple important sources of air pollution; while the disruptions caused by COVID-19 may open new opportunities for mitigating emissions from some sources, nascent policy efforts on others may regress. Examining emissions on a source-by-source basis is important because air quality management in India needs a multi-pronged approach: regulatory enforcement of emissions from industries and power plants, investments in sustainable urban mobility and cleaner commercial transport, much improved energy access, and investments in public services like waste management. Ensuring that these disparate efforts are planned, implemented and resourced in a coordinated manner is crucial. Central and State Pollution Control Boards, as the agencies with the policy planning mandate and technical expertise, have a critical role to play, and need to be appropriately empowered and well-resourced. In addition, broader institutional reforms are necessary, including a shift towards airshed-level management.

In brief, this report attempts to outline both the challenges and the opportunities of this moment for improved air quality in India, over the next two to three year horizon, even while acknowledging the substantial uncertainties over the future. Before turning to the narrative, institutions, and sectoral emissions, we start by inventorying the short term improvements witnessed as a result of the lockdown.

¹ In this report, we use COVID-19 to refer to the pandemic, and COVID crisis as a shorthand to refer to the larger set of disruptions caused by the pandemic, and by the responses to the pandemic.

1. Temporary air quality improvements during the lockdown

The restrictions on movements, and on a host of economic activities including industries and construction, resulted in dramatic reductions in pollution levels, blue skies and improved visibility. Similarly, rivers and ports became cleaner, and wildlife emerged in unusual places (Tripathi and Hait 2020, Kannadasan 2020). What was perhaps startling was also the pace at which these improvements occurred. These improvements are undoubtedly temporary, and have come at a huge, and unacceptable cost to livelihoods. As economic activities and vehicles return, these gains will likely vanish quickly.

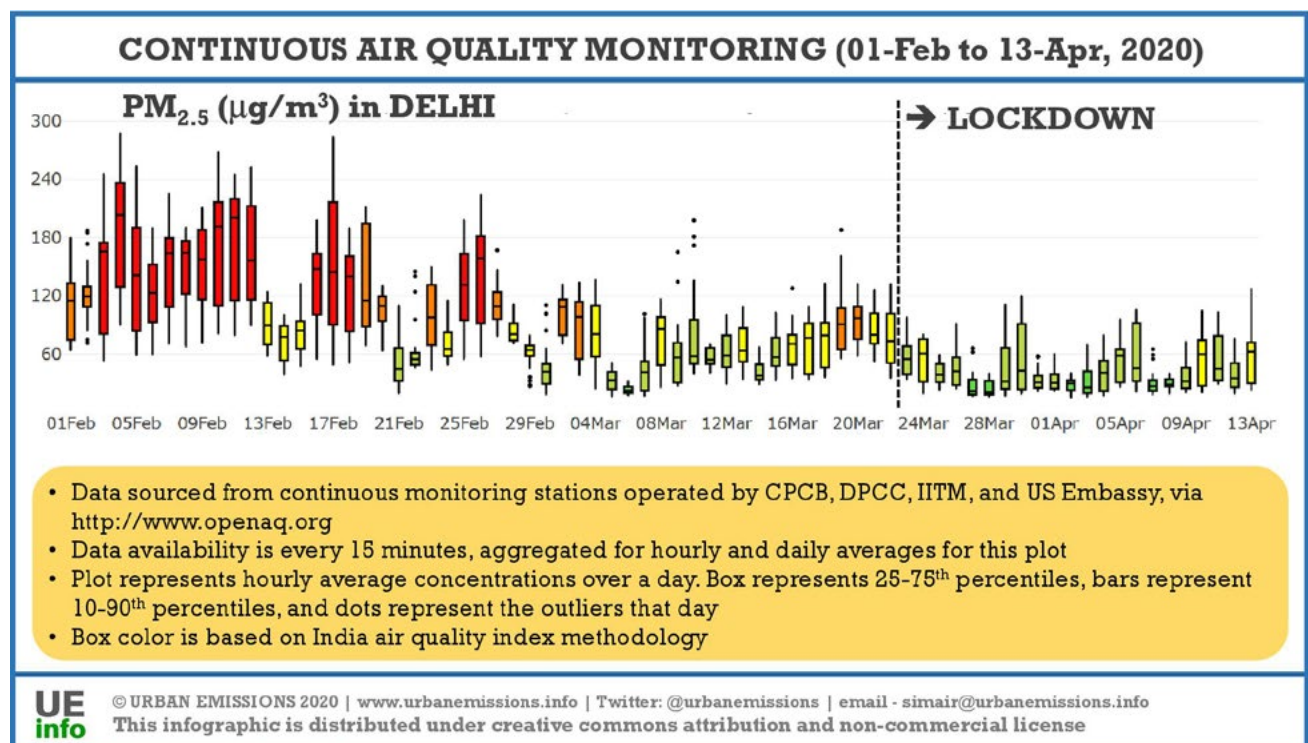
Improvements in air quality have been large and perceptible. The months of March and April in general have improved air quality levels compared to winter months, but the levels during the lockdown show a marked improvement compared to the past. Overall, the levels of PM_{2.5} and NO₂ improved across cities (Cuttikunda 2020a) in April, compared to the few weeks before the lockdown.² NO₂

concentrations through the day flattened with the absence of peak hour traffic (Roychowdhury and Somvanshi 2020). Similar dramatic reductions in concentrations were seen across the world (Broom 2020).

It is no surprise that air quality levels improved so much in the absence of emissions from a range of activities. But while stopping economic activity mechanically leads to cleaner air, clean air does not need economic activity coming to a halt, and certainly not at the cost of the socio-economic upheaval we have witnessed. There are other, more sustainable pathways to improved environmental and economic outcomes, and international experience to learn from.³

Visible improvements in air quality have provided the public a glimpse of what they are missing out on, and that it is possible for the skies to be blue and for the air not to be filled with smoke. For scientists, the lockdown presented an opportunity to understand better what the baseline levels

Figure 1: PM_{2.5} in Delhi from February 1 to April 13, 2020



Source: [Cuttikunda 2020b](#)

2 Ozone levels in Delhi increased a little bit, owing to the complexities of atmospheric chemistry (Cuttikunda 2020b).

3 With the US air quality experience, for example, aggregate emissions of six common pollutants have reduced by 74% over five decades since 1970, while the GDP itself has grown by 275% (United States Environmental Protection Agency 2019).

of air quality are without (most) polluting activities ([Thakur 2020](#)). This would be useful in taking a closer look at the national air quality standards.

Will the air quality improvements persist? Particles remain suspended in the air, at most, for a few weeks ([United States Environmental Protection Agency, n.d.](#)). Likewise, other health-damaging pollutants like carbon monoxide and ozone have short lifetimes. Restrictions in activities during the lockdown would therefore not continue to influence air quality levels for long, and indeed the pollution levels are on the rebound already in early June as the lockdown is getting lifted. Recovery post-lockdown will likely take time and possibly happen in a stop-start manner depending on the

spread of infection, and industrial and vehicular emissions may not reach pre-COVID levels for a while. 2020 will almost certainly be an outlier year for air quality.

Can these dramatic air quality gains be achieved in similar time spans through deliberate policy efforts? Unfortunately, although substantial reductions are possible through aggressive efforts on major contributors, India's air pollution crisis cannot be fixed in a few years. Instead, as seen from experience elsewhere, we need systematic efforts sustained over many years, perhaps over a decade, with interim markers to assess and communicate progress.⁴

2. Implications on framing air pollution as a public health crisis

What are the likely implications of the pandemic on how we discuss the impact of air pollution on public health? Several researchers and commentators, including ourselves, have referred to air pollution in India as a public health emergency to signal the scale of impacts and the need for a proportionate, urgent response. While the impacts and the need for urgency remain, COVID-19 has changed how all of us perceive a health emergency: how immediate the stakes are, how harsh and swift the policy response should be, and how quickly the success (or failure) of the policies can be seen. In light of COVID-19, the 'emergency' framing of air pollution may no longer elicit the desired response from the public.

There are, perhaps, other hooks that COVID-19 provides for the air quality discourse. In particular, masks have been mandated by governments and have been widely adopted – partly as a defensive measure, and partly to avoid transmission. Mask use may persist as a defensive measure against air pollution, if they become cheaper, more easily available and more accepted in public spaces.

As a health crisis, air pollution (a risk factor) and COVID-19 (a virus) differ greatly along two important axes: how quickly the impacts manifest, and the pathways leading to the

problem. The framework in Table 1 contrasts air pollution with COVID-19 and other well-known environmental issues. While the causal pathway for COVID-19 and ozone layer depletion are relatively more straightforward, there are multiple sources of pollution that could lead to acid rain. Air pollution impacts are much slower and accumulate over time. These cumulative impacts are staggeringly high, and begin early: right from the prenatal stage ([WHO 2018](#)). Further, the pollutants are emitted and formed in the atmosphere through complex pathways – there is no one source, no one agency responsible. Mitigating emissions from each of these sources needs a sustained multi-year, possibly multi-decade, effort, and calls for many structural changes. Indeed, climate change impacts manifest over a longer term than air pollution, and is caused by even more diffused pathways. Through deliberate policy efforts, acid rain (particularly in the USA) has been successfully addressed and substantial progress has been made to reverse ozone depletion.

Are there ways of juxtaposing the impacts of air pollution and COVID-19 that are effective without undermining the magnitude of death and suffering from the latter? One approach could be to emphasise air pollution as an “invisible killer”⁵: a risk factor that, based on current information, has

4 In the short to medium term, we need clear interim markers of progress that are ambitious yet achievable to measure and communicate success. In the next few years, the benchmarks could be defined around important policy milestones (e.g. the BSVI transition), or through outcomes that map to reduced emissions and improved air quality with reliable databases (e.g. percentage of households using LPG as their primary fuel). Year-on-year improvements in air quality are additionally important to track progress, but require careful analysis to ensure apples-to-apples comparisons ([Harish, Selvaraj and Dholakia 2019](#)).

5 Shashi Tharoor's commentary ([2020](#)) offers a good example for this framing.

Table 1: Two important dimensions distinguishing COVID-19 from air pollution as a health crisis

		Manifestation of impacts	
		Immediate/ short term	Long term/ cumulative
Traceability of cause	Direct	COVID-19	Ozone layer depletion
	Diffused/ multi-pathway	Acid rain	Air pollution Climate change

a long-term mortality and morbidity burden greater than COVID-19 given the severity of India's pollution levels, but also increases the risk of infections like COVID-19.⁶ Air pollution accounts for 1.2 million premature deaths in India a year: one-eighth of total deaths in the country ([India State-Level Disease Burden Initiative Air Pollution Collaborators 2018](#)).⁷ The impact of air pollution on public health is illustrated by a study on China, in which Chen et al. (2020) estimate that the avoided deaths due to improved air quality (in terms of NO₂, and PM_{2.5}) in Chinese cities during the lockdown there exceeded the total number of deaths in China due to COVID-19 (as of May 4, 2020).

Further, the most vulnerable groups to COVID-19 are the elderly and those with co-morbidities like diabetes or heart disease. Air pollution is found to increase the risk of “acute lower respiratory infections, ischaemic heart diseases, stroke, chronic obstructive pulmonary disease, lung cancer, and diabetes” ([India State-Level Disease Burden Initiative Air Pollution Collaborators 2018: E28](#)). COVID-19 has appropriately brought about an urgent response, given the scale of its effects. Should not air pollution-linked deaths and disease also merit a more proportionate and urgent response?

3. Implications for air quality policy and institutions

In this section, we take stock of how policies and institutions that cut across the various pollution sources may be affected by disruptions linked to COVID-19.

2019 and early 2020 witnessed a continued increase in political engagement with air quality, leading up to the Delhi elections and the Union Budget for FY 2020-21. The long awaited National Clean Air Programme (NCAP) was launched by the Ministry of Environment, Forest and Climate Change (MoEFCC) in January 2019. It recognized 102 non-attainment cities, and set a target of 25-30% reduction compared to 2017 levels by 2024 ([PIB 2019](#)). While NCAP expanded policy efforts beyond Delhi-NCR, it continued to limit air quality efforts to cities.

In the past two decades, the Indian judiciary has played a dominant role in pushing the air quality agenda, with the executive largely being reactive and the legislature absent. In 2019, air pollution started gaining political salience. In September 2019, the Delhi government, in anticipation of a spike in pollution levels due to stubble burning in

November, announced an emergency response plan ([India Today 2019](#)). In a first, both houses of the Parliament had extensive discussions in November 2019, nearly lasting 12 hours altogether, about air pollution. In the Delhi state elections in February 2020, all three political parties had air pollution featuring in their election manifestos. ([Carbon Copy 2020](#)).

The allocation of Rs. 4400 crores as performance-based grants to municipal corporations for tackling air quality in the Union budget for 2020-21 is an encouraging sign. However, the draft Environmental Impact Assessment notification released for public consultation in March 2020 ([Government of India 2020a](#)), and a flurry of clearances from the MoEFCC during the lockdown ([Nandi 2020b](#)) are deeply concerning and suggest that environmental safeguards may get short shrift citing the economic crisis.

We reflect below on what the COVID crisis could imply for institutions and policy measures that pervade air quality management in India.

6 Early evidence suggests that high pollution levels may lead to higher infection rates and more deaths. Wu et al. (2020) postulate that an increase of 1 µg/m³ in PM_{2.5} is associated with an 8% increase in the COVID-19 death rate in the United States; in China, Tian et al (2020) have suggested that an increase of 10 µg/m³ in PM_{2.5} is associated with a 15% increase in the number of COVID-19 cases, and a 10% increase in severe infection. However, we advise caution, and recommend waiting for more peer-reviewed evidence to accumulate.

7 For perspective, COVID-19 has resulted in nearly 17,000 Indian deaths as of June 30, 2020 ([Government of India, n.d.](#)), and more than 500,000 deaths globally ([Johns Hopkins University of Medicine n.d.](#))

3.1 Cross-agency air quality management

Air quality management in India involves a host of agencies at the central, state and local levels, with mandates and priorities that may not explicitly include air quality, but are directly linked. The city action plans developed under NCAP and the recently introduced Finance Commission grants to urban local bodies could facilitate improved planning and coordination. However, as a result of the COVID crisis, governments may become less ambitious with their action plans and policy initiatives, and undertake the absolute minimum required, citing paucity of funds and stretched resources as reasons for inaction. The research and civil society community needs to ensure that the processes under the NCAP and the Finance Commission make significant progress, and engage with government agencies, especially at the state and local levels, to improve planning and fund utilisation at the city level. In parallel, the airshed management conversation must continue to develop.

The principal changes introduced by the launch of NCAP in 2019 included a target for air quality improvements, and a process of identifying non-attainment cities, developing city-specific action plans, and institutionalising coordination across different agencies in these cities. Beyond these, NCAP did not really change the status-quo: budgetary allocation from the Union government in 2019-20 was miniscule, broader structural reforms were untouched, and the Delhi-

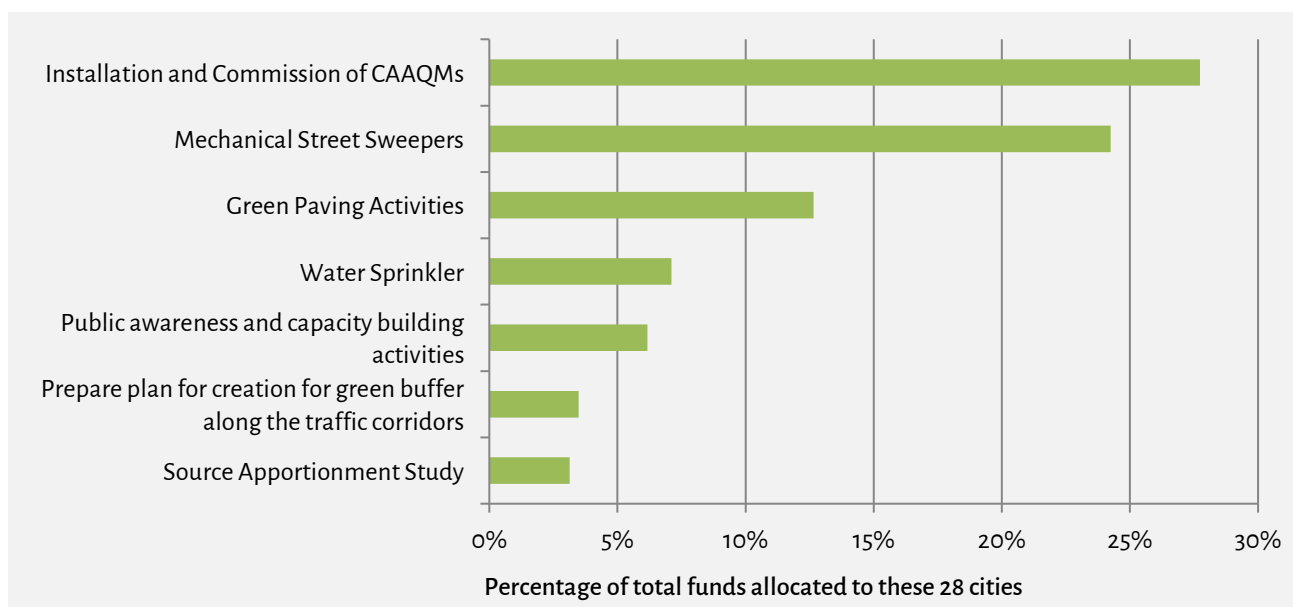
template was applied to other cities. The city action plans were developed without public consultation, and with uneven levels of rigour. Most plans are laundry lists of action points with no attempt at prioritisation or setting realistic timelines, and borrow generously from Central Pollution Control Board (CPCB) guidelines and Delhi's Comprehensive Action Plan.

In 2019-20, Rs. 300 crore was allocated between the 102 cities: larger cities with population of 1 million or more got Rs. 10 crore each, an intermediate category Rs. 20 lakhs, and the smallest towns (of less than 500 thousand) Rs. 10 lakhs for the year. Modest budgets beget modest actions. As Figures 2 and 3 show, 28 cities that received Rs 10 crores allocated the funds mainly in interventions of limited effectiveness like street sweepers, water sprinklers and "green paving"- all of which are dust management measures, not emissions reduction.

However, NCAP has provided a platform for government agencies, academic institutions and civil society groups to collaborate on developing some of the technical knowledge base across the country. In particular, source apportionment studies and monitoring networks have been catalysed.

Even if the budgetary allocation towards NCAP for 2020-21 is unaffected by any redirecting of expenditures by the Ministry of Finance due to COVID-19, it seems likely that

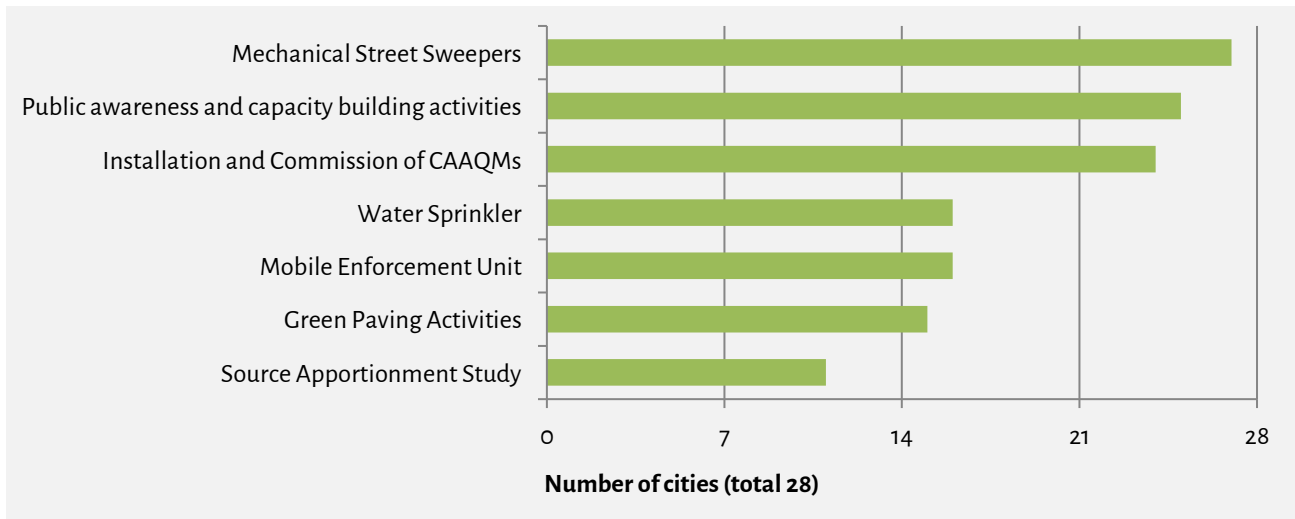
Figure 2: Action items with highest shares of fund allocation from NCAP among 28 large non-attainment cities



Source: Data: NCAP Tracker Dashboard by Carbon Copy (Carbon Copy n.d.)⁸

⁸ Data on allocations under NCAP were obtained from the MoEFCC through RTI queries for 28 cities in December 2019 (Carbon Copy n.d.). These 28 cities were allocated Rs. 10 crores each for FY 2019-20.

Figure 3: The most common action items funded through the NCAP budget in 28 large non-attainment cities



Source: Data: NCAP Tracker Dashboard by Carbon Copy ([Carbon Copy n.d.](#))

the actual mitigation efforts through this funding route will remain limited.⁹

The limited funds within NCAP make the new allocations in the Budget 2020-21 providing performance-based grants to municipal corporations for tackling air quality especially important. Accepting the recommendations of the interim report of the 15th Finance Commission (FC) ([Finance Commission India 2019](#)), the Finance Minister allocated Rs. 4400 crores to municipal corporations in 42 cities with a million-plus population.¹⁰ An order of magnitude higher than the NCAP outlay, the total allocation for these grants exceeds the total outlay of Rs. 3100 crores to the MoEFCC ([Ministry of Finance 2020](#)).

Providing the grants to the urban local bodies certainly represents a change in approach. It has the potential to strengthen local government capacity by giving them more ownership on air quality, promote innovations at the city level, and bring more focus to the sources that have traditionally been outside the formal regulatory net. However, it is essential for these grants to link more directly with the NCAP and city action plan process than outlined by the FC. While municipal corporations play an important role for some sources, air quality improvements need parallel progress on other sources too, and beyond just the city limits. Much depends on the performance framework that MoEFCC develops. Finally, while the FC's interim report

recommendations were for 2020-21, the grants need to be sustained over a longer duration – the 2021-26 period of the 15th FC's full report could serve as a start.

The status of the Finance Commission grants is uncertain as we write this. While there have been no announcements as yet, a new grant like this may get curtailed in the current circumstances. Further, even if the grants are released, given that the municipal corporations are at the frontlines of the COVID crisis, their capacity to effectively utilise the grants may be constrained. Civil society groups need to engage with the MoEFCC to finalise the framework, and then with the state governments and corporations for the grants to be used well.

Finally, the discussion on airshed level management needs to be sustained. Institutionally, airshed level regulation raises many questions. What are the appropriate boundaries for an airshed for effective regulation? How would coordination across agencies with different mandates and in different jurisdictions be institutionalised? Do we need a new regulatory agency at the airshed level? Beyond coordination in planning and monitoring, what additional powers can such an agency enjoy under existing law? India could benefit from learning and adapting from international experience, like in Mexico City, the South Coast Air Quality Management District, and Beijing-Tianjin-Hebei.

9 State governments and municipal corporations could, in theory, complement the resources from the Union Government. However, given the current fiscal situation of the states and local bodies, it seems unlikely that air quality-related interventions will get prioritised and additional resources will be mobilised for them.

10 The maximum amount that can be released to the cities is proportional to the population. The grants are to be released in two installments: half the maximum as an unconditional grant early in the financial year, and the rest based on the city's performance against a framework to be designed by the MoEFCC. There is another similarly structured grant for urban local bodies (ULBs) linked to water and sanitation, with the framework developed by the Ministry of Housing and Urban Affairs as the nodal ministry. The framework from MoEFCC is expected to be finalised in June 2020.

3.2 Regulatory and legal framework

The regulatory framework governing air quality in India is complicated. As there are several sources of emissions, different central, and sometimes state, laws are applicable, and institutionally the mandate is spread across various regulatory agencies and government institutions. Maintaining and strengthening this regulatory framework is essential for the fight against air pollution, and it is important that the response to the COVID crisis does not unintentionally dilute this framework, in the interests of perceived, but misplaced, short term economic gains.

To briefly recap, the MoEFCC is the nodal agency for the implementation and enforcement of the Environment (Protection) Act 1986 (EP Act), and emission standards and notifications (such as the Environmental Impact Assessment (EIA) Notifications and the Coastal Regulation Zone Notifications) issued under it. Some of the other central ministries which play an important role include the Ministries of Road Transport and Highways, Petroleum and Natural Gas, Coal and Power. At the state level, for emission sources like waste and construction, the urban local bodies, development authorities and public works departments are key actors.

The Central and State Pollution Control Boards (PCBs) are the principal regulatory agencies involved in the prevention and control of air pollution in the country. Empowered primarily under the Air (Prevention and Control of Pollution) Act 1981 along with rules issued under the EP Act, the Boards are responsible for regulating several point sources of emissions such as industries and power plants. Their functions include issuing appropriate emission standards, considering the grant of regulatory consents, monitoring compliance and taking enforcement action.

One of the main issues faced by PCBs is the high rate of vacancies in sanctioned posts and lack of technically competent staff. Their ability to fill these vacancies and hire staff is constrained by state government policies, and a hiring freeze as part of the government's austerity measures in response to the COVID crisis will affect the PCBs' efforts to enhance their capacity ([R. Mishra 2020](#)).

Government efforts to restart the economy post-COVID should not weaken or undermine the existing regulatory framework. Most industries were closed during the lockdown, and restarting them may be hindered by shortages in labour capacity, suppressed demand and disruptions in the supply chain. In response, there might be a general push for increasing the 'ease of doing business',

which has typically meant diluting environmental impact scrutiny and consent granting processes (Dubash and Ghosh 2019). For instance, recently the government has amended the rules to remove the maximum ash content requirement in coal used in thermal power plants ([Government of India 2020b](#)). This allows plants to use coal with much higher ash content. The preambular text to the amendment specifically cites the pandemic as a reason to support the removal of the cap. But there is no move in parallel to enforce compliance of emission standards.

Less frequent inspections, and a reduced willingness or ability to penalise noncompliance can become the norm, and such measures are likely to be short-sighted. Increasing transparency in monitoring data and enforcement actions should be prioritised as it involves negligible implementation costs, and does not require changing regulatory norms. Indeed, industry-led disclosure efforts could incentivise industries to go above and beyond in complying with regulatory norms.

In March 2020, the government put out for public consultation a draft notification to replace the EIA Notification 2006. The main objective of the EIA Notification is to ensure that certain categories of projects (such as mining, power projects, industries, etc) are required to undergo environmental impact assessment before an 'environmental clearance' is issued and work is permitted at the site.¹¹ Over the years, the notification has been amended on several occasions to serve different purposes.

The draft notification of 2020 builds on the 2006 notification, and instead of using the opportunity to tighten the impact assessment processes, and make public consultation more meaningful, the draft notification has done the opposite. It dilutes the process to obtain an environmental clearance, reduces the categories of projects and activities which require environmental clearances, curtails public consultation processes significantly, and proposes procedures to deal with violations and non-compliance of regulatory conditions which will condone the violations and regularize the illegalities, with effectively no penalty on the violator ([Aggarwal 2020](#), [Nandi 2020a](#)).

Recourse to judicial forums for air quality related cases may not be as convenient, practical or strategically advisable as before in the near future. All courts, including the National Green Tribunal, are currently hearing cases through video-conferencing and cases and documents have to be filed through websites (i.e. e-filing). This is likely to continue in the foreseeable future. Although this may appear as an enhancement of accessibility of these forums, in practical

¹¹ The notification lays out a detailed process which includes preparation of EIA reports, public hearing, expert appraisal and then a final decision by the MoEFCC, or the State-level Environment Impact Assessment Authority.

terms, this may not be so. Problems such as technological glitches at different ends, non-availability of relevant documents to all parties, and inability of clients and counsels to confer make the quality of a remote hearing distinctly poorer than an in-person, conventional hearing. These logistical problems are compounded by the fact that the Indian judicial and legal fraternity is yet to adapt to the mechanics of remote hearings, and till this happens, arguments in cases will not have the same quality as those witnessed in courts.

Apart from this, the higher judiciary in the recent past has been fairly sympathetic to the Central Government's measures relating to the lockdown and how it has dealt with it. Going forward, if environmental regulations are diluted or suspended to support post lockdown measures for 'recovery' in the economy, whether the courts will be sympathetic to the environmental costs of such dilution remains to be seen.

4. Implications on pollution sources

In this section, we discuss how individual sources of pollution may be affected by the disruptions and recovery efforts. We focus on those sources that are significant contributors, and are governed by agencies apart from the MoEFCC and the PCBs.¹²

4.1 Household sources

Household burning of polluting fuels for cooking, lighting, water-heating and space-heating is the single largest source of exposure to outdoor PM_{2.5} in India. Household sources contribute to about 30% of outdoor exposure ([Chowdhury et al. 2019a](#)). Mitigating these emissions requires millions of households to access and use cleaner fuels for cooking, water heating and space heating. In terms of providing access to cleaner cooking fuel, Pradhan Mantri Ujjwala Yojana (Ujjwala), launched in 2016, was an important effort. The next step is to help poor households use LPG as their primary cooking fuel. Providing higher and more targeted subsidies is key, and although there were no direct efforts pre-COVID-19, there might be new opportunities that build off the economic package announced in March 2020, and recent reductions in global LPG prices.

This requires deliberate policy effort to make the fuel more affordable for the poor households ([Josey et al. 2019](#)). With an economic crisis, and a lockdown that has disproportionately affected daily wage labour, there is a high risk that more households choose to rely largely on cheaper biomass fuels. After the lockdown was announced, Ujjwala beneficiaries were given three cylinders for the months of April, May and June, as part of the relief package ([Abdi 2020](#)).¹³ Direct benefit transfers of LPG subsidy thus became a form of

social protection, which also reduces household exposure to pollution, and improves outdoor air quality.

LPG prices have fallen for three consecutive months in 2020, from March to May. In May, the prices had fallen so much that subsidies were temporarily stopped (or reduced to a small minimum to cover transportation costs) ([IANS 2020](#)). This may provide an opening for bolder changes in targeting LPG subsidies as social protection. For instance, higher subsidies could be provided to 'priority households' under the National Food Security Act 2013, and free or highly subsidised cylinders could be provided to the poorest segment: 'Antyodaya households' ([Gupta and Vyas 2019](#)); subsidies can be rolled back for everybody else.

4.2 Power plants

Mitigating power plant emissions involves complying with the emissions standards set by MoEFCC, and a transition away from coal in the longer term. The COVID crisis may affect both of these, possibly delaying compliance with standards, but also possibly accelerating the closure of old thermal plants.

Thermal power plants emit particulate matter directly, and in addition, are the largest source of SO₂ and among the main contributors of NO_x, both of which are precursors of secondary particulate matter. In 2015, MoEFCC notified emission standards for gaseous pollutants (SO₂ and NO_x) and made standards for PM more stringent; compliance to these in most cases needed the installation of pollution control equipment as a first step ([CSE 2020](#)). Although the deadlines were extended for several plants by the Supreme Court from 2017 to 2022 after the Ministry of Power's

12 Although thermal power plants like other industrial sources, have to comply with emission standards, we discuss them separately in this section because the political economy of the sector is distinct, and the Ministry of Power and electricity regulators play important roles.

13 The amounts were also transferred in advance of the purchase of cylinders, unlike usual practice ([Jayaswal 2020](#))

representation, 10 of 11 plants in the NCR (whose deadline was December 31, 2019) are already non-compliant. Further, CSE (2020) estimates that as high as 70% of the installed capacity of coal power plants may not be able to meet the 2022 deadline, having either not awarded the tender or not even floated one. In addition, the NOx norms were relaxed in 2019 by the MoEFCC for plants commissioned after 2003, claiming that the technology is not suitable for coal with high ash content (Datta 2019).

Even before the lockdown, the power sector was already in crisis. Demand had dropped with the economy slowing down in 2019, leading to adverse impacts on discom finances, utilisation of new thermal power plants, and subsequently on banks with these new plants becoming nonperforming assets. The COVID crisis has further suppressed demand.¹⁴ Buckley (2020) estimates a reduction of energy demand by 24% from April 1- May 3, entirely at the expense of coal power generation. Discom finances worsened in the absence of the commercial and industrial load during the lockdown. As part of the economic recovery package, Rs. 90000 crores have been provided to discoms (PIB 2020).

Before the lockdown, CPCB issued show cause notices (PTI 2020a) to plants in Delhi NCR for not complying with the emission standards, and this could have led to other power plants moving faster.¹⁵ Although costs were initially cited as the barrier, progress remained slow despite Ministry of Power clarifying that the costs could be passed through to the consumers.¹⁶ However, the COVID crisis may provide a new excuse for stalling compliance with the emission standards. Policy efforts already seem afoot to relax other norms that involve costs to thermal power plants. As already mentioned, regulations on acceptable ash content in coal are also being simultaneously relaxed, seeking to reduce costs of coal procurement. Given that the technology is mature, the costs well-understood, and the emission sources being both limited in number and large contributors, mitigating power plant emissions within aggressive timelines must remain a top priority for air quality management in India.

The Finance Minister had mentioned retiring old plants not meeting the emission standards in her Budget speech (Koundal and Joshi 2020). The disruptions have strengthened

the case for retiring older plants. CSE (2020) estimates that over 70% of the roughly 21 GW of thermal power plants that are now over 30 years old, and do not seem to be in the pipeline for retirement, will be unable to comply with the standards by 2022.¹⁷ Retiring capacity that has already been identified and plants that remain poorly utilised is the “least cost and most direct way to eliminate chronic ‘Non-Performing Assets’” (Bharvirkar 2020) and may help the economics of the sector as a whole.

4.3 Stubble burning

Stubble burning is a major contributor to the first of two major spikes in pollution levels observed every year in North India.¹⁸ The policy response has so far relied on a technology fix – equipment like Happy Seeders that make it less necessary to remove the stubble before sowing wheat. As the choice of the paddy crop is unsustainable in the long term, given the ground-water requirements, a shift towards crops like maize and cotton seems promising (NABARD and ICRIER 2018). Uncertainties in labour availability due to the COVID crisis for transplanting paddy have accelerated the state governments’ efforts to shift crops this year. The disruptions therefore provide an opportunity to hasten the shift towards more sustainable agricultural practices.

Chowdhury et al (2019b) find that the spike observed between mid-October to mid- November became sharper and more prolonged after the passage of the Punjab Preservation of Subsoil Water Act 2009. This Act shifted the sowing period of the paddy crop by a few weeks to June 20. In 2019, SAFAR modeled the contribution to Delhi’s PM_{2.5} concentrations to be as high as 46% on November 2 (Nandi 2019), with this share varying significantly by day depending on meteorological conditions.¹⁹

The principal policy response has been a Central Sector Scheme to subsidise crop residue management technology, such as Happy Seeders. A total of Rs. 1152 crores was allocated to this scheme for the financial years 2018-19 and 2019-20. Substantial investments have been made so far in Happy Seeders – 16000 Happy Seeders were reportedly in use in Punjab as of January 2020 (Chaba 2020). Political discourse in 2019 finally acknowledged the limits of relying solely on

14 Analysis from the Energy Policy Institute at the University of Chicago found that energy demand, adjusted for weather and other factors, dropped by about 20% (Energy Policy Institute Chicago 2020) in the first two weeks of the lockdown.

15 CPCB seems to be continuing to take action and has ordered four non-compliant power plants to pay Rs. 18 lakh per month per unit on four thermal power plants in Haryana, for every month that the plants remain noncompliant (Mohan 2020).

16 The Ministry of Power has allowed for the costs to be passed through to the consumer (CSE 2020). However, there remain delays in getting in-principle regulatory approvals on the costs (Garg et al 2019).

17 About 75% of these are in critically polluted areas or in close proximity to dense populations (CSE 2020).

18 The second major spike in pollution levels in mid-late December observed each year has been attributed to meteorological conditions that facilitate the formation of secondary particulates (Chowdhury et al 2019b)

19 Similarly, Cusworth et al (2018) estimate the contribution of crop residue burning to daily concentrations in Delhi could vary from 7% - 78% during the burning season.

technology fixes. Instead, the policy instrument of choice in Punjab²⁰ and Haryana was to provide “incentives” to farmers at Rs. 2500 per acre for not burning stubble and managing the residue in alternative ways ([Mukherjee 2019](#)); unfortunately, this was announced in the last week of November after much of the residue had already been cleared.²¹

There has been an ongoing effort towards crop diversification in Punjab and Haryana, owing to the groundwater crisis. Indeed, the Punjab Chief Minister has said that paddy has no future in the state ([Nibber 2020](#)). This diversification appears to have been accelerated by the COVID-linked disruptions. Absence of migrant labour from Bihar and UP for transplanting paddy in June-July owing to the lockdown has further increased the cultivated area for alternative crops like maize and cotton ([Chaba and Damodaran 2020](#)). To sustain this transition, ensuring that the harvest finds a market and reasonable prices is key. The extent, scale and durability of any shift away from paddy cultivation is a key determinant of future air pollution due to stubble burning.

On current evidence, despite these changes in cropping, paddy will remain the dominant crop. Farmers will likely resort to stubble burning again in November 2020, and there might be even lower willingness to enforce the ban. The absence of migrant labour has also resulted in the government advancing the paddy sowing season by 10 days to give more time for transplanting ([PTI 2020b](#)). Incentives, if announced well in advance, could perhaps help reduce the instances in the near term. Modeling alternative scenarios of when the crop is harvested and residue burnt would be helpful in anticipating the November spike in pollution levels, and preparing emergency responses.

4.4 Transportation

Transport emissions were among the major sources that were reduced to a minimum during the lockdown, and the disruptions offer a mixed bag. On the positive side of the ledger, the transition to BSVI, an important milestone for air pollution control efforts, has been largely unaffected due to the lockdown: as of April 1, 2020, India has entered the BSVI era ([Roychowdhury 2020](#)). The vehicle scrappage policy, seemingly ever-imminent, could be implemented as a way to a boost to the struggling auto sector, while also improving

fleet efficiency, especially if targeted at commercial vehicles. In addition, several companies may persist with work from home: potentially reducing private vehicles on the road and reducing peak hour traffic to some extent. On the other hand, public transport, already under capacity in most cities, is likely to face challenges due to social distancing requirements. Commuters who can afford to shift away from public transport may do so—potentially locking them into private vehicle use. To avoid this lock-in will require proactive measures.

One of the most important wins in recent years is India leapfrogging from BSIV to BSVI. At the nudging of the Supreme Court, the Ministry of Road Transport and Highways announced in January 2016 that India will skip the BSV stage and advance the BSVI phase by two years to April 1, 2020. BSVI fuel was already available in Delhi since April 1, 2018, and all the suppliers were prepared to have the fuel available nationwide on April 1, 2020. Similarly, the automobile industry had planned for the transition in terms of their production and inventories. As a result, the COVID crisis has not affected the transition greatly.²²

Auto manufacturers have been asking for a vehicle scrappage policy to be notified.²³ The auto industry, already adversely impacted by the economic slowdown in 2019 and the transition to BSVI, has been severely hit by the lockdown. The Minister for Road Transport and Highways reiterated in May 2020 that the policy is in its final stages, and is awaiting for approvals from other ministries ([Nandi S. 2020](#)). If directed well, the scrappage policy could be well aligned with air quality objectives. In particular, channeling the policy towards scrapping old commercial vehicles and replacing them with newer, more efficient vehicles could be a win-win ([PTI 2020c](#)). Questions remain on whether and what kinds of incentives should be provided²⁴.

With health concerns and the lockdown forcing many professionals to work from home and adapt to meetings online, the crisis has accelerated the transition towards remote working. Several software companies with large workforces have already signalled a permanent shift to work from home policies post-COVID ([Kelly 2020](#)). Tata Consultancy Services has indicated that 75% of its employees (4.5 lakh globally with 3.5 lakh in India) will work from home by 2025 ([Khetarpal 2020](#)). This could result in reduced congestion and vehicular

20 The Punjab Chief Minister had reportedly requested incentives for farmers since 2015 ([Sharma 2020](#)).

21 The Supreme Court had previously asked the states to provide incentives of Rs. 100 per quintal ([ANI 2020](#)).

22 There were minor exceptions made for registering BSIV vehicles that could not get sold in the last 10 days of March ([Singh 2020](#)).

23 This is not a new demand: companies have been asking for it for years, and the Union Government has also been indicating that the policy is imminent in 2019 ([Saluja 2019](#)).

24 Car Allowance Rebate Scheme, or “Cash for Clunkers” as it is popular known, that was implemented in the USA in 2009 and cost nearly \$3 billion offers a cautionary tale. The programme aimed to stimulate demand during an economic recession, and improve fuel efficiency of the fleet. The programme provided incentives for trading in a less fuel efficient car for a more efficient vehicle. While [Mian and Sufi \(2012\)](#) suggest that the programme had no long run impacts on vehicles sales, other papers have suggested that the modest improvements in fuel economy did not justify the costs and more cost-effective policies exist to reduce emissions ([Lenski et al 2010](#); [Hoekstra et al 2017](#)).

emissions, especially given the demographics of professionals whose jobs are amenable to this flexibility. Questions remain on the rebound effects in terms of leisure travel and net changes in energy consumption ([Hook et al 2020](#)), and the differential implications of work-from-home by gender ([Deshpande 2020](#)).

COVID-19 concerns are likely to dissuade some commuters from using public transportation. Most public transport users cannot afford to not use it though.²⁵ To ensure the safety of the commuters and the staff, protocols need to be developed and followed ([ITDP India 2020](#)). Ever since the lockdown has been lifted, governments have already restored bus service with restrictions on the number of passengers per bus, mandatory requirements of masks and contactless passes. Seating capacity restrictions are bound to be relaxed over time to keep up with demand though. Many questions need to be addressed in the coming months. Could private buses be hired to partially augment capacity in the near term while limiting occupancy? Given that the number of buses are less than the number needed, could this catalyse bus procurement to meet the demand? With decreased revenues and additional costs for sanitising and other new services, how can the finances of the transport corporations be best supported?

Those who can afford to do so may shift to private vehicles. Auto companies as well as used vehicle outlets seem to be optimistic about the increased demand for two-wheelers ([Philip 2020](#)), used cars ([L. Mishra 2020](#)) and entry-level cars ([Chauhan 2020](#)). To preempt this lock-in, and subsequent increases in congestion and pollution, governments need to not only ensure safety and reliability of public transport and paratransit, but also communicate these effectively to build trust. In addition, investments in cycle lanes, and widening footpaths to make them amenable to pedestrians and bus users become necessary. Several global cities have explicitly prioritised the development of cycle lanes and pedestrianization, including London ([Thomas 2020](#)), Paris ([Woo 2020](#)) and Seattle ([Hanley 2020](#)). The Finance Commission grants to the municipal corporations could come in handy for investing in this infrastructure.

4.5 Municipal sources

Urban Local Bodies (ULBs) are responsible for tackling waste burning, road dust and construction dust— all of which are important contributors to urban air pollution. Since the constraints on the ULB capacity and fiscal resources are likely to be the principal barrier for all three sources, especially with the COVID crisis, we look at all three together. Municipal corporations are at the frontline of the cities' COVID-19 response. The pandemic has shown precisely how important the role of local government can be, and why city-specific needs can best be catered to by ULBs. Likewise, effective implementation of the waste management or construction and demolition dust rules need local commitment and innovation.

ULB finances are currently hanging by a thread. The Finance Commission grants linked to air quality, and water and sanitation could play a critical role here, in providing dedicated but performance-based funds for the municipal corporations to invest in public services. However, even if these grants are released as allocated in the budget announced in February 2020, questions remain on their ability to utilise them effectively, given the constrained capacity. It is therefore essential that civil society organisations engage more closely with the ULBs to build capacity and support planning and implementation.

Managing waste²⁶ and road dust²⁷ better need significant improvements in the corresponding public services, while reducing construction dust²⁸ requires improved widespread compliance to dust handling rules; all of these tasks require resources, state capacity and public buy-in. In light of the COVID crisis, waste segregation has assumed even greater importance than usual, as mixed waste- that may now include discarded masks and gloves- could expose the sanitation workers to medical risks ([Chakravorty 2020](#)). As with waste management, mitigating road dust emissions needs long-term, systemic improvements in governance. Many cities have invested in mechanical street sweepers to clean road dust; indeed, 27 of the 28 cities that were allocated Rs. 10 crore under NCAP in 2019-20 (see Figure 3) allocated funds to procure these. These could play a useful role, but reducing road dust resuspension over the long term requires improved design and maintenance of roads following international best practices, accompanied by scientific planting of roadside hedges.

25 According to the Census 2011, nearly 70% of the population uses public transport, cycles and walks ([The Hindu 2015](#)).

26 With waste burning, the ultimate objective is to avoid or minimise deliberate burning of waste for disposal, accidental landfill fires, and in poorly monitored waste-to-energy plants. Accomplishing this needs improved waste management across the board: improved waste collection and segregation, composting of wet waste, recycling of dry waste, and minimising the waste sent to landfills or to waste-to-energy plants.

27 Road dust has two major components: particles released from the abrasion of tyres, and resuspension of settled particles with vehicular movement.

28 Mitigating construction dust involves complying with the Construction & Demolition Waste Management Rules 2016 on construction sites, in the transport of construction material, and developing waste handling facilities. The construction industry is the second largest employer, and is often dependent on migrant labour. Activities had come to a halt during the lockdown, and have begun to open up. Given this background, measures like banning construction activity, that are a part of the graded response, may be seen unfavourably.

5. Concluding remarks

Several commentators have been stressing the unprecedented nature of these disruptions, and how the world we return to “post-COVID” is not going to be the same as the one we left behind before the lockdown. There are several uncertainties affecting nearly every sphere of activity. Given the multi-source nature of air pollution, COVID’s implications are complex and varied. In this report, we have attempted to reflect on some of the salient aspects of air quality management, and how the air quality discourse in the country may be affected.

Our analysis reveals that the disruptions caused by the pandemic, or actions taken in response to the disruptions, are likely to result in three sets of outcomes. In the **first** set are opportunities to set a new agenda or provide impetus to existing policy measures. These opportunities, when harnessed, will allow us to lock-in infrastructure or accelerate behavioral changes that are well-aligned with improved environmental and health outcomes, particularly air quality. We identify five such opportunities -

- Provide increased, better targeted subsidies as part of a social protection package to allow poor households to use LPG as their primary cooking fuel.
- Sustain the increased rate of shifting away from paddy cultivation in Punjab and Haryana, and ensure that the alternatives (e.g. maize, cotton) are truly viable for farmers.
- Channel the demand for vehicle scrappage policies towards the replacement of old, heavily polluting vehicles, especially trucks.
- Sustain gains made in the form of increased acceptability and experience with work-from-home and online meetings to reduce commuting, especially by private vehicles and cabs.
- Retire old coal power plants so that newer or less polluting plants can meet a larger fraction of the demand.

However, the government response to the disruptions may lead to environmental safeguards getting diluted, formally or informally, citing the need for urgent economic recovery and improving the “ease of doing business”. In the **second** set lie such potentially regressive outcomes, which need to be firmly contested by civil society, and here we identify four such outcomes and the actions needed against them -

- Push back against the dilution of environmental safeguards, especially through the Draft Environmental Impact Assessment Notification 2020.
- Stress on the unacceptable delays in compliance with power plant emission norms issued in 2015, and demand urgent enforcement actions.
- Push for greater transparency in monitoring, inspection and enforcement data from the pollution control boards to ensure dilutions in day-to-day regulation do not go unnoticed.
- Dissuade investments in projects like flyovers and road-widening that tend to further reinforce reliance on private transport, at the cost of more sustainable mobility infrastructure.

Finally, in the **third** set are areas that we believe will not be directly affected by the pandemic, but where we need to actively sustain the discourse, develop ideas and make progress on longer term process improvements.

- Continue developing the National Clean Air Programme (NCAP) framework, in particular on developing uniform processes for identifying non-attainment cities and tracking inter-year air quality improvements.
- Among the currently identified non-attainment cities, invest in knowledge base (source apportionment studies, monitoring networks), and complement it with efforts at identifying priorities at the city-level to develop more informed city action plans.
- Advance airshed level management as a foundational principle, deliberate on ways to delineate airshed boundaries and institutionalise planning and coordination efforts.
- Engage with urban local bodies to effectively utilise new grants from the 15th Finance Commission for 2020-21 in building capacity, investing in sustainable infrastructure, and improving public services, while anticipating substantial constraints in capacity this year.
- Develop a robust framework for assessing performance under the 15th Finance Commission grants, and sustain the grants over the 2021-26 period.

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