



Engagement of Urban Local Bodies (ULBs) in Air Pollution Control in Delhi: Behavioral Change; A Communication-based Approach





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Abbreviations

ULBs - Urban local bodies

MCD - Municipal Corporation of Delhi

GBD - The Global burden of diseases

MoEFCC- Ministry of Environment, Forest and Climate Change

NCAP - national clean air program

CAP- City clean air plans- CAP

SDMC- South Delhi Municipal Corporation

NDMC- North Delhi Municipal Corporation

EDMC- East Delhi Municipal Corporation

DEMS- Department of Environment management services

PUC - Pollution under Control.

C&D- Construction and demolition sites

SOP- Standard Operating Procedure

RWAs- Resident Welfare Association

MRS- Mechanical Road Sweeping

Background

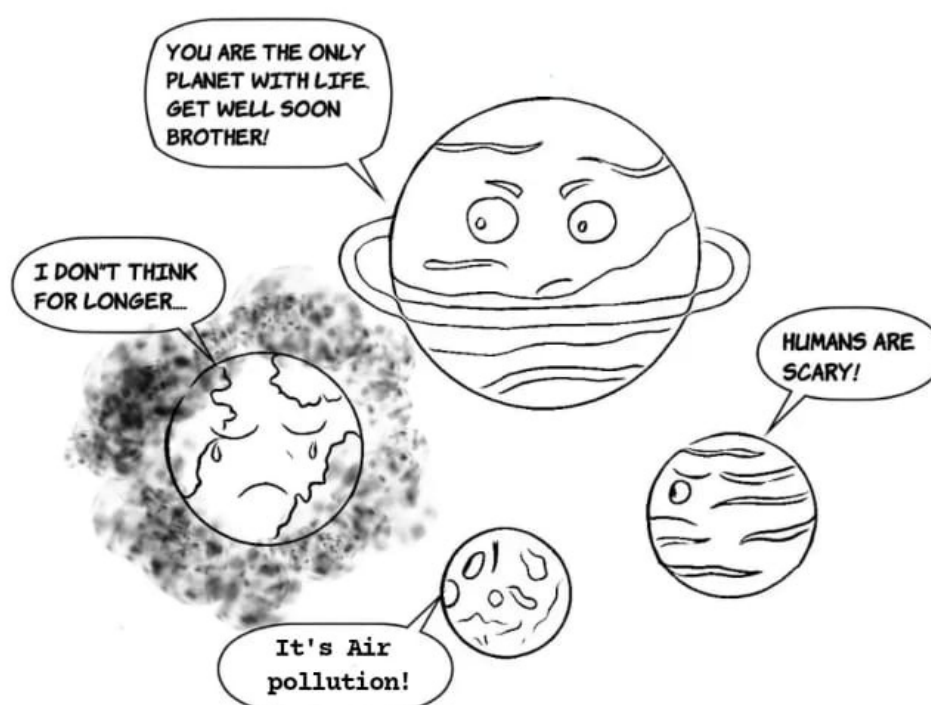
Air pollution is a major risk for ill health and death in urban areas worldwide. As per the State of Global Air report 2020, air pollution was the fourth leading risk factor for early deaths globally, surpassed only by high blood pressure, tobacco use, and poor diet, with approximately 67 lacs deaths in 2019.

In India, 100% of the population in urban areas is exposed to emissions that exceed the standards set by World Health Organization. According to SoGA 2022 report, highest PM2.5 exposure is in cities from India, i.e., Delhi, Kolkata, and Mumbai and are exposed to PM2.5 levels that are several-fold higher than the global averages. Solutions that engage urban local bodies with the public are needed to tackle air pollution.

We conducted a questionnaire drive to see how much the Municipal Corporation of Delhi (MCD) staff knew about air pollution and how much work the staff wants to or is able to do, to solve this problem in their locales. We developed an evidence-based framework for stimulating behavior change through engagement based on these findings.

Targeted localized information will appear more immediate and engaging, and positive framing will prevent cognitive dissonance. Communicating the co-benefits of action may turn out to be an effective solution. Finding ways to connect with people's emotions, including activating social norms and identities and creating a sense of collective responsibility, provides promising yet under-explored directions. Though air pollution is a global concern and a transboundary issue, local solutions, multidisciplinary teams' involvement and tools that can lead to effective action to tackle air pollution through behavioral solutions will be valuable.

“Taking context seriously, which requires tapping into the full range of staff knowledge and experier



1.0 Introduction:

The global burden of disease (GBD) estimates that 6.67 million people die prematurely because of ambient air pollution each year (GBD, 2020). Research also links air pollution to premature births, impaired cognitive and lung developments, and increased risk of respiratory illnesses, diabetes, cancers, strokes, and dementia (Kelly and Fussell 2015 & World Health Organization 2019). Air pollution is among the leading risk factors for human health in India. The National Capital Territory (NCT) of Delhi is among the most polluted cities in the world where PM2.5 levels often exceed the Indian National Ambient Air Quality Standards, especially during winter. Major sources of air pollution in Delhi-NCR include vehicles, industries, waste burning, construction, demolition dust, etc. Most of these sources are anthropogenic and therefore require targeted mitigation efforts.

Delhi along with its satellite towns which constitute the NCT, is home to 30.7 million people (Census, 2021) The urban local bodies (ULBs) are under the purview of the state/national government and are responsible for the maintenance of the infrastructure and smooth operations within Delhi and the region.

No matter where one lives, one can be exposed to air pollution. The type and amount of exposure vary depending on one's location, the time of day, and even the weather. Exposure to air pollution is higher near pollution sources like busy roadways or wood-burning equipment. Many of our daily activities expose us to higher levels of air pollution. Idling cars, gas-fueled yard equipment, and chemicals we use in our homes all contribute to overall air pollution and expose us to harmful air pollutants.

We know how air pollution harms us; there is no excuse not to act. Below are five reasons why we should talk to reduce and eliminate air pollution

- ***Polluted air is creating a health emergency***
- ***Children are most at risk***
- ***Pollution and poverty go hand in hand***
- ***The cheaper the fuels, the higher the costs***
- ***The right to clean air is a human right***

Effective ways of reducing both air pollution concentration and the public's exposure to it are required to prevent a public health crisis. A clean air plan is a collection of regulations, policies, and programs, which aim to improve air quality and public health by identifying cost-effective measures to reduce emissions from all known sources.

Policy Action to Fight Air Pollution

There are various policies and programs that have been implemented in India to address the issue of air pollution. Like any other policy measure, the success and efficacy of these programs have been conditioned upon collaboration and coordination across various stakeholders. One of the recent policies launched to tackle air pollution in the national capital and many other cities in India is the National Clean Air Programme (NCAP).

The NCAP aims to reduce national levels of particle air pollution (PM_{2.5}-PM₁₀) to 25-40% by 2024, taking 2019 as the base year. Under NCAP, India's 132 non-attainment cities were selected to meet their target by developing city-level clean air action plans to reduce pollution levels. More than 100 cities across India have already developed CAPs, which are in various stages of implementation.

The Objective of NCAP

- ***To ensure stringent implementation of mitigation measures for prevention, control, and abatement of air pollution.***
- ***To augment and evolve effective and proficient ambient air quality monitoring network across the country for ensuring a comprehensive and reliable database and***
- ***To augment public awareness and capacity-building measures encompassing data dissemination and public outreach programs for inclusive public participation and for ensuring trained manpower and infrastructure on air pollution.***

The NCAP document envisages the role of ULBs in air pollution control in a significant manner. Urban local bodies are one of the key stakeholders in this endeavor. This becomes more significant when ULBs actions are very important in mitigating air pollution contributed by road transport and from other sectors such as solid waste management, regulation of construction activities and disposal of construction waste, cleaning of public places, paving of roads and footpaths, and greening of open spaces which are under the purview of ULBs.

With the process (process of urban development) being behavior centric, there is a need to educate the masses on the effect of smog on humans, including other flora and fauna, since the errant behaviors are older than a generation, and thus are difficult to curb by law or guidance. With this project, we propose to bring changes in attitude and behavior through awareness and changing the way of communication.

Government funding for ULBs

Despite the pandemic disruption, the Union government has kept its fiscal promise of disbursing Rs 4,400 crore for million-plus cities in its Union Budget for 2020-21. Its focus on 42 urban agglomerations that include several municipalities is a departure from the city-centric focus of the National Clean Air Programme (NCAP) and approximates the air shed management approach. This injection of funds into the urban local body (ULB) system is consistent with the provision of the 74th Amendment of the Constitution.

In November 2020, the first tranche of 50% of the Finance Commission grants totaling Rs 2,200 crores (\$300 million) was released to state governments to allocate to selected city ULBs. According to the Prana Portal, a total of Rs 6897 crores have been released to the cities under the XV Finance Commission and NCAP. These grants are routed through the Ministry of Finance to state departments and further to the cities and UAs to fund air quality measures, which include capacity building of the local bodies and air quality monitoring.

“Delhi has received Rs 11.25 crore under the National Clean Air Program for the financial year 2021-2022. The funds were not utilized until June 2022. It has been allocated Rs 25.01 crore under for the year 2022-2023”.

Further, with this research, we have tried to put in the best of our efforts to understand the major factors of air Pollution in Delhi, of which the top five are industries, vehicles, roadside dust, household air pollution, and waste burning. To summon the issue, we engaged with the Local Municipality for this study as they are critical for the implementation of the programs.

2.0 Objectives:

This document serves as a tool for ULBs (MCD) to understand the range of key communication objectives and messages. It serves as a guideline for the ULBs in the development of strategic and effective behavior change activities. The following key objectives are identified -

- ***To determine knowledge and awareness among Urban Local Bodies staffs about their contribution to air pollution***
- ***To identify barriers to acceptance of such practices***
- ***To develop and disseminate audio-visual and printed matter for communication to promote pollution-reducing practices***
- ***To engage the stakeholders in a dialogue to remove the barriers***
- ***To assess the feasibility of using such communication tools***

3.0 Tools and Methods:

Municipal Corporation of Delhi (MCD) is the second-largest civic body which is divided into three separate civic bodies:

1. South Delhi Municipal Corporation (SDMC) has four zonal areas i.e., Centre, South, West, and Nazafgarh.
2. North Delhi Municipal Corporation (NDMC) covers Rohini, Civil Lines, Karol Bagh, City Sadar Paharganj, Keshavpuram, and Narela zones.
3. East Delhi Municipal Corporation (EDMC) covers two zones: Shahdara North and Shahdara South.

In this study, we have covered two zones- 'West and Nazafgarh' in SDMC region, and 'all 6 zones' under NDMC. The subject of research was Engineers working under Departments of Environment Management Services (DEMS), MCD inspectors, and Ground staff, who are directly involved in taking care of air pollution. The staff were interviewed to understand the challenges they face during work while providing them with basic knowledge about air pollution. The survey was conducted in 2021 during winter season (October, November & December).

This study was aimed to arrange interactive sessions (survey questionnaire designed specifically to understand the knowledge of persons engaged at low, medium, and high levels in hierarchy) in person as well as in groups in an institution like the Municipal Corporation of Delhi. MCD was purposely chosen as it is the key entity dealing with the maintenance and care of the State of Delhi and is directly associated with waste management.

Qualitative research tools were used to determine the awareness of the MCD employees and its role in pollution reduction. The tools used were:

Key Informant Interview,
Focused Group Discussions and,
In-depth interviews (We interviewed workforce deployed in fields and offices at different levels)

Further pointwise details of engagement with MCDs

1. Conducted Interactive Workshops

- In these workshops, we interacted and visited the offices and fields of all the concerned members of Urban Local Bodies.
- Our target audience remained the Grade A, Grade B, and Grade C officials as well as field workers and clerical staff. To increase engagement, we conducted the workshops one by one in different offices.
- These workshops/ interactive sessions were held in the open areas and fields of the workers. In addition, PowerPoint presentations with a lot of images and videos were shown to grab their attention.

2. Inclusion of those people in the mainstream who are on the field and help in implementing the policies on the ground

- The primary pollution sources are garbage dump sites, overflowing drainage, garbage burning, construction and demolition sites, debris dumped on public land, dust from unpaved roads, barren lands, industrial emissions, and vehicular pollution.
- So, while conducting the workshops, we engaged with the workers of MCDs in order to bring them in the limelight and appreciate their efforts so that they feel proud of doing their work.
- We even asked the officials to frequently appreciate the efforts of field workers.

3. Re-state all the Duties and Responsibilities of the Municipal Corporation of Delhi along with all current action plans.

- This act is useful to make them realize how vital their office is, how these officials can save the environment and why they are the strong pillar for change.
- The objective remained to make them realize the importance of their job. We need to keep in mind that most of the officials are in their mid40- 50s and re-generating their passion for efficiently doing their work might be difficult

4. Suggestions and recommendations from the officials

- To control air pollution, it is important to know the view point of those people/departments that are responsible for the implementation of policies. We have also interacted with the officials regarding this viewpoint.
- This is also to encourage the officials to think out of the box. This activity will make the officials/staff feel important and believe their opinions matter.
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4.0 Quantitative Results:

In this study, we have covered two zones- 'West and Nazafgarh' in the SDMC region and the NDMC zone. We targeted Engineer's working under the Department of Environment Management Services (DEMS), MCD inspectors, and Ground staff, who are directly involved in taking care of Air pollution. The distribution of the **Sample size (total 85) of the interviewed staff** is shown below (Figure 1&2).

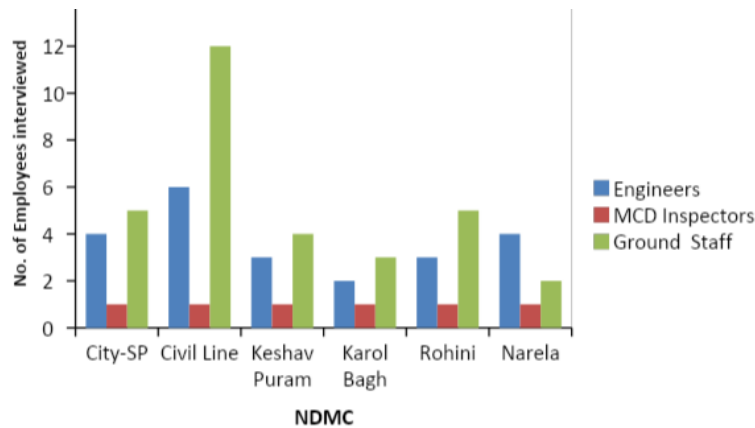


Figure 1: Sample size distribution amongst NDMC staff

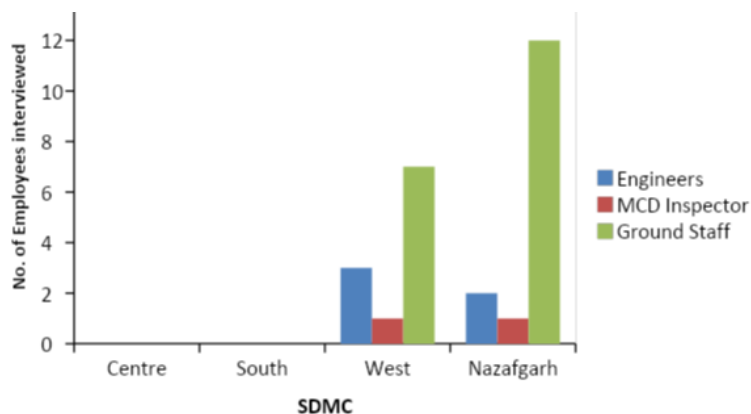


Figure 2: Sample size distribution amongst SDMC staff

Details of the Questionnaire survey covered the following:

1. General information about air pollution and their sources
2. Professional knowledge (how they can manage and execute)
3. Action plans
4. Interaction with public and other officials
5. Precautionary measures
6. Support of administration and funds
7. Suggestions and recommendation

We derived concise information from the survey

1. Air pollution awareness:

We analyzed the samples and found that a good number of the workers are aware of air pollution and its health implications

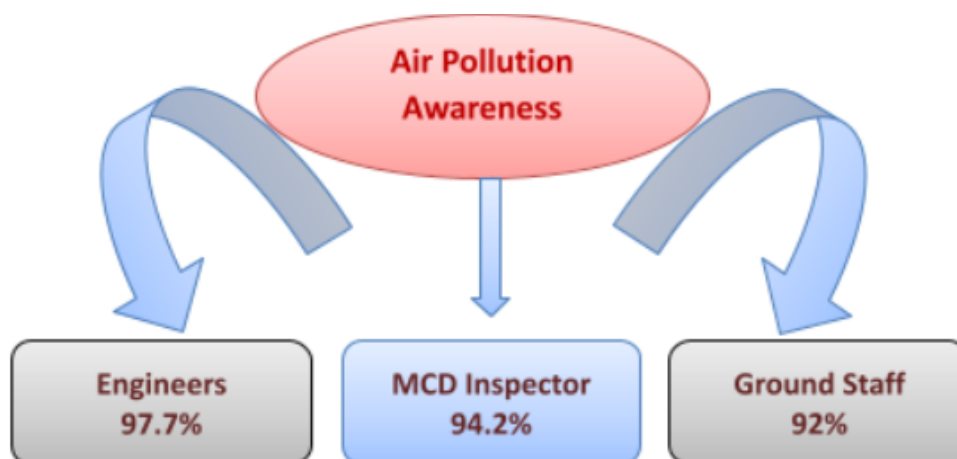


Figure 3: Results show the awareness level among the MCD staff.

Overall awareness of the term air pollution is 94.8% among the staff. Out of the three job profiles surveyed, a relatively higher proportion of engineers reported awareness of the terminology. But the staff lacks professional knowledge and understanding of their roles in pollution mitigation, and as a result, they have a casual approach towards their work. Furthermore, the morale of the grassroots workers is often low and they do not seem to identify with the cause.

2. Awareness about National government initiative to improve air quality through the National Clean Air Program (NCAP):

Relatively, NCAP and city action plans are less known, and this terminology is not so common among the field workers. However, engineers understand these initiatives up to some extent. Distribution is shown below –

- Engineers – 72.4% (Most of them have an idea about the national policies)**
- MCD Inspectors – 53.5% (They understand that government wants to reduce pollution but not aware about the policies)**
- Ground Staff – Not aware of national policies**

Three points emerged out of the policy awareness communications:

- Lack of clarity about their responsibility for communicating about air quality (information sources),
- Existing air quality communication strategies lack critical information including risk mitigation behaviors and long-term health impacts (information quality),
- Existing air quality communications fail to reach vulnerable populations (information reach).
- This study demonstrates that air quality communication towards policies awareness is lacking yet crucially needed.



3. Sources of Air Pollution

MCD employees at all levels understand sources of air pollution in their local areas. The most common answer we received is vehicular pollution, stubble burning in Punjab and Haryana, and dust. However, at local levels, there is an understanding amongst the field workers to identify the different sources. There is however a deficiency observed in how they can tackle the issues. It shows that there is a need to educate them about how to mitigate the sources. Some common local issues or sources related to air pollution in local are:

- Leaving a vehicle on at a traffic signal / longstop.
- Unpaved & broken sidewalks and roads.
- Polluted cooking practices, e.g., open tandoor, dhabas, improper kitchen ventilations, etc.
- Use of polluting vehicles / without valid PUC
- Overloading transport vehicles
- Dust from the dried desilting material from the drains.
- Construction and demolition (C&D) sites not covered.
- Open storage of construction materials along the road.
- Re-suspension of dust by the wind from open grounds and plots.
- Transport of garbage and C&D material in uncovered trucks.

Table 1: Major key sources of air pollution as per MCD staff in their local areas.

Vehicular Pollution	99%
Stubble Burning	91.5%
Construction and Road side dust	94%
Factories	89.6%
Waste	66.3%
Bonfire	61%
Restaurant Tandoor	37%
Weather Patterns	49.5%

When questioned about the exact load of each source in their area and technical details about the sources like total area/length of road swept, criteria for employing the total number of machines, and basis of contract, the officials from MCDs seemed unaware.

4. About the health issues related to Air Pollution.

A variety of questions were focused on the impact of air pollution on health. Three major diseases that were commonly identified to be impacted by air pollution were respiratory problems, dizziness and irritation in the eyes. There were only about 20% respondents who believed that air pollution can impact the prevalence of diseases such as cancer, heart disease and skin problems.

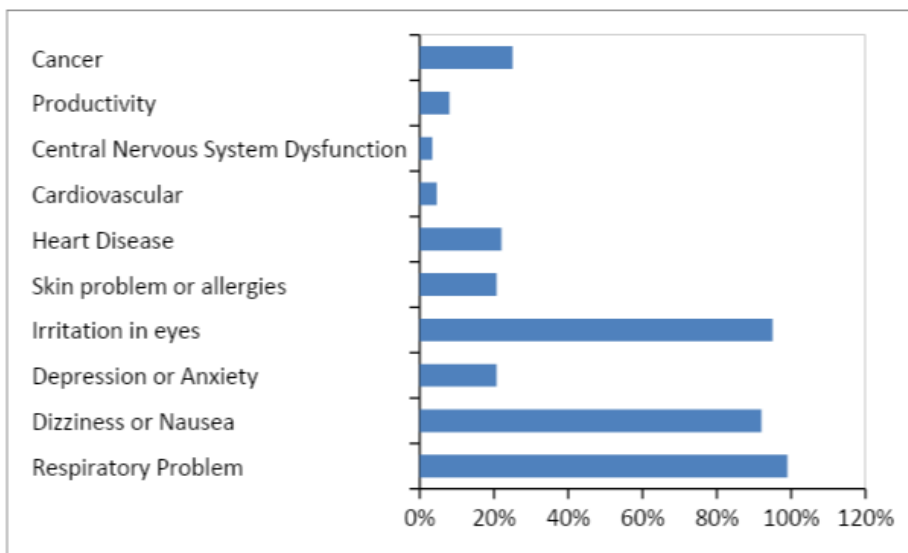


Figure 4: Shows the percentage-wise distribution of awareness about the diseases, which reflects interesting and important findings from Delhi city.

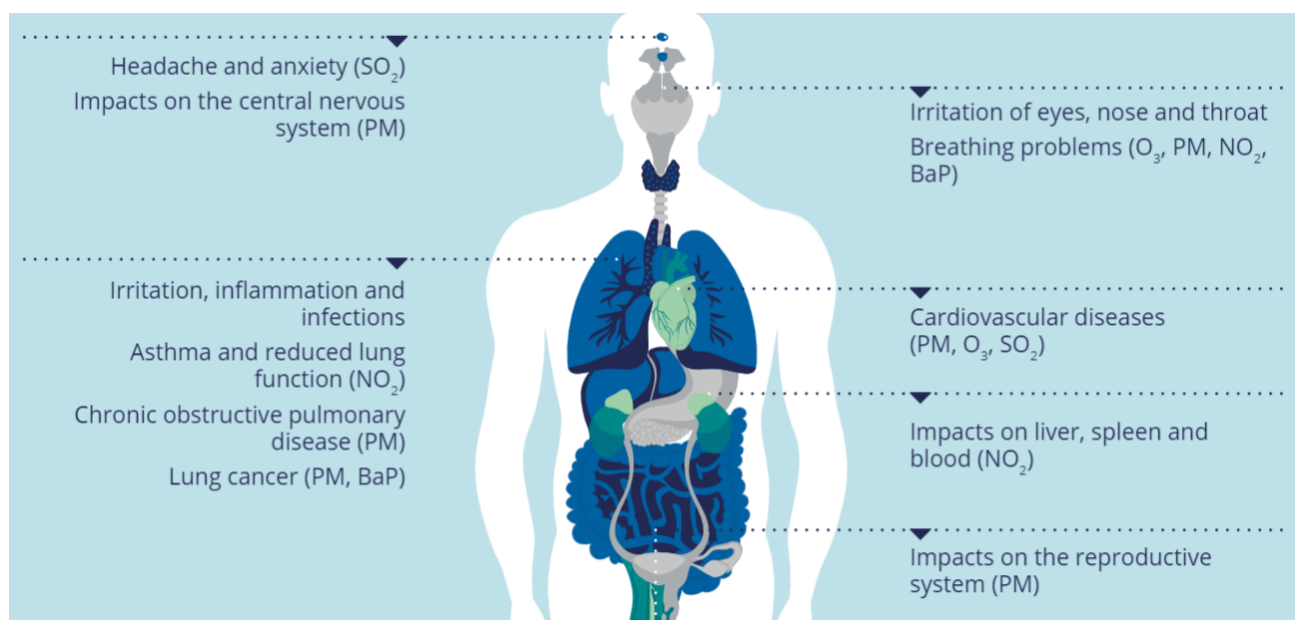


Figure 5 Source: European Environment Agency , "Healthy environment, healthy lives ," 2019.

5. Limitations of the Study

During conducting the study, from formal and informal interactions with MCD staff, we identified several hurdles and obstacles in their workflow. In most cases, workers are acutely aware of the obstacles but find themselves ill-equipped to bring meaningful change. Below are the key obstacles and challenges addressed during the study

- The multiplicity of agencies: Multiple ULBs work together to reduce air pollution in Delhi. Each ULB is responsible for the upkeep of areas governed by them. Delhi has a plethora of urban local bodies with overlapping geographical boundaries of their work, but limited interactions within and across different agencies. For example, the cantonment area is managed by the military establishment, railways have their own bodies. New Delhi has a separate municipal body, different from the rest of the city.



Figure:5 Wide ULB organizations to maintain the Delhi city.

- Gaps in understanding: Staff members at ULBs have inadequate knowledge and understanding of their roles in pollution mitigation, and as a result, they have a casual approach towards their work. Furthermore, the morale of the grassroots workers is often low and they do not seem to identify with the cause.
- The workers fail to understand how their work is significant to reducing air pollution in the city and thus develop a casual approach to their work.
- Lack of supervision: Quality control is a key component of effective action. Quality supervision is lacking in most of the places due to paucity of staff as well as due to lack of standard operating procedures (SOPs) for the purpose of supervision.
- Standard indices of performance assessment and impact assessment are not in place. Lack of ownership of tasks to be performed for control of air pollution by the stakeholders make them complacent.

- Personal grievances and lack of amenities demotivate the workers from optimum performance
- Lack of resources: The supply and maintenance of materials and equipment are erratic, and often, old dysfunctional equipment is not replaced in a timely manner. Staff frequently experience a lack of requisite materials.
- Mechanical Road Sweeper (MRS) machines are not effective for all road types (e.g.; narrow roads, unpaved roads, curvy roads, inclined roads, and waterlogged roads) and footpaths.
- Air pollution technological approaches are insufficient to assess the local air quality to work on the local sources. Should have more instruments such as low-cost sensors which can directly show the higher level of air pollutants and can educate/guide the working force accordingly.
- Lack of correct enforcement: Enforcement Failure against lawbreakers to contain construction dust, malba dumping, and waste burning (Hindrances/hitch by elected bodies and Bahubali in the working of MCD staffs in their area's)
- Lack of coordination from citizens and multi-disciplinary Working Group involving key stakeholders including Experts, NGOs, and various Community Groups like RWAs
- Lack of basic training/workshops to spread awareness among the people and residents for better cooperation with the MCD ground officials.

6. Suggestions and recommendations:

Most ULBs can help in reducing air pollution. There are multiple options to improve air quality. MCDs and other government organizations need to invest in capacity building and ensuring quality. The first step is to become responsible for reducing the air pollution. For this, actions are needed for necessary regulation, policies, and ensuring that enforcement mechanisms are in place and sufficiently supported. It is important to understand the benefits and costs associated with alternative actions or interventions to improve air quality. Most air pollution reduction measures have clear health and social benefits that far outweigh the costs of implementation. Strengthening ULBs, promoting behavioral change, instilling a pro-clean air culture, increasing capacity in all departments to effectively engage and contribute to solutions are some of the ways to fortify our fight against air pollution. In addition, increased funding for the awareness programs and instruments can also be the key elements of success. Considering these problems here are a few suggestions.

- Sensitization of ULB staff towards their roles and responsibilities
- Check list-based supervision system
- Prompt remedial measures for errant activities
- Frequent engagement of all stakeholders at the highest level and fixing of accountability and responsibility
- Ensuring timely supplies to avoid stockouts
- Keeping the equipment under proper maintenance and ensuring functionality with minimal downtime
- Developing a team of middle-level managers to supervise through objective supervision techniques
- The setting of norms, goals, and SOPs for smooth functioning

- Frequent feedback and prompt action on complaints, grievances, and breakdowns
- Preemptive actions and in advance preparations for peak pollution causing seasons and events.

5.0 Conclusion:

It suggests that the workers are aware of most of the obstacles but find themselves ill-equipped to contribute to bringing the desired change because they believe that they are not heard. Further, the interaction between various stakeholders is minimal. For example, digging of the roads is done by electricity supplying companies or telecom companies but once the holes have been dug, they are not properly repaired and often become a source of dust, detriment traffic flow resulting in more air pollution. Similarly, construction and demolition debris are left unattended on the roadside for several days, which continues to re-suspend and pollute the air. Solid waste disposal and dumping methods are not friendly to the environment.

The staff of MCD was given sensitization and awareness training about sources of air pollution. From the interaction with the MCD staff, the following issues emerged:

- The level of knowledge and understanding was below par.
- The staff was reluctant to proactively work on changing attitude towards the spread of pollution. They did not have the know-how to plan interventions for pollution control and prevention.
- They had also talked about the obstacles they faced from their supervisors on one side and the citizens on the other side
- The staff usually had low motivation for work
- Maximum Roads are not properly designed to use Mechanical Road Sweeping (MRS) Machine effectively
- Coordination between departments is very poor, eg: between MCD and other ULBs
- There are no norms or SOP to collect and manage road dust. For instance, the MCD staff doesn't know where to put the collected dust as landfills refuse to take it. So, after sweeping, they leave the dust on the road itself. This causes resuspension of dust.
- Lack of resources and equipment.

To conclude, whether, at the national or state level, governance for ensuring good air quality in a city like Delhi cannot be met without engaging Municipal Corporation. However, the role of municipal corporations needs to be clearly defined in the policy for prevention and control of air pollution rather than merely giving them the role of agent. Provisions of financial resources are essential to make National Clean Air Programme a success. Much air pollution communication raises concerns without providing solutions or suggesting single solutions that one zone/area may not be able to take or feel will make a difference.

Giving people a range of actions, such as writing to local MPs, engaging in discussion and actions with the local community, and joining or contributing to pressure groups, increases self-efficacy, prevents disengagement, and may encourage behavior change. ● ● ●

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