VOLUME 4 | ISSUE 4

INTERNATIONAL JOURNAL OF ADVANCED LEGAL RESEARCH

STUBBLE BURNING AND THE LEGAL FRAMEWORK OF DELHI

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ABSTRACT

This article on stubble burning offers an in-depth account of the various issues that stubble burning poses to Delhi's air qualityand aims to look at the regional landscape and legislative measures that the Delhi government has taken to deal with the ongoing problem. Delhi, which is located in India's northern plains and is landlocked, has particular difficulties because of its generally level terrain. A yearly haze that blankets the city is mostly caused by the seasonal practice of stubble burning in neighboring states, particularly Punjab and Haryana. Delhi's susceptibility is heightened during the post-harvest months by dominant winds that bring pollution from burning fields, particularly during temperature inversions.

In response to this environmental catastrophe, the government of Delhi has developed an extensive legislative framework. This study examines the legislative actions taken to prevent stubble burning, with a particular emphasis on rules, policy changes, and cooperative efforts with surrounding states. These efforts seek to address the underlying causes of the issue on a regional scale in addition to mitigating the acute effects of pollution in Delhi. This abstract contributes to our knowledge of the complex interactions among geography, agriculture, and government that affect air quality and the health of Delhi's citizens.

KEYWORDS: Air (Prevention and Control of Pollution) Act, Air Quality Index, BS VI vehicles, Commission for Air Quality Management, CPCB, Graded Response Action Plan, Particulate Matter, Stubble Burning, SAFAR Portal, vehicular emissions

INTRODUCTION

Located away in India's northern plains, the huge metropolis of Delhi is embroiled in a periodic battle with a fearsome foe: stubble burning. Delhi's topography, along with local farming methods, makes it especially susceptible to the yearly surge in air pollution resulting

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from the burning of crop waste in other states. The government of Delhi has taken a multipronged approach to addressing this environmental issue, enacting laws and implementing legislative measures to fight the haze that continues to cover the nation's capital.Due to its landlocked location and topography, Delhi's geographic location creates the ideal conditions for the convergence of air masses containing pollutants from several sources. The periodic practice of burning stubble in the nearby states of Punjab and Haryana, however, turns out to be a major factor in Delhi's air quality problem, particularly in the months following harvest. Delhi is shrouded in a heavy layer of haze during this season because the dominant winds bring plumes of smoke packed with particulate matter from the burning fields.

The city's vulnerability to temperature inversions, in which the colder air near the ground traps pollutants, intensifies the occurrence and raises the severity of the pollution levels.The Delhi government has responded to this recurring environmental issue by putting in place legislative frameworks designed to lessen the effects of stubble burning. These programs aim to work with nearby states to identify complete solutions, in addition to addressing the effects inside the city.The paper will explore the geographical elements that make Delhi more susceptible to pollution from stubble burning and how local farming practices affect the yearly haze. This paper also shall consider the legal actions that the government of Delhi has taken, with an emphasis on the rules, policy changes, and joint ventures with other states.

The legislative frameworks that have been established promise cleaner and healthier air as Delhi negotiates the complex confluence of geography, agriculture, and government. Worldwide studies have linked young children with non-Hodgkin lymphoma and acute myeloid leukemia to air pollution, mainly because of particulate matter, benzene, and NOx. When compared to areas with lower pollution levels, Delhi stands out for having a high incidence of children cases of lymphoma and leukemia.[2] All these details are explored in this study with a specific focus on the legal framework and the initiatives taken by the government to tackle the "*Issue of Haze"*.

RESEARCH OBJECTIVES

This paper aims to fulfill the following objectives:

[2]Clin Pathol, Non Hodgkin Lymphoma Among Children: Pathological Aspects and Diagnostic Challenges, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9019377/accessed 28 November 2023.

1. To evaluate the correlation between Delhi's air quality and stubble burning in nearby states.
2. To examine the geographic elements that affect Delhi's susceptibility to pollution.
3. To assess how well the Delhi government's legislative frameworks for reducing pollution are working.
4. To study thecauses of air pollution in Delhi and to establish the roleplayedby stubble burning in degrading the quality of air.

RESEARCH METHODOLOGY

This study used observational research with a qualitative approach. The author examined a broad spectrum of materials books, and other sources to obtain accurate data that would be pertinent to the study. An introduction outlining each topic the paper is built on precedes the paper. The report then goes on to explain the objectives and approach used. The primary part of the study then begins, with the author emphasizing Delhi's geographic location to support the observations made in this paper. The study goes on to discuss several sources of air pollution, stressing that burning stubble is a significant contributing element. After that, the study concentrates on the initiatives and legal framework. The author obtained secondary data from credible sources in order to elucidate observations and provide guidance for the future.

To achieve the set research objectives,scholarly works, public records, and policy documents are analyzed in-depth about Delhi's stubble burning, air pollution, and legal actions. This will determine what is established currently, what research is lacking, and how successful the current measures are.Data has been gathered using past statistics on air quality to identify trends, seasonal fluctuations, and pollutant concentrations from government monitoring organizations like the Central Pollution Control Board (CPCB). Rules, and legal papers are examined pertaining to Delhi's stubble burning and air quality toanalyze the effects, enforcement, and implementation of these legal frameworks.Certain case studies are chosen to learn more about the localized effects of stubble burning on Delhi's air quality. This might entail conducting research in certain specific areas, at certain times of year, or determining certain instances of effective pollution management strategies.Key findings are summarized to provide recommendations for policy and technological interventions based on research.

CAUSES OF AIR POLLUTION IN DELHI

Compared to many other Indian states, Delhi is more vulnerable to severe air pollution due to its peculiar landscape. Delhi has unique air quality problems that make it one of the most polluted cities in the nation due to a number offactors. A closer look at the geographic factors that affect Delhi's pollution explains reducing its impact on people. Delhi is a landlocked city that is isolated from large bodies of water. Delhi lacks the naturally purifying effects of coastal winds, in contrast to coastal cities whichbenefit from the moderating influence of sea breezes. Pollutants in the air may stagnate as a result of this landlocked situation, particularly when wind speeds are low.

The NCT of Delhi's geography, with its comparatively flat ground, influences how pollutants spread. Because there are fewer natural obstacles to air mass movement in the city, contaminants may spread more easily. Pollutants can, however, travel and collect across the city once they are released due to the absence of natural barriers. Delhi regularly sees temperature inversions throughout the winter. Pollutants are kept near the ground by inversion layers, which stop them from spreading upward. The geographic position of the city exacerbates this issue, resulting in the production of a thick layer of smog. The distinctive winter haze and serious decline in air quality are caused by the trapped pollutants, which include fine particulate matter (PM2.5).

Delhi is located near some of the state’s most productive agricultural areas, where burning stubble after harvest is a common custom. Delhi's air pollution is greatly increased by the smoke and other pollutants from these burning operations that are carried into the city by the wind. One significant contributing element is the seasonal inflow of pollutants, especially in the months following harvest. Delhi suffers from the urban heat island effect, which is caused by the city's large amounts of asphalt and concrete surfaces, which absorb and hold heat. As a result, the city experiences warmer temperatures than the nearby rural areas. The high temperatures have the potential to affect regional weather patterns, which can lead to the accumulation of pollutants.

Over the years, Delhi has experienced substantial population increase and urbanization. Pollutant emissions are increased as a result of heavy traffic, industrial activity, and building. The concentration of pollution sources in an urban setting with a high population density makes the problem of poor air quality worse overall.

1. **Stubble burning:**

Burning agricultural stubble by farmers in the surrounding states of Punjab, Haryana, and Uttar Pradesh remains to be a major contributor to increased air pollution in the nation's capital, brought on by north-westerly winds. The Delhi pollution in 2021 was attributed by 25% to stubble burning, according to SAFAR (System of Air Quality and Weather Forecasting and Research). The Ministry of Earth Sciences (MoES) launched a nationwide project to deliver location-specific air quality data in almost real-time.[3]

2. **Vehicular emissions:**

Another major cause of air pollution in Delhi and the NCR is vehicular emissions from the numerous automobiles, lorries, buses, and two-wheelers that use these routes. A study that was published in the Observer Research Foundation states that 28% of PM2.5 emissions originate from the transportation sector. India's capital, Delhi, has an infamous record for having some of the worst air quality standards in the world due to its extreme air pollution.[4] The intricate and numerous causes of Delhi's air pollution contribute to this environmental catastrophe, which has an effect on the citizens' health and well-being.

The number of vehicles on the roads in Delhi have increased exponentially as a result of the city's rapidly growing population and huge rate of urbanization. Pollutant emissions are greatly increased when private automobiles are used extensively, and the public transport infrastructure is not up to par. Significant amounts of particulate matter (PM), nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compounds (VOCs) are released into the atmosphere when fossil fuels are used in automobiles.[5]

3. **Emissions from Factories:**

The NCR region and its surroundings are home to several industries, all of which emit toxic pollutants into the environment. A significant amount of air pollution is caused by the different pollutants that industries release, including sulfur dioxide (SO2), nitrogen oxides (NOx), and particulate matter. The issue is made worse by the fact that many industries in the

[3]Kamali Dehghan, Saeed, "Burning issue: how enzymes could end India's problem with stubble," The Guardian,https://www.theguardian.com/global-development/2021/dec/10/burning-issue-how-enzymes-could-end-indias-problem-with-stubbleaccessed25 December 2023.

[4]Aparna Roy, Tanushree Chandra, Aditi Ratho,"Finding Solutions to Air Pollution in India: The Role of Policy, Finance, and Communities, Observer Research Foundation, http://20.244.136.131/research/finding-solutions-to-air-pollution-in-india-the-role-of-policy-finance-and-communities-74311accessed 28 November 2023.

[5]Winkler, S.L., Anderson, J.E., Garza, L. *et al*, "Vehicle criteria pollutant (PM, NO_x, CO, HCs) emissions: how low should we go?" npj Clim Atmos Sci **1**, 26 (2018).

area lack appropriate pollution control systems. Burning industrial garbage is another practice that raises concerns since it emits dangerous chemicals into the atmosphere.

In addition to other main sources of air pollution in Delhi, the Badarpur Thermal Power Stationgenerated less than 8% of Delhi's total electricity However, it was responsible for 80–90% of the particulate matter pollution coming from the electric power industry.[6] The Badarpur Power Plant was temporarily closed to reduce the extreme air pollution during the Great Delhi Smog of November 2016.[7] Since October 15, 2018, the power plant has been permanently closed due to its negative impact on the environment.

4. Construction Activities:

Pollution is caused in large quantities by construction sites, particularly by outlying brick kilns. The issue is exacerbated by incomplete waste management, noncompliance with environmental rules, and short building project timeframes. There is a significant amount of dust in the air due to rapid urban expansion and building activity. Particulate matter levels are raised in part because of uncovered work sites and the transportation of building materials. In addition to decreasing sight, the small particles in the air provide major health hazards when inhaled.

5. Domestic Sources:

Both indoor and outdoor air pollution is caused by household activities. When solid fuels like wood or biomass are used for cooking, contaminants like carbon monoxide and particulate matter are released. Cooking methods that are out of date and inefficient add to the interior air pollution problem, while outside emissions from domestic sources increase the overall pollution load.

6. Landfills and Burning of Waste:

Improper waste disposal releases airborne particulate matter and hazardous gases that have a substantial negative impact on air quality.In Delhi, the open burning of municipal solid waste, which includes plastics and other non-biodegradable materials, is a common problem. When

[6]"The Badarpur Plant's effect on Air Pollution and why it needs to be shut down", The Economic Times, 12 August 2016, https://economictimes.indiatimes.com/the-badarpur-plants-effect-on-air-pollution-and-why-it-needs-to-be-shut-down/articleshow/53669369.cms>accessed 25 November 2023.

[7]"Badarpur thermal power plant to remain shut till Jan 31 2017". Indian Express. 17 November 2016, https://indianexpress.com/article/delhi/badarpur-thermal-power-plant-to-remain-shut-till-jan-31-2017-4380987/accessed 28 November 2023.

such garbage is burned, toxic chemicals and other dangerous substances are released into the atmosphere, deteriorating air quality and endangering public health.

7. Geographical and Meteorological Factors:

The NCR region's geographic position and certain meteorological circumstances, such as temperature inversion during the winter, help to trap pollutants close to the ground, which raises pollution levels. In October 2023, Delhi-NCR region had the lowest pollution levels since 2020, in part because of rainfall. Rain usually helps to improve the Air Quality Index by settling dust and particle matter.The location of Delhi and the local climate both significantly contribute to the worsening of air pollution. Smog builds up in thick layers throughout the winter because temperature inversions trap pollutants near the ground. This phenomenon increases the impact of contaminants on air quality by decreasing their dispersion.

STUBBLE BURNING

The systematic burning of leftover straw, stalks, and other plant waste that remains in the fields following the harvest of crops like rice, wheat, and other grains is referred to as stubble burning or crop residue burning. Farmers frequently use this economical and efficient way of cleaning fields in order to get them ready for the upcoming harvesting season. Although stubble burninghas been a common practice for many years, its effects on the environment and human health have drawn more attention to it. Stubble burning frequently occurs throughout the agricultural cycle's post-harvest stage. The residual plant matter, sometimes referred to as crop residue or stubble, is left in the fields after the primary crop is harvested. In order to swiftly clear the field and prepare it for the following planting season, farmers burn this waste. Stubble burning is common in areas with a high concentration of wheat and rice farms, such as the north Indian states of Punjab, Haryana, and portions of Uttar Pradesh. Large-scale rice-wheat farming methods are used in these states, which results in significant volumes of agricultural waste following each harvest.

The detrimental effects of stubble burning on air quality are one of the main causes of concern. A considerable amount of particulate matter, carbon dioxide, methane, and other dangerous pollutants are released in the atmosphere during the burning of crop waste. These contaminants, especially in the post-harvest season, add to air pollution.

One of the main causes of the winter haze that covers Delhi and the neighboring areas is stubble burning. The smoke and other pollutants from the burning fields are carried to Delhi by the prevailing winds, worsening the city's already dire air quality situation.

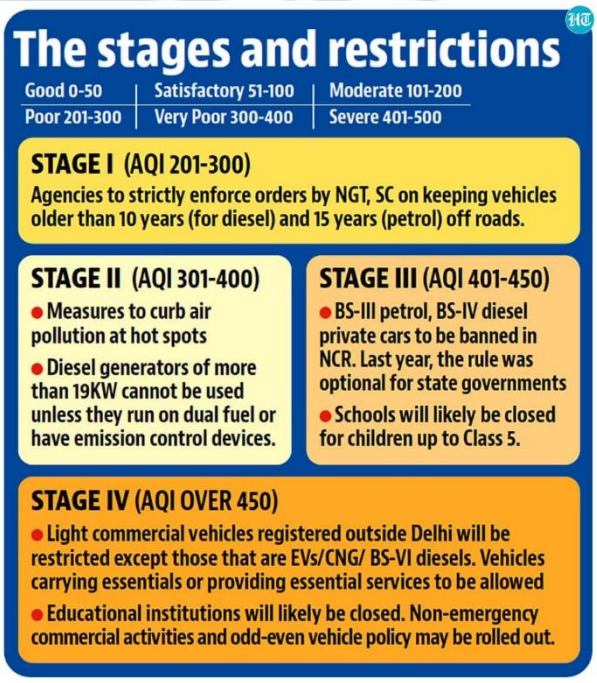
A thick layer of smog is created when contaminants enter the atmosphere and temperature inversions occur. There are major health risks associated with the air pollutants emitted during stubble burning.

Particulate matter and other pollutants can cause long-term health hazards, exacerbate pre-existing respiratory disorders, and cause respiratory problems when exposed. The effects are not just felt in rural regions; smoke may spread far and wide, impacting urban areas as well. There are initiatives in place to incentivize farmers to embrace different approaches to handling crop residue, such as composting or pumping it into the soil.

Therefore, to lessen the dependency on stubble burning, a variety of technical options are being advocated, including technology for residue management.

GRADED RESPONSE ACTION PLAN

In an effort to prevent a further decline in the region's air quality, the Commission for Air Quality Management in the National Capital Region (NCR) and Adjoining Areas has implemented an eight-point action plan that is in line with Stage-IV of the Graded Response Action Plan (GRAP). The GRAP was unveiled in 2017 by the Ministry of Environment and is a set of emergency protocols intended to stop the degradation of air quality in the Delhi-NCR region if it reaches a certain level. It is implemented in FOUR stages as explained in figure 1.1. Since GRAP is incremental in nature, the actions outlined in both sections must be taken when the air quality falls from "poor" to "very poor."



The Eight action plan laid out says:

1. Restricting truck traffic entering Delhi to only those carrying LNG, CNG, or electric vehicles and necessary products and services.
2. Limiting the entry of non-Delhi-registered Light

Commercial Vehicles (LCVs) into Delhi to only EVs, CNG, or BS-VI diesel vehicles, with the exception of critical service providers.

3. Prohibiting the use of diesel Medium Goods Vehicles (MGVs) and Heavy Goods Vehicles (HGVs) registered in Delhi, with the exception of those carrying necessities.
4. Prohibiting the execution of construction and demolition (C&D) operations for linear public projects, such as flyovers, pipelines, electricity transmission, and roads.
5. GNCTD and NCR State Governments are being advised to switch from holding in-person lessons for grades VI through XI to online ones.**Fig. 1.1. (source: HT)**
6. GNCTD and NCR State Governments are instructed to take into account permitting 50% of employees to work in public, private, and municipal offices while the remaining employees do so remotely.
7. Giving the Central Government the authority to determine policies regarding workers working from home in Central Government workplaces.
8. Encouraging state governments to consider more emergency measures including closing schools, stopping non-essential business operations, and instituting an odd-even car registration number system.

LEGAL FRAMEWORK AND INITIATIVES

To address stubble burning, governments at the state and federal levels have put regulations and implemented several initiatives. These consist of financial incentives for farmers who use alternative methods and sanctions for those who are involved in stubble burning. However, there are still issues with properly putting these policies into place and enforcing them. Although stubble burning is still a very common practice in some agricultural areas, the need for sustainable solutions to lessen the negative effects stubble burning has on the environment and protection of human health is becoming more widely acknowledged. A comprehensive plan to solve the issues raised by stubble burning must include encouraging farmers to embrace contemporary agricultural practices, raising farmer awareness, and investing in technology solutions.[8]

- **System of Air Quality and Weather Forecasting and Research (SAFAR) Portal.**

[8] Joydeep Thakur and Ritam Halder, "Stubble burning begins: Hold your breath Delhiites, that deadly smog is coming", 9 October 2017, https://www.hindustantimes.com/delhi-news/stubble-burning-begins-hold-your-breath-delhiites-that-deadly-smog-is-coming/story-ahzIniEIeYF12iBDHtGHpO.html accessed 27 November 2023.

The Ministry of Earth Sciences (MoES) launched the System of Air Quality and Weather Forecasting and Research (SAFAR), a nationwide program to gauge the general pollution level and site-specific air quality of a city. The project's ultimate goal is to raise public awareness of the city's air quality so that proper mitigation strategies and methodical action may be implemented.[9]By educating the public and encouraging self-mitigation, it organizes awareness drives. It also assists policymakers in creating mitigation plans that take the country's economic development into account. The first Air Quality Early Warning System in India, which is located in Delhi, is completely dependent on SAFAR.It tracks every weather variable, including UV and solar radiation, temperature, precipitation, humidity, wind direction, and speed.Mercury, PM2.5, PM10, Ozone, Carbon Monoxide (CO), Nitrogen Oxides (NOx), Sulphur Dioxide (SO2), Toluene, Xylene, and Benzene are among the pollutants that are monitored.[10]A large number of industries that are impacted by weather and air quality, whether directly or indirectly, including infrastructure, tourism, aviation, agriculture, and disaster management, would profit financially from the SAFAR system.

❖ Air Quality Index

A significant index used to report daily air quality is the Air Quality Index.It focuses on potential health consequences that inhaling contaminated air may cause within a few hours or days.For eight main air contaminants, the AQI is calculated. The two pollutants that are most dangerous to human health in India are ground-level ozone and airborne particles. Other pollutants include PM10, PM2.5, carbon monoxide, sulphur dioxide, nitrogen dioxide, ammonia, lead, and carbon monoxide.

❖ For Reducing Vehicular Pollution:

- BS-VI Vehicles:The Government of India established the Bharat Stage Emission Standards (BSES) to control the amount of air pollutants that are released by equipment that uses compression ignition engines and spark ignition engines, such as cars. The Ministry of Environment, Forests, and Climate Change's Central Pollution Control Board establishes the guidelines and the schedule for implementation.[11]

[9]Ministry of Earth Sciences, IITM, <http://safar.tropmet.res.in/ABOUT%20SAFAR-1-2-Details> accessed 26 November 2023.
[10]World Meteorological Organization, "Essential Climate Variables", <https://public-old.wmo.int/en/programmes/global-climate-observing-system/essential-climate-variables> accessed 27 November 2023.
[11] "Functions of the Central Pollution Control Board". Central Pollution Control Board, 28 August 2018, <https://cpcb.nic.in/functions/> accessed 25 November 2023.

Although the regulations contribute to reducing pollution, they also inevitably raise the cost of vehicles because of advances in technology and rising fuel prices. Nonetheless, since there is less air pollution and disease-causing particulate matter, the public's health expenses are reduced, offsetting this rise in private costs.

An estimated 6,20,000 premature deaths in 2010 were attributed to respiratory and cardiovascular disorders brought on by exposure to air pollution. The health cost of air pollution in India has been estimated to be 3% of the country's GDP.[12]

- Odd-Even Policy as an emergency measure (for Delhi):The Delhi government introduced the Odd-Even Rule in November 2017. As a result, vehicles having license plates ending in odd numbers could only be driven on specific days of the week, whereas vehicles with license plates ending in even numerals may be driven on all other days.[13]

❖ Subsidy to farmers for buying Turbo Happy Seeder (THS) Machine for reducing stubble burning.

❖ National Air Quality Monitoring Program (NAMP)

Additionally, local governments in a number of states have put regulations pertaining to car emissions into effect, harsher fines for burning trash, and improved management of road dust.The Indian government has pledged to cut the number of homes that use solid fuel for cooking by 50%.[14]Among the objectives for the future are:

- Add 1,000 electric public transportation buses to the current 550 vehicles to help clean up the transportation industry.
- All cars with internal combustion engines should be upgraded to BS6 emission requirements.
- Achieve the target of 25% of private automobiles running on electricity by 2023.
- Give farmers a Happy Seeder, a device that turns agricultural waste into fertilizer.
- Promote crop diversity to farmers and cultivate water-conserving crops that are sustainable, such as pulses and coarse grains.
- Increase the number of sensors deployed and make use of IoT-based mobile and drive-by sensing techniques to improve air quality monitoring.

[12] "SC makes emission norms mandatory for new vehicles". The Indian Express. 30 April 1999.

[13]Delhi odd-even rule for cars back from November 13, <https://economictimes.indiatimes.com/news/india/delhi-odd-even-rule-for-cars-back-from-november-13-five-things-you-need-to-know/articleshow/105007453.cms> accessed 28 November 2023.

[14] "WHO | India takes steps to curb air pollution". Bulletin of the World Health Organization. 94 (7): 487–8. 2016, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4933146/> accessed 25 November 2023.

- The Air (Prevention and Control of Pollution) Act was enacted in 1981 with the intention of regulating air pollution; however, due to lax enforcement of the regulations, pollution has not been able to be reduced significantly.[15]
- India began 'The National Clean Air Program' in 2019 with a provisional national objective of 20%–30% reduction in PM2.5 and PM10 concentrations by 2024, using 2017 as the base year. It will be implemented in 102 cities where the National Ambient Air Quality Standards are thought to be exceeded by the quality of the air.[16]

In terms of PM 2.5 concentrations, 14 of the 15 most polluted cities in the world are located in India, according to the WHO.The Air Quality Index (AQI) is a figure that is used to indicate the amount of air pollution. It basically provides information on the amount of air pollution in a certain city on a particular day.

Delhi's AQI was classified as being in the "severe-plus category" by the System of Air Quality and Weather Forecasting and Research when it reached 574.[17]Four air pollutants are currently regularly monitored by India's Central Pollution Control Board: respirable particulate matter (PM10), suspended particulate matter (SPM), oxides of nitrogen (NOx), and sulphur dioxide (SO2). Target air pollutants are those that 308 operational stations in 115 cities/towns throughout 25 states and 4 Union Territories of India regularly monitor.

RECOMMENDATIONS – WAY FORWARD

Delhi's air pollution comes from a variety of interrelated and diverse sources, which combine to create a complicated web of environmental problems. An all-encompassing strategy that tackles waste management, industrial processes, burning of agricultural products, automobile emissions, and residential activities is needed to address this challenge. The use of cleaner technology, public awareness initiatives, and policy interventions are crucial measures in reducing the effects of these sources and enhancing Delhi's air quality for the benefit of its citizens.Although air pollution is a problem in other Indian states as well, Delhi is especially vulnerable due to a confluence of regional, urban, and topographical factors. Delhi's

[15]"Air pollution law languishes toothless when air pollution surges". Mongabay-India. 2020-11-10, <https://india.mongabay.com/2020/11/indias-40-year-old-law-to-combat-air-pollution-languishes-as-the-crisis-intensifies/> accessed 28 November 2023.

[16]"National Clean Air Programme". 2019. Archived from the original on 20 December 2019, <https://www.impriindia.com/insights/policy-update/national-clear-air-programme/>accessed 25 November 2023.

[17] "Delhi records worst air quality of year after rampantly bursting crackers", India Today. <https://www.indiatoday.in/india/story/delhi-smog-air-pollution-diwali-firecrackers-1384147-2018-11-08> accessed 29 November 2023.

complicated air pollution problem calls for a thorough and well-coordinated response that includes both local and regional actions to lessen the effects of various pollution sources.

Strict Emission Control Policies:

To reduce the amount of pollutants discharged into the environment, industries, cars, and building activities must adhere to stricter emission standards.

Public transport and traffic management:

There is a requirement to promote and improve public transport use as a means of lowering emissions from moving vehicles. Reducing emissions and traffic may be achieved via enhancing and growing public transport systems. An important step in the right direction has been taken with the latest effort in Delhi, which includes more electric buses and more trips for the Delhi Metro.

Trash Management and Regulation:

Tight rules and efficient enforcement in trash management to reduce emissions from landfills and open burning of waste. Promoting waste-to-energy, composting, and recycling programs in order to reduce the amount of rubbish burned in the open air.

Crop Residual Management:

Happy Seeder is one of the sustainable and affordable options for managing crop residuals that farmers may use to avoid crop burning. Promoting and rewarding these practices can help to considerably lessen the need for burning.

Policy and Legal Framework:

Make sure that the laws and rules that now forbid burning stubble are strictly enforced. Increase the severity of the penalties for infractions and use frequent monitoring to make sure the implementation is going well.

Improve the Systems of Monitoring:

To keep tabs on pollution levels and pinpoint the sources of pollution, invest in sophisticated air quality monitoring equipment. For focused actions and policy changes, use real-time data.

Promote Alternatives:

Offer farmers monetary rewards and other forms of assistance in exchange for using sustainable farming methods, including crop diversification, zero-tillage, and the application of cutting-edge equipment to manage crop waste.

CONCLUSION

In conclusion, the recurring battle against Delhi's air pollution, which is made worse by the widespread practice of stubble burning in other states, highlights the complex interactions between geography, agriculture, and government. Delhi is particularly vulnerable to the seasonal inflow of pollutants brought in by winds from areas where stubble burning is common due to its landlocked location and level terrain.The consequent pollution degrades public health and air quality by covering the city in a dense haze, particularly during the post-harvest season. The Delhi administration has put in place a number of legislative frameworks and policy efforts to lessen the impact of stubble burning on the environment of the capital since it recognizes how urgent the problem is.

Regulations, fines for farmers using stubble burning, and financial incentives for switching to non-burning farming methods are examples of legal interventions. In order to address the regional aspect of the issue, cooperative activities with neighboring governments have been started. However, there are obstacles to these measures' efficacy, calling for a comprehensive strategy that incorporates regulatory frameworks, technical advancements, public awareness campaigns, and support for sustainable agricultural practices. The legal actions that the Delhi government has taken in response to this environmental dilemma serve as shining examples of its dedication to the welfare and health of its citizens. When regional stakeholders join together, a common duty becomes apparent: the need to build a future in which the haze from stubble burning disappears.

The legislative frameworks enacted by the government are essential instruments in Delhi's battle against stubble-burning pollution as it navigates the intricate web of environmental issues. The emphasis on interstate cooperation emphasizes the necessity for coordinated action and acknowledges that states have a shared responsibility in the fight against air pollution. In addition to addressing the immediate effects, the path towards cleaner air also entails promoting agriculture that is resilient and sustainable, and that is in line with the long-term welfare of both rural and urban residents.