



***Open Burning Of Agricultural Residues In Adjoining Areas Of Delhi: A Threat To
Air Pollution***

Md Kasif Raza Khan¹

ABSTRACT

Breathe clean air is one of the fundamental rights of every citizen, as held by the apex court of India. But still, the people of Delhi-NCR have to breathe in air that is even considered very unhealthy. When the winter comes, the air quality reaches a hazardous level each time. Whether they were people, politicians, or the media, everyone started to blame farmers for their stubble burning. The topic of how much air pollution is increased due to stubble burning is critical since measures such as a ban on stubble burning impose high costs on farmers. It imposes economic burden on them to clear agricultural residue from their land using alternative methods such as machinery or human resources. This paper aims to discover the main reason behind the great smog in Delhi-NCR, mainly in the winter season. Instead of bringing new policy ceding the significant factors causing air pollution, officials put forth skewed research and stated that stubble burning is the leading cause. This paper establishes a comprehensive and Quantitative analysis of the major pollutants that corroborate Delhi air pollution at periodic and interminable times. It emphasizes the employment and enforcement of some legal measures to curb air pollution.

Key Words: Air Pollution in Delhi, Agricultural residue, Stubble burning

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¹ Research Scholar, Department of Law, Aligarh Muslim University, Aligarh, India
Email: kasifkhanamu@gmail.com ORCID Id: 0009-0008-2327-9944

Introduction

New Delhi, the National Capital of India, is one such city that is always in the limelight of the global media. Delhi has been a pivotal place on the face of the earth for its diverse cultural and historical legacy. In the last couple of years Delhi and its adjoining region, which is also referred to as the 'National Capital Region (NCR) is in the media due to its bad air quality. Air Pollution in the Delhi NCR has become one of the hottest debates on domestic as well as international platforms. Especially, in the month of October to January not only does winter arrives in Delhi NCR but also the air pollution increases up to a hazardous level. (AQI level 999). Over time infestation of particulate Delhi's air quality is on the verge of becoming a death knell. Delhi's air quality accelerated the covid 19- infestation and a bigger scourge than any widespread disease to Delhi and the NCR region. Authorities misconstrued the severity of air quality because of its indirect effects on people's health. However, recent forthright statistical data present a mind-wrenching picture of how much they need to be knee-eyed and must take unprecedented legal action. According to a report published by Down to Earth, air pollution in Delhi is responsible for 10,000 to 30,000 deaths every year. This means that PM 2.5 pollution claims the lives of 80 people in the capital city every day. According to an article published on 26- April 2022 Lancet study (Hindustan time), The per-capita GDP loss in Delhi was \$62, with neighbouring Haryana coming in second (\$53.8).

The matter of air pollution in Delhi NCR is so grave that the Apex court of India has to intervene and ask the states and central government to control the air pollution. "*We will close this matter*", was the statement of the CJI of India in the recent hearing of the court on Delhi's air pollution. The Apex Court also requested information from the governments of Punjab, Haryana, and Uttar Pradesh on any studies that show how much stubble has been cleared from these states and what emission control strategies have been used. (Zee Media Bureau, 2021).

Research Questions

- Whether only stubble burning is responsible for the air pollution in the Delhi-NCR area or are there any other factors affecting it.
- At periodic and yearly stubble burning contributes to Air pollution in how much proportion.
- What steps has the state government taken to reduce air pollution in the Delhi-NCR area?
- Whether any laws have been enacted by the parliament to control the air pollution also the role played by the Supreme Court of India.

Methodology of the Study

While writing this research paper the descriptive method has been employed. The research study is based on secondary material gathered from a variety of sources, including books, reports, articles,

journals, and newspapers available both online and offline.

Objective of the Study

The objective of this research paper is to find out the main reason behind air pollution in the Delhi-NCR area. Whether only stubble burning is a major responsible factor that contributes to pollutant in the air of the Delhi-NCR region or is there any other factors also which contributes a major part to it.

What is Stubble Burning?

In the past, when harvesting was done manually, the amount of stubble created was minimal and could be maintained by the farmers. Indian farmers now utilize crop cutters and harvesters that only cut the crop's top half, leaving the bottom half on the field, which is very difficult to manage. As a result, after harvesting, farmers have to burn the agricultural residue to prepare their fields for the upcoming crops.

In general, Stubble burning is the intentional burning of agricultural residue by farmers after the harvesting of their crops. Stubbles are the chopped stalks or straws that remain on the field after grains such as wheat, paddy and sugarcane have been harvested.

The Reason Behind Stubble Burning

Farmers in the states of Haryana, Punjab, and Uttar Pradesh burn stubble from past harvests for two major reasons.

Crop rotation:

Rice is commonly planted in the summer, around May/June, and harvested in the winter, around October/November. Wheat, on the other hand, is often planted in the winter and harvested in the summer, generally around April/May. (Jain et al., 2015). From the farmer's perspective, burning agricultural residue after harvest makes it easier to prepare the farmland for the subsequent sowing season (of wheat or rice as the case may be).

Economic reason: Burning of crop residue cost nothing to the farmer and if they use any type of machinery instead of burning it will impose an economic burn on them. For example, the government attempted but failed to supply a happy seeder to the farmer on rent, as every farmer cannot afford a happy seeder capable of planting wheat directly into the vast volumes of crop leftover. (Alwin Keil et al.,2020).

Apart from the two causes mentioned above, there are additional factors that lead to the burning of agricultural residues, such as the types of seeds used and government policies that favour late

harvesting in order to protect groundwater (Economic Times 2019). Farmers in neighbouring states are also under the impression that burning the stubble will return nutrients to the soil. The Hindustan Times (Hindustan Times, 2019).

Impact of Air Pollution

- **Impacts on Health**

Heart problems, allergies, high blood pressure, and eye discomfort are all caused by smog. (Sughis et al., 2012). Poor air quality has a negative impact on one's health. Children and women are more sensitive to pollution because they absorb more air per pound of body weight. (Shabbir et al., 2019). Because of its small size, particulate matter can enter the lungs and ultimately enter the bloodstream, causing irreversible harm. As per the Lancet Commission, air pollution causes 2.5 million deaths 300,000 pre-mature deaths in India (Khan, 2017; Hincks, 2017).

- **Impact on Environment**

The smog generated due to air pollution mixed with fog forming in the winter month produces a compound of gases that could cut visibility to a very low level. Release of one tonne of stubble 2 kilograms of sulfur dioxide, 3 kilograms of particulate matter, 60 kilograms of carbon monoxide, 1460 kilograms of carbon dioxide, and 199 kilograms of ash (Source: www.fao.org (2018)).

- **Impact on Economic**

According to a tourism survey conducted in 2018, the influx of visitors into Delhi has fallen by roughly 25% -30% as a result of the rising pollution. As a result, air pollution has a significant negative influence on tourism and economic growth. Flights were canceled and airports were closed. Various industries in Delhi were also shut down. A few coal-fired power units in Delhi were temporarily shut down to improve air quality. Due to the suffocating pollution, 6000 schools in New Delhi stayed closed. (Phys Org, 2017). On November 9th, eight students were murdered in Punjab when a truck crashed into them while waiting for their bus on the side of the road owing to smog-related visibility concerns. (Phys Org, 2017). Northern India loses an estimated \$30 billion each year owing to air pollution caused by stubble burning. (Source: International food policy research Institute (2019)).

Other Factors Contribute to Air Pollution:

In the Delhi-NCR area, the significant source of air pollution is not only stubble burning. The central government cited a scientific study at the Supreme Court stating that stubble burning contributes only 4% in winter and 7% in summer, of PM 2.5 and PM10 in the air of Delhi (Hindustan Times, 2021)

So, other factors also contribute to the air pollution in Delhi NCR areas like vehicular emissions, traffic congestion, adulterer fuel, non-disposal of wastes, etc., which contribute to air pollution.



The research examined the influence of using firecrackers during Diwali on Delhi's air quality using hourly data on PM 2.5 particle concentrations from 2013 to 2017. Diwali has been demonstrated to produce an increase in pollution levels in all parts of Delhi. In two days, Diwali raises PM 2.5 particle levels by around 40 g/m³. (Ghei D, Sane R 2018).

Vehicle emissions have emerged as the leading cause of air pollution, according to research conducted by the think tank Centre for Science and Environment (CSE). According to CSE's data, automotive emissions were responsible for more than half of Delhi's pollution between October 24 and November 8, 2021, (Mint, 2021). The Supreme Court of India ordered the authorities to take immediate action to address the acute problem of vehicular pollution in Delhi in the year 1998, including the phase-out of leaded gasoline, the replacement of old cars, taxis, and buses, the construction of new Interstate Bus Termini at entry points, and improved air quality monitoring. However, no fruitful result still came out even after the passing of more than 24 years. According to the research (Kathuria 2002), the command and control (CAC) instrument should be widely used to manage air pollution caused by vehicle emissions.

Household activities also contribute to air pollution, either directly via the use of fuel in the home or indirectly through the manufacturing of purchased goods. The majority of Delhi's surrounding territory is rural, and residents there cook on solid fuels and kerosene. The contribution of various home activities by household decile is shown in the study (Narasimha D. Rao et al., 2021). Cooking, heating, and lighting with solid fuels and kerosene contributes roughly 9 µg m⁻³ to the ambient PM_{2.5} concentration ((or 22% of the total air pollution).

Apart from the above factors the industrial also plays a most impotent role in contributing in air pollution in Delhi-NCR area. Delhi features India's most dense concentration of small-scale industries. With 3,182 industries in the Delhi-National Capital Region (NCR), industrial pollution contributes approximately 18.6 % to the poor air quality. Emissions in the range of 200-1000 tonnes per year have been detected in industrial zones adjacent to the busiest highways. (Choudhary, 2019). In 2017, the Supreme Court, to the relief of the capital territory, prohibited the use of cheaper alternatives in the NCR, such as petroleum coke and furnace oil, and tribunal proposed that similar measures be adopted in other states (Economic Times, 2017).

Issues and Challenges

In India alone, the total amount of crop residue and burnt was estimated to be 516 million tonnes and 116 metric tonnes (Mt), respectively, in 2017–2018, generating approximately 176.1 metric tonnes of Carbon dioxide CO₂, 10 metric tonnes of Carbon monoxide CO, 0.31 metric tonnes of Methane CH₄, 0.008 metric tonnes of Nitrous Oxide N₂O, 0.151 metric tonnes of Ammonia (NH₃), and 0.814 metric tonnes of Non-methane volatile organic compounds (NMVO), 0.453 metric tonnes of particulate matter 2.5, and 0.936 metric tonnes of particulate matter 10 (Venkatramanan, V. et al. 2021)

The main issue is that government authorities are not focussing on the other factors contributing to air pollution, which are the major contributor to air pollution in these areas. Apart from these providing better machinery to cut the agricultural residue and incentives, they impose fines and punishment for stubble burning. The farmers also need to understand that the pollution caused by stubble burning will harm them first, then others. Also, some farmers consider that it will cost less to pay a fine instead of the cost incurred to clean the stubble from land after harvesting. To strategize the agenda of sustainable development and promotion of inter-generational equity (Nomani,2004; Nomani, 2000) the researcher understands the fact that the present legal frameworks and the public policies are inadequate to tackle the current situation arising due to air pollution in Delhi-NCR area.

Alternatives to Stubble Burning

As per the research conducted by Kumar et al., the crop residue can be used for Mushroom cultivation, food for animals, and their bedding material. Crop wastes can be used in various ways instead of being burned, such as cow feed, compost with manure, rural roofing, bioenergy, beverage manufacturing, packaging materials, wood, paper, bioethanol, and so on. (Porichha et al., 2021). Farmers may be taught to cut, collect, and transform agricultural residue into biochar at a local level. (Choudhary et al., 2021). Another study conducted by Ahmed T and Ahmad B (2014) and Shyam, (2002) recognized crop residue as a sustainable source of energy supply and proposed creating a decentralized electricity delivery system based on crop residue in rural regions. These solutions will not only tackle the problem of agricultural residue management but will also minimize air pollution.

A Legal Framework to Control Air Pollution

Several laws prohibit the burning of agricultural residue, including Section 144 of the Criminal Procedure Code (CrPC), the Air Prevention and Control of Pollution Act of 1981, the Environment Protection Act of 1986, the National Tribunal Act of 1995, and the National Environment Appellate Authority Act of 1997. India enacted new laws and amended old ones. To give effect to the Vienna Convention for the Protection of the Ozone Layer, 1985, and the Montreal Protocol on Substances



that Deplete the Ozone Layer, 1992, internationally, and Sections 6, 8, and 25 of the Environment (Protection) Act, 1986, nationally, India passed the Ozone Depleting Substances (Regulation and Control) Rules, 2000. As a signatory to the Vienna Convention and the Montreal Protocol, India is deeply concerned about the protection of the ozone layer and the phase-out of ozone-depleting compounds (Nomani and Parveen,2020; Nomani,1996). The National Green Tribunal (NGT) has implemented rigorous steps to curb agricultural residue burning, particularly in the states of Rajasthan, Uttar Pradesh, Haryana, and Punjab. In 2014, the Union Agriculture Ministry developed the 'National Policy for Crop Residue Management' for states, which outlined a number of goals for the management of stubble through the use of technology. However, no major progress has been achieved on this front, according to a 2020 study by the Energy and Resources Institute. Stubble burning was outlawed by the National Green Tribunal in 2015, and this restriction has been frequently backed by the Supreme Court of India since multiple studies have revealed that the crude practice exacerbates Delhi's air pollution issue. Those caught stubble-burning are either fined for violating the court's prohibition or punished under the Indian penal code, which might result in a month in jail.

In October 2020, The Supreme Court has instructed the governments of Punjab, Haryana, and Uttar Pradesh to develop strategies to avoid agricultural residue burning and give incentives to farmers. Simultaneously, the Supreme Court established a commission to oversee stubble burning, chaired by retired Justice Madan Lokur. However, only ten days later, the court suspended the committee after the Central Government informed them that laws to combat pollution would be introduced.

Furthermore, the Central Government introduced the "The Commission for Air Quality Management in the National Capital Region and Adjoining Areas Bill 2021," which was approved by Parliament in August 2021 (The Indian Express, 2021) and came into force from 13th April 2021. This Act authorizes the Centre to establish a commission to monitor air quality in and around the capital. It combines all of its bodies and replaces the Supreme Court-monitored Environment Pollution (Prevention and Control) Authority. Since its inception, the commission, which reports to the Union Environment Ministry, has conducted multiple meetings and given directives to state governments, as well as procured 1,43,801 equipment to farmer remove stubble from fields. The commission also supervises the deployment of the Indian Agricultural Research Institute's bio-decomposer, also known as the Pusa decomposer.

Conclusion

The agricultural residue is burned at a specified period whether it is wheat crop stubble in April and

May and rice crop stubble in October and November every year in different parts of India, mainly Punjab Haryana and western Uttar Pradesh, according to the findings of the above study. So, the pollution problems in the Delhi-NCR region due to stubble burning are only periodical but the other factors which are affecting the air pollution in this area are permanent.

The government as well as the Supreme court has taken various measures to curb air pollution but failed. The need of the hour is to implement the policies in an effective manner and also to impose restrictions on other factors like industries, construction work, vehicular emissions, traffic congestion, adulterer fuel, non-disposal of wastes, etc to control the air pollution in the Delhi-NCR area.

Recommendations

- Both governments, as well as the farmers, must step together in the direction to curb air pollution caused by stubble burning. Farmers must be trained on how to cut, collect, and transform agricultural leftovers into other alternative uses.
- There is a need for more research to find out other alternatives to stubble burning and also the policies which can be implemented by the government.
- Both the state and the central governments should adopt policies at the local level to address this problem.
- The commission established under the Act of 2021 must take appropriate measures and conduct ground research to find the most suitable solution to tackle this problem.
- Also, the focus should be made on other factors like industries, increase in vehicular emissions, traffic congestion, adulterer fuel, and non-disposal of wastes, etc to control air pollution.

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