

Item Nos. 01 to 04

Court No. 1

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

Original Application No. 249/2020
(I.A. No. 370/2020, I.A. No. 371/2020,
I.A. No. 372/2020& I.A. No.373/2020)

Tribunal on its own Motion Applicant(s)
Versus

Ministry of Environment, Forest
& Climate Change & Ors. Respondent(s)

WITH

Original Application No. 254/2020

Shobhit Shukla Applicant(s)
Versus

Govt. of NCT of Delhi Respondent(s)

WITH

Original Application No. 255/2020

Chirag Jain Applicant(s)
Versus

Govt. of NCT of Delhi Respondent(s)

WITH

Original Application No. 93/2020(CZ)

Dr. P. G. Najpande & Anr. Applicant(s)
Versus

State of M. P. & Ors. Respondent(s)

Date of hearing: 05.11.2020

Date of uploading of order: 09.11.2020

**CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. SATYAWAN SINGH GARBYAL, EXPERT MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER**

ORDER

I. The Issue

1. Common question in these matters is remedial action against pollution by use of fire crackers aggravating the menace of Covid-19

pandemic, posing higher danger to the lives and health of the vulnerable groups.

II. Current Restrictions on Firecrackers

2. At the outset, we note that considering the potentially harmful consequences of burning of crackers amidst COVID-19 pandemic situation and approaching winter (when there is higher level of air pollution), the States of Odisha, Rajasthan, Sikkim, NCT Delhi (DPCC) and UT Chandigarh have prohibited sale and use of fire crackers to protect the vulnerable groups like elderly, children, persons with co-morbidities and others. Reliance has been placed on Technical Expert Committee that prohibition is necessary to avoid harmful health impact on account of bursting of crackers, aggravating Covid during increased pollution. The notifications are as follows:

**“Government of Odisha
Office of Special Relief Commissioner
No. 6218 /R&DM(DM) Date: 03-11-2020**

RDM-RLF-MISC-0290-2020

ORDER

Whereas, the State is passing through a critical stage of COVID-19 pandemic;

And whereas, the winter season is approaching during which the elderly, children, persons with co-morbidities and others develop respiratory problems;

And whereas, the Deepavali and Kartika Purnima festivals are approaching and people usually burn fire crackers during such occasions;

And whereas, it is a well-known fact that burning of the fire crackers releases copious amounts of harmful chemicals, which have severe impact on the respiratory health of vulnerable groups and such pollutants can further aggravate health conditions of COVID-19 positive persons besides persons staying in home isolation;

And whereas, the Technical Expert Committee of the State Government has recommended for prohibition of burning of fire crackers to protect the vulnerable groups like elderly, children, persons with co-morbidities and others;

And whereas, considering the potentially harmful consequences of burning of crackers amidst COVID-19 pandemic situation and approaching winter, the State Government have directed to prohibit the sale and use of fire crackers from 10th to 30th of November, 2020 in public interest;

Now, therefore, in exercise of the powers conferred under section 24(1) of the Disaster Management Act, 2005 read with rule 8(1) of the Odisha Disaster Management Rules, 2010, the undersigned hereby directs that the sale and use of fire crackers shall remain prohibited in all parts of the State from 10th to 30th of November, 2020.

Any person found violating this order shall be punished under the provisions of the Disaster Management Act, 2005 and other relevant laws.

Chief Secretary,
Odisha”

**“Home (Gr.V) Department
Notification
Jaipur, November 03, 2020**

S.O.402 :-In continuation of this department's notification even number dated 03.05.2020, 12.05.2020, 21.05.2020, 27.07.2020 and 17.10.2020, in exercise of the powers conferred by section 11 of the Rajasthan Epidemic Diseases Act, 2020 (Act No. 21 of 2020), the State Government hereby authorizes all Executive Magistrates, all Police Officers not below the rank of Assistant Sub-Inspector, all officers of Municipal Corporation/ Council/Board not below the rank of Revenue Inspector, all Chief Executive Officers of Zila Parisad and all Block Development Officers, within their respective jurisdiction, to compound the offences committed under section 4 of the said Act, by violating the order or regulation **prohibiting the actions specified in column 2 of the schedule given below** for the amount specified against each of them in column 3 of the said schedule.

Schedule

S.No.	Offence	Amount in Rupees for which the offence is to be compounded
1	2	3
1.	Any shopkeeper selling any kind of fireworks.	Rs. 10,000/-
2.	Any person found using or allow the firing of any kind of	Rs. 2000/-

**“GOVERNMENT OF SIKKIM
HOME DEPARTMENT
GANGTOK**

No. 38 /Home/2020

Dated: 04/11/2020

ORDER

Subject: **Ban on bursting of fire crackers**

Whereas, the active cases of Covid-19 are on the decline in the State and significant number of patients have recovered, **increase in air pollution on account of bursting of fire crackers may prove hazardous for recovered as well as active Covid-19 patients.**

Now, therefore, in exercise of power conferred u/s 22 (2) (h) of the Disaster Management Act, 2005, the undersigned in his capacity as Chairperson, State Executive Committee hereby directs that there shall be a complete ban on bursting of fire crackers in the State till further orders. The District Magistrates and Superintendents of Police shall take all measures and necessary action to ensure compliance of this order.

Sd-
(S.C. Gupta, IAS)
Chief Secretary
Govt. of Sikkim"

DPCC

"DELHI POLLUTION CONTROL COMMITTEE

F. No DPCC/(10)(10)(01)/ leg-20151/144'

ated:06.11.2020

Subject: Directions u/s 31 (A) of Air (Prevention and Control of Pollution) Act, 1981, read with Rule 20 (A) (6) of the Air (Prevention and Control of Pollution) (Union Territories) Rules, 1983, to stop bursting and sale of all kind of fire crackers.

Whereas, Delhi Pollution Control Committee in view of the Hon'ble Supreme Court directives dated 23.10.2018 in Writ Petition (Civil) No. 728/2015 titled as, " Arjun Gopal and Mother's Versus Union of India and Others" and in exercise of the powers conferred under section 31 (A) of Air (Prevention and Control of Pollution) Act, 1981, and keeping in view to curb high air pollution in Delhi, issued directions on 29.10.2020 prohibiting bursting of fire crackers and restricted the Licensed Traders only to sale/ store fire crackers with reduced emission (improved crackers) and Green Crackers. The fire crackers which were compliant with PESO prescribed standards, only to be manufactured, stored and sold through Licensed Traders. It was further directed that no e-commerce websites shall accept any online orders and effect online sales and on Diwali days or on any other festivals like GURPURAB etc., when such fireworks generally take place, it would strictly be from 8:00 PM to 10:00 PM only. On Christmas eve and New Year eve, it would be from 11:55 PM to 12:30 AM only and use of barium salts in the fireworks was also banned.

Whereas, Delhi faces grave air pollution particularly in winter season and level of pollutants like Particulate Matter Concentration (PM_{2.5} and PM₁₀) goes much beyond the prescribed standards for Ambient Air Quality.

Whereas, air quality of Delhi is deteriorating day by day and as on 05.11.2020 at 6.00 PM, Air Quality Index (AQI) reached 435, which is classified as "Severe" category warranting extreme measures to contain further worsening and prevent hazards, as a result of air pollution, to public at large.

Whereas the city of Delhi is reeling under a third peak of outbreak of COVID19 and large scale celebrations by bursting of fire crackers will result not only in agglomeration of people, in violation of social distancing norms, but also would result in high level of air pollution leading to serious health issues in Delhi, which under the prevalent pandemic crisis situation is not favourable for the cause of larger community health given the possible high level of exposure to air pollutants leading to short term and long term adverse health effects given the significant relationship between air pollution and respiratory infections.

Whereas, when severe AQI levels reach such a dangerous level, the deadly air pollutants can make their way into lungs causing severe discomfort and health issues, and hazardous AQI levels can be highly unacceptable to health by aggravating to chronic health conditions caused by breathing poisonous air.

Whereas, burning of fire crackers would cause extensive air pollution and releases metal particles, dangerous toxins, harmful chemicals and noxious gases which would form one of the main sources of air pollution particularly when AQI is already reeling under "Severe" category. The air quality in the severe category may cause respiratory effects even on healthy people and severe health impact on people with lung /heart diseases. The health impacts may be experienced even during light physical activity.

Now, therefore, in view of the above in suppression of directions issued vide even number dated 29.10.2020 and in exercise of the powers conferred under Section 31(A) of Air (Prevention and Control of Pollution) Act, 1981, read with Rule 20 (A) (6) of the Air (Prevention and Control of Pollution) (Union Territories) Rules, 1983, and keeping in view the need in public interest to curb high air pollution in Delhi, Delhi Pollution Control Committee hereby directs as under:

"There will be a 'Complete Ban' on bursting and sale of all kinds of fire crackers from 07.11.2020 to 30.11.2020 in the territory of NCT of Delhi."

The District Magistrates and Deputy Commissioners of Police shall implement the aforesaid directions. Daily action taken reports are required to be submitted to Delhi Pollution Control Committee on email ID: msdpcc@nic.in."

CHANDIGARH

"OFFICE OF ADVISER TO THE ADMINISTRATOR, UT-CUM-CHAIRPERSON, STATE EXECUTIVE COMMITTEE OF STATE DISASTER MANAGEMENT AUTHORITY, UT, CHANDIGARH

ORDER

No.13180-HIII(5)2020/

Dated 06/11/2020

*In exercise of the powers conferred on the undersigned as Chairperson of the Disaster Executive Committee of State Disaster Management Authority, I hereby order, a complete ban on sale or use of crackers of any kind, throughout the Union Territory of Chandigarh. **These directions are issued as a containment measure to prevent risk of spread of covid-19, due to polluted atmosphere created by bursting of crackers.***

These orders will come into force with immediate effect and will remain in force until further orders.

Any violation of the orders will invite penal action under Section 51 to 60 of Disaster Management Act, 2005 besides legal action under Section 188 of the IPC and other provisions as applicable.

*MANOJ PARIDA, IAS Adviser
to the Administrator, UT &
Chairperson, State Executive
Committee of State Disaster
Management Authority, UT,
Chandigarh”*

3. We further note that the Calcutta High Court vide interim order dated 5.11.2020 in WPA No. 1984 of 2020, *Ms. Anasua Bhattacharya vs. State of West Bengal & Ors.* has banned fire crackers as follows:

“
As far as the firecrackers are concerned, notwithstanding the pendency of the matter before the NGT, in view of the appeal issued by the State and the unique problem brought about by the pandemic, **the State should ensure that there is no use or display or bursting of firecrackers at all during the Kali Puja and Diwali celebrations. For this purpose, only wax or oil-based diyas would have to suffice, for the greater good of the citizens and in the larger public interest. This direction as to firecrackers will be effective all over the State and will cover not only the Kali Puja and Diwali celebrations, but also the Chhat Puja, Jagadhatri Puja and Guru Nanak’s birthday celebrations thereafter.**

The police should maintain a strict vigil to ensure that there is no sale or purchase of firecrackers of any form in the State between now and the end of the month. The police should make every effort to confiscate firecrackers and any kind of like material which have the potential to pollute the air. Immediate appropriate measures must be taken by the police against those seeking to act in contravention of these directions. The State will ensure that no firecrackers of any kind are brought into the State, except for immediate transit to another State.

The compendious word “firecrackers” is used in this order to include all types of sparklers and the like, whether or not the use or burning thereof involves any sound or light being generated.”

III. Procedural History

4. We now refer to the cases before the Tribunal. In OA 249/2020, *Indian Social Responsibility Network through Santosh Gupta vs. Ministry of Environment, Forest & Climate Change & Ors.*, (the title later modified on application of the applicant seeking to withdraw his name as *Tribunal on its own Motion vs. Ministry of Environment, Forest & Climate Change & Ors.*), the Tribunal considered the matter on 02.11.2020 and passed following order:

*“1. The issue raised in this application relates to remedial action against **pollution by use of fire crackers in NCR during the time air quality is unsatisfactory with potential of severity of Covid-19 pandemic.** The application refers to the statement of the Union Health Minister and the Health Minister of Delhi that during festive season there will be rise of Covid cases due to air pollution. Increased pollution may further affect the vulnerable groups and increase the fatality rate. Covid cases in Delhi may go up to 15,000 per day, as against the current cases of about 5,000 per day. Use of green crackers will not remedy the situation. The smoke will choke and may create gas chamber like situation. It will lead to poor visibility, hazy conditions and asphyxia.*

2. The issue of fire crackers has been dealt with by the Hon’ble Supreme Court by several orders. The matter has been considered in the light of right to clean environment and acknowledged adverse effect of bursting of crackers on health due to increased pollution. Particular reference may be made to the following:

(I) Vide order dated 11.11.2016, in Arjun Gopal v. Union of India, (2017) 1 SCC 412,¹ it was noted that air quality standards in Delhi are from ‘poor’ to ‘severe’ during winter resulting in potential of diseases. Following directions were issued:

“We direct the Central Government to:

- (i) Suspend all such licenses as permit sale of fireworks, wholesale and retail, within the territory of NCR.*
- (ii) The suspension shall remain in force till further orders of this Court.*
- (iii) No such licenses shall be granted or renewed till further orders.”*

¹ Para 5, 19 & 20

- (II) *Vide order dated 12.09.2017, in Arjun Gopal v. Union of India (2017) 16 SCC 280² it was noted that since under the law, the health of the people has to take precedence over any commercial or other interests, graded regulation of fire crackers was necessary which would eventually result in prohibition. Accordingly, directions were issued to restrict the temporary licenses to 50%, pending further consideration.*
- (III) *Vide order dated 23.10.2018, in Arjun Gopal v. Union of India, (2019) 13 SCC 523,³ while banning certain categories of fire crackers and directing regulation of the remaining, it was inter-alia directed that on Diwali days or other festivals, fire crackers will be used strictly between 8 p.m. to 10 p.m. only with different timings for some other festivals. It was also directed that the Union of India, Government of NCT of Delhi and the State Governments of NCR would permit community fire crackers only (for Diwali and other festivals, etc. as mentioned above), wherever it can be done.*
- (IV) *There are also directions of the Hon'ble Supreme Court with regard to the noise level of the crackers vide judgment In Re: Noise Pollution-implementation of the Laws for Restricting Use of Loudspeakers and High-Volume Producing Sound Systems, (2005) 5 SCC 733.*

3. The above cases do not consider Covid-19 situation when the adverse effect may be so severe that number of deaths of children, senior citizens and other vulnerable persons may increase. Number of diseases may also increase. There are reports in public domain that air quality of Delhi is deteriorating and further deterioration may give rise to increase in Covid cases.⁴ It is well known that the Graded Response Action Plan (GRAP) has been introduced envisaging prohibiting of polluting activities if the air quality deteriorates. The Air Quality Index (AQI) is reported to be averaging between 410 and 450 i.e. 'hazardous' category. Fire crackers emit poisonous gases like SO₂, NO_x, CO as well as the metal besides creating noise. In the given climatic conditions, this may result in respiratory/pulmonary diseases, diabetic, hypertension and other diseases.

² Para 69 to 72

³ Para 48

⁴ (i). Festivals, Air Pollution Reasons for rise in Delhi Covid cases: Centre: <https://www.ndtv.com/india-news/festivals-air-pollution-reasons-for-rise-in-delhi-covid-cases-centre-2317795>

(ii). Covid-19 recoveries continue to surpass new cases; next two-and-a-half month period crucial says Harsh Vardhan: <https://www.firstpost.com/india/covid-19-recoveries-continue-to-surpass-new-cases-next-two-and-a-half-month-crucial-says-harsh-varadhan-8922691.html>

(iii). Covid cocktail: Why Delhi's air pollution crises may deepen this winter: <https://www.indiatoday.in/news-analysis/story/covid-cocktail-why-delhi-air-pollution-crisis-deepen-winter-coronavirus-lockdown-1722602-2020-09-17>

(iv). Covid-19 and pollution: 'Delhi staring at coronavirus disaster': <https://www.bbc.com/news/world-asia-india-54596245>

4. There are also expert views on clear nexus of air pollution with Covid-19.⁵ With increased air pollution, virus can cause more damage.

5. In view of above, issue notice to the MoEF&CC, CPCB, DPCC, Police Commissioner, Delhi, Governments of Delhi, Haryana, Uttar Pradesh and Rajasthan on the question whether the use of fire crackers may be banned for the period from 07.11.2020 to 30.11.2020 in the interest of public health and environment.”

5. In O.A. No. 254/2020, *Shobhit Shukla vs. Govt. of NCT of Delhi*, the applicant has stated as follows:

“That the applicant herein most respectfully submits that the use of fireworks in Delhi has posed a serious problem to the quality of the air during the week of Diwali, which followed by usage of crackers during the weddings in the winter season. That the quality of air in the months of October, November and December since the time the applicant has shifted to Delhi has deteriorated to catastrophic levels. With each passing year the issue of extreme smog in Delhi is becoming more and more deadly. It is essential to highlight here that on 02.11.2020, Delhi’s air quality was in the “very poor” category, as per the data from the Central Pollution Control Board (CPCB). The capital recorded an Air Quality Index (AQI) of 310 at 7 am.

That in this regard, the, the situation has become more hazardous in 2020 because of the on-going corona pandemic. According to the Delhi state health department, 4,001 fresh cases were detected in Delhi in the last 24 hours, pushing the total tally more than 3.96 lakh. In fact, in the wake of the deadly coronavirus disease (Covid-19) pandemic and rising pollution in the national capital, the Delhi government has also launched an anti-firecracker campaign from November 3rd, 2020.

Under the campaign, 11 special squads of the Delhi Pollution Control Committee (DPCC) and city police will inspect firecracker manufacturing units to ensure that there is no old stock left. The government has also urged people to not burn crackers at all this year as the city battle surge in Covid-19 cases.

That however it is wishful and ideal that it is expected out of people that they shall themselves refrain from bursting crackers on the eve

⁵ "SARS-CoV-2 virus (COVID-19) is a member of the coronavirus family and is responsible for the pandemic declared by the World Health Organization. A positive correlation has been observed between the spread of the virus and air pollution, one of the greatest challenges of our millennium. COVID-19 could have an air transmission and atmospheric particulate matter (PM) that could create a suitable environment for transporting the virus at greater distances than those considered for close contact. Moreover, PM induces inflammation in lung cells, and exposure to PM could increase the susceptibility and severity of the COVID-19 patient symptoms. The new coronavirus has been shown to trigger an inflammatory storm that would be sustained in the case of pre-exposure to polluting agents. Given this state of affairs, the potential role of PM in the spread of COVID-19, focusing on Italian cities whose PM daily concentrations were found to be higher than the annual average allowed during the months preceding the epidemic. Furthermore, a positive correlation between the virus spread, PM, and angiotensin-converting enzyme 2 (ACE2), a receptor involved in the entry of the virus into pulmonary cells and inflammation was observed": <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7345938/>

of Diwali and other forthcoming festivities, it has been seen in the past years that the such voluntary restrictions do not translate into legitimate constraint on the usage of such fire crackers. This has shown extremely hazardous effects upon the air quality of the Delhi-NCR region.”

6. In O.A. No. 255/2020, *Chirag Jain vs. Govt. of NCT of Delhi*, the applicant has stated as follows:

“That currently we are undergoing an unprecedented time in our country with the ongoing pandemic of COVID-19, cases of which are sure to rise with the advent of winters in Delhi.

That it is now a common knowledge that the respiratory system is immensely adversely affected by the COVID-19 virus and that the same stress will increase manifold with the increase in the air pollution in the area of Delhi. It is also the view of the Government both of the NCT of Delhi as well as the Central Government. It has been stated in the media that the onset of winter season and rising air pollution in Delhi NCR shall aggravate the pandemic and may affect vulnerable groups and could lead to a drastic increase in the fatality rate in the country.

Delhi is encircled by Haryana from three sides and Uttar Pradesh on its eastern side. Delhi is a bowl state, in sense that, thickly populated cities like Noida, Ghaziabad, Faridabad and Gurugram encircle it and that the wind cycle from the areas surrounding the city coagulate the wind of the city. With the ongoing burning of stubble in the northern regions of the country the downwind brings all the smoke residue into the city due to which the entire region which is referred as NCR is predominated with high background dust, intensified industrial activities, high vehicular density, issues of re-suspension of dust etc. that are some of the primary causes of the deteriorating air quality in Delhi NCR.

The Air Quality Index (AQI) of Delhi and adjoining cities more or less is a testimony of the same. With the exception of monsoon season, AQI of the region more or less remains in the above 'Moderate' category. Therefore, there is an imminent need for actions to be taken for regulating various activities which have been identified as pollution contributors in the region.

As per the statement of the Health Minister of Delhi, an expert panel had been constituted by the Government which gave an indication that the COVID-19 cases in Delhi may go up to 15000 per day. This has been attributed on account of the onset of festival season, harsh winter conditions and rising air pollution levels.

AIIMS, a premier medical institution in the country has also issued advisories in view of anticipated conditions. Health Care Experts in other states have also released such medical advisories.

With the onset of the festival season in the country, there shall be use of fire crackers in huge numbers that will aggravate the air

pollution concern in Delhi NCR. Using green crackers (also known as environmentally friendly crackers) is also futile since they are neither emission free and nor noise free. Hon'ble Supreme Court is reviewing the proceedings and adjudication is presently focusing on substitution of the ingredients to minimize pollution levels referring as Green Crackers.

There is also no mention on the regulation of firecrackers in Graded Response Action Plan (GRAP) perhaps with the view that their use is for limited period. However, such a stand is not correct owing to the fact it is contrary to the Air Act and considering that post the Diwali Day, the sky is engulfed with smoke. Deepawali celebrations with Firecrackers is not an integral part of the traditional celebrations. Right to earning a livelihood at the cost of severe health risks and damage to the environment should not be treated as a constitutional right.

There has been plethora of literature that is publicly available to show that air pollution leads to several diseases and discomfort. According to study from Harvard T.H. Chan School of Public Health, people who live in regions with high levels of air pollution are more likely to die from the disease than people who live in less polluted areas. Therefore, there exists a clear nexus between the rising air pollution and COVID-19 related deaths.

Harsh winter periods in Delhi NCR also results in reduction in the mixing heights thereby locking the pollutants and leading to hazy and poor visibility conditions. The emissions from Delhi, Faridabad, Gurugram, Noida and Ghaziabad are almost identical and Delhi gets locked experiencing the most unbearable conditions. Undoubtedly, the community at large has to live under distressed conditions.

It is a well-established fact that fire crackers emit poisonous gases like SO₂, NO_x, CO as well as the metal besides creating noise. The Government of India and the Government of Delhi have accepted in Media that air pollution and the winter conditions will lead to a surge in the COVID-19 cases and the most vulnerable groups will be the ones that could potentially suffer from respiratory/pulmonary diseases, hypertension and other such ailments. They might also lack the financial resources to seek the help of any medical institution. This also places an additional burden on the healthcare system of the country that is already struggling with shortage of beds, lack of PPE kits etc.”

7. In O.A. No. 93/2020(CZ), Dr. P.G. Najpande & Anr. v. State of MP & Ors. which has been filed before the Bhopal Bench and transferred to this Bench, to be heard with connected matters, it is stated as follows:

“Therefore, the main grievance of applicants is that this smoke filled air will increase in mortality rate of corona patients, it will lead to increase in number of corona patients.

Those patients who have recovered from the corona infection diseases may again be put to hazardous situation.

All above effects will be because of huge air pollution causes by bursting of crackers.

Hon'ble National Green Tribunal (CZ) Bhopal in OA No.113/2013 observed on 31.10.2013 to take necessary steps against bursting of crackers causing air pollution in Diwali Festival by State Pollution Control Board, District Administrations and State Govt. of Madhya Pradesh, Rajasthan and Chhattisgarh.

A complaint regarding sale of substandard crackers causing air and noise pollution was filled before Hon'ble M.P. human Right Commission on 26.10.2018. Hon'ble Commission had directed to Inspector General of Police Bhopal on 05.10.2018 to take an necessary action. But neither the State Govt., State Pollution Control Board, Inspector General of Police, nor the District Administrative Department took appropriate action to curb the menace of crackers.

This year a situation is still more disastrous, because of covid-19 situation, people are suffering and their "Rights to Life" enshrined under Article 21 of the Constitution of India is under threats and hence it will be hazardous if the bursting of crackers is not banned."

8. Vide order dated 04.11.2020 on consideration of the above matters, the Tribunal directed all the matters to be heard together and observed:

*"9. However, having regard to further developments such as grievance being raised for the State of MP and States of Odisha and Rajasthan have banned use of fire crackers in the wake of unsatisfactory air quality, **the scope of proceedings may need to be extended beyond NCR so as to suggest that in all the concerned States where air quality is not satisfactory may consider taking action on the pattern of action taken by the States of Odisha and Rajasthan. Further, with respect to non-attainment cities (where air quality as per record maintained by the CPCB is generally beyond norms) which are 122 in number, as per record of CPCB, the Tribunal may have to consider direction to prohibit use of fire crackers during the period air quality is beyond a threshold (and beyond the norms notified under the Air Act) to protect the health of the vulnerable groups.** The remedial action with regard to the said cities is being separately dealt with by this Tribunal in O.A. No. 681/2018, News item published in "The Times of India" Authored by Shri Vishwa Mohan titled "NCAP with multiple timelines to clean air in 102 cities to be released around August 15." List of the said cities is as follows:*

"List of 122 Non-Attainment Cities (Air Pollution)

Sl. No.	State	Sl. No.	City
1.	Andhra Pradesh	1.	Anantapur*
		2.	Chittoor*
		3.	Eluru*
		4.	Guntur
		5.	Kadapa*
		6.	Kurnool
		7.	Nellore
		8.	Ongole*
		9.	Rajahmundry*
		10.	Srikakulam*
		11.	Vijaywada
		12.	Vishakhapatnam
		13.	Vizianagaram*
2.	Assam	14.	Guwahati
		15.	Nagaon
		16.	Nalbari
		17.	Sibsagar
		18.	Silcher
3.	Bihar	19.	Gaya
		20.	Muzzaffarpur
		21.	Patna
4.	Chandigarh	22.	Chandigarh
5.	Chhattisgarh	23.	Durg Bhilainagar
		24.	Korba
		25.	Raipur
6.	Delhi	26.	Delhi
7.	Gujarat	27.	Ahmedabad
		28.	Surat
		29.	Vadodara*
8.	Himachal Pradesh	30.	Baddi
		31.	Damtal
		32.	Kala Amb
		33.	Nalagarh
		34.	Paonta Sahib
		35.	Parwanoo
		36.	Sunder Nagar
9.	Jammu & Kashmir	37.	Jammu
		38.	Srinagar
10.	Jharkhand	39.	Dhanbad
11.	Karnataka	40.	Bangalore
		41.	Devangere
		42.	Gulburga
		43.	Hubli-Dharwad
12.	Madhya Pradesh	44.	Bhopal
		45.	Dewas
		46.	Gwalior
		47.	Indore
		48.	Sagar
		49.	Ujjain
13.	Maharashtra	50.	Akola
		51.	Amravati
		52.	Aurangabad
		53.	Badlapur
		54.	Chandrapur
		55.	Jalgaon
		56.	Jalna
		57.	Kolhapur
		58.	Latur
		59.	Mumbai
		60.	Nagpur
		61.	Nashik
		62.	Navi Mumbai
		63.	Pune
		64.	Sangli
		65.	Solapur
		66.	Thane*
		67.	Ulhasnagar
14.	Meghalaya	68.	Byrnihat
15.	Nagaland	69.	Dimapur
		70.	Kohima

Sl. No.	State	Sl. No.	City
16.	Odisha	71.	Angul
		72.	Balasore
		73.	Bhubneshwar
		74.	Cuttack
		75.	Kalinga Nagar*
		76.	Rourkela
		77.	Talcher
17.	Punjab	78.	Amritsar
		79.	Dera Baba Nanak
		80.	Dera Bassi
		81.	Gobindgarh
		82.	Jalandhar
		83.	Khanna
		84.	Ludhiana
		85.	Naya Nangal
		86.	Patiala
18.	Rajasthan	87.	Alwar
		88.	Jaipur
		89.	Jodhpur
		90.	Kota
		91.	Udaipur
19.	Tamil Nadu	92.	Trichy*
		93.	Tuticorin
20.	Telangana	94.	Hyderabad
		95.	Nalgonda
		96.	Patencheru
		97.	Sangareddy*
21.	Uttar Pradesh	98.	Agra
		99.	Allahabad
		100.	Anpara
		101.	Bareilly
		102.	Firozabad
		103.	Gajraula
		104.	Ghaziabad
		105.	Jhansi
		106.	Kanpur
		107.	Khurja
		108.	Lucknow
		109.	Moradabad
		110.	Noida
		111.	Raebareli
		112.	Varanasi
22.	Uttarakhand	113.	Dehradun*
		114.	Kashipur
		115.	Rishikesh
23.	West Bengal	116.	Asansol*
		117.	Barrackpore*
		118.	Durgapur*
		119.	Haldia*
		120.	Howrah*
		121.	Kolkata
		122.	Raniganj*

10. Accordingly, we consider it appropriate to issue notice to all the States/UTs where the above cities fall, in addition to notice already issued to the Governments of Delhi, Haryana and Uttar Pradesh. Notice need not be issued to the States of Odisha and Rajasthan in view of the notification issued by the said States. To all other States/UTs where the above cities fall, notice may be issued by e-mail to the concerned Chief Secretaries returnable for tomorrow.”

18. That the proposed suggestive ban on the use of firecrackers has sent shivers down the spine of the sellers who are anyway facing acute financial hardship owing to the present pandemic. It is submitted that in a news article published online by Republic world on 05.11.2020, The sellers in the Delhi's Sadar Bazar, Delhi's largest firecracker market are requesting the National Green Tribunal (NGT) not to ban crackers ahead of the festival season. In recent times only 10 shops in Sadar Bazar have received the certificate to sell green crackers-that causes less pollution comparatively and are allowed by the Government. The number of shops dealing with firecrackers massively decreased from 70 to now just 10, over the last four years. A copy of the news article dated 05.11.2020 is annexed hereto and marked as **Annexure R-12.**

19. It is submitted that similarly, the decision of the Government of West Bengal to impose the ban on use of firecrackers may impact almost 4 lakh workers. This apprehension further stems from the fact that it would have been much better if the State Governments made the decision a few months ago and issued guidelines as it would have saved the manufacturers from the risk of sustaining huge losses at a time when they are yet recover from the impact of the lockdown. A copy of the article dated 04.11.2020 published in Deccan Herald is annexed hereto and marked as Annexure-R13.

20. That further complete ban on fire crackers the markets would be flooded with illegal crackers violating the noise limit of 90 decibels. In a situation like this where vocal for local and Atma-Nirbhar Bharat is echoing in the heart of every Indian, a ban on legal firecrackers will mean that the market will be flooded with illegal Chinese crackers which will serve no purpose both for the buyers, the sellers and the environment.

21. That it is wrong to presume that there is any correlation between bursting of firecrackers and the increase in the number of Covid cases. The primary concern will be that of air pollution which in effect is a concern already addressed by the introduction of Green Firecrackers. CPCB in its affidavit in 2017 filed before the Hon'ble Supreme Court in the aforesaid Writ petition have already given a report of Gangaram Hospital that no significant health hazard was noticed during Diwali because of fireworks. It is submitted that that special norms of social distancing and wearing masks in public were mandated in liquor and cigarette shops which are consumed daily. The Firecracker Industry will ensure that such social norms will be followed for selling and using of crackers.

22. That the European Society of Cardiology Report referred to by the amicus curie discusses the effect of air pollution on covid patients. However, same report also suggests that "attributable fraction does not imply a direct cause-effect relationship between air pollution and COVID-19 mortality (although it is possible). Instead it refer--; to relationships between two, direct and indirect, i.e. by

aggravating co-morbidities [other health conditions] that could lead to fatal health outcomes of the virus infection".

23. It is submitted that in the order dated 02.11.2020, this Hon'ble Tribunal has taken note of the orders dated 11.11.2016, 12.09.2017, 23.11.2018, passed by the Hon'ble Supreme Court in Writ Petition No. 728 of 2015 [Arjun Gopal v. Union of India]. However, the important orders in the aforesaid Writ Petition have been passed only on 05.03.2019, 11.04.2019 and 26.11.2019. Further, the Hon'ble Tribunal has not taken into consideration the status report filed by the MOEF dated 17.08.2019, 10.12.2019 and 26.10.2020 wherein the permission to manufacture green firecrackers in accordance with the guidelines of PESO was sought. It is submitted that banning the sale of firecrackers on the basis of a partial and myopic observation rather than a holistic approach is a case writ large of travesty of justice.

24. It is submitted that during the pooja for Ayodhya temple construction in Corona period, the whole state of Uttar Pradesh celebrated with fireworks. There was no increase of any covid cases because of bursting of fireworks. Further, in Sivakasi there are more than 1200 fireworks factories and more than 8 lakh people are directly or indirectly employed in the industry. The factories check quality of fireworks daily by bursting it. Though fireworks are burst daily the fresh covid cases on 05.11.2020 were only 15 cases in the entire district. Nowhere around the world has any country banned fireworks during this Covid situation during their festival celebrations.

25. That the Firecracker Industry wrote letters to all Chief Ministers of the states on 01.09.2020 September itself requesting to issue temporary license for fireworks shop forth coming Diwali. Many Governments replied that it will do the needful and started the process of issuing licenses. With this confidence fireworks were produced and sent to the wholesalers of all state. Huge loans were availed by Manufacturers and dealers for the production and purchase of the same. None of the governments said that fireworks will not be allowed this year as soon as they got the representation from the firecracker Industry. If the fireworks are banned at the last hour, nothing will be left of the Firecracker Industry or of the 8 lakh workers.

*26. That Rediff news in an article dated 05.11.2020 has reported that 42% pollution is because of stubble burning, whereas IIT reported Fireworks accounts to less than 0.1%. Details of information availed from Rediff News are annexed hereto and marked as **Annexure-R14.**"*

11. The stand of the State of Tamil Nadu is that banning of crackers will affect livelihood of the manufactures and workers and the same is

12. I.A. Nos. 370/2020 and 371/2020 have been filed by the Indian Fireworks Manufacturers' Association, Sivakasi, Tamil Nadu for being impleaded and urgent hearing respectively. It is stated that the said association is the largest association of fire cracker manufacturers in Sivakasi. The crackers with reduced emissions and green crackers were permitted under the order of the Hon'ble Supreme Court dated 23.10.2018 in *Writ Petition No. 728/2015, Arjun Gopal v. Union of India* while others were banned. There is also ban on joined fire crackers and for use of barium salts. Petroleum and Explosive Safety Organization (PESO) is to review composition of the fireworks. There is also reference to meetings of CSIR-NEERI to consider composition and standards of the crackers on 27.02.2019 which was considered by the Hon'ble Supreme Court on 05.03.2019 and 11.04.2019. MoEF&CC filed status report before the Hon'ble Supreme Court on 17.08.2019 that there will be 90% reduction of Barium in emissions with the new composition. The MoEF&CC has filed further affidavit dated 10.12.2019 before the Hon'ble Supreme Court mentioning the steps for implementing green crackers. I.A. Nos. 372/2020 & I.A. No. 373/2020 have been filed by Tamil Nadu Fireworks and Amorges Manufacturer's Association, Sivakasi, Tamil Nadu for being impleaded and for urgent hearing respectively.

V. Amicus Submissions

Research and Studies

13. Shri Panjwani, learned Amicus has filed written submissions. It is submitted that air pollution increases the risk of mortality from Covid-19. Reliance has been placed on the following studies:

- i. *'A. Pozzer et al, 'Regional and global contributions of air pollution to the risk of death from COVID-19' Cardiovascular Research revised on 3.10.2020.*⁶
- ii. *Aparna Banerjea, 'After studies, it's clear that air pollution contributes to Covid mortality: ICMR' Mint, 27 October 2020.*⁷
- iii. *Sandipan Talukdar, 'Air Pollution May Account for 15% of COVID-19 Deaths Worldwide, Says New Study', News Click, 28 October 2020.*⁸
- iv. *The CPCB report titled 'Report on Ambient Noise Levels & Ambient Air Quality during Deepawali Festival 2018 & 2019'.*
- v. *'State of Global Air 2020' report released by the Health Effects Institute and the Institute for Health Metrics and Evaluation's Global Burden of Disease Project.*⁹
- vi. *Report: 'India recorded highest infant deaths due to air pollution in 2019, shows study', Scroll.in, 21 October 2020.'*¹⁰

14. Shri Panjwani referred to the articles referred to above during hearing. In *'A. Pozzer et al, 'Regional and global contributions of air pollution to risk of death from COVID-19' Cardiovascular Research*, which is an article published by the **European Society of Cardiology, revised on 03.10.2020**, a study has been conducted about the nexus of Covid-19 and air pollution using relevant data and attributable fraction. It is opined that both **the air pollutant PM_{2.5} and the SARS-CoV-2 virus enter the lungs via the bronchial system (portal organ), with potential systemic health impacts through the blood circulation. Both PM_{2.5} and SARS-CoV-2 cause vascular endothelial dysfunction, oxidative stress, inflammatory responses, thrombosis, and an increase in immune cells. The SARSCoV-2 infection facilitates the**

⁶ <https://academic.oup.com/circres/advance-article/doi/10.1093/cvr/cvaa288/5940460>

⁷ <https://www.livemint.com/news/india/after-studies-it-s-clear-that-air-pollution-contributes-to-covid-mortality-icmr-11603799525870.html>

⁸ <https://www.newslick.in/air-pollution-account-15-per-COVID-19-deaths-worldwide-new-study>

⁹ <https://www.stateofglobalair.org/>

¹⁰ <https://scroll.in/latest/976376/india-recorded-highest-infant-deaths-due-to-air-pollution-in-2019-shows-study#:~:text=As%20many%20as%2016.67%20lakh,2019%2C%20according%20to%20the%20survey.&text=More%20than%201%2C16%2C000%20infants,2020%20report%20published%20on%20Wednesday.>

induction of endothelial inflammation in several organs as a direct consequence of viral cytotoxic effects and the host inflammatory response, which can aggravate pre-existing chronic respiratory and vascular (coronary) dysfunction, and cause lung injury by alveolar damage, as well as stroke and myocardial infarction by inducing plaque rupture. Potential common pathophysiological mechanisms of increased risk thus relate to endothelial injury and pathways that regulate immune function. Further, there are strong indications of increased susceptibility to viral infections from exposure to air pollution.

Lung injuries, including the life-threatening acute respiratory distress syndrome and respiratory failure, as well as acute coronary syndrome, arrhythmia, myocarditis, and heart failure, were shown to be clinically dominant, leading to critical complications of COVID-19. **Recent studies in China, the USA, as well as Europe indicate that patients with cardiovascular risk factors or established cardiovascular disease and other comorbid conditions are predisposed to myocardial injury during the course of COVID-19. From the available information, it thus follows that air pollution-induced inflammation leads to greater vulnerability and less resiliency, and the pre-conditions increase the host vulnerability. Air pollution causes adverse events through myocardial infarction and stroke, and it is an additional factor capable of increasing blood pressure, while there is emerging evidence for a link with type 2 diabetes and a possible contribution to obesity and enhanced insulin resistance. Bronchopulmonary and cardiovascular pre-conditions, including hypertension, diabetes, coronary artery disease, cardiomyopathy, asthma, COPD, and acute lower respiratory illness,**

all negatively influenced by air pollution, lead to a substantially higher mortality risk in COVID-19. Furthermore, it seems likely that fine particulates prolong the atmospheric lifetime of infectious viruses, thus favouring transmission. It is possible that future research will reveal additional pathways that mediate the relationship between air pollution and the risk of death from COVID-19.

15. In article by Aparna Banerjea titled **'After studies, it's clear that air pollution contributes to Covid mortality: ICMR'** Mint, 27 October 2020', it is mentioned that **the ICMR studies have proved that long-term exposure to air pollution has been linked to an increased risk of dying from Covid-19.** It is further stated that there have been studies from Europe and US, where they have looked at polluted areas and have compared mortality during lockdown and correlation with pollution. **"It is found that pollution is contributing to mortality in COVID, that's well established by studies,"** said Dr. Balram Bhargava, DG ICMR, in a health ministry briefing today.

According to a study, published in Cardiovascular Research, scientists estimated that about 15% of deaths worldwide from COVID-19 could be attributed to long-term exposure to air pollution. In Europe the proportion was about 19%, in North America it was 17%, and in East Asia about 27%.

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The study further mentions that the Air Quality Index (AQI) (as on 04.11.2020) was recorded at 346 in Rohini, 329 in RK Puram, 377 in Anand Vihar, and 363 in Mundka, all four in the 'very poor' category, as per Central Pollution Control Board (CPCB) data. In an attempt to curb the increasing air pollution in the national capital, the Delhi government recently launched the 'Red Light On, Gaadi

Off' campaign as part of its 'Yuddh Pradushan Ke Viruddh' (War Against Pollution) initiative. Along with this, Delhi Environment Minister Gopal Rai had also announced the launch of a campaign starting on Monday to include the citizens of the capital in raising awareness on air pollution.

16. In article by Sandipan Talukdar titled '**Air Pollution May Account for 15% of COVID-19 Deaths Worldwide**, Says New Study', News Click, 28 October 2020, similar observations have been made.

It is stated that Prof. Jos Lelieveld of Max Planck Institute of Chemistry, Mainz, Germany, and a corresponding author of the study said "Since the numbers of deaths from COVID-19 are increasing all the time, it's not possible to give exact or final numbers of COVID-19 deaths per country that can be attributed to air pollution. However, as an example, in the UK there have been over 44,000 coronavirus deaths and we estimate that the fraction attributable to air pollution is 14%, meaning that more than 6,100 deaths could be attributed to air pollution. In the USA, more than 220,000 COVID deaths with a fraction of 18% yields about 40,000 deaths attributable to air pollution."

On the mechanism of how PM_{2.5} can aggravate the respiratory disease, Prof. Thomas Munzel of Gutenberg University, Germany, said "When people inhale polluted air, the very small polluting particles, the PM_{2.5}, migrate from the lungs to the blood and blood vessels, causing inflammation and severe oxidative stress, which is an imbalance between free radicals and oxidants in the body that normally repair damage to cells. This causes damage to the inner lining of arteries, the endothelium, and leads to the narrowing and stiffening of the arteries. The COVID-19 virus also enters the body

via the lungs, causing similar damage to blood vessels, and it is now considered to be an endothelial disease.”

“If both long-term exposure to air pollution and infection with the COVID-19 virus come together then we have an additive adverse effect on health, particularly with respect to the heart and blood vessels, which leads to greater vulnerability and less resilience to COVID-19. If you already have heart disease, then air pollution and coronavirus infection will cause trouble that can lead to heart attacks, heart failure and stroke,” he further added. **The study also shows a country wide estimation of COVID-19 deaths attributable to long term air pollution exposure. According to it, Czech Republic has a share of 29%, China 26%, Germany 22%, Italy 15% and so on. New Zealand has a very low share of 1%.**

Extending this analogy to Indian conditions, it is possible to infer that deaths attributable to pollution in India may not be less than 15%.

17. In CPCB ‘Report on Ambient Noise Levels & Ambient Air Quality during Deepawali Festival 2018 & 2019’, it has been found that there was increase in PM₁₀ and PM_{2.5}. The report mentions City-wise increase/decrease in PM₁₀ and PM_{2.5} on Deepawali day in Table 2 as follows:

“Table - 2

Table 2: City-wise increase in PM₁₀ and PM_{2.5} on Deepawali day compared to Pre-Deepawali Period (in%)							
	Agra	Delhi	Kolkata	Bengaluru	Bhopal	Lucknow	Vadodara
PM ₁₀	33	247	112	83	59	107	-9.0
PM _{2.5}	68	592	137	218	57	113	64

City-wise summary of 15 days’ data of prescribed elements in PM_{2.5} for pre-Deepawali period, Deepawali day and Post Deepawali period is presented in Table 3 as follows:

“Table - 3

	Agra			Bhopal			Bengaluru			Delhi		
	Al	Ba	Fe	Al	Ba	Fe	Al	Ba	Fe	Al	Ba	Fe
Pre Deepawali	0.97	0.05	0.93	0.55	0.03	0.53	0.02	0.01	1.13	1.30	0.27	0.59
Deepawali	14.45	8.67	0.81	9.16	6.04	0.40	4.17	2.63	0.25	32.87	18.77	1.12
Post Deepawali	3.38	1.55	0.82	1.09	0.42	0.47	0.97	0.49	0.24	2.66	0.86	0.51
	Kolkata			Lucknow			Vadodara					
	Al	Ba	Fe	Al	Ba	Fe	Al	Ba	Fe			
Pre Deepawali	1.05	0.52	0.67	0.85	0.23	0.44	0.53	0.15	0.41			
Deepawali	19.44	20.03	0.53	23.63	15.08	0.81	2.63	1.60	0.20			
Post Deepawali	4.03	3.21	0.84	4.60	2.60	0.54	0.62	0.42	0.25			

Note: (a) All values are in ug/m³ in PM_{2.5}(b) Short Term Critical Ambient Air Quality Critical Values (CAAQVs) are : Al – 40 ug/m³; Ba – 0.4 ug/m³ and Fe – 40.0 ug/m³ (All these are given for 24 hourly averages)

From the above Table it is evident that Aluminum and Iron in PM_{2.5} fraction are well within the prescribed short term AAQCVs in all cities, however, the main violation occurred in Barium. Barium exceeded AAQCVs (4.0 ug/m³) in Delhi, Kolkata, Agra, Bhopal and Lucknow. This year with the promotion of Green Cracker and new formulation crackers in Barium concentration was not expected.”

Comparative Concentration of PM_{2.5} & PM₁₀ (Based on Real time data) During Deepawali days (2016, 2017, 2018 & 2019) is as follows:

“Table-5

Year/Day	2016			2017			2018			2019		
	DATE	PM _{2.5}	PM ₁₀	DATE	PM _{2.5}	PM ₁₀	DATE	PM _{2.5}	PM ₁₀	DATE	PM _{2.5}	PM ₁₀
7 Day Before Deepawali	23-Oct	165	399	12-Oct	157	356	31-Oct	237	430	20-Oct	102	208
6 Day Before Deepawali	24-Oct	130	380	13-Oct	150	353	1-Nov	225	403	21-Oct	114	232
5 Day Before Deepawali	25-Oct	110	304	14-Oct	154	312	2-Nov	188	355	22-Oct	98	231
4 Day Before Deepawali	26-Oct	191	411	15-Oct	160	369	3-Nov	129	254	23-Oct	137	305
3 Day Before Deepawali	27-Oct	212	507	16-Oct	163	394	4-Nov	192	293	24-Oct	165	326
2 Day Before Deepawali	28-Oct	216	491	17-Oct	159	361	5-Nov	313	454	25-Oct	133	289

1 Day Before Deepawali	29-Oct	349	600	18-Oct	198	414	6-Nov	149	290	26-Oct	173	315
Deepawali day	30-Oct	445	862	19-Oct	344	445	7-Nov	324	432	27-Oct	284	391
1 Day after Deepawali	31-Oct	259	766	20-Oct	325	628	8-Nov	371	532	28-Oct	247	386
2 Day after Deepawali	1-Nov	197	674	21-Oct	225	520	9-Nov	267	411	29-Oct	286	455
3 Day after Deepawali	2-Nov	354	945	22-Oct	168	373	10-Nov	301	477	30-Oct	269	446
4 Day after Deepawali	3-Nov	261	716	23-Oct	188	434	11-Nov	246	433	31-Oct	361	560
5 Day after Deepawali	4-Nov	272	632	24-Oct	200	426	12-Nov	264	466	1-Nov	319	511
6 Day after Deepawali	5-Nov	421	1031	25-Oct	197	466	13-Nov	233	393	2-Nov	434	592
7 Day after Deepawali	6-Nov	424	1231	26-Oct	181	435	14-Nov	112	196	3-Nov	486	557

18. Conclusion in the report is as follows:

“Conclusion:

- 1) **On Deepwali day PM_{2.5} concentrations were found to be 5.0 to 6.0 times higher than pre-Deepawali average levels across various cities. Maximum increase was observed in Delhi (6.0 times) followed by Bengaluru (2.2 times), Kolkata (1.4 times) and Lucknow (1.1 times). Bhopal recorded minimum increase in PM_{2.5}.**
- 2) SO₂ was found within prescribed NAAQS (80 ug/m³) limits durin the entire monitoring period including 27th October, 2019 (Deepawali day).
- 3) Similarly, NO₂ was also found to be within prescribed NAAQS limit in all the cities during monitoring period.
- 4) **During post Deepawali period PM₁₀ concentration was reduced by 14-42% in different cities compared to Deepawali day level. Agra has 7% increase in PM₁₀ during post Deepawali period. Maximum reduction was observed in Vadodara (42.5%) and minimum at Lucknow (14%). In Delhi PM₁₀ was reduced by 27% in post Deepawali period compared to Deepawali peak.**
- 5) PM_{2.5} levels during post Deepawali declined by 11-62% in comparison with Deepawali day in different cities. Highest decrease was found in Vadodara (62%) and lowest in Lucknow (11%). In Delhi, PM_{2.5} concentration was decreased by 15% during post Deepawali compared to Deepawali day concentration. Agra recorded little increase in PM_{2.5} during post Deepawali. The reduction in particulates during post Deepawali also indicate that the prevailing meteorology is governing the scenario and in Indo Gangetic plain the particulates remained in suspension for more duration this year. Vadodara got heat by cyclonic depression and the PM

concentrations reduced substantially due to high wind speed and rain.

- 6) **Barium exceeded AAQCVs (4.0 ug/m³) in Delhi, Kolkata, Agra, Bhopal and Lucknow. This year with the promotion of Green Cracker and new formulation crackers increase in Barium concentration was not expected.**
- 7) *The concentration of Iron in PM_{2.5} was found well within the AAQCVs (40 ug/m³) in all the cities monitored by CPCB.*
- 8) *Aluminium levels were also found within AAQCVs (40 ug/m³).*
- 9) **In Delhi Barium in PM_{2.5} got reduced by about three times this year on Deepawali day. It is also pertinent to mention that with the introduction of Green Cracker and banning of Barium in fireworks as directed by Hon'ble Supreme Court, Barium concentration was not supposed to be elevated from pre-Deepawali level in Deepawali day."**

19. In 'State of Global Air 2020' report released by the Health Effects Institute and the Institute for Health Metrics and Evaluation's Global Burden of Disease Project, it is stated that:

*"Extensive evidence links exposure to air pollution with higher rates of respiratory and cardiovascular diseases including lower-respiratory infections. **Could air pollution also increase a person's risk of developing a COVID-19 respiratory infection or suffering its most severe complications?***

There is reason to believe it could SARS-CoV-2, the corona virus that causes COVID-19, is a respiratory virus that can affect the lungs, blood vessels, and many other parts of the body. Exposure to air pollution has been shown to affect the body's immune defense, making an individual more susceptible to respiratory and other infections. In addition, many of the health conditions that have been associated with increased vulnerability to COVID-19-such as diabetes, cardiovascular disease, and chronic obstructive lung diseases-are also caused by long-term exposure to air pollution.

What we learned from the SARS-CoV-1 outbreak in 2002-2004 offers some insight into the interaction between air pollution and the effects of COVID-19. Several studies reported an association between higher air pollution concentrations and higher than expected death rates from SARS-CoV-1 handful of early studies of COVID-19 appear to suggest that areas with higher air pollution concentrations-PM_{2.5} or NO₂ in particular-might similarly experience either higher infection rates or higher case fatality rates. Investigators around the world are hard at work trying to understand fully the linkages between COVID-19 and air pollution, and how exposure to air pollution might affect rates of COVID-19 infection, the severity of disease, or the likelihood of dying."

20. It has been concluded that:

“Air pollution – comprising ambient PM_{2.5} ozone and household air pollution is an increasingly important risk factor contributing to death and disability worldwide. In 2019, air pollution ranked 4th among major mortality risk factors globally, accounting for nearly 6.75 million early deaths and 213 million years of healthy life lost. Ambient PM_{2.5} accounted for 4.14 million deaths (118 million years of healthy life lost); household air pollution accounted for 2.31 million deaths 365,000 early deaths (6.21 million years of healthy life lost). Taken together these forms of air pollution accounted for more than 1 in 9 deaths worldwide in 2019.”

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“Does Air Quality Affect COVID-19 Susceptibility?”

The health effects of long-term exposure to air pollution have likely made some people more vulnerable to COVID-19. Here’s what we know about the possible connections so far:

- **Long-term exposure to air pollution can cause many of the health conditions associated with increased vulnerability to COVID-19, such as diabetes, cardiovascular disease, and chronic obstructive lung diseases.**
- **Exposure to air pollution has been shown to affect the body’s immune defense, increasing susceptibility to respiratory and other infections.**
- **Studies of the SARS-CoV-1 outbreak in 2002-2004 reported as association between higher air pollution levels and higher than expected death rates for that disease.**
- **A few early studies of COVID-19 similarly appear to suggest that areas with higher air pollution levels experience higher rates of infection or of case fatalities.**

Further Submissions of the amicus

21. Shri Panjwani submitted that Covid-19 issue has not been factored in when the Hon’ble Supreme Court permitted limited use of green crackers. In any case, even green crackers only partly reduce pollution. With Covid-19, even reduced pollution becomes hazardous. What may be permitted in normal time can also not be permitted during Covid-19. That is the reason for the ban by the States which was never considered without Covid. The States have gone by expert advice in doing so. There is enough material indicting nexus between the pollution and the Covid and that the increased pollution will increase Covid impact by reducing immunity level rendering citizens susceptible to more diseases which

may affect lungs, heart and cause cancer. With co-morbidities Covid impact may be higher in NCR and other areas where air quality is not satisfactory. Air quality in Delhi in November is around 400 as per Air Quality Index (AQI) and every feasible step is required to be taken to reduce air pollution and prevent increase thereof.

It is further pointed out that the Hon'ble Supreme Court stipulated community celebrations involving bursting of crackers which is not permissible during Covid pandemic.

It is further submitted that even if conclusive scientific evidence is not available, Precautionary principle need to be invoked, as per law laid down by the Hon'ble Supreme Court in the orders referred to in the order dated 2.11.2020.

Media Reports Referred

22. Following media reports have also been referred to by learned Amicus:

- i. *'Coronavirus: Delhi health minister blames pollution, winters, festive season for rise in cases', Scroll.in, 31 October 2020¹¹*
- ii. *Abantika Ghosh, 'Covid virus found on pollution particles, masks & social distancing a must, say govt experts', ThePrint, 27 October 2020.¹²*
- iii. *Durgesh Nandan Jha, 'From Record 5.9k Last Fri, City Cases Soar To 6,725', The Times of India, 4 November 2020¹³.*

The above media reports refer to the nexus between air pollution and deaths and diseases particularly during winter and festive season with reference to the statements of the Delhi Health Minister and the Union Health Minister in support of the said statement. **There is further**

¹¹ <https://scroll.in/latest/977303/coronavirus-delhi-health-minister-blames-pollution-winters-festive-season-for-rise-in-cases>

¹² <https://theprint.in/health/covid-virus-found-on-pollution-particles-masks-social-distancing-a-must-say-govt-experts/531981/>

¹³ <https://timesofindia.indiatimes.com/city/delhi/Covid-19-From-record-5900-last-Friday-Delhi-cases-soar-to-6725/articleshow/79031687.cms>

reference to apprehended increase of Covid cases on account of air increased pollution.

The news item in 'Times of India' dated 04.11.2020 mentions that Delhi recorded 6,725 new cases of Covid-19 – its highest single-day tally – on Tuesday, taking the total number of cases to over 4,00,000 even as hospitals struggled to accommodate the critically ill patients due to paucity of ICU beds. This is leading to increased demand for the hospital beds and increased mortality figures. The increasing trend is clearly attributable to the deteriorating air pollution level.

Other Media reports and Global Trends

23. Apart from the media reports relied upon by the learned Amicus, there are other media reports to which reference may be made as follows:

- a) *ASRP Mukesh, 'Ban firecrackers or prepare for Covid disaster, warn docs' Times of India, 30 October, 2020.*¹⁴
- b) *Science, 'Smoky firecrackers can spread coronavirus faster: Experts, Deccan Chronical, 4 November, 2020.*¹⁵
- c) *Cole Sullivan, 'COVID cancellations hit fireworks display companies hard' 10 News, 11.06.2020.*¹⁶
- d) *'BEFORE BURNING CRACKERS LOOK AT US AND BE CONSIDERATE, SYMPATHETIC AND HUMANE' URGES COVID RECOVERED PATIENTS "DEEPAVALI DOES NOT MEAN BURNING CRACKERS FOR ENJOYMENT"- BISWAJIT MUKHERJEE 07.11.2020, PIB Kolkata.*¹⁷
- e) *'After falling for 7 weeks, Covid-19 cases in India rise', Times of India, 09.11.2020.*¹⁸
- f) *Stephanie Pagones, 'Coronavirus-prompted July 4th cancellations leave fireworks display companies 'on life support', FOX Business, 02.07.2020.*¹⁹

¹⁴ <https://timesofindia.indiatimes.com/city/ranchi/ban-firecrackers-or-prepare-for-covid-disaster-warn-docs/articleshow/78941525.cms>

¹⁵ <https://www.deccanchronicle.com/nation/in-other-news/031120/smoky-firecrackers-can-spread-coronavirus-faster-experts.html>

¹⁶ <https://www.wbir.com/article/news/health/coronavirus/covid-cancellations-hit-fireworks-display-companies-hard/51-f16191a3-fdbb-44a3-8447-de4454d761b5>

¹⁷ <https://pib.gov.in/PressReleasePage.aspx?PRID=1671145>

¹⁸ <https://timesofindia.indiatimes.com/india/after-falling-for-7-weeks-covid-19-cases-in-india-rise-again/articleshow/79119707.cms>

- g) Joanna York, 'What will France's July 14 celebrations look like this year? Celebrations will still take place in France on 14 July this year, but with some differences due to the Covid-19 crisis, the Connexion, 06.11.2020.²⁰
- h) Tim Baker, 'Coronavirus: London's New Year's Eve fireworks cancelled due to pandemic', Sky News, 18.09.2020.²¹
- i) Wong Shiyong, 'No fireworks display at Marina Bay New Year's Eve countdown this year', the Straits Times, 05.11.2020.²²

As per (a), there is a statement by Jharkhand chapter of Indian Medical Association (IMA) that smoke from firecrackers during Diwali can turn out to be fatal for Covid-19 patients. The report particularly mentions the names of the State President Dr. A.K. Singh and Dr. Pradeep Bhattacharjee. It is also further mentioned that winter dry air can aggravate breathing difficulties, especially among those suffering from lung ailments. Smoke from crackers can turn out to be recipe for disaster. Pollutants released will remain suspended in cool air for a long duration.

The reports (b) & (e) show discussion that ban on fire crackers is imperative to prevent harm on account of Covid-19 which will be aggravated by use of fire crackers.

The media reports from (f) to (i) show that having regard to the Covid situation, fireworks display was cancelled in several other countries.

24. As per the data of CPCB, Delhi witnesses a typical air pollution locking mechanism in which the level PM₁₀ and PM_{2.5} and the mixing heights varies seasonally. The table given below for 2019 clearly indicates

¹⁹ <https://www.foxbusiness.com/lifestyle/fireworks-displays-july-4-coronavirus>

²⁰ <https://www.connexionfrance.com/French-news/What-will-France-s-July-14-celebrations-look-like-this-year>

²¹ <https://news.sky.com/story/coronavirus-londons-new-years-eve-fireworks-cancelled-due-to-pandemic-12074859>

²² https://www.straitstimes.com/singapore/no-fireworks-display-at-marina-bay-countdown-this-year?utm_medium=Social&utm_campaign=STFB&utm_source=Facebook&fbclid=IwAR1_4Gj7dYzCq-8BNdxiy1GLEgGgvC3hPTgdOsd-wa-TUyGNED4k3JpQi-o#Echobox=1604550165

that with the onset of winter i.e. October and November, the levels of PM₁₀ and PM_{2.5} tends to increase and mixing heights goes down and this create favorable condition for increasing pollution in Delhi.

PM Concentration (CAAQMs) & Mixing Height, Delhi (Monthly Average: Year 2019)

Parameter→/Month↓	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	Mixing Height (m)
January	203	322	413
February	122	215	385
March	83	184	500
April	83	236	602
May	89	247	811
June	63	209	817
July	47	143	729
August	35	85	651
September	40	98	758
October	128	247	622
November	202	312	501
December	209	316	433
Annual Average	109	218	-

Hon’ble Supreme Court order issuing contempt notice against manufacturers of crackers for using prohibited chemicals in violation of Supreme Court order

25. A copy of order of the Hon’ble Supreme Court dated 03.03.2020 in *Writ Petition No. 728/2015, Arjun Gopal (supra)* has also been filed by learned Amicus alleging violation of order of the Hon’ble Supreme Court on the subject by the manufacturers. It was alleged that same chemicals were used by the manufacturers which were prohibited and the products were not being labeled as required under the order of the Hon’ble Supreme Court dated 10.02.2017. The Hon’ble Supreme Court issued

notice to the manufacturers for contempt and directed the CBI to investigate the allegation.

VI. Respondents' contentions in reply to Amicus Submissions

26. Shri Mahesh Jethmalani, appearing for the Firework Manufacturer's Association fairly stated that health of the citizens is of paramount importance but if use of new formulations ensures that there is no addition of pollution or if it is scientifically proved that pollution does not impact Covid, the drastic direction of regulating and restricting use of firecrackers may not be called for. Learned Counsel for the Firework Manufacturer's Association in I.A. Nos. 372/2020 and 373/2020 submitted that if the sale use of Indian crackers is to be restricted, the Chinese crackers from the pay market may be used clandestinely. Further, there will be financial loss and loss of employment to lacs of workers.

27. Learned counsel for the MoEF&CC stated that the Ministry is considering undertaking of a study on the subject to remedy the situation and may take further action only thereafter. Learned counsel for the CPCB stated that according to the study of the CPCB referred to above, the level of air pollution may go up by six times during Diwali and though a study was entrusted to the Maulana Azad Medical Institute about the health impact, further study for next five years is proposed to be conducted. Learned Counsel for the DPCC stated that vide order dated 29.10.2020, the DPCC has allowed only green crackers but the matter is to be further considered. As already mentioned, DPCC has now banned sale and use of crackers on 6.11.2020. Shri Mishra on behalf of the State of UP submitted that under an ordinance, Air Quality

Monitoring Commission has been set up in pursuance of the proceedings before the Hon'ble Supreme Court in *WP 13029/1985, M.C. Mehta v. Union of India & Ors.* and the matter can be left to the said Commission. Learned counsel for the State of Assam stated even in some of the non-attainment cities in Assam, the air quality may not be satisfactory but at best it is moderate and the restriction, if any, should apply if the air quality is beyond moderate i.e. 'poor', 'very poor', 'severe' or 'severe plus'. Learned counsel for the State of West Bengal stated that the Chief Secretary has already made an appeal against use of firecrackers and further measures are also proposed on the subject. As noted earlier, the Calcutta High Court has banned use of fire crackers, after hearing before the Tribunal. Contentions in the response of the State of Tamil Nadu are identical to the contentions of the firework manufactures. Contentions of the State of Punjab have already been noted above. Factually, it is stated that the air quality is moderate and that green crackers are permitted for limited period as directions of the Hon'ble Supreme Court, applicable to NCR.

VII. Consideration and Analysis

28. We have considered the rival submissions and the studies referred to above. The orders of the Hon'ble Supreme Court on the subject have been referred to in the order dated 02.11.2020, reproduced in the earlier part of this order. As regards setting of Air Quality Monitoring Commission, such setting up is not shown to affect the jurisdiction of this Tribunal. The matter before the Hon'ble Supreme Court is not shown to involve the impact of Covid-19, which makes it necessary for the Tribunal to proceed further. The order of Calcutta High Court and of Governments of Odisha, Rajasthan, Sikkim, UT Chandigarh and DPCC

are in the wake of Covid-19 and are relevant for consideration by this Tribunal in the present context.

29. Financial loss or loss of employment cannot be a consideration not to remedy the situation affecting lives and health of the citizens by pollution, aggravated by Covid. While it is true that any restriction on sale and use of crackers may affect the business and employment, at the same time if use of crackers results in pollution and affects life and health of the citizens and the environment, such use may have to be restricted/prohibited to effectuate the 'Sustainable Development' principle of which 'Precautionary' principle is a part, as per mandate of Section 20 read with Section 15 of the National Green Tribunal Act, 2010. Citizens are entitled to breathe fresh air which right cannot be defeated on the ground that enforcement of such right will lead to closing of such business activity. If authorities, do not take action, the Tribunal has to exercise its jurisdiction.

30. The matter is no longer *res integra*. As rightly pointed out by learned Amicus and not even disputed by learned senior advocate Shri Jethmalani, right of trade is not absolute and is to be subject to the 'Sustainable Development' principle, which is part of right to life. In emergency situation, emergency measures may be required in the interest of life and health of the citizens.

Relevant Supreme Court Directions and Observations

31. The Hon'ble Supreme Court, vide order dated 11.11.2016²³, after noting the air quality standard in Delhi and potential of diseases, directed suspension of all licenses for sale of fireworks in NCR. It will be appropriate to refer to the relevant observation:

²³ (2017) 1 SCC 412

“4. The onset of winter and the festival/marriage season this year, presented to the residents of NCR severe concerns regarding the air quality standards. According to reports, the air quality standards in early November of this year were the worst in the world. **It is reported that the PM_{2.5} levels recorded were “beyond scale” values (see India's Air Quality Among World's Worst Over Diwali Weekend: Report. 4-11-2016, Hindustan Times).** The report indicates that 24-hour average of PM_{2.5} levels in South Delhi in 2016 were 38% higher than on the Diwali night of 2015. The day after Diwali, these levels were twice as high as the day after Diwali in 2015, crossing 650 µg/m³, which is 26 times above the WHO's standards or levels considered safe. Shockingly, on the morning of 1-11-2016, Delhi woke up to an average PM_{2.5} level of over 700 µg/m³ — some of the highest levels recorded the world over and 29 times above WHO standards. The report further states that the WHO guideline for 24-hour average PM_{2.5} levels is 25 µg/m³ and with an annual average PM_{2.5} level of 122 µg/m³, Delhi's air is the worst among global megacities with dense populations. We have particularly referred to the PM_{2.5} levels because of the extreme effects and near invisibility of this type of particulate matter. PM_{2.5} or particulate matter 2.5 (PM_{2.5}), refers to tiny particles or droplets in the air that are two-and-one-half microns or less in width. It may be noted that the widths of the larger particles in the PM_{2.5} size range would be about thirty times smaller than that of a human hair. These particles primarily emanate from vehicle exhausts and other operations that involve the burning of fuels such as wood, heating oil or coal, and of course, use of fire crackers.

5. In India, air quality standards are measured in terms of the Air Quality Index (hereinafter “AQI”). The AQI was launched in India on 17-10-2014 by the Ministry of Environment and Forests. According to the press release of the Press information Bureau of the same date, it consists of a comprehensive set of parameters to monitor and assess the air quality. The AQI considers eight pollutants (PM₁₀, PM_{2.5}, NO₂, SO₂, CO, O₃, NH₃, and Pb), and based on the levels of these pollutants six categories of AQI ranging from “Good” to “Severe” have been prescribed. The index also suggests the health effects of the pollution categorywise. The gradation of AQI and its health impact is extracted below:

Table 1

AQI	Associated Health Impacts
Good (0-50)	Minimal impact.
Satisfactory (51-100)	May cause minor breathing discomfort to sensitive people.
Moderately polluted (101-200)	May cause breathing discomfort to people with lung disease such as asthma, and discomfort to people with heart disease, children and older adults.
Poor (201-300)	May cause breathing discomfort to people on prolonged exposure, and discomfort to people with heart disease.
Very Poor (301-400)	May cause respiratory illness to the people on prolonged exposure. Effect may be more pronounced in people with lung and heart diseases.

<i>Severe May (401-500)</i>	<i>May cause respiratory impact even on healthy people, and serious health impacts on people with lung/heart disease. The health impacts may be experienced even during light physical activity.</i>
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Table 2

AQI Category, Pollutants and Health Breakpoints								
AQI category (Range)	PM ₁₀ 24-hr	PM _{2.5} 24-hr	NO ₂ 24-hr	O ₃ 8-hr	CO 8-hr (mg/m ³)	SO ₂ 24-hr	NH ₃ 24-hr	Pb 24-hr
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200	0-0.5
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400	0.5-1.0
Moderately polluted (101-200)	101-250	61-90	81-180	101-168	2.1-10	81-380	401-800	1.1-2.0
Poor (201-300)	251-350	91-120	181-280	169-208	10-17	381-800	801-1200	2.1-3.0
Very poor (301-400)	351-430	121-250	281-400	209-748*	17-34	801-1600	1200-1800	3.1-3.5
Severe (401-500)	430+	250+	400+	748+*	34+	1600+	1800+	3.5+

6. Reports indicate that AQI in Delhi was much above the severe standard, shooting off the AQI 500 mark on many days this November. On the day after Diwali, it was more than 14 times the safe limits (see *Delhi's Pollution Levels Peaks at 14-16 Times Safe Limits, 31-10-2016, The Hindu*). The adverse health effects of these hazardous levels of pollution are only too evident from the table given above. We do not intend to refer to the multiplicity of reports and data on this front.

7. The hazardous levels of air pollution in the last few weeks has spared very few from its ill effects. The life of the citizens of NCR was brought to a virtual standstill, not to speak about the plight of the thousands of mute flora and fauna in NCR. Schools were declared shut, denizens of the city advised to stay indoors, construction activities stopped, power stations shut and ban imposed on burning of garbage and agricultural waste. The fall in air quality has had a significant impact on people's lifestyle as well. The rising costs to protect against air pollution are substantial. It has come to our notice that people are queuing up to purchase protective masks and air purification systems in the wake of dense smog all over the NCR. In short, the capital was “smogged” into an environmental emergency of unseen proportions.

8. The adverse effects of these extreme levels of air pollution spare no one — the young, the old, the infirm and even the future generations. A study of the data of the Global Health Depository of the World Health Organisation reveals that India has the world's highest death rate from chronic respiratory diseases and that about 1.5 million people in India die annually due to indoor and outdoor pollution (see *Delhi Wakes up to an Air Pollution Problem it cannot Ignore, 15-2-2015, The New York Times*). The Kolkata-based Chittaranjan National Cancer Institute (CNCI), in a study commissioned and handed over to the Central Pollution Control Board, found that key indicators of respiratory health, lung function to palpitation, vision to blood pressure, of children in Delhi, between four and 17 years of age,

were worse off than their counterparts elsewhere. It also found that more than 40% of the school children suffer from lung damage (see Landmark Study Lies Buried, 2-4-2015, The Indian Express). We note with apprehension that there are nascent studies that suggest that pollution can lower children's IQ, hurt their test scores and increase the risks of autism, epilepsy, diabetes and even adult-onset diseases like multiple sclerosis (see Holding Your Breath in India, 29-5-2015, The New York Times).

9. It has been brought to our notice that the severe air pollution in the NCR is leading to multiple diseases and other health related issues amongst the people. It is said that the increase in respiratory diseases like asthma, lung cancer, bronchitis, etc. is primarily attributable to the worsening air quality in the NCR. The damage being caused to people's lungs is said to be irreversible. Other health related issues like allergies, temporary deafness are also on the rise. Various experts have pointed towards multiple adverse effects of air pollution on human health like premature deaths, rise in mortality rates, palpitation, loss of vision, arthritis, heart ailments, cancer, etc.

*10. When we refer to these extreme effects, we are not merely referring to the inconvenience caused to people, but to abject deprivation of a range of constitutionally embedded rights that the residents of NCR ought to have enjoyed. Needless to state, the grim situation of air quality adversely affected the right to education, work, health and ultimately, the right to life of the citizens, and this Court is constitutionally bound to address their grave concerns. May we remind ourselves, that this is not the first time that this Court was impelled into ensuring clean air for the citizens of the capital region (see *M.C. Mehta v. Union of India* [*M.C. Mehta v. Union of India*, (1998) 6 SCC 60] · [*M.C. Mehta v. Union of India*, (1998) 9 SCC 589] , *M.C. Mehta v. Union of India* [*M.C. Mehta v. Union of India*, (1998) 8 SCC 648] and *M.C. Mehta v. Union of India* [*M.C. Mehta v. Union of India*, (1998) 8 SCC 206]).”*

32. After the above discussion, the Hon'ble Supreme Court directed suspension of all licenses permitting sale of fireworks within the territory of NCR. The direction was subsequently modified by orders dated 12.09.2017²⁴ and 23.10.2018²⁵ to the extent that only green crackers were permitted for two hours on Diwali or other festivals, subject to conditions laid down therein. Even in the said orders, it was observed that health of the people had to take precedence over the commercial interest and **instead of straightaway prohibiting crackers, there has**

²⁴ (2017) 16 SCC 280

²⁵ (2019) 13 SCC 523

be graded regulation, resulting in prohibition. It was also observed that even when there are several sources of pollution, there is no bar to a particular polluting activity being prohibited as there could be no right of parity amongst the polluters. The 'Precautionary' principle was held to be applicable even without a scientific study. Directions in order dated 23.10.2018, reported in *Arjun Gopal v UOI*, (2019) 13 Scc 523 are:

“48. We are of the opinion that the aforesaid suggestions strike a nice balance between the two competing interests. We accept the aforesaid measures as suggested by the Union of India and direct the Union of India and other authorities concerned to implement the same with immediate effect. In view thereof, the following specific directions are issued:

48.1. The crackers with reduced emission (improved crackers) and green crackers, as mentioned in Suggestions II and III above only would be permitted to be manufactured and sold.

48.2. As a consequence, production and sale of crackers other than those mentioned in Suggestions II and III is hereby banned.

48.3. The manufacture, sale and use of joined firecrackers (series crackers or laris) is hereby banned as the same causes huge air, noise and solid waste problems.

48.4. The sale shall only be through licensed traders and it shall be ensured that these licensed traders are selling those firecrackers which are permitted by this order.

48.5. No e-commerce websites, including Flipkart, Amazon, etc., shall accept any online orders and effect online sales. Any such e-commerce companies found selling crackers online will be hauled up for contempt of court and the Court may also pass, in that eventuality, orders of monetary penalties as well.

48.6. Barium salts in the fireworks is also hereby banned.

48.7. PESO is directed to review the clinical composition of fireworks, particularly reducing Aluminium content, and shall submit its report in respect thereof within a period of two weeks from today. For undertaking this exercise, PESO would also associate FRDC.

48.8. Even those crackers which have already been produced and they do not fulfil the conditions mentioned in Suggestions II and III above will not be allowed to be sold in Delhi and NCR.

48.9. PESO will ensure fireworks with permitted chemicals only to be purchased/possessed/sold/used during Diwali and all other religious festivals, of any religion whatsoever, and other occasions like marriages, etc. It shall test and check for the presence of banned chemicals like lithium/arsenic/antimony/lead/mercury.

48.10. PESO will ensure suspension of the licences of manufacturers of such fireworks items and appropriate disposal of such stock.

48.11. PESO will ensure that only those crackers whose decibel (sound) level are within the limits are allowed in the market and will ensure to take action by suspending the licences of the manufacturers on such violations and disposal of such lots. To add to it, as mentioned in the order dated 12-9-2017, the directions

issued and restrictions imposed in the order passed by this Court on 18-7-2005 in Noise Pollution shall continue to be in force.

48.12. Directions 4 to 9 and 11 contained in the order dated 12-9-2017⁵ shall continue to operate and are reiterated again.

48.13. Extensive public awareness campaigns shall be taken up by the Central Government/State Governments/Schools/Colleges informing the public about the harmful effects of firecrackers.

48.14. On Diwali days or on any other festivals like Gurupurab, etc., when such fireworks generally take place, it would strictly be from 8.00 p.m. till 10.00 p.m. only. On Christmas eve and New Year's eve, when such fireworks start around midnight i.e. 12.00 a.m., it would be from 11.55 p.m. till 12.30 a.m. only.

48.15. The Union of India, Government of NCT of Delhi and the State Governments of NCR would permit community firecracking only (for Diwali and other festivals, etc. as mentioned above), wherever it can be done. For this purpose, particular area/fields would be pre-identified and pre-designated by the authorities concerned. This exercise shall be completed within a period of one week from today so that the public at large is informed about the designated places one week before Diwali. The areas designated now for the purpose of Diwali shall be valid for community firecracking on other occasions/festivals as well, as mentioned above. Even for marriages and other occasions, sale of improved crackers and green crackers is only permitted. Insofar as other States are concerned, an endeavour shall be made by them also to explore the feasibility of community firecracking. However, it is made clear that Direction 48.14 pertaining to the duration within which fireworks can take place on all such occasions would be applicable throughout India. Similarly, Direction 48.13 for extensive public awareness campaigns is also a pan India direction.

48.16. All the official respondents, and particularly the police, shall ensure that fireworks take place only during the designated time and at designated places, as mentioned above. They shall also ensure that there is no sale of banned firecrackers. In case any violation is found, the Station House Officer (SHO) of the police station of the area concerned shall be held personally liable for such violation and this would amount to committing contempt of the Court, for which such SHO(s) would be proceeded against.

48.17. CPCB and respective State Pollution Control Boards/Pollution Control Committees (SPCBs/PCCs) of the States and Union Territories shall carry out short-term monitoring in their cities for 14 days (commencing from 7 days prior to Diwali and ending 7 days after Diwali) for the parameters namely, aluminium, barium, iron apart from the regulatory parameters against the short-term Ambient Air Quality Criteria Values (AAQCVs) proposed by CPCB with regard to bursting of firecrackers. This will help in generation of data on pollution caused by the bursting of firecrackers and would be helpful for regulation and control quantity of aluminium, barium and iron used in the manufacture of firecrackers.

49. One clarification needs to be given at this stage. Our discussion pertaining to the arguments based on Article 19(1)(g), Article 25 as well as the argument of loss of substantial revenue and unemployment, in cases the manufacture and sale of the firecrackers is totally banned, is prima facie and we have not given our conclusive determination. It is because of want of detailed studies on various aspects which have been mentioned and taken

note of during discussion in this order. However, we also make it clear that, *prima facie*, we do not find much merit in these arguments for which we have given our reasons in brief.

50. Having regard to the overall circumstances, we have decided that, for the time being, a balanced approach to tackle this problem is needed, which may take care of the concerns of both the parties and, at the same time, provide a reasonable and adequate solution. When the picture would become clearer after the requisite studies/research is undertaken, more stringent measures can be adopted in future if the situation so warrants.”

33. In *Arjun Gopal (supra)*²⁶, the scope of precautionary principle, even in absence of scientific certainty, was considered, apart from the contention of economic considerations, as bar to remedy pollution. It was observed that it was desirable to err on safe side to enforce right of pollution free environment even in absence of scientific study and right to safe environment is not controlled by economic considerations. The relevant observations from the judgment are:

“37 The aforesaid findings are sufficient to negate the arguments of the opposite side that there is absence of scientific study about the adverse effect of firecrackers during Diwali. In environmental law, “precautionary principle” is one of the well-recognised principles which is followed to save the environment. It is rightly argued by the petitioners that this principle does not need exact studies/material. The very word “precautionary” indicates that such a measure is taken by way of precaution which can be resorted to even in the absence of definite studies. In Vellore Citizens' Welfare Forum [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647], this Court explained the principle in the following manner: (SCC pp. 658 & 660, paras 11 & 14-16)

“11. Some of the salient principles of “Sustainable Development”, as culled out from Brundtland Report and other international documents, are Inter-Generational Equity, Use and Conservation of Natural Resources, Environmental Protection, the Precautionary Principle, Polluter Pays Principle, Obligation to Assist and Cooperate, Eradication of Poverty and Financial Assistance to the developing countries. We are, however, of the view that “the precautionary principle” and “the polluter pays principle” are essential features of “Sustainable Development”. The “precautionary principle” — in the context of the municipal law — means:

(i) Environmental measures — by the State Government and the statutory authorities — must anticipate, prevent and attack the causes of environmental degradation.

²⁶ (2019) 13 SCC 523

(ii) Where there are threats of serious and irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

(iii) The “onus of proof” is on the actor or the developer/industrialist to show that his action is environmentally benign.

14. In view of the abovementioned constitutional and statutory provisions we have no hesitation in holding that the precautionary principle and the polluter pays principle are part of the environmental law of the country.

15. Even otherwise once these principles are accepted as part of the Customary International Law there would be no difficulty in accepting them as part of the domestic law. It is almost an accepted proposition of law that the rules of Customary International Law which are not contrary to the municipal law shall be deemed to have been incorporated in the domestic law and shall be followed by the courts of law. To support we may refer to H.R. Khanna, J.s' opinion in *ADM, Jabalpur v. Shivakant Shukla* [*ADM, Jabalpur v. Shivakant Shukla*, (1976) 2 SCC 521] , *Jolly George Varghese case* [*Jolly George Varghese v. Bank of Cochin*, (1980) 2 SCC 360] and *Gramophone Co. case* [*Gramophone Co. of India Ltd. v. Birendra Bahadur Pandey*, (1984) 2 SCC 534 : 1984 SCC (Cri) 313] .

16. The constitutional and statutory provisions protect a person's right to fresh air, clean water and pollution-free environment, but the source of the right is the inalienable common law right of clean environment. ...”

38. The precautionary principle accepted in the aforesaid judgment was further elaborated in *A.P. Pollution Control Board case* [*A.P. Pollution Control Board v. M.V. Nayudu*, (1999) 2 SCC 718] as under: (SCC pp. 732-34, paras 31-35)

“31. The “uncertainty” of scientific proof and its changing frontiers from time to time has led to great changes in environmental concepts during the period between the Stockholm Conference of 1972 and the Rio Conference of 1992. In *Vellore Citizens' Welfare Forum v. Union of India* [*Vellore Citizens' Welfare Forum v. Union of India*, (1996) 5 SCC 647] a three-Judge Bench of this Court referred to these changes, to the “precautionary principle” and the new concept of “burden of proof” in environmental matters. *Kuldip Singh, J.* after referring to the principles evolved in various international conferences and to the concept of “sustainable development”, stated that the precautionary principle, the polluter pays principle and the special concept of onus of proof have now emerged and govern the law in our country too, as is clear from Articles 47, 48-A and 51-A(g) of our Constitution and that, in fact, in the various environmental statutes, such as the Water Act, 1974 and other statutes, including the Environment (Protection) Act, 1986, these

concepts are already implied. The learned Judge declared that these principles have now become part of our law. The relevant observations in Vellore case [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647] in this behalf read as follows: (SCC p. 660, para 14)

'14. In view of the abovementioned constitutional and statutory provisions we have no hesitation in holding that the precautionary principle and the polluter pays principle are part of the environmental law of the country.'

The Court observed that even otherwise, the abovesaid principles are accepted as part of the customary international law and hence there should be no difficulty in accepting them as part of our domestic law. In fact, on the facts of the case before this Court, it was directed that the authority to be appointed under Section 3(3) of the Environment (Protection) Act, 1986 shall implement the "precautionary principle" and the "polluter pays principle".

The learned Judges also observed that the new concept which places the burden of proof on the developer or industrialist who is proposing to alter the status quo, has also become part of our environmental law.

32. The Vellore [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647] judgment has referred to these principles briefly but, in our view, it is necessary to explain their meaning in more detail, so that courts and tribunals or environmental authorities can properly apply the said principles in the matters which come before them.

33. A basic shift in the approach to environmental protection occurred initially between 1972 and 1982. Earlier, the concept was based on the "assimilative capacity" rule as revealed from Principle 6 of the Stockholm Declaration of the U.N. Conference on Human Environment, 1972. The said principle assumed that science could provide policy-makers with the information and means necessary to avoid encroaching upon the capacity of the environment to assimilate impacts and it presumed that relevant technical expertise would be available when environmental harm was predicted and there would be sufficient time to act in order to avoid such harm. But in the 11th Principle of the U.N. General Assembly Resolution on World Charter for Nature, 1982, the emphasis shifted to the "precautionary principle", and this was reiterated in the Rio Conference of 1992 in its Principle 15 which reads as follows:

'Principle 15. - In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for proposing cost-effective measures to prevent environmental degradation.'

34. In regard to the cause for the emergence of this principle, Charmian Barton, in the article earlier referred to in "The Status of the Precautionary Principle in Australia" [(1998) 22 Harvard Environmental Law Review 509 at p. 547] says:

*‘There is nothing to prevent decision-makers from assessing the record and concluding that there is inadequate information on which to reach a determination. If it is not possible to make a decision with “some” confidence, **then it makes sense to err on the side of caution and prevent activities that may cause serious or irreversible harm.** An informed decision can be made at a later stage when additional data is available or resources permit further research. To ensure that greater caution is taken in environmental management, implementation of the principle through judicial and legislative means is necessary.’*

In other words, the inadequacies of science is the real basis that has led to the precautionary principle of 1982. It is based on the theory that it is better to err on the side of caution and prevent environmental harm which may indeed become irreversible.

35. The principle of precaution involves the anticipation of environmental harm and taking measures to avoid it or to choose the least environmentally harmful activity. It is based on scientific uncertainty. Environmental protection should not only aim at protecting health, property and economic interest but also protect the environment for its own sake. Precautionary duties must not only be triggered by the suspicion of concrete danger but also by (justified) concern or risk potential. The precautionary principle was recommended by the UNEP Governing Council (1989). The Bomako Convention also lowered the threshold at which scientific evidence might require action by not referring to “serious” or “irreversible” as adjectives qualifying harm. However, summing up the legal status of the precautionary principle, one commentator characterised the principle as still “evolving” for though it is accepted as part of the international customary law, ‘the consequences of its application in any potential situation will be influenced by the circumstances of each case’. (See First Report of Dr. Sreenivasa Rao Pemmaraju — Special Rapporteur, International Law Commission dated 3-4-1998, paras 61 to 72.)”

(emphasis in original)

39. In such cases which pertain to the protection of environment, thrusting of “onus of proof” on the developer/industrialist in Vellore Citizens' Welfare Forum [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647] was also elaborated by the Court in the following manner: (A.P. Pollution Control Board case [A.P. Pollution Control Board v. M.V. Nayudu, (1999) 2 SCC 718] , SCC pp. 734-35, paras 36-38)

“36. We shall next elaborate the new concept of burden of proof referred to in Vellore case [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647] at p. 658. In that case, Kuldip Singh, J. stated as follows: (SCC p. 658, para 11)

‘(iii) The “onus of proof” is on the actor or the developer/industrialist to show that his action is environmentally benign.’

37. It is to be noticed that while the inadequacies of science have led to the “precautionary principle”, the said “precautionary principle” in its turn, has led to the special principle of burden of proof in environmental cases where burden as to the absence of injurious effect of the actions proposed, — is placed on those who want to change the status

quo (Wynne, “Uncertainty and Environmental Learning: Reconceiving Science and Policy in the Preventive Paradigm” [(1992) 2 *Global Environmental Change* 111 at p. 123]). This is often termed as a reversal of the burden of proof, because otherwise in environmental cases, those opposing the change would be compelled to shoulder the evidentiary burden, a procedure which is not fair. Therefore, it is necessary that the party attempting to preserve the status quo by maintaining a less polluted state should not carry the burden of proof and the party who wants to alter it, must bear this burden. (See James M. Olson, “Shifting the Burden of Proof: How the Common Law can Safeguard Nature and Promote an Earth Ethic” [(1990) 20 *Environmental Law* 891 at p. 898] .) (Quoted in “The Status of the Precautionary Principle in Australia” [(1998) 22 *Harvard Environmental Law Review* 509 at p. 547] at pp. 519, 550.)

38. The precautionary principle suggests that where there is an identifiable risk of serious or irreversible harm, including, for example, extinction of species, widespread toxic pollution in major threats to essential ecological processes, it may be appropriate to place the burden of proof on the person or entity proposing the activity that is potentially harmful to the environment. (See Report of Dr Sreenivasa Rao Pemmaraju, Special Rapporteur, International Law Commission, dated 3-4-1998, Para 61.)”

(emphasis in original)

The relevant observations from judgment in *Arjun Gopal (supra)*²⁷,

are:

41. It may be stressed that in *Vellore Citizens' Welfare Forum case [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647]*, this Court had banned the tanneries when it was found that they were causing immense damage to the environment. Thus, environment protection, which is a facet of Article 21, was given supremacy over the right to carry on business enshrined in Article 19(1)(g). We state at the cost of repetition that right to health, which is recognised as a facet of Article 21 of the Constitution and, therefore, is a fundamental right, assumes greater importance. It is not only the petitioners and other applicants who have intervened in support of the petitioners but the issue involves millions of persons living in Delhi and NCR, whose right to health is at stake. However, for the time being, without going into this debate in greater details, our endeavour is to strive at balancing of two rights, namely, right of the petitioners under Article 21 and right of the manufacturers and traders under Article 19(1)(g) of the Constitution.

44. Applying the aforesaid principle, in the first blush it may appear that the aforesaid argument has substantial force in it. However, that would be only one side of the picture as there are two contra-arguments which are sufficient to take the sheen

²⁷ (2019) 13 SCC 523

out of the aforesaid plea. First aspect is that the argument of economic hardship is pitched against right to health and life. **When the Court is called upon to protect the right to life, economic effect of a particular measure for the protection of such right to health will have to give way to this fundamental right. Second factor, which is equally important, is that the economic loss to the State is pitched against the economic loss in the form of cost of treatment for treating the ailments with which people suffer as a result of burning of these crackers. Health hazards in the form of various diseases that are the direct result of burning of crackers have already been noted above. It leads to asthma, coughing, bronchitis, retarded nervous system breakdown and even cognitive impairment. Some of the diseases continue on a prolonged basis. Some of these which are caused because of high level of PM_{2.5} are even irreversible. In such cases, patients may have to continue to get the medical treatment for much longer period and even for life.** Though there are no statistics as to what would be the cost for treating such diseases which are as a direct consequence of fireworks on these occasions like Diwali, it can safely be said that this may also be substantial. It may be more than the revenue which is generated from the manufacturers of the crackers. However, we say no more for want of precise statistical data in this behalf.”

Relevant Orders of the Tribunal

34. The Tribunal, vide order dated 15.10.2020 in OA 1016/2019, *Utkarsh Panwar vs. Central Pollution Control Board & Ors.*, has recently dealt with the issue invoking the precautionary principle in the context of permissibility of brick kilns in NCR, adding to the air pollution. Prohibiting brick kilns adding to the air pollution, even when affected right to trade, it was observed:

“27. Thus, in view of report of the CPCB, at this stage it is not possible to vacate direction not to permit operation of brick kilns in NCR beyond the carrying capacity found by the CPCB. **All applications of the brick kiln owners seeking rejection of CPCB report and vacation of interim order against operation of brick kilns, without air quality assimilative capacity permitting such activity will stand rejected** subject to further exploring viable options, including change to clean fuel like natural gas. We are conscious that brick kilns may be necessary. Object of this order is not to stop any legitimate business activity but to enforce the right to breathe fresh air which is right to file. The source apportionment studies, placed on record, show that brick kilns contribute 5-7% PM. Air pollution Control devices to be installed by the polluting sources including the brick kilns need to comply not only the consent standards but are also the Ambient Air Quality norms and available assimilative capacity of the region. If the right to fresh air is not enforced, the consequences of brick kilns beyond carrying capacity of the air quality in the area are disastrous in terms of deaths

and air borne diseases. This will be contrary to the mandate of the Constitution and the environmental law, particularly the principle of ‘Sustainable Development’. It is well established that deteriorated ambient air quality in terms of PM₁₀ and PM_{2.5} affects respiratory system particularly, the lungs which may make individuals more vulnerable to get other related fatal diseases.”²⁸

35. Vide order dated 21.08.2020 in O.A. No. 681/2018, **News item published in "The Times of India" Authored by Shri Vishwa Mohan titled "NCAP with multiple timelines to clean air in 102 cities to be released around August 15"**, the Tribunal considered the issue of remedial action against **air pollution in 102 non-attainment cities (where air quality is generally found to be beyond norms) as per monitoring by CPCB (number of cities is now 122)**. After referring to earlier proceedings in the matter, it was observed:

“30. In view of the above, the directions are summed up as follows:

(i). to (ii).xxx.....xxx

(iii). Let further steps of prohibiting/shifting polluting activities which are found unsustainable/non-conforming and beyond carrying capacity of NACs, as a consequence of SA/CC Studies or otherwise, to other locations, in the interest of public health and protection of environment to give effect to ‘Sustainable Development’ principle be taken by the States/UTs;

(iv). The States may take further steps to set up and operate PGRPs* expeditiously, within three months. The CPCB as well as State PCBs/PCCs may evaluate functioning of such portals on real time basis in the direction of protection of environment. In particular analysis may be undertaken about the number of complaints received, effective steps for redressal taken and improvement achieved and planned. Such exercise may be ongoing but in the first instance may be compiled as on 31.12.2020 and report filed by the State PCBs/PCCs with the CPCB within one month thereafter;

(v).xxx.....xxx

(vi). All the concerned States/UTs may execute action plans, including control of stubble burning, where ever necessary and bursting polluting and noise generating

²⁸ <https://airqualitynews.com/2020/08/13/the-link-between-air-pollution-and-covid-19/http://www.babushahi.com/full-news.php?id=107487>

fire crackers and give information about the status of compliance of action plans as on 31.12.2020 to CPCB before 15.1.2021. They may also give information in a tabulated form about the extent of improvement achieved, if any, in terms of reduction in pollution load. Steps in terms of action plans completed, actions ongoing and actions incomplete;

(vii) to (xiii)xxx.....xxx

(xiv). All the States/UTs and PCB/PCCs may take steps to coordinate with the State Disaster Management Authorities and Meteorological Departments. The observations of this Tribunal while dealing with the problem of frequent environmental disasters in order dated 23.07.2020 in OA 134/2020, News Item published on 13.07.2020 in daily "India Today" titled "Massive fire engulf Vizag chemical plant, explosions heard, injuries reported" may also be taken into account. Action taken reports be filed with the CPCB for submission of consolidated report to this Tribunal."

(***Public Grievance Redressal Portal**)

36. As already noted, the Tribunal has the mandate to issue appropriate directions in exercise of its jurisdiction under Section 15 read with Section 20 of the NGT Act, 2010. The scope of Section 15 has been considered in a recent judgement in *the Director General (Road Development) NHAI v. Aam Aadmi Lok Manch & Ors.*²⁹ wherein it was observed:

"1 to 70.xxx.....xxx.....xxx

71. The power and jurisdiction of the NGT under Sections 15(1)(b) and (c) are not restitutionary, in the sense of restoring the environment to the position it was before the practise impugned, or before the incident occurred. **The NGT's jurisdiction in one sense is a remedial one, based on a reflexive exercise of its powers. In another sense, based on the nature of the abusive practice, its powers can also be preventive.**

72. As a quasi-judicial body exercising both appellate jurisdiction over regulatory bodies' orders and directions (under Section 16) and its original jurisdiction under Sections 14, 15 and 17 of the NGT Act, the tribunal, based on the cases and applications made before it, is an expert regulatory body. Its personnel include technically qualified and experienced members. **The powers it exercises and directions it can potentially issue, impact not merely those before it, but also state agencies and state departments whose views are heard, after which general directions to prevent the future occurrence of incidents that impact the environment, are issued.**

²⁹ AIR 2020 SC 3471, Paras 71, 72 & 75

73&74...xxx.....xxx.....xxx

75. **The NGT's directions, though placed in the context of its adjudicatory role, have a wider ramification in the sense that its rulings constitute the appropriate norm which are to be followed by all those engaging in similar activities. Therefore, its orders, contextually in the course of adjudication, also establish and direct behaviour appropriate for future guidance. In these circumstances, given the panoply of the NGT's powers under the NGT Act, which include considering regulatory directions issued by expert regulatory bodies under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981 and the Biodiversity Act, 2002 it has to be held that general directions for future guidance, to avoid or prevent injury to the environment for appropriate assimilation in relevant rules, can be given by the NGT."**

37. After conclusion of the hearing, a note has been filed by the CPCB on 06.11.2020 giving the current air quality scenario in Delhi as follows:

"1 to 6.xxx.....xxx

7. CPCB including its Regional Directorates conducts extensive (15 days) air quality monitoring (7 days before Diwali, Diwali day and 7 days after Diwali) for all parameters suggested by the Hon'ble court.

Year wise comparative data of relevant parameters are presented below:

Comparison of PM _{2.5} and elements in PM _{2.5} in Delhi during Diwali 2016, 2017, 2018 and 2019																
All Concentrations are in µg/m ³																
	PM _{2.5}				Aluminum (Al)				Barium (Ba)				Iron (Fe)			
	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
Delhi Average	1013	604	936	512	176	159	3.8	32.9	74	34.7	54.2	18.8	2.66	1.37	1.41	1.1
Notes: NAAQS PM _{2.5} - 60 µg/m ³ ; AAQCVs: Al - 40 µg/m ³ , Ba - 4.0 µg/m ³ and Fe - 40 µg/m ³																

Air quality data published by CPCB reveals that both PM₁₀ and PM_{2.5} increase on Diwali day if compared with pre-Diwali data in Delhi and other cities. Elevated PM concentrations and the signature elements like barium, aluminum (major ingredient of Fire cracker) in PM_{2.5} fraction on Diwali day indicate contribution of firecracker bursting in ambient air quality. Generally, PM_{2.5} may remain in suspension for several days; however, the levels of these metals also observed to come down to the ranges as found in normal days only after 48 hours. This may be due to rapid inertial deposition of metals having high molecular weight (mass).

Considering the facts that firecrackers is not the only cause of deteriorated air quality in Delhi - NCR, Hon'ble Supreme Court has ordered MoEFCC to submit concrete proposal on development of

"Green Crackers" besides banning Barium salts and joint crackers, instead of imposing complete ban on firecrackers.

MoEF & CC has submitted consolidated proposal for implementation of Green crackers after thorough consultation with NEERI, CPCB, 11TB and PESO. Hon'ble court has raised the concern of quality control in manufacturing stage, which is already addressed and appraised to Hon'ble court for necessary direction.

The matter is under consideration of the Hon'ble Supreme Court.

Current air quality scenario in Delhi

The air quality of Delhi started worsening in terms of PM_{2.5} and PM₁₀ since second week of October with changes in meteorology. The increase in fire counts in stubble burning areas further aggravated the situation during last fortnight. As per forecast from India Meteorology Department (IMD) and Indian Institute of Tropical Meteorology (IITM), PM_{2.5} concentrations are expected to decline slightly during 4-6th November, 2020. The forecast for next 10 days will be available on 7th November, when the expected concentrations on Diwali day may be available.

The predicted mixing heights and ventilation coefficients during 3 - 7th November will remain between 800 to 1200 m and 6000 to 9500 m² /sec, respectively. Ventilation index with less than 6000 m²/sec is conducive for poor dispersion.

However, considering previous years' experience, with business as usual scenario on Diwali day (bursting crackers) may increase PM_{2.5} concentrations and remain in air for about 48 hours if major changes in meteorology is not observed. Meteorology and air quality forecast by IMD/IITM before Diwali may indicate likely ambient levels of PM_{2.5}. In case of use of green crackers for limited duration with strict enforcement, rise in ambient PM_{2.5} levels after Diwali may be comparatively low. It may also be flagged that minimizing the impact of firecrackers on air pollution would give respite for limited period.

Impact due to COVID:

COVID 19 related issues and its relationship with air quality perhaps is beyond the expertise domain of CPCB."

However, it is stated that the CPCB does not have domain expertise to comment on the relationship of air quality and Covid-19.

38. We may now deal with the stand of the States of Punjab, Assam and Tamil Nadu. State of Punjab has claimed moderate air quality during some period but the said period does not refer to month of November

which is the issue for consideration. On the other hand, AQI bulletin available on the website of the CPCB on 06.11.2020 shows Amritsar, Jalandhar, Khanna and Ludhiana in the category of ‘poor’ air quality.

The status of AQI in certain cities/towns is as follows:

AQI (06.11.2020)		
POOR (201-300)	VERY POOR (301-400)	SEVERE (>401)
Ahmedabad	Agra	Delhi
Amritsar	Gwalior	(NCR)
Asansol	Varanasi	Ghaziabad
Bhopal	Gurugram	(NCR)
Guwahati	(NCR)	Kanpur
Howrah	Meerut	Lucknow
Indore	(NCR)	Moradabad
Jalandhar	Hapur	Noida
Jodhpur	(NCR)	(NCR)
Khanna	Charkhidadri	Faridabad
Kolkata	(NCR)	(NCR)
Ludhiana	Panipat	Greater
Muzzaffarpur	(NCR)	Noida
Patna	Rohtak	(NCR)
Sagar	(NCR)	Jind
Thane		(NCR)
Ujjain		Baghpat
Muzaffarnagar		(NCR)
(NCR)		Bulandshahr
Bhiwani		(NCR)
(NCR)		
Karnal (NCR)		
Sonipat		
(NCR)		
Ambala	Bahadurgarh	Fatehabad
Hajipur	Ballabgarh	
Katni	Bhivadi	
Mandideep	Dharubera	
Mandikhera	Hisar	
Narnaul	Kaithal	
Palwal	Kurukshetra	
Roopnagar	Manesar	
Sirsa	Siliguri	
Singbrauli		
Vapi		
Vatva		

39. The above data of CPCB is only for certain States/cities and is not exhaustive for all cities and States. In view of above data, it is not

possible to accept that in the State of Punjab air quality is satisfactory or moderate everywhere in November. Moreover, apart from non-attainment cities, there are other cities where air quality norms are not met. We have to apply a uniform yardstick based on objective criteria of air quality in the context of Covid-19 pandemic and associated adverse health impacts.

40. Tables 1 and 2 in Supreme Court judgement quoted in para 31 above show health impact and categories of air quality. For moderate and above air quality, there are adverse health impact in normal times which is aggravated by Covid. Contention that Covid does not add to the adverse health impact due to pollution has to be rejected in view of studies and decisions of some of the authorities themselves. For poor and above air quality, health impacts are serious.

41. Thus, two categories of poor and above and moderate and below need to be dealt with separately. While bursting of green fire crackers for duration of two hours on festival days may be allowed in areas with moderate and below air quality, where not otherwise prohibited by authorities/Courts, there has to be total ban where air quality is poor and above. The States who have filed response have not given the data of November. They have stated that ban be not imposed throughout the States or green crackers be allowed for two hours on festival days. This request is justified where air quality is moderate and below but not where air quality is poor and above which may result in deaths and diseases which has to be avoided even if there is financial loss. Celebration by crackers is for happiness. It is not to celebrate deaths and diseases. Happiness of few at the cost of life of others is not the value in Indian society which stands for happiness and well-being of all.

42. We find that though notice was not issued to all the States/UTs but to States/UTs falling in NCR and where 122 non-attainment cities are located, we propose to issue directions *in rem* applicable to all States/UTs, we have to, in the interest of natural justice, make this order subject to such States being at liberty to move this Tribunal to be heard, if so desired. We note that MoEF and CPCB are at notice and the order proposed is not individual State/City specific and absence of notice to such State is only a matter of formality. The situation is grave and emergent and it is not desirable that the order should not be passed pan India once a clear case has been made out and rival viewpoints have been considered.

43. We are also of the view that since we have taken the view that air pollution aggravates Covid-19, not only crackers are to be banned/restricted depending upon air quality, all States/UTs, PCBs/PCCs must take special initiative to contain air pollution by regulating all other sources to pollution, particularly during Covid-19. No doubt pollution for crackers being seasonal source, particular focus is required thereon.

VIII. Conclusion and Directions

44. In view of above, having regard to increased adverse health impact of pollution by use of crackers on Covid-19, aggravating risk to lives and health which has led to ban by the Governments of Odisha, Rajasthan, Sikkim, UT Chandigarh, DPCC and by the Calcutta High Court on sale and use of crackers,, applying the 'Sustainable Development' and 'Precautionary' principles, a case is made out for issuing directions for banning sale and use of fire crackers during November 9 to 30 in areas where air quality is 'poor', 'very poor' and 'severe'.

45. Further, case is made out for restricting sale and use of fire crackers in areas with moderate and poor air quality where also on account of Covid19, there will be serious adverse effects, though less than areas where air quality is poor and above. In such areas, unless covered by the ban or restrictions by the authorities, restrictions on the pattern of those imposed by the Hon'ble Supreme Court vide order dated 23.10.2018, (2019) 13 SCC 523, reproduced in para 32 above will apply i.e. only green crackers be sold and use of crackers will be allowed only for two hours during festivals and not on any other day during November 9 to 30.

46. It is well known that in NCR, this threshold is continuously crossed during November. Thus, ban will be absolute in NCR.

47. Outside the NCR, where air quality standards are poor or more than poor during November, the sale and use of fire cracker has to be banned. It is not necessary to distinguish between non-attainment and other cities. Even in non-attainment cities, though average air quality may not be as per norms for five years, it may be poor or above during November. On the other hand, even in non-attainment cities, air quality may not be as per norms but may not be 'poor' or more than that. This is demonstrated by the data from CPCB website in respect of certain cities quoted above. In Haryana, there is no non-attainment cities in the list of 122, but as per air quality data of CPCB 'Fatehabad', falling outside NCR has 'severe' air quality in November. Similarly, Hisar, Bahadurgarh, Ballabgarh, Dharuhera, Kaithal, Kurukshetra and Manesar are falling under 'very poor' category of air quality and Ambala, Narnaul, Palwal and Sirsa in 'poor' air quality. Similarly, for the State of Punjab, only Amritsar, Jalandhar, Khanna and Ludhiana are shown in the 'poor'

category of air quality out of eight non-attainment cities. This will not be read as debarring the authorities from taking more cautious approach in prohibiting/restricting fire crackers to any other areas not covered by prohibition or restrictions under this order, as has already been done by some of the States.

48. Accordingly, we direct as follows:

- i. There will be total ban against sale or use of all kinds of fire crackers in the NCR from midnight of November, 9 -10, 2020 to the midnight of November 30 - December 1, 2020, to be reviewed thereafter.
- ii. Direction (i) will also apply to all cities/towns in the country where the average of ambient air quality during November (as per available data of last year) fall under 'poor' and above category.
- iii. The cities/towns where air quality is 'moderate' or below, only green crackers be sold and the timings for use and bursting of crackers be restricted to two hours during festivals, like Diwali, Chatt, New Year/Christmas Eve etc., as may be specified by the concerned State. This direction is on pattern of direction of the Hon'ble Supreme Court in (2019) 13 SCC 523 which we are applying to areas moderately polluted or below air quality due to aggravated effect during Covid-19, as already noted. If nothing is specified by the State, timing will be 8 to 10 pm on Diwali and Gurupurb, 6 am to 8 am on Chatt and 11.55 pm to 12.30 am during Christmas and New year eve (which have yet to come and do not fall in November but if ban continues) and not otherwise.
- iv. At other places, ban/restrictions are optional for the authorities but if there are more stringent measures under orders of the authorities, the same will prevail.

- v. All States/UTs/PCBs/PCCs may initiate special drives to contain air pollution from all sources in view of potential of aggravation of Covid-19
- vi. The Chief Secretaries and DGPs of all the States/UTs may issue and circulate an appropriate order in above terms with appropriate enforcement guidelines to all the District Magistrates and Superintendents of Police, PCBs/PCCs.
- vii. The CPCB and the State PCBs/PCCs may regularly monitor the air quality during this period which may be uploaded on their respective websites. CPCB may compile information on the subject, including the status of compliance of this order from all the States/UTs and file a consolidated report with data compiled till filing of report, before the next date by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF.

List for further consideration on 1.12.2020.

A copy of this order be forwarded to the MoEF&CC, CPCB, Chief Secretaries and DGPs, State PCBs/PCCs and District Magistrates of all the States/UTs and by e-mail for Compliance.

We place on record our sincere gratitude to learned Amicus Shri Raj Panjwani, senior advocate and other learned counsel for the assistance rendered in the matter.

Adarsh Kumar Goel, CP

S.K. Singh, JM

Dr. S.S. Garbyal, EM

Dr. Nagin Nanda, EM

November 09, 2020

Original Application No. 249/2020

Original Application No. 254/2020

Original Application No. 255/2020

Original Application No. 93/2020(CZ)

DV