



BEFORE THE NATIONAL GREEN TRIBUNAL  
PRINCIPAL BENCH AT NEW DELHI

O.A. No. 638 of 2023

**IN THE MATTER OF:**

News item appearing in Times of india dated 10/10/2023  
Titled "Feeling anxious? Toxic air could be to blame." ...**SuoMoto**

VERSUS

UNION OF INDIA & OTHERS ... RESPONDENT

**INDEX**

<b>S.NO.</b>	<b>PARTICULAR</b>	<b>PAGE NO.</b>
1.	Reply on behalf of Respondent No.3 Indian Council of Medical Research (ICMR) to the SUO-MOTO Original Application under the National Green Tribunal Act, 2010.	1 - 6
2.	Vakalatnama	7

*Shashwat*  
M/s. SIKRI & COMPANY  
COUNSEL FOR THE RESPONDENT  
229, LAWYER'S CHAMBER  
HIGH COURT OF DELHI  
NEW DELHI - 110 003  
MOBILE No. 9311331805  
EMAIL: [SIKRICO@SIKRILAW.COM](mailto:SIKRICO@SIKRILAW.COM)

Place New Delhi  
13/12/2023

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

**O.A. No. 638 of 2023**

**IN THE MATTER OF:**

In re: News item appearing in Times of India dated 10.10.2023  
titled **“Feeling anxious? Toxic air could be to blame.”**

..... *SUO-MOTO*

Versus

UNION OF INDIA & OTHERS

...RESPONDENTS

**REPLY ON BEHALF OF RESPONDENT No. 3 -INDIAN  
COUNCIL OF MEDICAL RESEARCH (ICMR) TO THE  
SUO-MOTO ORIGINAL APPLICATION UNDER THE NA-  
TIONAL GREEN TRIBUNAL ACT, 2010:**

**Most Respectfully Showeth:**

I, Dr. R. Lakshminarayanan, s/o Mr. Rajarathnam, aged about 57 years, presently working as Deputy Director General (Admn.), Indian Council of Medical Research (ICMR), V. Ramalingaswami Bhawan, Ansari Nagar, New Delhi-110029 do hereby solemnly affirm and state as under:

That I am presently working as Assistant Director General (Admn.), Indian Council of Medical Research (ICMR), and authorized to file this Reply Affidavit on behalf of Respondent No. 3.

2. That save as expressly admitted herein and save what are matters of record, each and every contention made in the present Original Application shall be deemed to have been emphatically and specifically denied and disputed.

Dr. R. Lakshminarayanan / Dr. R. Lakshminarayanan  
Deputy Director General (Admn.)  
Indian Council of Medical Research  
V. Ramalingaswami Bhawan, Ansari Nagar, New Delhi-110029

Dr. R. Lakshminarayanan / Dr. R. Lakshminarayanan  
Deputy Director General (Admn.)  
Indian Council of Medical Research  
V. Ramalingaswami Bhawan, Ansari Nagar, New Delhi-110029

Dr. R. Lakshminarayanan / Dr. R. Lakshminarayanan  
Deputy Director General (Admn.)  
Indian Council of Medical Research  
V. Ramalingaswami Bhawan, Ansari Nagar, New Delhi-110029

Dr. R. Lakshminarayanan / Dr. R. Lakshminarayanan  
Deputy Director General (Admn.)  
Indian Council of Medical Research  
V. Ramalingaswami Bhawan, Ansari Nagar, New Delhi-110029

Dr. R. Lakshminarayanan / Dr. R. Lakshminarayanan  
Deputy Director General (Admn.)  
Indian Council of Medical Research  
V. Ramalingaswami Bhawan, Ansari Nagar, New Delhi-110029

3. That liberty is further craved in making such other and further submission/filing Additional Affidavits as may be required in the facts of the case subsequently or as may be directed by this Hon'ble Tribunal.
4. That the answering Respondent - Indian Council of Medical Research (ICMR), New Delhi, the apex body in India for the formulation, coordination and promotion of biomedical research, is one of the oldest medical research bodies in the world.
5. That this Hon'ble Tribunal has taken cognisance of the present matter, keeping in view the News item titled **"Feeling anxious? Toxic air could be to blame."** published in the Newspaper - Times of India on 10.10.2023. That the above said news item contains the following studies:

**"HAVING A BAD AIR DAY?"**

- *A study from researchers at Harvard, published in March 2023, adds to the evidence connecting exposure to air pollution [small particulate matter (PM 2.5), nitrogen oxide and nitrogen dioxide] to increased risk of dementia.*
- *A study published in journal Neuro Toxicology reveals that people who breathe polluted air are more likely to develop mental health problems than those who breathe clean air.*
- *Some researchers have associated air pollution with higher levels of stress, psychological distress, increased risk of dementia, Alzheimer's and depression.*
- *A study published in Environmental Health Perspectives found an association between short-term exposure to*

डॉ. आर. लक्ष्मिनायन / Dr. R. LAKSHMINAYANAN  
उप महासचिव (सा.) / Deputy Director General (Admn.)  
भारतीय चिकित्सा अनुसंधान परिषद  
Indian Council of Medical Research  
संस्थान, आर. आर. एम. एन. रोड, पॉस्ट बिल्डिंग कम्प्लेक्स  
Department of Health & Family Welfare, Government of India  
New Delhi - 110054

daye

*elevated levels of air pollution and increased emergency room psychiatric visits among children."*

A copy of the news item "**Feeling anxious? Toxic air could be to blame.**" published in the Newspaper - Times of India on 10.10.2023, is annexed herewith as **ANNEXURE R-1.**

6. That this Hon'ble Tribunal vide order dated 31.10.2023, has been pleased to implead the answering Respondent in the instant Original Application, seeking assistance on the issue involved in the present matter, which has been highlighted in para 2 of the said order issued by this Hon'ble Tribunal, and the same is reproduced herein below:

*"2. Hence, the issue which needs to be examined in this OA is in respect of various chemical and physical components causing air pollution and adverse effect of each of such physical and chemical component on different organs of human body. Adequate measures are required for control of such air polluting components and their adverse effect on various organs of human body, especially those which are affecting the brain and emotional, psychological aspect".*

7. That it is submitted that according to the studies, including systematic review and meta-analysis published in various journals, showed that there exists a correlation between exposure to particulate matter (PM) in the air and mental health issues. That fine particulate matter (PM2.5) and coarse particulate matter (PM10) have been associated with an increased risk of depression, anxiety, and other mood disorders. However, the limited literature and methodological challenges, in-

*long*

डॉ. ए. ए. लक्ष्मीनारायण / Dr. A. A. Lakshminarayana  
 उप सचिव (आ. टी.) / Deputy Director General (Admin.)  
 सचिवालय, स्वास्थ्य विभाग, नई दिल्ली  
 In-charge, Office of Medical Research  
 Director, Central Board of Secondary Education  
 Department of Health Research (Min. of Health & FW)  
 Government of India  
 सचिवालय, स्वास्थ्य विभाग, नई दिल्ली-110026

cluding heterogeneous outcome definitions, exposure assessment, and residual confounding, suggest the need for further studies to investigate potentially causal associations between air pollution and poor mental health.

8. That in the current systematic review and meta-analysis examined 22 relevant studies, ultimately including 9 in their primary analyses. In a meta-analysis focusing on long-term exposure to PM<sub>2.5</sub> and depression (5 studies), a significant association was found, with a pooled odds ratio of 1.102 per 10- $\mu\text{g}/\text{m}^3$  increase in PM<sub>2.5</sub>. Two studies on long-term PM<sub>2.5</sub> exposure and anxiety also showed significant positive associations. The results emphasize the potential impact of air pollution on mental health, urging consideration in public health strategies.

Reference: Braithwaite I, Zhang S, Kirkbride JB, Osborn DPJ, Hayes JF. "Air Pollution (Particulate Matter) Exposure and Associations with Depression, Anxiety, Bipolar, Psychosis and Suicide Risk: A Systematic Review and Meta-Analysis." Environ Health Perspect. 2019

9. That another study published in the British Journal of Psychiatry found that increases in NO<sub>2</sub>, NO<sub>x</sub>, and PM<sub>2.5</sub> were associated with an elevated risk for in-patient days.

Reference: Newbury JB, Stewart R, Fisher HL, et al. "Association between air pollution exposure and mental health service use among individuals with first presentations of psychotic and mood disorders: retrospective cohort study." Br J Psychiatry. 2021 Dec;219(6):67

Dr. R. Lakshmi / Deputy Director General (Admin.)  
 Director General of Medical Research  
 Department of Health Research (Min. of Health & FW)  
 Government of India  
 New Delhi-110002

10. That a cohort study involving 1481 pregnant women from Seoul assessed maternal exposure to PM2.5, PM10, NO2, and O3 during each trimester. The study estimated the relative risk (RR) of depressive and anxiety symptoms associated with increases in these pollutants. Results indicated that exposure during the second trimester to PM2.5, PM10, and NO2 was linked to an increased risk of depressive symptoms. Similarly, exposure to O3 during the third trimester was associated with depressive symptoms, while exposure during the first trimester was linked to a decreased risk. PM2.5, PM10, and NO2 during the second trimester were significantly associated with anxiety symptoms.

Reference: Lamichhane DK, Jung DY, Shin YJ, et al. "Association of ambient air pollution with depressive and anxiety symptoms in pregnant women: A prospective cohort study." Int J Hyg Environ Health. 2021 Aug;237:113823. doi: 10.1016/j.ijheh.2021.113823.

11. That review study published in current environmental health reports found that cerebral white matter, cortical gray matter, and basal ganglia might be the targets of traffic related air pollution. The detected brain damages could be involved in cognition changes.

Reference: de Prado Bert P, Mercader EMH, Pujol J, Sunyer J, Mortamais M. The Effects of Air Pollution on the Brain: a Review of Studies Interfacing Environmental Epidemiology and Neuroimaging. Curr Environ Health Rep. 2018 Sep;5(3):351-364. doi: 10.1007/s40572-018-.

Dr. A. Lakshminarayana  
 (Dr.) / Deputy Director General (Admin.)  
 Director General of Health Research  
 Council of Medical Research  
 Department of Health Research (Min. of Health & FW)  
 Government of India  
 New Delhi-110028 / Ansari Nagar, New Delhi-110028

6 (33)

12. **RE: PRAYER:**

That the present reply and the submissions contained herein may please be considered and taken on record.

**DEPONENT****VERIFICATION:**

I, Dr. R. Lakshminarayanan, s/o Mr. Rajarathnam, aged about 57 years, presently working as Deputy Director General (Admn.), Indian Council of Medical Research (ICMR), V. Ramalingaswami Bhawan, Ansari Nagar, New Delhi-110029, do hereby solemnly affirm and declare, that the above reply has been drafted by our counsel as per instructions and the contents of the reply are true and correct as per official record and the best of my knowledge and belief. No part of it is false and nothing material has been concealed there from.

Verified at New Delhi, on 8th day of November, 2023.

**DEPONENT**

डॉ. आर. लक्ष्मीनारायणन / Dr. R. LAKSHMINARAYANAN  
उप महानिदेशक (अ.स.) / Deputy Director General (Admn.)  
भारतीय आयुर्विज्ञान अनुसंधान परिषद  
Indian Council of Medical Research  
स्वास्थ्य अनुसंधान विभाग (स्वास्थ्य एवं परिवार कल्याण मंत्रालय)  
Department of Health Research (Min. of Health & FW)  
Government of India  
अंसारी नगर, नई दिल्ली-110029

Respondent

Through **M/S. SIKRI & COMPANY**  
ADVOCATES FOR RESPONDENT NO. 3  
229, LAWYERS CHAMBERS,  
DELHI HIGH COURT  
NEW DELHI 110003

Place: New Delhi MOBILE No. 9671444468, 9311331805

Dated: 13.11.2024 EMAIL: SIKRICO@SIKRILAW.COM

# Feeling anxious? Toxic air could be to blame

Anuja Jaiswal @timesgroup.com

New Delhi: Long-term exposure to air pollution could lead to higher risk of depression and anxiety, besides respiratory disorders. People who breathe in polluted air experience changes within the brain that control the emotions and as a result their chances of developing anxiety and depression are much higher than those who breathe in cleaner air, said doctors on the eve of World Mental Health Day.

"Fresh and clean air is a prerequisite for healthy living and thinking. An optimal amount of oxygen is essential for rational thinking," explained Dr Ashish Kumar Mittal, senior consultant psychiatrist, Columbia Asia Hospital. "When the air gets polluted, our survival instinct starts acting and blurs our higher order logical cognitive processes and simultaneously disturbs our emotional state, severely impacting our mental health. This impact is visibly noticed in the form of a lower threshold of irritation and tolerance to frustration."

Dr Nand Kumar, professor of psychiatry, AIIMS, agreed that mental health was an important dimension of air pollution. "Its effects range from behavioural variations to depression, schizophrenia, bipolar disorder and other neurodegenerative disorders," he said. "The mechanism is not clear, but it is likely to trigger inflammation in the region of the brain that regulates the emotions, focusing on the hippocampus, amygdala and prefrontal cortex.

## HAVING A BAD-AIR DAY?

> A study from researchers at Harvard, published in March 2023, adds to the evidence connecting exposure to air pollution (small particulate matter (PM2.5), nitrogen oxide and nitrogen dioxide) to increased risk of dementia



> A study published in journal NeuroToxicology reveals that people who breathe polluted air are more likely to develop mental health problems than those who breathe clean air



> Some researchers have associated air pollution with higher levels of stress, psychological distress, increased



risk of dementia and Alzheimer's and depression

> A study published in Environmental Health Perspectives found an association between short-term exposure to elevated levels of air pollution and increased emergency room psychiatric visits among children



## WORLD MENTAL HEALTH DAY



Exposure to air pollution may exacerbate existing mental health conditions in all age groups."

A major concern with air pollution, Kumar added, was its potential impact on children and adolescents who are vulnerable as their brain is still developing.

Research suggests that air pollution can lead to anxiety, depression and memory issues. As Dr Vipul Rastogi, senior consultant Neuropsychiatrist, Medanta Hospital, pointed out, "A clear, blue sky makes a person feel calmer and peaceful while a hazy and polluted

sky causes frustration and anxieties about our health."

Rastogi said going out and exercising on heavily polluted days has to be limited, but one should ensure activity indoors, say through yoga, dance and anything that gets one moving. "Exercise helps us stay positive in an environment of doom and gloom," he said.

The review of existing literature on the subject claims that exposure to air pollution increases chances of depression by 1%, noted Harshal Ramesh Salve, additional professor, community medicine, AIIMS. Like any other body part, air pollution, particularly particulate matter, can hit the brain, causing depression, he said, adding that neurodevelopment-related diseases are also associated with exposure to air pollution.

BEFORE THE NATIONAL GREEN TRIBUNAL  
PRINCIPAL BENCH AT NEW DELHI  
O.A. No. 638 of 2023

7  
39

IN THE MATTER OF:

In re: News item appearing in Times of India dated 10.10.2023 titled "Feeling anxious? Toxic air could be to blame."  
..... Suo-moto

VERSUS

Union of India & Ors.

..... Respondents

KNOW ALL to whom these present shall come that I, \_\_\_\_\_  
\_\_\_\_\_ the above named PETITIONER do hereby appoint:

**SIKRI & CO. Advocates**

- |       |                                   |      |                                    |
|-------|-----------------------------------|------|------------------------------------|
| (i)   | MS. EKTA SIKRI (D/564/05)         | (v)  | SHRI JASBIR BIDHURI (D-1973/2015)  |
| (ii)  | SHRI VIKALP MUDGAL (D-2113/2013)  | (v)  | SH. ARUN SANWAL (D-1719/2017)      |
| (iii) | SHRI AJAY PAL SINGH (D-1280/2013) | (vi) | SHRI SHASHWAT SHARMA (D-2187/2018) |

(herein after called the Advocates)

to be my / our Advocates in the above case and authorize them:

To act, appear and plead in the above-noted case in this Court or in any other Court in which the case is tried or heard and also in the appellate Courts.

To sign, file, verify and present pleadings, appeals, cross objections or petitions for execution, revision, restoration, withdrawal, compromise or other petitions, replies, objection or affidavits or other documents may be deemed necessary or proper, for the prosecution of the said case in all stages.

To file and take back documents.

To withdraw or compromise the said case or submit arbitration any differences, disputes that may arise touching or in any manner relating to the said case.

To take out execution proceedings.

To deposit, draw and receive money, cheques and grant receipts therefore, and to do all other acts and things which may be necessary to be done for the progress and in the course of the prosecution of said case.

To appoint instruct any other legal Practitioner authorizing him to exercise the power and authorities hereby conferred upon the Advocates whenever they may think fit to do so and to sign the power of attorney on my/our own acts, as if done by me/us to all intents and purposes.

And I/we undertake that I/we or my/our authorized agent would appear in Court on all hearings and will inform the advocates for appearance, when the case is called.

And I/we the undersigned do hereby agree not to hold the advocates or their substitute (s) responsible for the result of the said case in consequence of this absence from the Court when the said case is called up for hearing, or for any negligence of the Advocates or their Substitute (s).

And I/we undersigned do hereby agree that in the event of the whole or any part of the fee agreed by me/us to be paid to the Advocates remaining unpaid, he shall be entitled to withdraw from the prosecution of said case until the same is paid up. If any costs are allowed for adjournment in Advocates would do the same.

IN WITNESS WHEREOF I/we do here unto set my/our hand to these presents the contents of which have been understood by me/us this 8th day of Dece, 2023

Accepted

(EKTA SIKRI)

(VIKALP MUDGAL)

(AJAY PAL SINGH)

(ARUN SANWAL)

(JASBIR BIDHURI)

(SHASHWAT SHARMA)

Advocates

I Identify the Client who has Signed in my presence

डॉ. आर. लक्ष्मीनारायणन / Dr. R. LAKSHMINARAYANAN  
उप महानिदेशक (प्रशा.) / Deputy Director General (Admn.)  
भारतीय आयुर्विज्ञान अनुसंधान परिषद  
Indian Council of Medical Research  
स्वास्थ्य अनुसंधान विभाग, स्वास्थ्य एवं परिवार कल्याण मंत्रालय  
Department of Health Research (Min. of Health & FW)  
भारत सरकार  
Ministry of Health & Family Welfare, Government of India

Shashwat

Client



Sikri Company &lt;sikrico@sikrilaw.com&gt;

---

**In the matter of: Suo-Moto Vs. UOI & Ors. ( NGT) OA 638 of 2023.Advance service of Reply Affidavit filed by the Respondent No.3 Indian Council of Medical Research**

1 message

---

**Sikri Company** <sikrico@sikrilaw.com>

12 December 2023 at 16:26

To: sarojbala.cpcb@nic.in, bisht.poonam@gov.in, menu.batra@nic.in, director@aiims.gov.in

Cc: cbaisya &lt;cbaisya@gmail.com&gt;

Regards

**M/s. Sikri & Company****Advocates**Office Add:- C-108 Basement, Defence Colony,  
New Delhi -110024.Chamber Add:-229, Lawyers Chambers,  
Delhi High Court, Sher Shah Road,  
New Delhi-110003.Contact Add:- +91-35113567, +91-9311331805,  
+91-9311331810**Green Tribunal ICMR OA 638 of 2023.pdf**

407K