

BEFORE THE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

**Original Application No. 638/2023**

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

WITH

**Original Application No. 658/2023**

In re: News item appearing in Times of India dated 10.10.2023 titled  
“Delhi, Chennai studies hint at pollution link to diabetes”

**REPLY ON BEHALF OF THE HEALTH DEPARTMENT, GNCT  
OF DELHI, RESPONDENT NO. 5**

**MOST RESPEXTFULLY SHOWETH:**

1. That this Hon’ble Tribunal is considering the effects of long-term exposure to air pollution on mental health and psychological well-being. The present response is being filed pursuant to the notice issued by this Hon’ble Tribunal to the answering respondent.
2. It is respectfully submitted that environmental pollution has been recognized as a significant factor affecting public health, with a growing body of research exploring its impact on psychological health. In India, where rapid industrialization and urbanization have led to increased pollution, understanding the mental health implications is particularly crucial. Based on research papers, the following are the keyinsights with regard to air pollution and mental health:



- (a) Exposure to various environmental pollutants, including air pollutants, heavy metals, and noise pollution, is associated with an increase in mental health disorders such as anxiety, mood, and psychotic syndromes, with both direct biological effects and stress-related impacts being implicated.
- (b) A study published in the journal *Environmental Health Perspectives* found that people living in areas with high levels of air pollution were twice as likely to be diagnosed with depression as those living in areas with low levels of pollution.
- (c) A study published in the journal *JAMA Psychiatry* found that people living in areas with high levels of air pollution were more likely to experience symptoms of anxiety, such as worry, irritability, and restlessness.
- (d) A study published in the journal *Environmental Health* found that exposure to air pollution can increase levels of stress hormones in the body.
- (e) A study published in the journal *Neurotoxicology* found that exposure to air pollution can lead to problems with thinking, memory, and learning.
- (f) A study published in the journal *Environmental Health Perspectives* found that people living in areas with high levels of air pollution were more likely to be diagnosed with psychosis, a mental disorder that causes a loss of contact with reality.
- (g) The built environment, including factors like high rise housing, poor-quality housing, and loud exterior noise, can increase psychological distress and indirectly affect mental health through altering psychosocial processes (Evans 2003).

- (h) Air pollution has been found to significantly reduce subjective well-being (SWB), with negative emotions such as nervousness, depression, and restlessness being more prominent in individuals exposed to higher levels of pollutants like PM<sub>2.5</sub>.
- (i) Several recent systematic reviews have been conducted on the impact of air pollution on mental health (Borroni et al., 2022; Braithwaite et al., 2019; Fan et al., 2020; Q. Liu et al., 2021; Margolis et al., 2022; Trushna et al., 2021; Zeng et al., 2019; Zhao et al., 2018). However, these reviews either focused on one specific air pollutant (e.g., PM) or on specific developmental periods (e.g., adults).
- (j) In the systematic review by Zundel et al (in year 2022) on air pollution and internalizing symptoms and behaviours revealed that air pollution exposure is consistently associated with increased anxiety and depression across different exposure windows and in both human and animal models. Further they also reported that air pollution exposure is associated with several neurobiological changes, predominantly increased inflammation, neuronal degeneration, and oxidative stress.
- (k) Clara G. Zundel had stated in a World Economic Forum Report that humans exposed to polluted air tend to experience changes in the brain regions that govern emotions such as amygdala, hippocampus, and the prefrontal cortex.
- (l) According to another research, children and adolescents breathing polluted air could display depressive symptoms and be at a high risk for suicidal behaviours.



- (m) Data reported from China stated that standard deviation by 1 for increase in the particulate matter according to the accepted level of PM2.5 concentration in the air tends to increase the chances of developing psychiatric illness by 6.67% in individuals which is equivalent to a medical expense of approximately 22.88 billion dollars. This data holds important implications as majority of the global population resides in regions which have PM2.5 concentration levels much higher than permissible limits defined by the WHO guidelines.
- (n) Braithwaite et al in 2019 published a meta-analysis of 22 studies and reported that the findings supported the hypothesis of an association between long-term PM2.5 exposure and depression, as well as of possible associations between long-term PM2.5 exposure and anxiety and between short-term PM10 exposure and suicide.
- (o) The synthesis of research indicates a clear link between environmental pollution and psychological health, with various pollutants contributing to increased mental health issues.

#### **Indian Perspective :-**

3. That there is evidence suggesting that air pollution exposure worsens mental health outcomes in India, leading to feelings of sadness, cognitive difficulties, and a reduced ability to cope with life's challenges.

4. In India, the impact is particularly evident, with air pollution and climate variability exacerbating psychological distress, especially in rural and economically vulnerable populations. These findings underscore the importance of addressing environmental pollution not only for physical health but also for the mental well-being of individuals in India.
5. These studies suggest that in India, environmental pollutants, particularly air pollution, are linked to a range of mental health issues, including anxiety, mood changes, and psychotic disorders, with notable impacts on subjective well-being, psychiatric symptoms, and psychological disorders across different populations, and that hot weather may also worsen psychological health in rural areas due to economic stress.
6. A report by Rizwan and colleagues from Department of Community Medicine, AIIMS, New Delhi had reported the magnitude and effects of air pollution on health in Delhi in 2012.
7. There is no published data from IHBAS, the state mental health institute in Delhi on this aspect.
8. However, there is need for further studies to investigate the causal associations between air pollution and poor psychological/mental health due to the data being largely from the West and meagre Indian studies. Also, there are methodological challenges in the studies conducted till date. Future research should also incorporate more advanced



modelling of air- pollution estimates or the use of personal air monitors.

9. That the Indian Council of Medical Research (ICMR) as the nodal agency for research in the country may be directed to conduct multi-site task force project to document authentic data in Indian context including urban-rural differences, if any.

**10. General Remedial Measures suggested are as follows:--**

- i. Reduce exposure to air pollution: To reduce the impact of air pollution on person's mental health, there are a number of things one can do to reduce one's exposure. Avoid going out when not extremely necessary.
- ii. Staying Active: One can try to incorporate a healthy and active lifestyle. To be regular in exercise, yoga, dance etc , in indoors as well, as it will help to manage mental well-being.
- iii. Wearing a mask: If one must spend time outdoors when pollution levels are high, one can wear a mask to help filter out pollutants.
- iv. Maintain a healthy lifestyle: A healthy lifestyle can help to reduce one's risk of mental health problems. This includes eating a healthy diet, exercising regularly, getting enough sleep, and managing stress.
- v. Seeking social support: Social support is important for mental health. Make time for activities that one enjoys with friends and family.

- vi. Talking to a therapist: If anyone is struggling with mental health problems, he/she can talk to a therapist. They can help you to understand your symptoms and develop coping mechanisms.

**11. Specific measures under taken by the GNCTD of Delhi are as follows :--**

- i. Delhi Govt hospitals like DDU , BSA and GTB with Psychiatry department provide treatment for persons with mental health issues including depression and anxiety.
- ii. IHBAS is the State mental health institution under Delhi govt catering to population of NCT of Delhi and neighbouring states of Northern India. It provides OPD; inpatient; emergency and community outreach services for persons with mental health conditions. It provides counseling services and medications free of cost.
- iii. IHBAS also runs Mobile Mental Health Units (MMHU) services in Delhi covering all the 11 districts in the state and provides mental healthcare to homeless and homebound persons with mental illness.
- iv. Telemanas is the govt mental health helpline for persons with psychological issues to reach out for support and care. [Telephone No. 14416]
- v. Public awareness campaigns highlighting mental health alongside physical health and services available for seeking help.

Deputy Secretary  
Health & Family Welfare Deptt.  
Govt. of NCT of Delhi  
Delhi Secretariat, New Delhi-02

Deputy Secretary  
Health & Family Welfare Deptt.  
RESPONDENT  
Govt of Delhi  
Delhi Secretariat, New Delhi-02

THROUGH

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NEW DELHI

01.04.2024

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AFFIDAVIT

I, Arvind Kumar , New Delhi, affirms and states as under:

1. That I am Deputy Secretary, Health and Family Welfare Department, Govt. of NCT of Delhi and therefore, in that capacity, I am well conversant with the facts and circumstances of this case and as such I am competent to swear this affidavit.
2. That I have read and understood the contents of the accompanying reply and I state that the facts contained therein are true to my knowledge, and submissions made therein are based on legal advice received from my counsel and believed by me to be correct.

*[Signature]*  
 DEPONENT  
 Deputy Secretary  
 Health & Family Welfare Deptt.  
 Govt. of NCT of Delhi  
 Delhi Secretariat, New Delhi-02

VERIFICATION:

- 1 APR 2024

Verified at New Delhi on this \_\_\_ day of April, 2024 that the contents of  
 the above affidavit are true and correct, nothing stated therein is false  
 and nothing material has been concealed therefrom.



**ATTESTED**  
*[Signature]*  
 BY NOTARY PUBLIC  
 NEW DELHI (INDIA)  
 AZAD KUMAR - Adv.  
 - 1 APR 2024

*[Signature]*  
 DEPONENT  
 Deputy Secretary  
 Health & Family Welfare Deptt.  
 Govt. of NCT of Delhi  
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