

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI
ORIGINAL APPLICATION NO. 1093 OF 2024**

IN THE MATTER OF:

News Item titled “Study finds wide variety of nitrogen-use efficiency in Indian rice varieties” appearing in the Hindu dated 11.08.2024

To,

1. Indian Council of Agricultural Research
Through its Secretary, Krishi Bhavan, New Delhi-110001
Email: secy.car@nic.in ...Respondent No. 1
2. Ministry of Agriculture and Farmer Welfare
Through its Secretary, Krishi Bhavan, New Delhi-110001
Email: secy-agri@gov.in ...Respondent No. 2
3. Ministry of Environment, Forest and Climate Change
Through its Secretary, Indira Paryavaran Bhawan,
Jorbagh Road, New Delhi- 110003
Email: secy-moef@nic.in ...Respondent No. 3
4. Central Pollution Control Board
Through its Member Secretary, Parivesh Bhawan,
East Arjun Nagar, Delhi-110032
Email: mccb.cpcb@nic.in ...Respondent No. 4

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NDOH- 26.03.2025

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Place: New Delhi
Dated: 24.03.2025

THROUGH



[Ashish Tiwari]
 Advocate for the Respondent No. 1 (ICAR)
 B-3, Sagar Apartment
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 (M)9971382986
 Email:law.aashish@gmail.com

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**BEFORE THE NATIONAL GREEN TRIBUNAL
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IN THE MATTER OF:

News Item titled "Study finds wide variety of nitrogen-use efficiency in Indian rice varieties" appearing in the Hindu dated 11.08.2024

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4. Central Pollution Control Board
Through its Member Secretary, Parivesh Bhawan,
East Arjun Nagar, Delhi-110032
Email: mshb.cpcb@nic.in ...Respondent No. 4

**SHORT AFFIDAVIT ON BEHALF OF RESPONDENT NO.1 I.E., INDIAN
COUNCIL OF AGRICULTURAL RESEARCH (ICAR)**

I, Vampad Sharma aged about 48 years, working as, Director (Law) Indian Council of Agricultural Research, Krishi Bhawan, New Delhi-110001, do hereby solemnly affirm and state as follows:

1. That, I am duly authorized to submit this counter affidavit on behalf of the Respondent No. 1 in the above captioned matter and as such I am well acquainted with the facts and circumstances of the case based on the records of the case and hence, competent to swear and file this counter affidavit.



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2. That the present original application was filed and registered on 21.08.2024 suo motu on the basis of the News Item titled “Study finds wide variety of nitrogen-use efficiency in Indian rice varieties” appearing in the Hindu dated 11.08.2024.

True copy of News Item titled “Study finds wide variety of nitrogen-use efficiency in Indian rice varieties” appearing in the Hindu dated 11.08.2024 is annexed herein and marked as **Annexure R-1 [at page 7 to 9]**;

3. The present Original Application was listed before the Hon’ble Tribunal on 23.08.2024, wherein the Hon’ble Tribunal passed the following Order:

9. Hence, we implead the following as respondents in the matter:

- 1) *Indian Council of Agricultural Research, through its Secretary, Krishi Bhavan, New Delhi-110001*
- 2) *Ministry of Agriculture and Farmer Welfare, through its Secretary, Krishi Bhavan, New Delhi-110001*
- 3) *Ministry of Environment, Forest and Climate Change, through its Secretary, Indira Paryavaran Bhawan, Jorbagh Road, New Delhi- 110003*
- 4) *Central Pollution Control Board, through its Member Secretary, Parivesh Bhawan, East Arjun Nagar, Delhi-110032*

10. Issue notice to the above respondents for filing their response/reply by way of affidavit before the Tribunal at least one week before the next date of hearing. If any of the respondents directly files the reply without routing it through his advocate then the said respondent will remain virtually present to assist the Tribunal.

11. List on 03.12.2024.

A true copy of order dated 23.08.2024 passed by this Hon’ble Tribunal annexed herein and marked as **Annexure R-2 [at page 10 to 12]**;



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4. The Answering Respondent shares the concerns of the Hon'ble Tribunal as regards wide variations that exist among the popular varieties of rice for their ability to use nitrogen and concerns expressed in the news reports are quite genuine.
5. It is submitted that Indian Institute of Rice Research (IIRR) coordinates with All Indian Coordinated Research Project on Rice (AICRPR) and facilitates the release of various rice varieties after multi-location evaluation.
6. Targeting NUE in rice, AICRPR has conducted special trial for the evaluation of nitrogen use efficient rice breeding lines and promising results have been obtained. About five advanced breeding lines for NUE are currently in the final stages of testing, release and notification, which when deployed and popularized with farmers may result in saving of nitrogenous fertilizers.
7. It is further stated that cereals especially, rice and wheat consume major portion of nitrogen as these crops are the staple foods of India and occupy majority area in the country.
8. The poor NUE in rice is due to fact that the total quantity of applied nitrogen is subjected to various losses in submerged soils viz., volatilisation, leaching, runoff, nitrification, denitrification etc. and only 30-40% of the applied nitrogen, remains available for the crops. Though these losses cannot be controlled to full extent, the proper knowledge, education and management along with use of improved variety of crops can reduce the losses to some extent depending upon the weather and soil conditions. Hence, existing genotypic variation for NUE can be better utilised for improving NUE and reducing Nitrogen inputs.



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9. It is further submitted that as per the scientific literature available, under aerobic condition, there is more chances of N_2O and NH_3 emissions, when nitrogenous fertilizers are applied, as it is in oxidized condition but under anaerobic condition chances of nitrate/ammonium pollution that adversely affect water pollution, biodiversity and climate change. It is also cannot be denied that the best NUE varieties of crops may have potential to reduce these environmental issues, however, facts and figures in this regard are yet to be validated through scientific studies and experiments.
10. It is further submitted that though there is a unwanted necessity for farmers to focus on breeding varieties with higher yields to meet the food demands of such a large population of the country, compelling use of more and more synthetic fertilizers, yet our country is also focuses on the development of resource efficient varieties to save water, nutrient use efficient varieties to reduce use of nitrogen and phosphorus to the extent possible and conducting trials like aerobic trial, direct seeded rice trial, low nitrogen tolerant trial and low phosphorus tolerant trial to address the issues in AICRIP system and to identify the genotype that would have high NUE while not comprising on yield reduction.
11. It is submitted that the nitrous oxide (N_2O) a very potent gas causing global warming emits from use of fertilizer. When nitrogenous fertilizers are applied under aerobic condition, emits N_2O . Therefore, the development of nitrogen Use Efficient (NUE) varieties with alternate wetting and drying could help to reduce its emission from the rice field. Global input of synthetic fertilizer N increased dramatically starting from 1930s', and this is responsible for dramatic increase in the current atmospheric N_2O concentration. The anthropogenic activities, mainly intensification of agriculture facilitated by manufacture of synthetic N fertilizers, increased fossil fuel burning and the land use change are the main causes of dramatic



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increase of N₂O emissions starting from 1950. It is submitted that the agriculture is the largest anthropogenic source of N₂O fluxes which is likely to further increase with the projected increase in use of nitrogenous fertilizers to meet the ever-increasing demand for food of the growing population of our country. Therefore, crop varieties with high N use efficiency requiring lower quantities of nitrogenous fertilizers may help in lower emissions of nitrous oxide.

12. It is submitted that strategies to reduce N₂O emissions from rice paddy fields includes:

- (i) matching N supply with the crop demand,
- (ii) minimizing fallow periods to limit mineral N accumulation,
- (iii) optimizing split N application schemes,
- (iv) using controlled/slow-release fertilizers,
- (v) using nitrification inhibitors, and
- (vi) optimize tillage, irrigation and drainage.

13. It is submitted that while issue is of utmost importance for the environment and public health and considering the prevailing conditions, it would also require unprecedented mass movement to ensure dissemination of information, educating and sensitizing the farmers of this country to use improved varieties of crops seeds as the ultimate choice for their crop productions lies with them.

14. That the Answering Respondent reserves its right to add, amend and file the revised affidavit if so instructed or directed by this Hon'ble Tribunal.

15. That the Contents of the above stated paras are true and correct to the best of my knowledge and nothing material has been concealed therefrom.



Vampad Sharma
DEPONENT

वामपद शर्मा / VAMPAD SHARMA
निदेशक (प्रशासन) / Director (Admn.)
भारतीय कृषि अनुसंधान परिषद / ICAR
कृषि भवन, नई दिल्ली-110001
Krishi Bhawan, New Delhi-110001

VERIFICATION:

Verified at New Delhi on _____ day of _____, 2025 that the contents of the above Counter-Affidavit are true and correct to the best of my knowledge as derived from the official records maintained by the Respondent No. 1 and nothing material has been concealed therefrom.

Vampad Sharma
DEPONENT

वामपद शर्मा / VAMPAD SHARMA
निदेशक (प्रशासन) / Director (Admn.)
भारतीय कृषि अनुसंधान परिषद / ICAR
कृषि भवन, नई दिल्ली-110001
Krishi Bhawan, New Delhi-110001

24 MAR 2025

*I Identified the deponent who
has signed in my presence*



CERTIFIED THAT DEPONENT	
Sh./Ms.....	Age.....
S/o, W/o, D/o.....	<i>Vampad Sharma</i>
R/o.....	<i>Vampad Sharma</i>
Identified by Sh./S.....	<i>Nitendra Kumar</i>
that solemnly affirms that the contents & expressions therein are correct to his/her knowledge	<i>Nitendra Kumar</i>
NITENDRA KUMAR, NOTARY PUBLIC Govt. of India, DELHI	

ANNEXURE R-1

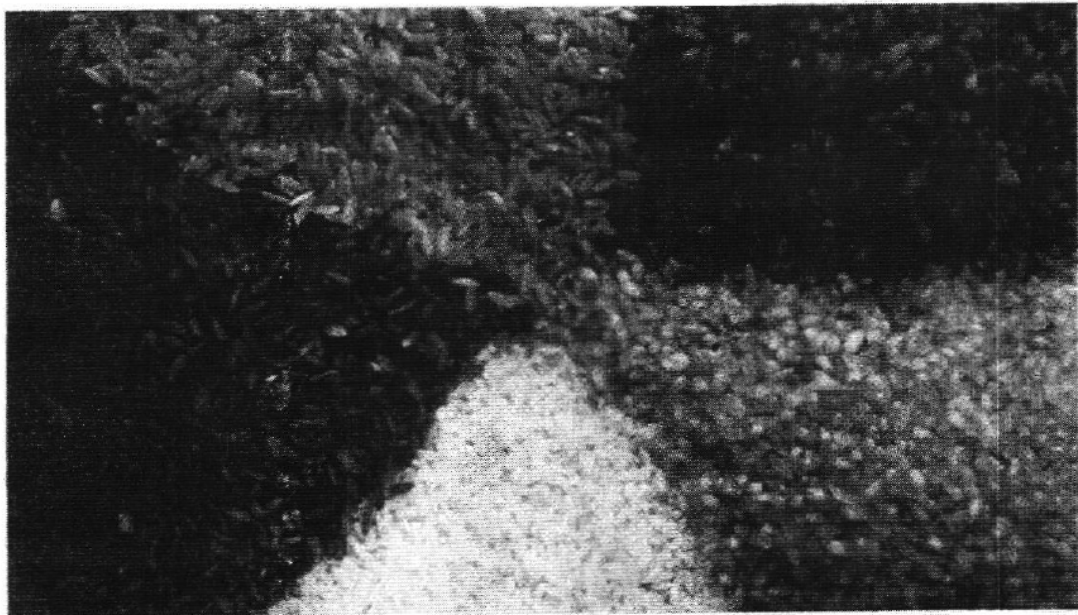
Study finds wide variety of nitrogen-use efficiency in Indian rice varieties

This can lead to the development of newer varieties that use less nitrogen and are high-yielding, cutting costs on imported fertilizers and reducing nitrogen-linked pollution

Updated - August 11, 2024 07:08 pm IST Published - August 11, 2024 06:42 pm IST - NEW DELHI



JACOB KOSHY



Nitrogen use efficiency refers to the yield of a crop relative to the nitrogen (natural and artificial) available to it | Photo Credit: The Hindu

Biotechnologists at the Guru Gobind Singh Indraprastha University (GGU) in New Delhi have discovered a wide variation among popular varieties of rice in India in their ability to use nitrogen. This knowledge can be used to develop newer varieties that use less nitrogen and are high-yielding, thus slashing expenditure on imported fertilizers and reducing nitrogen-linked pollution.

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"Cereals consume two-thirds of all urea in India, led by rice. Poor fertilizer nitrogen-use efficiency (NUE) wastes N (nitrogen)-fertilizers worth ₹1 trillion a year in India and over \$170 billion per year globally," N. Raghuram, Professor at GGU, and lead author of the paper, said, reporting these findings.

Nitrogen use efficiency refers to the yield of a crop relative to the nitrogen (natural and artificial) available to it.

"Worse, N-fertilizers are the main source of nitrous oxide and ammonia pollution of air and nitrate/ammonium pollution of water, affecting our health, biodiversity, and climate change. Yet, we don't have a ranking of any Indian crop varieties in terms of their NUE for crop improvement by selection or breeding," Dr. Raghuram said.

The paper was published late last week in the peer-reviewed *Journal of Plant Growth Regulation*.

The NUE of the best varieties were five times as much as the least, the investigation found. However, a high NUE doesn't always mean the highest yields and farmers in India generally prefer varieties with the highest yields.

"The focus of Indian agriculture has for a long time been to solely increase yield. This was necessary during the Green Revolution but this also meant more synthetic fertilizers, more wastage, and pollution. India has tens and thousands of rice varieties but only a few are actually used and studied as part of agricultural research. To find newer crops that have improved NUE and yields, we have to have a wider approach," Dr. Raghuram told *The Hindu*.

The study was co-authored by Ashu Tyagi and Navjyoti Chakraborty, both scientists from the Centre for Sustainable Nitrogen and Nutrient Management, School of Biotechnology, GGU.

While some improvements in NUE could be done by improving fertilizer formulations, legume-based crop-rotations and crop management practices, it was now become necessary to lay more stress on improving the crop using biotechnology, the authors of the study said.

"Our screening of a dozen rice varieties out of over a thousand Indian-released varieties revealed five-fold variation in NUE that can be tapped for crop improvement. There could be even higher potential in the tens of thousands of untapped farmers' varieties/landraces" Ms. Tyagi, who carried out this work for her doctoral thesis, said. "This was by far the most comprehensive study of 46 phenotypic and physiological parameters in any crop. We found 19 parameters strongly associated with NUE, including eight we discovered for the first time, subject to confirmation in field trials," she added.

The studies are a result of investigation done over a decade using different sets of 34 released rice varieties by different researchers in the lab with a consistent methodology to evaluate NUE in the university greenhouse, which are plots within campuses to simulate agricultural fields.

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"The varieties we earlier found to be of high NUE in the greenhouse were later confirmed in the field by our partners in agricultural institutes. So we are increasingly confident that we have a reliable field-relevant methodology for biological assessment of NUE. On that basis, we can recommend large-scale screening of all the Indian varieties of rice to find more and more NUE cultivars that suit different agroclimatic conditions and markets," Dr. Raghuram said.

India is the world's second-largest source of nitrous oxide (N₂O), a greenhouse gas that heats up the atmosphere far more than carbon dioxide. Nearly 11% of such global manmade emissions in 2020 were from India, topped only by China at 16%. The major source of these emissions is fertilizer usage, according to a global assessment of N₂O emissions conducted in June.

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[True copy]

Item No.06

Court No. 1

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

Original Application No.1093/2024

News Item titled "Study finds wide variety of nitrogen-use efficiency in Indian rice varieties" appearing in The Hindu dated 11.08.2024

Date of hearing: 23.08.2024

**CORAM: HON'BLE MR. JUSTICE PRAKASH SHRIVASTAVA, CHAIRPERSON
HON'BLE DR. A. SENTHIL VEL, EXPERT MEMBER**

Applicant: None appeared

ORDER

1. This original application is registered *suo motu* on the basis of the news item titled "Study finds wide variety of nitrogen-use efficiency in Indian rice varieties" appearing in The Hindu dated 11.08.2024.

2. The news item relates to wide variations found among popular varieties of rice in India in their ability to use nitrogen. As per the article, this knowledge can be used to develop newer varieties that use less nitrogen and are high-yielding, thus slashing expenditure on imported fertilizers and reducing nitrogen-linked pollution.

3. The news article states that Cereals consume two-thirds of all urea in India, led by rice. Poor fertilizer nitrogen-use efficiency (NUE) wastes N (nitrogen)-fertilizers worth ₹1 trillion a year in India and over \$170 billion per year globally. It highlights that Nitrogen use efficiency refers to the yield of a crop relative to the nitrogen (natural and artificial) available to it.

4. The news item further states that N-fertilizers are the main source of nitrous oxide and ammonia pollution of air and nitrate/ammonium pollution of water, affecting health, biodiversity, and climate change. As

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per the research, the NUE of the best varieties were five times as much as the least, the investigation found. However, a high NUE doesn't always mean the highest yields and farmers in India generally prefer varieties with the highest yields.

5. The article states that the focus of Indian agriculture has for a long time been to solely increase yield. The article alleges that though this was necessary during the green revolution, it also meant more synthetic fertilizers, more wastage and pollution. It claims that India needs to find newer crops that have improved NUE and yields.

6. The article further explains that India is the world's second-largest source of nitrous oxide (N₂O), a greenhouse gas that heats up the atmosphere far more than carbon dioxide. Nearly 11% of such global manmade emissions in 2020 were from India, topped only by China at 16%. The major source of these emissions is fertilizer usage, according to a global assessment of N₂O emissions.

7. The news item raises substantial issue relating to compliance of the environmental norms, especially compliance of Air (Prevention and Control of Pollution) Act, 1981 and the Environment Protection Act, 1986.

8. Power of the Tribunal to take up the matter *suo-motu* has been recognized by the Hon'ble Supreme Court in the matter of "*Municipal Corporation of Greater Mumbai vs. Ankita Sinha & Ors.*" reported in 2021 SCC Online SC 897.

9. Hence, we implead the following as respondents in the matter:

- (1). Indian Council of Agricultural Research, through its Secretary, Krishi Bhavan, New Delhi 110 001



- (2). Ministry of Agriculture and Farmer Welfare, through its Secretary, Krishi Bhavan, New Delhi 110 001
- (3). Ministry of Environment, Forest and Climate Change, through its Secretary, Indira Paryavaran Bhawan Jorbagh Road, New Delhi – 110 003
- (4). Central Pollution Control Board, through its Member Secretary, Parivesh Bhawan, East Arjun Nagar, Delhi-110032

10. Issue notice to the above respondents for filing their response/reply by way of affidavit before the Tribunal at least one week before the next date of hearing. If any of the respondents directly files the reply without routing it through his advocate then the said respondent will remain virtually present to assist the Tribunal.

11. List on 03.12.2024.

Prakash Shrivastava, CP

Dr. A. Senthil Vel, EM

August 23, 2024
Original Application No.1093/2024
SN

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[True Copy]

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI
ORIGINAL APPLICATION NO. 1093 OF 2024**

IN THE MATTER OF:

News Item titled "Study finds wide variety of nitrogen-use efficiency in Indian rice varieties" appearing in the Hindu dated 11.08.2024

VAKALATNAMA

I/We, Vampad Sharma working as Director (Law), at ICAR, Krishi Bhavan, New Delhi, Aged 48 years, the above named Respondent No. 1 (ICAR) in the above application/Suit Appeal / Reference do hereby appoint and retain **Mr. Ashish Tiwari, Advocate** for National Green Tribunal, to act and appear for me /us in the above application/Suit /Appeal /Reference and on my / Our behalf to conduct and prosecute or (defend) the same and all proceedings that may be taken in respect of any application connected with the same or any decree or order passed therein, including proceedings in taxation and applications for Review, to file and obtain return of documents, and to deposit and receive money on my / our behalf in the application/Suit /Appeal /Petition /Reference and in applications of Review and to represent me/us and to take all necessary steps on my behalf in the above matter. I/we agree to ratify all acts done by the aforesaid advocate in pursuance of this authority.

Date this the 24th day of March of 2025

IDENTIFIED, SATISFIED AND ACCEPTED:

(Ashish Tiwari, Advocate)

.....
PETITIONER(S) /RESPONDENT(S)
APPELLANT (S)

The address for service of the said advocate is office:

Ashish Tiwari, Advocate
Address- B-3, Sagar Apartments, Tilak Marg, New Delhi-01
Mob- 9971382986
Email id- law.aashish@gmail.com

वामपद शर्मा /VAMPAD SHARMA
निदेशक (प्रशासन) / Director (Admn.)
भारतीय कृषि अनुसंधान परिषद् / ICAR
कृषि भवन, नई दिल्ली-110001
Krishi Bhawan, New Delhi-110001

MEMO OF APPEARANCE

The Registrar
National Green Tribunal
New Delhi-01

Please enter my appearance on behalf of petitioner(s) Appellant(s)/Respondent(s) in the above matter.

New Delhi
Dated 24.03.2025

(Ashish Tiwari, Advocate)





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Sahib Patel <adv.sahibpatel@gmail.com>

Service : Counter Affidavit filed on Behalf of the Respondent No. 1 (ICAR) in OA 1093 of 2024 before the National Green Tribunal

1 message

Sahib Patel <adv.sahibpatel@gmail.com>

Mon, Mar 24, 2025 at 6:09 PM

To: secy-agri@gov.in, secy-moef@nic.in, mscb.cpcb@nic.in

Cc: law.aashish@gmail.com

Dear Sir/Mam,

Please find attached Counter Affidavit filed on behalf of the Respondent No. 1 (ICAR) in above mentioned matter.
Kindly accept the Proof of Service of the same.

For Mr. Ashish Tiwari, Advocate
[Counsel of the Respondent No. 1- ICAR]

Regards,
Sahib Patel, Advocate
B-3, Sagar Apartments,
Tilak Marg, New Delhi- 110001

 **OA 1093 OF 2024 COUNTER AFFIDAVIT ICAR OCR.pdf**
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