

**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: mscb.cpcb@nic.in Respondent No. 4

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THROUGH

Place: New Delhi

Dated: 14-10-25



**GIGI.C.GEORGE
ADVOCATE
STANDING COUNSEL (UOI)
NGT
M-9810625315**

Souzar Kumar Khan

**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
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Respondent No. 1

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4. Central Pollution Control Board
Through its Member Secretary, Parivesh Bhawan,
East Arjun Nagar, Delhi-110032
Email: mscb.cpcb@nic.in

Respondent No. 4

**COUNTER AFFIDAVIT ON BEHALF OF RESPONDENT NO.2 i.e THE MINISTRY
OF AGRICULTURE AND FARMERS WELFARE**

I, Dr. Sourav Kumar Khan aged about 35 years, working as, Assistant Commissioner in NRM Division, DA&FW, 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. 2 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 the file this counter affidavit.
2. That the present original application was filed and registered on 21.08.2024 suo-moto 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.

Sourav Kumar Khan



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 4 to 6];

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

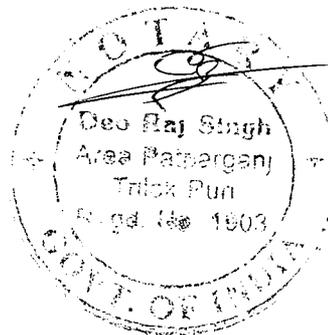
10. Issue notice to the above respondents for filing their response/reply by way of affidavit before the Tribunal at least one week before the next date of hearing. If any of the respondents directly files the reply without routing it through his advocate then the said respondent will remain virtually 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 7 to 9];

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 express in the news reports are quite genuine.
5. It is submitted that Indian Council of Agricultural Research (ICAR) is mandated with development of high yielding, nitrogen use efficient and climate resilient varieties in major food and commercial crops including rice. ICAR also coordinates with and facilitates the release of various rice varieties after multi-location evaluation.
6. The Department of Agriculture and Farmers Welfare (DA&FW) under Ministry of Agriculture and Farmers Welfare is implementing the National Food Security & Nutrition Mission (NFSNM) with the objective to increase production of Rice, Wheat, Pulses, Coarse Cereals (Maize & Barley), Commercial Crops (Cotton, Jute &

Sourav Kumar Khan



Sugarcane) and Nutri-Cereals (Shree Anna) through area expansion, adoption of different cropping patterns and productivity enhancement in a sustainable manner.

7. Further the Ministry of Agriculture is promoting improved rice cultivation practices such as System of Rice Intensification (SRI) and Direct Seeded Rice (DSR) to boost the productivity, conserve resources, and reduce environmental impact. As per the research findings of ICAR-NRRI, Cuttack (2024), Direct Seeded Rice (DSR) has emerged as a promising alternative to traditional puddled transplanting methods. DSR offers numerous advantages, including reduced water usage, lower labour requirements, and enhanced profitability. Further, ICAR-NRRI (2016) reported that the System of Rice Intensification (SRI) is perhaps the best current example of options available to farmers and nations to promote community-led agricultural growth, while managing soil and water resources more sustainably and even enhancing their future productive capacity.
8. It is submitted that the agriculture is a State subject. Government of India is supporting the efforts of State governments to ensure balanced use of fertilizers and to improve soil health through its various schemes which include the following :
 - i. Soil Health Card (SHC) / Soil Health Management (SHM) : Under this Scheme, Soil Health Cards are issued to farmers. These cards contain an advisory based on the soil nutrient status of a farmer's holding and recommendations on dosage of different nutrients needed.
 - ii. Crop Diversification Programme: this program is being implemented in traditional green revolution states of Punjab, Haryana, and Western UP to encourage a shift from water-intensive paddy to pulses, oilseeds, nutri-cereals, cotton, and agroforestry to conserve soil fertility and groundwater.
 - iii. Paramparagat Krishi Vikas Yojana (PKVY) and Mission Organic Value Chain Development for North Eastern Region (MOVCDNER) which aim at promoting organic farming to reduce excess use of nitrogenous fertilizers including urea.
9. 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.
10. That the Contents of the above stated paras are true and correct to the best of my knowledge and no material has been concealed therefrom.

VERIFICATION:

Verified at New Delhi on 13 OCT 2025 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. 2 and nothing material has been concealed therefrom.

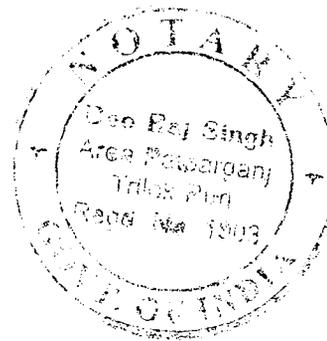
Identify the Deponent/Exhibitor

Sourav Kumar Khan
DEPONENT

डॉ. सौरव कुमार खॉं/Dr. Sourav Kumar Khan
सहायक आयुक्त/Assistant Commissioner
भारत सरकार/Government of India
कृषि एवं किसान कल्याण मंत्रालय/Min Agriculture & Farmers Welfare
कृषि एवं किसान कल्याण विभाग/Do Agri. & Farmers Welfare
कृषि भवन, नई दिल्ली/Krishi Bhawan, New Delhi-110001

ATTESTED
NOTARY PUBLIC
GOVT. OF INDIA

13 OCT 2025



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.

65 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.

"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.

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

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

**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 India rice varieties" appearing in the Hindu dated 11.08.2024

VAKALATNAMA

I/We, Dr. Sourav Kumar Khan working as Assistant Commissioner (NRM), at DA&FW, Krishi Bhavan, New Delhi, Aged 35 years, the above named Respondent No 2 (MoAFW) in the above applications/Suit Appeal/Reference do hereby appoint and retain GIGI.C.GEORGE, 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 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.....^{14th}.....day of October.....of 2025

IDENTIFIED SATISFIED AND ACCEPTED:

(GIGI.C.GEORGE, Advocate)

.....*Sourav Kumar Khan*.....

PETITIONER(S)/ RESPONDENTS(S)
APPELLANT(S)

The address for service of the said advocate is office

**GIGI.C.GEORGE
ADVOCATE
STANDING COUNSEL (UOI)
NGT
M-9810625315**

MEMO OF APPEARANCE

The Registrar
National Green Tribunal
New Delhi-01

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

New Delhi
Dated 14-10-2025

Gigi.C.George
(GIGI.C.GEORGE, Advocate)