GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

RAJYA SABHA
UNSTARRED QUESTION NO. 2307
TO BE ANSWERED ON 20.03.2025

Emission of nitrous oxide in the atmosphere

2307 SHRI A. D. SINGH:

Will the Minister of ENVIRONMENT, FOREST AND CLIMATE CHANGE be pleased to state:

(a) whether it is a fact that India is the one of the largest sources of nitrous oxide, a green house gas which heats up atmosphere;
(b) the details of the main causes of the emission of nitrous oxide in the atmosphere;
(c) the remedy to reduce this gas in the atmosphere; and
(d) the efforts being taken in this regard?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(SHRI KIRTI VARDHAN SINGH)

(a) to (d) As per India's fourth Biennial Update Report (BUR) submitted to the United Nations Framework Convention on Climate Change (UNFCCC) on 30th December 2024, total greenhouse gas (GHG) emissions, excluding Land Use Land-Use Change and Forestry (LULUCF) in 2020 were 2,958.6 million tonne CO_2e and 2,436.7 million tonne CO_2e with the inclusion of LULUCF. Nitrous oxide (N_2O) contributes 5.1 percent to India's total GHG emissions. India is the fourth largest emitter of N_2O after China, the United States of America, and Brazil.

The agriculture sector contributes 70% to nitrous oxide emissions followed by energy (16 percent), waste (12 percent) and Industrial Process & Product Use (IPPU) (2 percent). The major sources of N_2O emission from agriculture sector are agricultural soils (89 percent) mainly due to the application of synthetic fertilizers, and manure management (9 percent) and remaining 2 percent from agricultural residue burning. The major sources of N_2O emission from energy sector are fuel combustion activities in energy industries, manufacturing industries, construction and transport. The major sources of N_2O emissions from waste sector is from domestic and commercial wastewater handling. Whereas, the major source from IPPU sector is during the manufacturing of nitric acid (91 percent) and ferroalloys (9 percent).

The Government is implementing several programs and schemes to reduce the nitrous oxide emissions in the country. The Government, since 2016, has made it mandatory to manufacture 100% neem oil coated urea as it has higher nitrogen use efficiency and lower loss of

nitrogen due to inhibition of nitrification process in soil compared to prilled urea. An emission reduction of 26.81 $MtCO_2$ eq was achieved during 2019-24 from neem coated urea application. Further, one of the flagship programmes of the Government of India is the National Innovations in Climate Resilient Agriculture (NICRA). It aims at developing resilient technologies that reduce nitrous oxide emissions from the agriculture sector. Some of these technologies/practices include soil test based nitrogen application, zero tillage, crop residue management, use of organic manure, crop rotation with legumes and use of nitrification inhibitor coated urea fertilizer like neem coated urea. The government is promoting natural and organic farming practices which will result in reduction of consumption of synthetic N fertilizer, thereby lowering the N_2O emitted. Government has also launched the soil health card scheme, so that judicious application of fertilizer to cropped soils takes place.

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