

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
DEPARTMENT OF AGRICULTURE AND FARMERS WELFARE

LOK SABHA
UNSTARRED QUESTION NO. 2657
TO BE ANSWERED ON THE 04TH AUGUST, 2026

CHALLENGES IN TRADITIONAL FARMING

2657. SHRI EATALA RAJENDER:

Will the Minister of AGRICULTURE AND FARMERS WELFARE कृषि एवं किसान कल्याण मंत्री be pleased to state:

- (a) whether the Bio-technology addresses challenges in traditional farming by enhancing crop resilience, improving yields and fostering sustainability through tools like genetically modified (GM) crops, bio-fertilizers and molecular breeding and these innovations help combat climate change, reduce reliance on synthetic pesticides and improve nutrient absorption;
- (b) if so, the details of the steps taken and results yielded in this regard;
- (c) whether the Bio-technology offers green growth prospects in agriculture industry and if so, the details thereof and views of experts in this regard; and
- (d) whether it is also a fact that given the population growth and climate change, there are challenges to traditional farming practices and food security, which can be addressed with the application of biotechnology; and
- (e) if so, the details of the steps taken and foreign assistance received, funds sanctioned and utilised therefor?

ANSWER

MINISTER OF STATE FOR AGRICULTURE AND FARMERS WELFARE
कृषि एवं किसान कल्याण राज्य मंत्री (SHRI RAMNATH THAKUR)

(a) to (e): As reported by the Indian Council of Agricultural Research (ICAR), several research, development and capacity-building initiatives have been undertaken to harness biotechnology for enhancing agricultural productivity, resilience and sustainability. These initiatives include research on molecular breeding, genomics, marker-assisted selection, genome editing, molecular diagnostics and genetic resource characterization through ICAR

Institutes, All India Coordinated Research Projects (AICRPs), All India Network Projects (AINPs) and Consortia Research Platform Projects (CRPs). The major outcomes of these initiatives include development and dissemination of bio-fertilizers such as Rhizobium, Azotobacter, Azospirillum, phosphate-solubilizing and potash-mobilizing microorganisms for improving nutrient-use efficiency and soil health. Further, microbial biopesticides and bio-control agents such as Trichoderma, Pseudomonas fluorescens, Bacillus thuringiensis (Bt), Beauveria bassiana, Metarhizium anisopliae and nucleopolyhedrovirus (NPV) have been developed for eco-friendly pest management. Further, genome editing research has been initiated by ICAR in 24 field crops and 17 horticultural crops covering 41 crops across 34 research institutions. The Government of India has allocated ₹500 crore for genome editing research at ICAR in March 2024. Two genome-edited rice varieties, namely DRR Dhan 100 (Kamala) and Pusa DST Rice 1, have been developed by ICAR.

Bio-technology offers significant green growth prospects by enabling sustainable intensification of agriculture. It facilitates the development of climate-resilient crops and improves resource-use efficiency. It also helps in reducing dependence on synthetic agrochemicals and promotes environmentally sustainable farming practices. These technologies, when integrated with conventional breeding, good agronomic practices and appropriate biosafety and regulatory frameworks, are expected to contribute towards enhanced productivity, conservation of natural resources, environmental sustainability, improvement in farmers' income and long-term food and nutritional security.

As reported by ICAR, to address the challenges posed by increasing population, climate change and declining natural resources, biotechnology, along with conventional breeding and improved crop management practices, provides opportunities for sustainable agricultural development. It enables the development of high-yielding and climate-resilient crop varieties. It also helps in improving nutrient and water-use efficiency and strengthening pest and disease management. Further, it promotes the use of bio-fertilizers and bio-control agents for sustainable agricultural production.
