GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY
RAJYA SABHA
UNSTARRED QUESTION No. 4456
ANSWERED ON 02.04.2026

Green hydrogen and Bio-manufacturing in NER

4456. Shri Harsh Vardhan Shringla:

Will the Minister of ***Science and Technology*** be pleased to refer to answer to Unstarred Question 1557 given in the Rajya Sabha on the 12th February, 2026 and state:

the manner in which the Bio-RIDE scheme is promoting the development of Biomanufacturing and Biofoundry capacity in the North Eastern Region (NER)?

ANSWER

MINISTER OF STATE (INDEPENDENT CHARGE) FOR THE
MINISTRY OF SCIENCE AND TECHNOLOGY & EARTH SCIENCES
(DR. JITENDRA SINGH)

The BioE3 (**Bio**technology for **E**conomy, **E**nvironment and **E**mployment) policy of the Government of India has laid down the strategic framework for promoting High Performance Biomanufacturing in the country. The policy has identified six thematic areas viz. (i) Biobased chemicals, Biopolymers, APIs and Enzymes; (ii) Smart Proteins and Functional foods; (iii) Precision therapeutics; (iv) Climate resilient agriculture; (v) Carbon Capture and Utilization; and (vi) Marine and Space Research. Eleven calls for proposals have been announced in these thematic areas of Biomanufacturing under the categories; a) Discovery & Application-oriented Integrated Network Research and, b) Bridging the Gap for Scale up. In order to augment research infrastructure for scale up across the six thematic verticals, initiatives have been taken to set up the "मूलांकुर BioEnablers – Biofoundries and Biomanufacturing Hubs" including the Bio-Artificial Intelligence Hubs across the country.

These initiatives are being implemented by Ministry of Science and Technology, Department of Biotechnology jointly with its public sector undertaking, Biotechnology Research Assistance Council (BIRAC) in a manner, to provide the opportunities to stakeholders from academia, start ups and industries; for building Biomanufacturing and Biofoundry capacities across the country on the basis of scientific merit, innovation element and scale of the process and products. The proposal under the 'Biomanufacturing and Biofoundry Component' are being taken up through open call for proposals and in Mission Mode, while 10% of the budget under the component has been earmarked for the North Eastern Region (NER).

Department is also strengthening Centre-State partnerships to establish the BioE3 cells for building capacities in states to promote the state specific biomanufacturing ecosystem. Towards this, State BioE3 Cells have been notified by the respective state governments in two north-eastern states viz. Assam and Sikkim. A Network proposal has been supported involving iBRIC Institutes and State Government of Sikkim to develop and test, bio-based solutions in circumventing pest/pathogens of large cardamom and develop new disease-tolerant varieties. The program also aims to utilize bio-innovations to address local priorities and promote sustainable farming systems.

A list of projects supported under the 'Biomanufacturing and Biofoundry Component' being implemented in NER, is placed at Annexure I.

Annexure- I

List of projects being implemented in NER states under 'Biomanufacturing and Biofoundry Component.

S.Nm	Project Titled	NER State	Implementing Institute
1.	Exploring Carbon Capture and Utilization in Millet-Based Agroforestry Systems: Enhancing Biomass and Soil Carbon through Microbial Activity	Arunachal Pradesh	Central Agricultural University, Manipur
2.	Carbon Sequestration through Afforestation & Bioengineered Plant Systems	Meghalaya	Bio-Resources Development Centre, Shillong
3.	Developing and demonstrating microalgae-based CO_2 capture and biomass valorization towards high-performance biomanufacturing of sustainable aviation fuel and biopesticide	Assam	Indian Institute of Technology , Guwahati Malaviya National Institute of Technology , Jaipur
4.	Development of Genetically Engineered Microalgae, Membrane-Based Photobioreactors and Microalgal-Derived Acid-Base Bifunctional Activated Biochar for Enhanced CO_2 Capture and Biofuel Generation: A Life Cycle Assessment	Assam	National Institute of Technology Silchar CSIR- Central Glass and Ceramic Research Institute, Kolkata
5.	Integrated Biotechnological and Geochemical Approach for Carbon Capture, Utilization, and Storage (CCUS) and Valorization of Wasted Drill Cuttings using ACT and MICP	Assam	Indian Institute of Technology , Guwahati Dibrugarh University, Assam
6.	Biotechnological interventions for revitalizing sustainable large Cardamom (Amomum subulatum Roxb.) cultivation	Sikkim	Sikkim State Council of Science & Technology Institute of Bioresources and Sustainable Development, Imphal and other National Institutions

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