Ministry of Science & Technology

Biodiversity to Bioeconomy

How Biotechnology is Transforming North East India

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Nestled in the lap of the Himalayas and blessed with lush biodiversity, **India's North East Region (NER)** is a land of hidden treasures. Its vibrant landscapes, rich culture, and vast pool of resources offer immense potential for innovation. Now, with the **transformative power of biotechnology**, the NER is not just preserving its natural heritage but also scripting a new chapter of **growth and sustainability**.

Programmes to support locals

To emphasise services to farmers, and academics, the **"DBT-North East Centre for Agricultural Biotechnology (DBT-NECAB): Phase III"** project has been supported. Similarly, to strengthen Citrus research in NER, facilities were established at **Institute of Horticulture Technology (IHT),** Mandira, Assam, for the generation of certified scion material from **Khasi mandarin (Citrus reticulata) and sweet orange.** Rootstocks free from **Citrus greening bacteria (CGB) and Citrus tristeza virus** have been developed.

In view of promoting sustainable bioresources, a total area of **64.1 acres** was covered for captive cultivation of selected medicinal crops like **Curcuma caesia and compound-rich lemongrass (elemicinrich and methyl-eugenol-rich).** About **649 farmers** and entrepreneurs from NER benefited from the training and awareness program. Additionally, an **essential oil distillation unit** has been installed at Mudoi village, Arunachal Pradesh, to support farmers in revenue generation. Furthermore, the **Docynia indica, commonly known as Assam apple or wild apple**, has been successfully explored towards making value-added products such as **pickles, jam, candy, juice, etc.,** and the knowledge is being popularized among the tribal communities of Assam and Meghalaya through awareness campaigns and meetings

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Research Unit
Press Information Bureau
Government of India

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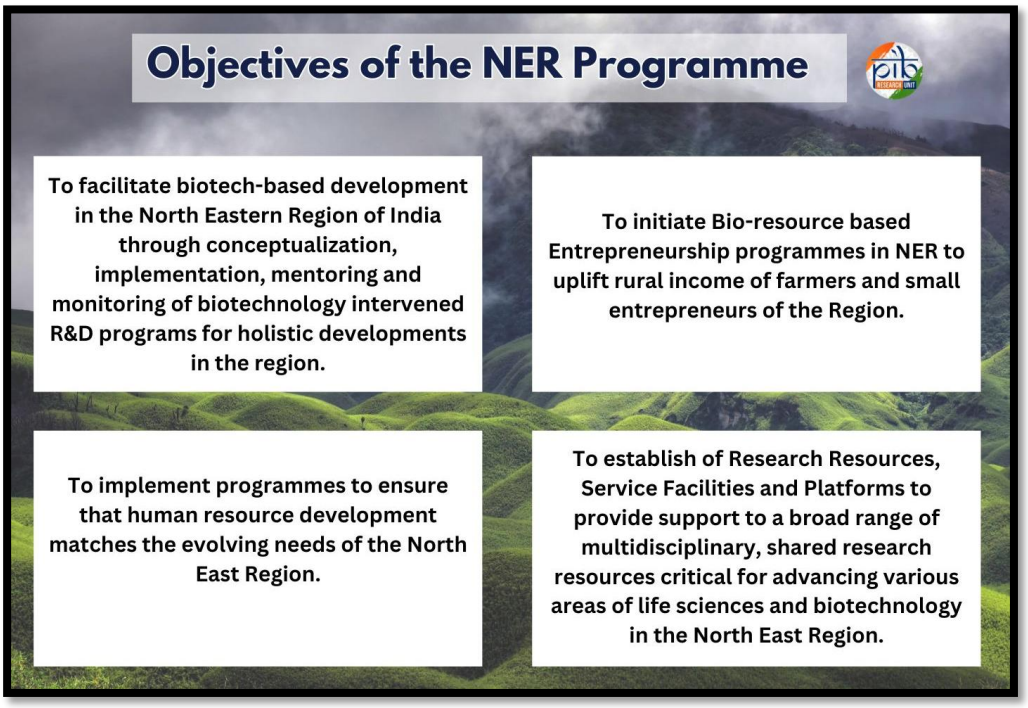
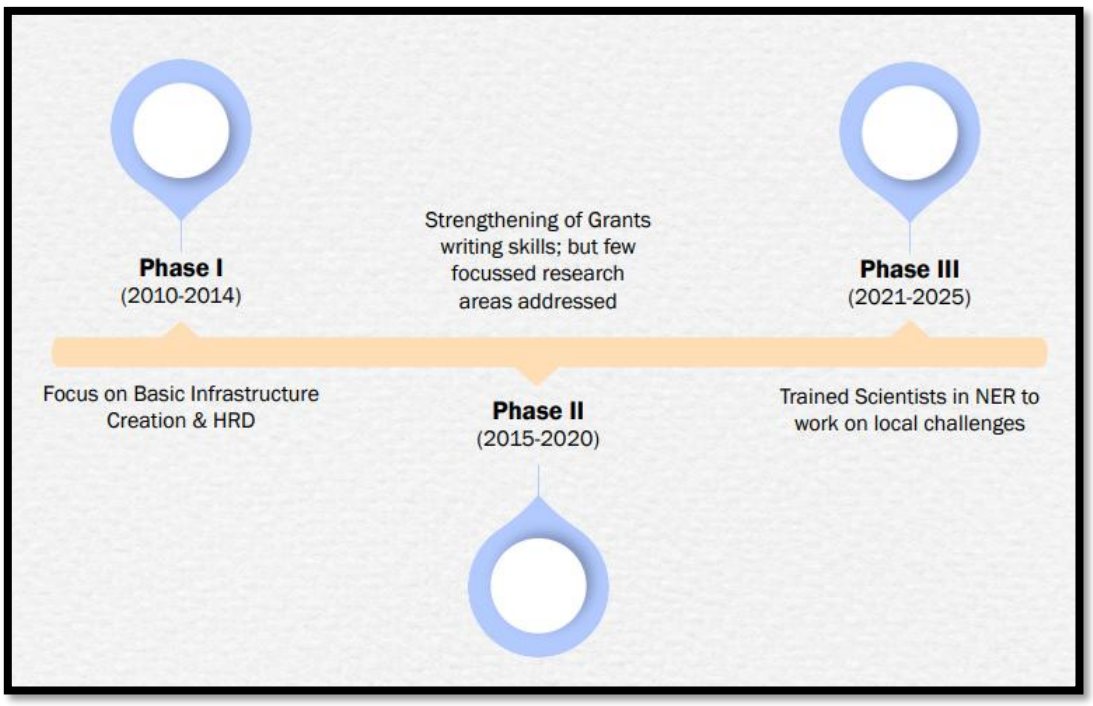
A Green Revolution with Biotech at its Core[1]

Imagine a region where farmers cultivate medicinal plants that fuel both health industries and local incomes, where young researchers develop resilient crop varieties that withstand changing climates, and where bio-entrepreneurs thrive by transforming indigenous knowledge into global products. This vision is steadily turning into reality, thanks to the **Department of Biotechnology's North Eastern Programme.** The main objectives of the programme are:



[1] https://dbtindia.gov.in/scientific-directorates/advanced-biofuels-sustainability-ner/ner

Since 2010, DBT has consistently allocated **10% of its annual budget** to specialized programmes in the NER, aiming to bridge the gap between potential and prosperity. These initiatives focus on harnessing endemic bioresources, promoting biotech education, and creating employment opportunities through bio-based entrepreneurship.[2]



[3]

North Eastern Programme timeline

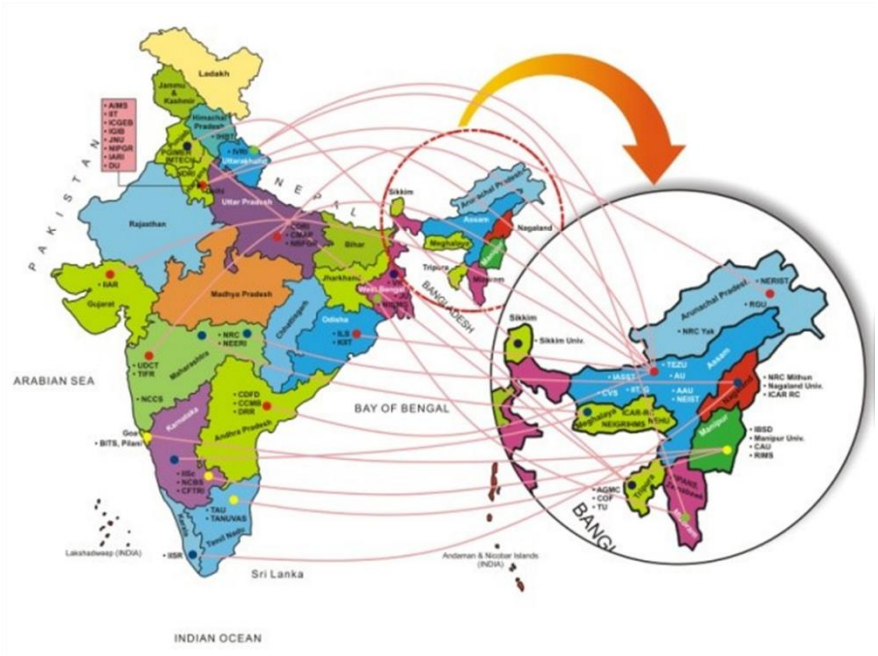
Major Programmes under NER

Biotechnology thrives on knowledge and innovation. Recognizing this, the DBT has launched multiple educational and training programmes focused on NER:

Twinning R&D Programme for NER

The programme was initiated in 2010-2011 towards developing core competence and capacity in various areas of biotechnology through collaboration of Institutes from North East India with other leading Institutes across the country. The programme has catalyzed vibrant collaborations between **65+ institutions** from NER and those from the rest of India in various spheres of biotechnology, where close to **650 R&D projects** has been supported benefitting around **450 researchers and 2000 young researchers / students**.

[2] https://dbtindia.gov.in/scientific-directorates/advanced-biofuels-sustainability-ner/ner#
[3] Biotechnology Support in the North Eastern Region (2010-2021) pdf https://dbtindia.gov.in/publications



Collaborations under the DBT- Twinning R&D Programme

Establishment of Biotech Hubs across NER

Since 2011, a network of 126 Biotech Hubs were established across NER, providing necessary infrastructure in universities/ colleges/ institutions and the required training in sophisticated technologies to support and promote biological sciences / biotechnology education and research. In the Phase-II, **54 Biotech have been supported for focused Research & training on local issues.**

Biotechnology Labs in Senior Secondary schools (BLiSS) of NER [4]

To create awareness among school students about biological sciences at the school level and also to provide an environment of access to a well-equipped laboratory, DBT initiated a programme for establishing **"Biotechnology Labs in Senior Secondary Schools (BLiSS)" in NER in 2014.**

[4] Biotechnology Support in the North Eastern Region (2010-2021) pdf
https://dbtindia.gov.in/publications

Visiting Research Professorship (VRP) programme

The Programme was initiated in 2015, to utilize the expertise of outstanding scientists for bringing advancements in the Biotechnology and Life Science related activities in various institutions of research and higher learning in the NE States of India.

Specialized training programmes for NE researchers by National Institutions

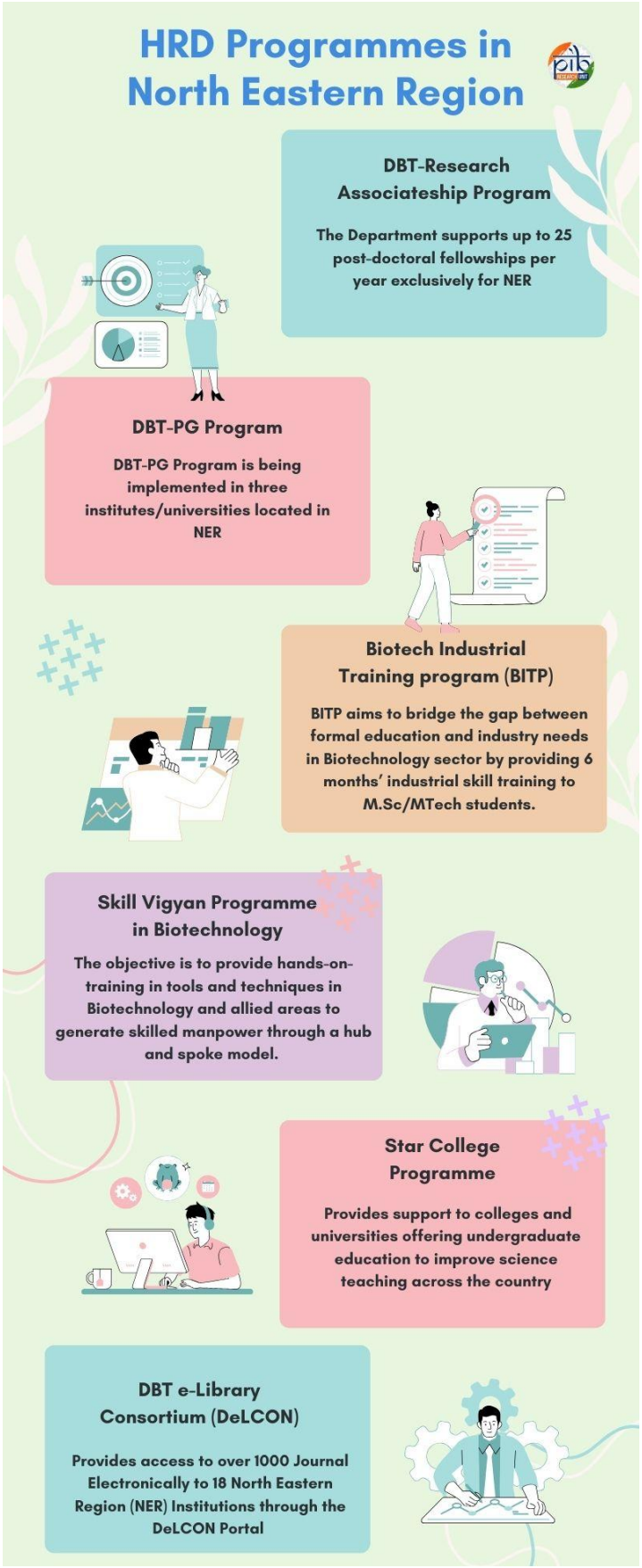
Chemical Ecology Programme between NER and Bangalore Institutes (NCBS, UAS and IISc.) initiated in 2015, trained and equipped young scientists from the NER to produce quality research outcomes by providing tailormade interdisciplinary training to Ph.D. students and postdoctoral fellows recruited under collaborative projects in the field of chemical ecology.

Enhancing Capacity in Genomics-Driven Research in Human Health & Disease in the North-East Region by DBT-NIBMG, Kaylani.

The programme, **initiated in 2016** provided comprehensive training to scientists, research students and clinicians belonging to the NER, engaged in **"Biomedical Research".** Short-term training programme included workshops on various aspects of molecular and genetics-based analyses, handling clinical materials such as blood and tissue samples and/or cell lines.

HRD Programme in NER

The following Human Resource Development focused programmes are being implemented in the North Eastern Region:



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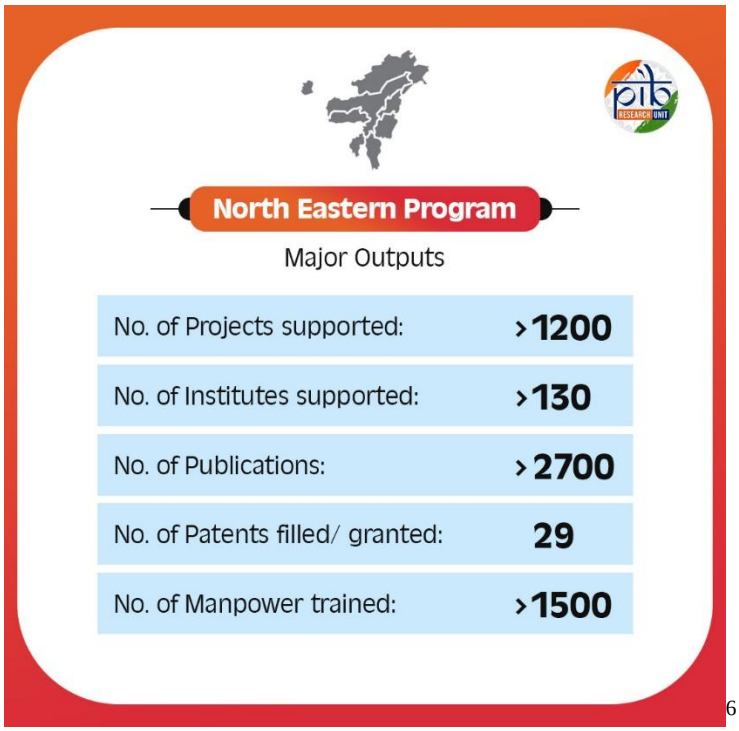
Major Achievements

The major outcomes of the North Eastern programmes are:



[6]

[5] Annual Report 2023-24 https://dbtindia.gov.in/about-us/annual-report/dbt
[6] https://dbtindia.gov.in/scientific-directorates/advanced-biofuels-sustainability-ner/ner

- **Bacterial Blight resistant introgressed rice variety "Patkai":** A rice variety has been developed by AAU- Assam using introgressing blight resistant from improved samba mahsuri (ISM) into Ranjeet Sub1 background. This variety was notified by Central Variety Release Committee (CVRC)

- **Lateral flow assay for the rapid detection of brucellosis:** A chimeric protein conjugate based Lateral Flow Assay (LFA) for the detection of anti-brucella antibodies in multiple livestock was standardized. The analytical sensitivity considering iELISA test as gold standard with sera sample revealed significant positivity in lateral flow tests.

- **Mobile app** - Pig Disease Diagnosis Expert System (PDDES), a Computer-based application to assist in the diagnosis of pig diseases or medical conditions was developed. Using PDDES, veterinarians, farmers, and other swine industry professionals can quickly identify and treat diseases to minimize their impact on pig production and profitability. The application is available in Google playstore.[7]

Conclusion

By harnessing the region's rich biodiversity and empowering local communities through education, research, and entrepreneurship, the Department of Biotechnology's initiatives are not only preserving cultural and ecological heritage but also driving sustainable economic growth. As North East India continues to evolve into a hub of bio-innovation, it sets a remarkable example of how science and tradition can coexist to shape a prosperous and sustainable future.

References

https://dbtindia.gov.in/scientific-directorates/advanced-biofuels-sustainability-ner/ner#

Annual Report 2023-24 https://dbtindia.gov.in/about-us/annual-report/dbt

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Santosh Kumar/Sarla Meena/ Madiha Iqbal

[7] Department of Biotechnology.