

Attaining New Heights in Biotechnology

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DBT announces three High-investment, High Outcome Thrusts for the North East Region

Bio-technology in the NER – DBT's Efforts are bringing a paradigm shift

The Department of Biotechnology (DBT) under the Ministry of Science & Technology, has taken many steps to bring about a paradigm shift in biotechnology in the country's North-East Region (NER). Eyeing an inclusive growth, DBT has announced a series of new programs and missions to turn this into a reality. DBT has established a dedicated 'North Eastern Region Biotechnology Programme Management Cell (NER-BPMC)', with an annual investment of Rs. 180 crores, to evolve, implement and foster biotechnology research in the north east states.

On the occasion of Pandit Deendayal Upadhyaya Birth Centenary, the Minister of S&T, Earth Sciences and Environment, Forests & Climate Change, Dr. Harshvardhan announced three major new initiatives for the North East. These new initiatives are in congruence to the Pandit Deendayal Upadhyaya's philosophy of "Integral Humanism" which is a synthesis of the material and the spiritual, the individual and the collective, which the world is now calling as "One Health" embodying the health of human, animal and environment as one.

The Minister said that DBT has committed to dedicate each year, at least 10% of the budget for the North-East. This year at least Rs.200 crores is expected to be spent for North-East Programmes. The Minister informed that as a result of the programmes, North East has become a major hub of biotechnology at the foundational level. The biotech programmes are of the highest quality, the institutions have state-of-the-art facilities and there has now been an impact on innovation and entrepreneurship because of excellent human resources programmes.

I. Phyto-Pharma Plant Mission: This is a Rs 50 crore Mission aimed at conservation and cultivation of endangered and threatened endemic medicinal plants, and discovery of new botanical drugs for unmet medical needs using the rich traditional ethno-botanical knowledge and biodiversity of these states and at the same time also improve availability of authentic and quality botanical raw material on sustainable basis for a boom in the phyto-pharmaceutical industry. Through this Mission, it is expected to enable farmers from NE states and phyto-pharmaceutical industry to become global leaders in production and export of some quality botanical drugs for unmet medical needs. For this Mission, DBT will be the nodal coordinating and implementing department and work closely with Ministry of DONER and other identified institutions.

DBT has announced launch of the Phyto-pharmaceutical Mission in NER with three major objectives:

- (i) Captive cultivation of selected medicinal plants of NER, which have great demand to ensure supply of authentic and quality botanical raw material to the user industries in the country.
- (ii) Development of technology packages for production of GMP grade medicinal plant extracts for export markets.

(iii) Production of safe and efficacious phytopharmaceuticals from medicinal plants of NER for unmet medical needs using modern scientific tools and following global standards.

II. Brahmaputra Biodiversity and Biology Boat (B4) on the Brahmaputra River, a major ecology hotspot, in NER, in collaboration with DONER, B4 will establish a large barge on the river with a well-equipped laboratory for analysis of all components of the entire ecosystem of the river and surroundings. The B4 will link to all the local research institutions along the river, as well as national and international laboratories.

B4 will have capability to analyse soil, water, environment, plant and animal life, human health and agriculture and an equal component that involves local citizens in the experimental process of science in data generation and management. B4 will also have a teaching laboratory for school/college children. It is also proposed to have mobile satellite boat labs which will run along the tributaries of Brahmaputra to feed in data to the main B4.

III. Frugal microscopy through the Foldscope: a frugal microscope assembled from simple components, including a sheet of paper and a lens, is acting as a tool connecting students and science from the region, with the rest of the country.

A total 525 applications from schools, colleges have been received: 112 from schools, 357 from colleges and 56 from citizen scientists. All applicants will receive a micro grant between Rs 4 lakhs to 8 Lakhs as well as a supply of Foldscopes while being linked with NER.

Dr. Harshvardhan informed that in addition to the three new announcements, DBT has many major ongoing projects in the North-East in the following areas:

Skilling Human Resources:

Twinning R&D Programme: DBT has initiated 480 R&D twinning programs that link institutes in NER with those across the country. With an investment of Rs. 90 crores in the last three years, this effort has resulted in 252 research publications and 600 Junior and Senior Research fellowships awarded to the students to pursue biotechnology research.

To create an environment of training and research in medial biotechnology, DBT has **supported Medical Diagnostic facilities at 11 medical colleges** in NER with an investment of Rs. 40.00 crores. This facility is providing quality diagnostic services as well as carrying out research on various health problems prevalent in the region using modern biotechnology tools and technologies. So far more than 4.70 lakhs tests in different disease have been conducted by these diagnostic facility.

DBT's '**Overseas Associateship for North East Region**' has seen 208 scientists from NER being trained overseas with Rs. 5.25 crore invested every year to support this programme. Through the DBT-NER Visiting Research Professorship (VRP) Scheme, 30 Scientists/Faculty are selected for bringing advancement in the field of biotechnology and life sciences in various institutions by sharing their vast experience and expertise with NER researchers and students.

At school levels, DBT has launched the '**Biotechnology Labs in Senior Secondary schools (BLISS) programme**', a first of its kind in India, for schools where biotechnology labs have been set

up at 88 Senior Secondary Schools from NER with an investment of Rs. 2.20 crores.

For universities, DBT has **set up 30 Bioinformatics Centre** at an investment of Rs. 9 crores for conducting research on genomics, proteomics and data analysis.

Under the '**Biotech Industrial Training Programme**', deserving students have been provided stipends during their training at biotech/life science industries. DBT is also supporting 15 institutes in NER recognised as 'Star colleges' to provide them with enhanced lab infrastructure and mentoring by leading scientists and Fellows of various national academies.

To provide these students with access to world-class journals and publications, the DBT **e-Library consortium (DeLCON)** has been launched in partnership with 18 institutions of NER, which provides access to more than 900 high impact e-journals. With an investment of Rs. 54. crores in last 3 years, this facility has been extended to more than 150 colleges benefiting about 1500 life science students.

Infrastructure and Resource building

Infrastructural support for biotechnology has been provided under many programs. DBT has established 126 '**Biotech Hubs**' at various institutions, universities and colleges to promote education, training and research in biological sciences including biotechnology. With over Rs. 22 crores invested in last three years, about 1000 training programmes were conducted by these hubs, with more than 1000 students, researchers and school teachers as beneficiaries.

DBT has also created biotech infrastructural facilities at **North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS)**, Shillong, at an investment of Rs. 4.50 crores.

The DBT has established many centres of excellence across NER to focus on different applications of biotechnology. The **DBT-AAU Centre of Excellence on Agriculture Biotechnology** at Assam Agricultural University (AAU), Jorhat, promotes agriculture biotechnology research and is helping farmers by developing elite varieties for local crops and improving their yield. The centre, established with an investment of Rs. 36.70 crores.

The **Centre of Excellence on Fisheries & Aquaculture Biotechnology (FAB)** in Tripura has adopted 2 villages to provide local fishermen with good quality fish seeds to produce high quality fish products, benefiting 200 farmers.

DBT has also sanctioned an amount of Rs. 45.00 cores for the establishment of a regional level **Animal House facility at Regional Medical Research Centre (RMRC), Dibrugarh** in Assam, which will be accessible to entire biomedical research community of NER for carrying out critical animal experiments in disease biology, molecular medicine, vaccinology and pharmacology.

Another related initiative is the **Advance Animal Disease Diagnostic & Management Consortium (ADMaC)** for surveillance and control of trans-boundary, exotic and zoonotic pathogens from NER. This programme will house a first Animal-BSL 3 lab in NER.

To conserve the delicate ecology of the region, DBT has sanctioned Rs. 26 crores for a major **network programme on chemical ecology of NER** in collaboration with leading institutions in India like IISc, NCBS, and UAS Bangalore.

Recognising the rich biodiversity of the region, DBT is also pushing for the **development of 'NER-Scented Rice'** -- a biotechnology inspired variant of the aromatic rice, and NER-Banana. The

aromatic rice of NER, especially Joha and Black rice, are of premium value because of their aroma and high medicinal characteristics. But, these are also poor yielders and are susceptible to pest attacks. DBT is now seeking innovative approaches that use biotechnological intervention to ameliorate the agronomic characteristics of this aromatic rice and other scientific properties, besides yield enhancement. Under the various twinning programmes, projects like these are being implemented with an investment of Rs.16.67 crores.

Existing programs flagged off by DBT in the region have been enormously successful with almost all the allocated budget being utilised for the proliferation of biotechnology in the North-Eastern states of India. Dr. Harsh Vardhan, Hon'ble Minister for Science & Technology and Earth Sciences has been instrumental in implementing these initiatives in the region and has personally visited each and every state in NER to review on-the-spot progress of these programmes and to interact with students, academia, scientists and local communities. This has resulted in skilled human resources and enhanced research infrastructure and resource building

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