

## **Progress Report for R&D Projects [Year 1]\***

### **Section-A: Project Details**

**A1. Project Title:** DBT-NER Institutional Level Biotech Hub at B.P. Chaliha College, Kamrup, Assam (Phase-II)

**A2. DBT Sanction Order No. & Date:** No.: BT/NER/143/SP44333/2021 dated 21.02.2023

**A3. Name of Principal Investigator:** Mr. Chiranjib Mili

**Name of Co-PI/Co-Investigator:** Dr. Manash Jyoti Deka

**A4. Institute:** B.P.Chaliha College, Kamrup, Assam

**A5. Address with Contact Nos. (Landline & Mobile) & Email:**

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**A6. Total Cost:** Rs. 1218400.00

**A7. Duration:** 1 year

**A8. Approved Objectives of the Project:**

1. To conduct hands-on training/workshops.
2. To perform outreach activities.
3. To organize faculty improvement programmes.
4. To implement student-oriented small research projects on local bioresources.
5. To produce compost manures, mushrooms, biofertilizers, etc.

**A9. Specific Recommendations made by the Task Force (if any):** None

## **Section-B: Scientific and Technical Progress**

### **B1. Summary of the project (within 1500 words)**

B.P. Chaliha College (Estd. 1972) is situated in the headquarter of Nagarbera Revenue Circle in the district of Kamrup, Assam. The place is a confluence of three districts viz. Kamrup, Goalpara and Barpeta. It is exclusively an agricultural region. The northern border line of the area is aligned with the alluvial landmass created by rivulet Joljoli and the mighty Brahmaputra. Farmers of the area, like most other places, are utilizing chemical fertilizers, pesticides, insecticides, fungicides, herbicides, etc. to increase their production. These chemicals are having manifold adverse and irreparable effects on the soil health, food chain, water bodies, and atmosphere as well which is being seriously felt all over the world now. Most of the farmers are also concerned regarding the environmental impact of these chemicals. Some of them even cultivate separately, employing little or nil chemicals, for their own household use. Farmers are forced to depend mostly upon the above-mentioned chemicals mainly due to the lack of other harmless alternative options in their reach. Biodegradable organic wastes may be a potent alternative to these chemicals. Besides remediation of organic wastes to wealth is the need of the hour. Again most of the locally cultivated plant species are gradually disappearing from the farmers' field. In the context of the challenge of harmless agricultural produce and mitigating organic wastes, the research and training area of our hub has been focused on developing eco-friendly agricultural practices and entrepreneurship among stack holders of the locality.

Since the B.P.Chaliha College is the only higher institution situated in such a large rural area, it holds a responsibility to play a vital role in promoting scientific knowledge among the students as well as in society. In this regard, different scientific programs such as awareness programs, workshops, hands-on training, popular talks, etc. can be organized which could spark interest and curiosity in science among rural populations. Moreover, such scientific-practical activities are essential in rural areas to bridge the gap in access to resources, develop relevant skills, empower individuals, foster interest in science, enhance problem-solving abilities, and contribute to overall community development. Furthermore, it is very crucial to create a scientific temper among the students in the present scenario to cope with the advanced research.

In this context, implementing student-oriented small research projects on local bioresources could be a fruitful approach.

Taking into account the above-mentioned facts, the present project has been proposed to carry out with the following objectives.

1. To conduct hands-on training/workshops.
2. To perform outreach activities.
3. To organize faculty improvement programs.
4. To implement student-oriented small research projects on local bioresources.
5. To produce compost manures, mushrooms, biofertilizers, etc.

### **Methodology & Work Plan:**

To carry out the above-mentioned activities, different programs were organized with the help of a number of invited Resource Persons or Experts in their respective fields, in the Biotech hub of B.P.Chaliha College, Kamrup, Assam. The outreach activities (e.g. Awareness program on eco-friendly farming) were conducted in different villages located in the Char area. The students-oriented small research projects were implemented by involving BSc 6<sup>th</sup> Semester (Honours) students of the college. Moreover, the students of the college were catalyzed by the Biotech Hub to promote scientific knowledge through Advanced lab visits, excursions, and field visits. Indeed, the students from neighboring schools were also invited to Biotech Hub for lab exposure. The Vermicomposting has been carried out with waste banana trees (e.g. discarded banana trees after harvesting, discarded trees after Diwali celebration, and different traditional occasions) collected from the local area. In addition, the synthesis of activated carbon nanoparticles from *Areca* nut husk waste was also carried out in the Biotech hub in collaboration with the Department of Chemistry.

### **Outcome of the Project:**

- A total number of 7 workshops and hands-on training have been successfully conducted.
- A total number of 9 outreach programs and seminars have been successfully organized.

- A total number of 6 research articles and book chapters have been produced from Biotech Hub, of which 1 paper is under revision, 1 paper communicated, 2 papers are to be communicated shortly, and 2 book chapters accepted for publication.
- Production of *Oyster* mushroom and Vermicompost facilities were created and are going on.
- B.Sc. 6<sup>th</sup> Semester students' dissertations have been completed using the equipment of Biotech Hub.

### **Discussions:**

During the year, the Biotech hub successfully conducted a number of in-house and outdoor programs in which a high number of participants have participated. The participants were highly benefitted from the proposed programs as they expressed in feedback. It is noteworthy that the selection of two students of Class XI of the college in the 31<sup>st</sup> National Children's Science Congress (NCSC) at the state level organized by the Department of Science and Technology (DST), Govt. of India, was a great achievement for Biotech Hub as well as College family. Indeed, due to the availability of some advanced instrument facilities in the Biotech Hub, the students of B.Sc. can perform their practical course which is a great success of the implementation of Biotech Hub as it was not possible to carry out such practical course in the past. Moreover, two unemployed young persons trained in the Biotech Hub going to initiate mushroom cultivation and vermicomposting for their own businesses. On the other hand, some faculties of the college are doing their small research in support of Biotech Hub. Overall, we believe that the implementation of Biotech Hub yielded a fruitful outcome during the year.

## B2. Achievements till date (Objective-wise):

### Objective 1: To conduct hands-on training/workshops.

The following programs were successfully conducted:

Sl. No.	Topic	Duration and Date	No. of participants	Level of participants
1	Workshop on "Basic Microscopy"	Two days (14-15 <sup>th</sup> Sept, 2023)	43	H.S. & B.Sc. students
2	Workshop on "Stomatal Analysis"	One day (9 <sup>th</sup> Oct, 2023)	40	Class VIII to X, H.S. students
3	Workshop on "UV-Vis Spectrophotometry"	One day (10 <sup>th</sup> Nov, 2023)	09	Techers, B.Sc. students
4	Workshops on "Mushroom Cultivation"	Three days (8-10 <sup>th</sup> Dec, 2024)	15	Unemployed youth, farmers, and students
5	Hands-on training on "Basic Bioinformatics tools"	Two days (15-16 <sup>th</sup> March, 2024)	22	Teachers, B.Sc. students
6	Hands-on training on "DNA isolation Technique"	Two days (22-23 <sup>rd</sup> March, 2024)	29	Teachers, B.Sc. students
7	Hands-on training on "Basic Instrumentation of Microbial Biotechnology"	Five days (26 -30 <sup>th</sup> March, 2024)	47	B.Sc. students

### Objective 2: To perform outreach activities.

The following outreach activities were successfully carried out.

Sl. No.	Program	Venue	Date
1	Demonstration on "Vegetative cell and Chromosome in onion root tips"	Nagarbera Higher Secondary School, Nagarbera, Kamrup,	21 <sup>th</sup> July, 2023

		Assam	
2	The awareness program entitled “ <b>Basic Life Support and First Aid Training</b> ” in collaboration with NEMCARE Group of Institution, Mirza	B.P.Chaliha College, Kamrup. Assam	25 <sup>th</sup> Nov, 2023
3	Awareness programme on Ecofriendly farming	Vill: Bhokuradiya, Nagarbera, Kamrup, Assam	28 <sup>th</sup> Sep, 2023
4	Advanced lab visit to ICAR, New Delhi, NBPGR, Delhi.	New Delhi	3-7 <sup>th</sup> April, 2023
5	Invited talk on “ <b>Genetics to Genomics: An Incredible Journey of Science</b> ”	Online	3 <sup>rd</sup> May, 2023
6	Invited Talk on “ <b>Basic Biotechnological Tools</b> ”	Chamupara Higher Secondary School, Boko, Kamrup, Assam	8 <sup>th</sup> August, 2023
7	Invited Talk on “ <b>Basic Biotechnological Tools</b> ”	PDUAM, Amjonga, Goalpara	9 <sup>th</sup> March, 2023
8	Observed Science Day with “ <b>Awareness program cum sampling distributions</b> ”	Vill: Daspara, Nagarbera, Kamrup, Assam	28 <sup>th</sup> Feb, 2024
9	Field study at Udpad Beel Wetland, Goalpara.	Agiya, Goalpara, Assam	9 <sup>th</sup> March, 2024

### Objective 3: To organize faculty improvement programs

- Due to some technical issues, the proposed objective has been scheduled to be conducted very shortly.

**Objective 4: To implement student-oriented small research projects on local bioresources.**

- Two students of class 11<sup>th</sup> standard of B.P.Chaliha College surveyed ethnoveterinary medicinal plants used in char areas of Kamrup district, Assam. These two students presented their findings at the district level and were then selected for the 31<sup>st</sup> National Children's Science Congress (NCSC) at the state level organized by the Department of Science and Technology (DST), Govt. of India.
- The students of B.Sc. 6<sup>th</sup> Semester (Honours) carried out a project on "Green synthesis of CuO nanoparticle from the medicinal plants".
- Research on "Cytotoxic and genotoxic effect of widely used insecticides on *Alium cepa* L." is completed.
- Research on "Synthesis of carbon nanoparticle from the waste of *Areca* nut husk" is completed.

**Objective 5: To produce compost manures, mushrooms, biofertilizers, earthworms, vermiwash etc.**

- Vermicompost was produced and distributed to stakeholders as well as utilized in gardens on college campuses and still going on.
- *Oyster* mushrooms were produced and still going on.

**B3. Challenges, if any:** During the year, I have encountered a few difficulties. Firstly, servicing of the instruments/equipment, organizing advance lab visits/exposure visits for our target groups, and inviting resource persons from other neighboring higher institutes require a little more attention due to the remoteness of our college. Secondly, due to the renovation of the Biotech Hub and the retirement of the earlier Coordinator (Dr. Surya Kalita) I as a Junior, had to learn so many new things which was one of the most challenging tasks for me.

**B4. Action taken on the earlier recommendations of the TEC / STAG / Review Committee:** (NA) as there are earlier recommendations.

**B5. Details of New Leads Obtained, if any:** It has been proposed to create an organic farming transformation centre by involving farmers of the five panchayat areas and catalyzing entrepreneurship development in the coming days.

**B6. Details of Publications & Patents, if any:**

**Article**

- A comprehensive review on traditional uses, phytochemical, and pharmacological properties of the genus *Antidesma* L. *Fitoterapia* (Under revision)
- Study on ethnoveterinary medicinal plants used by local people inhabiting char area, Kamrup district, Assam, North-East India. *Ecological Questions* (Under review)
- Screening of cyto-genotoxicity of two widely used pesticides (alphamethrin and carbofuran) on *Alium cepa* L. (To be communicated shortly).
- Investigating physiochemical properties of *Areca* nut husk derived carbon quantum dots and activated carbon tentative. (To be communicated shortly).

**Book chapter**

- Hybrid superconductor and Semiconductor Nanomaterials potential application. Book title: Superconducting Nanoscience and Nanotechnology, Publisher: Willey. (accepted).
- Wild aromatic leaves used in ethnic cuisines as flavouring agents by the Mising tribe of Assam, Northeast India: An experience-based study. (accepted).

**Patents: Nil**

**Section-C: Details of Grant Utilization#**

**C1. Equipment Acquired or Placed Order with Actual Cost:**

Sl. No.	Item (s)	Quantity	Actual cost (Rs.)
1	Digital pH Meter	1	71372.92
2	Electric balance	1	45000.48
3	Vortex Mixer	1	11999.42
4	Electrophoresis System	1	52999.70

5	Compound Microscope	1	10999.96
6	Pen-type pH Meter	1	7627.51
	<b>Total</b>		<b>199999.99</b>

**C2. Manpower Staffing and Expenditure Details:**

Name of the person	Name of the post	Date of Joining	Total monthly salary	Duration (Total no. of months)	Total salary paid during the FY (Rs.)
Chhan Kumar Kalita	Technical Assistant	01.04.2023	21600 (20000 Basic + 8% HRA)	12	259200.00
Dweepjyoti Medhi	Laboratory Assistant	01.04.2023	21600 (20000 Basic + 8% HRA)	12	259200.00
<b>Total</b>					<b>518400.00</b>

**C3. Details of Recurring Expenditure:**

Sl. No.	Item (s)	Amount Utilized (Rs.)
1	Workshop/Training/Outreach/Awareness/Popular lecture	200000.00
2	Travel	50000.00
3	Contingency	50000.00
4	Consumables	147616.00
	<b>Total</b>	<b>447616.00</b>

**C4. Financial Requirements for the Next Year with Justifications:**

Sl. No.	Heads	Amount (Rs.)
1	Technical Assistant (1 No. Rs. 20000+HRA)	259200.00
2	Lab Assiatance (1 No. Rs. 20000+HRA)	259200.00
3	Consumables	150000.00
4	Travel	50000.00
5	Training/Workshop/Outreach/ Awareness/Popular Talk	200000.00
6	Contingency	50000.00
7	Overhead	50000.00
	<b>Total</b>	<b>968400.00</b>

**Justification:**

Financial requirements for the second year in different heads as has been proposed in the proposal will be required to continue the Biotech Hub activities smoothly.

*#Grant utilization details (UC&SE, Assets Certificate & manpower details) also required to be submitted separately as per the prescribed format*

**[Signature(s) of the Investigator(s)]**

*Chiranjit*  
COORDINATOR  
B.P. CHAKRABORTY COLLEGE  
NAGARBERA  
*(M. J. Deha)*

**Instructions:**

- All the information needs to be provided; otherwise the Progress Report will be treated as incomplete. In case of 'Nil' / 'Not Applicable' information, the same may be indicated.
- In case of multicentre project, a combined Progress Report should be submitted incorporating the progress of all components. The Project Co-coordinator/ PI will be responsible for this.
- \*Please indicate the reporting period [i.e. Year 1/2/3/4/5].
- Submission of Progress Report by the end of the 11<sup>th</sup> month of grant sanction is linked with further continuation of the project and timely release of funds for the next year.