SRI RAMKRISHNA ASHRAM, NIMPITH

VIVEKANANDA INSTITUTE OF BIOTECHNOLOGY

ANNUAL REPORT • 2025 – 2026

Vivekananda Institute of Biotechnology, Nimpith, South 24 Parganas

"Science in the Service of Mankind"

A Research & Development Wing of Sri Ramkrishna Ashram, Nimpith

Serving the Sundarbans since 1991

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Presentation session, with stakeholder group photo (inset)

Achievements of the DST-supported STI Hub Project presented before members of the Local Project Monitoring Committee (LPMC). Inset: LPMC members Dr. N. Tiwari, IARI, and Prof. D. R. Mondal, Former Vice-Chancellor, Sidhu-Kanhu University, with the STI Hub team.

ABOUT THE INSTITUTE

The Vivekananda Institute of Biotechnology (VIB), a Research and Development wing of Sri Ramkrishna Ashram, Nimpith, was established in 1991 with the vision of applying science and biotechnology for sustainable rural development, particularly in the Sundarbans regions of West Bengal. Operating in the heart of this ecologically fragile, saline, and flood-prone delta, the Institute focuses on addressing the livelihood challenges of marginalised and poor communities by undertaking research, development, and adaptation of appropriate agricultural and rural biotechnologies, and facilitating their transfer to farming communities through training, demonstrations, awareness programmes, and entrepreneurship development.

Its work spans agriculture, aquaculture, biofertilizers and biopesticides, renewable energy, plant and microbial biotechnology, and community mobilisation — integrating modern scientific practices such as Good Agricultural Practices (GAP) and Good Aquacultural Practices (GAqP) with indigenous traditional knowledge. VIB has also been recognised as a Scientific and Industrial Research Organisation (SIRO) by DSIR, Government of India, and functions as a postgraduate research laboratory and technology resource centre.

Through externally supported initiatives such as the DST-funded Science, Technology and Innovation (STI) Hub and grant programs backed by organizations like the Azim Premji Foundation, and guided by its integrated approach of “Science in the Service of Mankind,” VIB has built a strong track record of participatory, community-driven rural development — working closely with Self-Help Groups, Community-Based Organizations, and Village Resource Persons to transfer technology, build local institutional capacity, and empower farmers, rural youth, and communities with the knowledge and skills needed to improve household incomes, living standards, and environmental sustainability across the Sundarbans.

YEAR AT A GLANCE

2,232 Households Reached	**8,380** Beneficiaries	**49%** Women Participants
20–30% Yield Improvement		**6** Jeevan o Jeevika Kendras

01 RESEARCH AND DEVELOPMENT

The Vivekananda Institute of Biotechnology has built its technology development efforts on a foundation of applied, field-oriented scientific research tailored to the saline, flood-prone Sundarbans ecosystem. On the agricultural and microbiological front, VIB's research has spanned soil amendment studies to improve crop productivity — such as microbial research on plant growth-promoting bacteria, including the genome sequencing of a Microbacterium paraoxydans strain with arsenic bioremediation potential, and studies on optimizing Azotobacter-based biofertilizers by improving carbon-to-nitrogen ratios and assessing their contribution to crop yields. This research directly informed the development of Good Agricultural Practices (GAP) modules, incorporating integrated nutrient and pest management along with Trichoderma-based seed treatment to reduce chemical dependency and build crop resilience.

In parallel, VIB pursued research in aquaculture, integrated farming, and renewable energy to diversify and strengthen rural livelihoods. This included developing Good Aquacultural Practices (GAqP) and low-cost freshwater aquaculture protocols covering nursery-to-rearing pond management, and pioneering trials on the domestication of the mangrove alga Catenella repens using low-cost coir-rope substrates — opening a promising new avenue for the development of carrageenan-based enterprise in rural areas of Sundarbans. The Institute also designed integrated farming system models combining aquaculture, agriculture, and livestock (such as pond dyke horticulture and fish-cum-livestock systems), adapted micro-solar domes and energy-efficient cookstoves to reduce fuelwood dependency, and undertook systematic documentation and scientific validation of indigenous traditional knowledge.

VIB's tissue-culture facility churns out thousands of disease-free banana plantlets — from lab jars to hardened field-ready saplings — marking a major boost in the institute's micropropagation capacity.

Together, this body of research — published in peer-reviewed journals such as J. Soil and Crops, The Microbes, and the International Journal of Current Microbiology and Applied Sciences — has translated into concrete technologies transferred under the STI Hub project, including GAP and GAqP packages, integrated fish farming, and Catenella repens domestication.

Kanda Pani, a plant growth-promoting suspension prepared from old cow dung, is being popularized in the Sundarbans as a refined indigenous technology.

Extensive use of bio-inputs in betel vine cultivation on Sagar Island, promoted under the DST-supported STI Hub Project, fostering sustainable and eco-friendly farming practices

02 AZIM PREMJI TRUST PROJECT

Community Institution Building

Under the Azim Premji Foundation (APF)-supported project to enhance incomes of marginal farmer households across 13 hamlets in Madhabnagar and Bhagbatpur villages of Pathar Pratima block, South 24 Parganas, the first year focused on building strong community institutions. A baseline survey covering 1,193 households was completed, and project staff and community resource persons underwent structured capacity-building on modules ranging from group and financial management to livelihood schemes.

- 15 capacity-building sessions reached 36 SHGs (234 members)
- Two Village Development Committees formed with 39 members total, guiding beneficiary selection and crop planning
- Stakeholder Workshop held 5 August 2025 at the Patharpratima BDO Office, aligning convergence with government schemes (BDO, FEO, ADA, BLDO, WBSRLM)
- Tangible linkages achieved: organic manure supply from the solid waste management unit and beneficiary connections to “Duare Sarkar” camps

Demonstration of organic input production for vegetable cultivation to women beneficiaries at Madhabnagar Village, Patharpratima, under the APF Project.

Capture of fingerlings from the rearing pond for distribution among beneficiaries of different hamlets of Bhagabatpur and Madhabpur village under the APF Project.

Fishery and Agriculture Interventions

On the livelihoods side, 500 beneficiaries (300 for organic farming, 200 for fishery) were identified and supplied with inputs, and the project successfully built a structured fishery value chain from spawn to table fish. Four nursery ponds and eight rearing ponds were established, generating fry and fingerlings worth an estimated market value of Rs. 1.02 lakh and Rs. 1.70 lakh respectively, while training VRPs and SHG members to eventually operate these as independent enterprises.

In agriculture, homestead vegetable cultivation already shows income gains — rising from an average of Rs. 3,000 to Rs. 3,270 per household — supported by organic practices like biofertilizers, ITK-based inputs, and NPM techniques, while Kharif paddy cultivation (covering 4,100 beneficiaries) is still at the tillering stage with full outcomes pending harvest.

Production of papaya seedlings at Nebedita Nursery, Bhagbatpur village, under the APF Project.

Promotion of an Integrated Farming System in Madhabnagar village, Patharpratima, under the APF Project.

Despite challenges from unusually heavy monsoon rainfall — which caused pond overflows, waterlogging, and crop submergence — the project maintained momentum through community coordination, distribution of 3 nursery units and 13 fishery tool kits, and consistent monthly review meetings, positioning it well to scale further in the coming year.

03 SCIENCE, TECHNOLOGY AND INNOVATION (STI) HUB PROJECT

The STI Hub in Sundarbans, implemented by VIB in eight blocks of South 24 Parganas district (Joynagar I & II, Kultali, Basanti, Patharpratima, Namkhana, Kakdwip, and Sagar), successfully enhanced livelihoods of Scheduled Caste communities through science-based interventions combining GAP, GAqP, renewable energy, and indigenous knowledge. The project reached 2,232 households and 8,380 beneficiaries, with women comprising 49% of participants, and built a robust local capacity base through 86 Women's SHGs, 16 CBOs, 40 trained Village Resource Persons, and 200 Master Farmers, who together delivered 64 training sessions, 16 seasonal advisory clinics, and 32 field demonstrations.

Six Jeevan o Jeevika Kendras (JOJKs) were established as decentralised hubs for technology transfer and enterprise promotion, ultimately reaching over 2,000 households and supporting 40 women-led ventures.

Integrated Aquaculture–Agriculture–Livestock Farm of Sri Jagannath Hembram, Gangasagar, under the STI Hub Project — promoting diversification, scientific farm management, and circular resource utilisation to foster income optimization and sustainable rural livelihoods in a climate-vulnerable coastal region.

Economic Outcomes

- Household incomes rose across all eight blocks — from about Rs. 15,000 in Joynagar-II to nearly Rs. 44,700 in Patharpratima
- Individual case studies show income gains of 50% to over 300% (e.g., Rs. 11,000 → Rs. 49,400; Rs. 71,000 → Rs. 1,42,500)
- GAP adoption produced 20–30% yield gains alongside reduced input costs
- GAqP practices improved fish quality and productivity
- 200 improved cookstoves and 70 micro-solar domes distributed, cutting fuel dependency and improving indoor air quality
- Successful domestication of mangrove algae (Catenella repens) on low-cost coir-rope substrates — a new, replicable livelihood avenue with carrageenan production potential

Institutional & Social Capital

Beyond the numbers, the project built lasting institutional and social capital: strengthened SHGs and CBOs, validated and documented indigenous traditional knowledge (ITK), and a model integrated farming site established at Sagar near the Women's Technology Park. Equipment worth over Rs. 29 lakh (spectrophotometers, water/soil testing kits, solar domes, etc.) remains operational and in active use.

While the project team flagged post-completion risks — such as continuity of technical support, financial sustainability, and climate vulnerability (cyclones, salinity) — it laid out a clear follow-up strategy (refresher VRP training, revolving funds, market linkages, government scheme convergence) to help sustain the gains. Overall, the STI Hub is presented as a replicable, scalable model of science-driven, participatory rural development for other climate-vulnerable coastal regions.

PARTNERSHIPS & FIELD ENGAGEMENTS

Dr. Priya Gupta, Lead — Governance, Law and Policy, WWF-India, visiting fields and facilities developed in Hingalgaunj under the DST-supported "Promotion of Bee-Flora" project.

04 TRAINING AND FIELD DEMONSTRATION

During 2025–26, VIB strengthened its training and technology-transfer activities across 8 blocks, reaching 2,232 households and approximately 8,380 beneficiaries. Training and field demonstrations covered biofertilizers, biopesticides, integrated nutrient management, GAP/GAqP and other biotechnology-based livelihood technologies.

- 20–30% improvement in crop yield
- Over 60% adoption of bio-inputs
- Up to 25% reduction in chemical fertilizer use
- Up to 64% reduction in pesticide use
- Average household income improvement of about 38%

Rural youth being trained in soil analysis techniques at VIB's soil testing laboratory — building skilled manpower for the institute's agricultural project activities while creating income-generation opportunities for rural persons.

VIB organises hands-on training on vermicomposting and bio-input production, opening up meaningful livelihood opportunities for rural women and strengthening their role in the agricultural economy.

05 PRODUCTS AND SERVICES

Over the reporting period, the unit produced and delivered a diverse range of biotechnology-based products and services in support of sustainable agriculture and allied sectors.

Product / Service	Output
Carrier-based biofertilizer	**4.29 MT**
Liquid biofertilizer	**3.75 KL**
Carrier-based biopesticides	**21.12 MT**
Liquid biopesticides	**0.82 KL**
Vermicompost	**50 MT**
Micropropagated banana plantlets (tissue culture)	**5,000**
Nursery plantlets — flowering & ornamental varieties	**10,323**
Nursery plantlets — fruit species	**9,412**
Mature fruit plants	**9,142**
Mushroom spawn packets	**20,000**
Fresh mushrooms cultivated	**4 MT**
Soil samples analysed	**1,000**

Collectively, these outputs reflect the unit's sustained contribution to promoting biotechnology-driven, environmentally sustainable agricultural practices.

VIB's Biofertilizer Unit is well equipped with the infrastructure and human resources to produce quality biofertilizers, driving an irreversible transformation of Sundarban agriculture toward a sustainable future.

Biopesticide production at VIB has grown from 19.52 MT last year to 21.12 MT this year, backed by its well-equipped and well-maintained production and quality control laboratory.

VIB has expanded its vermicompost production capacity from 50 MT to 150 MT per year, strengthening its sustainable agricultural input production.

VIB standardised an in-house production protocol for paddy straw mushroom, facilitating its extension, demonstration, and adoption by mushroom producer enterprises.

VIB's Mushroom Section is equipped with facilities for training, demonstration, spawn production, and supply — enabling hands-on learning at every stage of mushroom cultivation, and empowering rural entrepreneurs to build sustainable livelihoods.

06 PUBLICATIONS

1. Das S. K. and Das T.K. (2025). Assessment of Plant Growth Promoting Parameters of Azotobacter for their Contribution to Yield of Chili (Capsicum annum) through Path Coefficient Analysis. Int. J. Curr. Microbiol. App. Sci., 219–227. doi.org/10.20546/ijcmas.2025.1406.020

2. Malay Kanti Modak and Sadhan Kumar Das (2026). Evaluation of the Impact of Improved Agricultural Practices, Including Integrated Nutrient Management and Integrated Pest Management, on Farm Economy in the Paddy-Okra Cropping System of the Gangetic Alluvial Agroclimatic Zone in West Bengal. International Journal of Agricultural Science and Technology (IJAST), 8(1), 22–32.

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Recognised as a Scientific and Industrial Research Organisation (SIRO) by DSIR, Government of India