



## **ANNUAL REPORT (2008-2009)**

**Vivekananda Institute Of Biotechnology**

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Vivekananda Institute of Biotechnology, a branch institution of Sri Ramkrishna Ashram Nimpith under Core Support Program of Department of Science and Technology, Government of India, is engaged in development, innovation, modulation and adaptation of appropriate rural technologies, and transferring the selected technologies to the farming community of the Sundarban area through training, awareness building and follow up programs since its inception in 1991. This branch was established with the objectives to access, design and develop multi skill biotechnology programs for application in the field of rural development, to build village based human resource as biotechnology entrepreneurs and create a network of these knowledge worker for the transfer of technology, and to provide service and create knowledge base in the village through network of rural entrepreneurs.

For its constant effort on unfolding mysteries of science and advancement of technologies for application at the grass root level, the Council for Advancement of People's Action and Rural Technology (CAPART) entrusted VIB as Technology Resource Centre for Sundarban areas, Burdwan University (West Bengal) also has recognized VIB to be the Post Graduate Research laboratory. VIB is now registered as a Scientific & Industrial Research Organization of DSIR, Ministry of Science & Technology (Government of India).

### **1. Accessing, designing and developing multi-skilled biotechnology programs for application in the field of rural development.**

A multi-skilled biotechnology program was developed for rural development with the components-

- a) Bio-fertilizer Technology consisting of soil testing and fertilizer application, production and application of different bio-fertilizers and bio-pesticides, vermi-composting.
- b) Horticultural biotechnology including micro-propagation (tissue culture).
- c) Mushroom Technology.

Based upon the above technologies, following Technology Models were designed and developed for application in rural area:

- i. Low cost soil testing services
- ii. Low cost microbial culture (Bio-fertilizer and bio-pesticide) production
- iii. Package of integrated Nutrient Management (INM) for Crops
- iv. *Azolla*-Fish-Rice culture in deep water rice system.
- v. Use of Neem Seed Kernel Aqueous Extract for pest control.
- vi. Integrated model for biogas production and vermi-composting
- vii. Hardening of micro-propagated banana plantlets
- viii. Mushroom cultivation
- ix. Model for application of *Azolla* in deep water rice system
- x. Extraction of banana fiber and making value added products.

**Some R & D works are done constantly for the development of different technologies:**

⇒ **Isolation/Collection of Germ-plasms and their maintenance.**

VIB has realized that a germ-plasm bank of active organisms is necessary sustainability of this centre in future terms of commercialization of bio-inputs supply and supply of suitable strains to the rural entrepreneurs. Emphasis was given to collect/isolate, purify, document and preserve the germ-plasms of bio-fertilizer, bio-pesticides, earthworm, mushroom, banana and mangrove plants. Germ-plasms of different organisms maintained here are-

- **Biofertilizer:** *Azolla*-6, Blue Green Algae-490, *Rhizobium*-17, *Azotobacter*-38, Phosphate Solubilising Microorganisms-46 and Vasicular Arbuscular Mycorrhizae-2.
- **Biopesticides:** *Trichoderma*, *Bacillus thuringensis*, *Metarrhizium*, *Beauveria*, *Paecilomyces* and *Trichogama*
- **Banana:** 14 varieties- *Baischada*, *Kachakel*, *Martaman*, *Giant Governor*, *Robusta*, *Red banana*, *Monthan*, *Nendran*, *Kanai Banshi*, *Chatim*, *Kanthali*, *Amrit Sagar* and *Dwarf Cavendish*
- **Mushroom:** 22 strains of mushroom under 12 species
- **Earthworm:** Three species, namely, *Eisenia foetida*, *Eudrilus eugeniae*, *Perionyx excavatus*
- **Mangrove plant:** *Nypa fruticans*

⇒ **Selection of region-specific microbial strains to be used as biofertilizer.**

Through a three step method, laboratory testing, pot experiment and field trial, the region specific strains of different biofertilizers have been selected for different agro-climatic zones.

⇒ **Field level trials and demonstration**

- **Azolla-Fish-Rice culture:** Total 10 trials and 40 demonstration has been organized on *Azolla*-Fish-rice culture in deep water rice system of Sagar Island. It has been noted that this system, with Pit and ditch model, can increase the profit of the farmers up to 100% by means of increased yield of rice and fish.
- **Organic Farming:** A trial of organic farming in Rice- Sunflower cropping system is being carried out in the Institute field at Nimpith. It is noted that in the third year the yield of Rice and sunflower is 75% as compared to that by the conventional chemical input based farming. With the technical guidance of Dr. O.P. Rupela, Adviror, FAO, large scale Organic Farming is contemplate at Kaikhali.
- **Application of Neem Seed Kernel Aqueous Extract (NSKAE):** A model for the collection of neem seed, production of neem seed kernel extract and its application for pest control in crops has been developed in this institute with the financial support from, UNDP, UNIDO and Ministry of Chemicals and petrochemicals (GoI). This year 36 mt has been collected. For the promotion of NSKAE, 125 training and demonstrations were organized. Total 8 field trials and 2203 field level demonstrations were organized a in 10 blocks of South 24 Parganas district. Farmers' experiences with demonstration in crops like bean, capsicum, sunflower, beetle vine, pointed gourd, guava and mango are enthusiastic. The applications of NSKAE keep the pest population below the threshold
- Level demonstration in 121 betel vine yard (*Pan boroj*) confirms an increase in yield up to 15% and reduction of use of hazardous chemicals up to 50%.

**2. Building village based human resource as biotechnology entrepreneurs and creating a network of these knowledge workers for the transfer of technology.**

The concern of sustainable development is to abolish hunger and meet people's basic minimum need, thus conceals its vast potential in the process of economic development. This Institute has envisioned creating Agro-Entrepreneurs and Agro-professionals with spirit and enthusiasm so that along with self-Sufficiency they can also contribute to the GDP. For this purposes, this year 40 educated rural youths have been trained to enable themselves work either as entrepreneurs or agro professionals. Instructional manuals on Bio-fertilizer Technology and Horticultural Biotechnology, Leaflets, 10 posters on bio-fertilizer, bio-pesticides, banana technology, honey bee etc., three promotional CDs on bio-fertilizer and vermicompost were developed and used during training.

**3. Providing service and creating knowledge base in the village through network of entrepreneurs.**

- **Vivekananda Centre for Skills**

Vivekananda Centre for Skills has been established in four regions: at Patharpratima of South 24 Parganas, Amdanga of North 24 parganas, Borobainan of Burdwan and Jiaganj of Murshidabad district. A training hall, well equipped

with audio visual system, has been developed in each centre. The farmers take training on different aspects of agricultural practices on payment of a reasonable fee. Total 60 skills have been identified for farmers' training. Farmers also get escort services at these centers. Training of farmers on different agricultural skills has increased the acceptability of different bio-products to the farmers. A number of **Krishi Sampad Karmis (KSKs)** are working under each VCS to provide the services as and when necessary. KSKs are working for providing service of soil testing and fertilizer recommendation at the door step of the farmers. They are working under the umbrella of VCS or independently in those regions where there are no VCS.

Total 6.30 MT biofertilizer, 3.40 MT biopesticides, 17144 Pcs banana plantlets, 2450 papaya seedlings, 5950 seedlings and propagules of flowering plants, 36 MT neem seed kernel powder and 106 Mt vermicompost were supplied to the farmers by the KSKs independently and through these VCSs. Total 1170 soil samples were analyzed for fertilizer recommendation.

- **Women's Technology Park**

A Women's Technology Park (WTP), funded by DST, Govt of India, is established at Sagar Island. The building was provided by Sunderban Development Board, Government of West Bengal. A computer training laboratory and a soil testing laboratory are established here. Seven computers, one printer, one scanner and other accessories were contributed by Society for the Opportunities to Women, Kolkata. The main objective of this program is to empower the rural women with technologies for improvement of their livelihood. Training and escort services for rural people, especially women, have been organized here. This year, about 270 women have been trained on vermin-technology and 120 persons have participated in computer training programme. Five rural girls were taken hands on training on micro- and macro-propagation, extraction of banana fiber through this centre.

- **Science & Technology for Entrepreneurship Development (STED) project:**

This project is supported by Department of Science and Technology, GoI, aiming at establishment of micro enterprises with the trades Food processing, apiculture, vermicomposting and mushroom production. This year, total 14 Entrepreneurship Awareness Programs and 2 Entrepreneurship Awareness programs have been organized in this year. In food processing trade, which involved the preparation of *Goyna Bori* resulted in formation of 03 groups of total 22 members. Under *Apiculture (Rock bee honey production)* there is a single group formation of total 31 members. 6 vermicompost units were revitalized at the said target area. Simultaneously we also have been involved in communicating with the various colleges for the Entrepreneurship Development Programme namely Daakhin Barasat College, Baruipur college, Fakir Chand college-Diamond Harbour, Sundarban Mahavidyalaya- Kakdwip, Raidighi College, Patharpratima college, Gouri Mohan Sachin Mandol Mahavidyalaya, Bireshwarpur, Rudranagar College, Sagar & Bankim Sardar College, Canning.