

5. BIOTECHNOLOGY BASED PROGRAMMES FOR SOCIETY

5.1. Biotechnology based programme for SC/ST population.

Under the programme, which is meant specifically for the welfare of SC/ST population, projects are funded to universities, governmental institutions, voluntary and non-governmental organisations for transferring proven biotechnological process and techniques through training, demonstrations and extension oriented activities with the participation of the targeted group of people. The programme facilitates SC/ST people to increase their skills and create additional job avenues for them or help in improving their health status. During the reporting period a total of 43 projects have been pursued in 19 states and union territories which would benefit an approx. 15,000 people. Achievements of the of the various projects in different areas are as follows:

Aromatic and medicinal plants: “Promotion and cultivation of aromatic plants and production of essential oils for the benefit of tribal population of Arunachal Pradesh” has been implemented at the Itanagar branch of RRL, Jorhat. With the objective is to motivate local people through training and demonstration to take up organised cultivation of potential aromatic plants in Arunachal Pradesh. During the period, training, motivation and demonstration on cultivation and processing of *Citronella* have been conducted in 6 different villages and selected 218 beneficiaries. 2.3 lakhs Citronella seedlings have been distributed free of cost. Ninety acres of land have been covered so far. Three processing units of 600 kg/batch have been installed in three different villages and produced about 800 litres of oil valued Rs 1.8 lakhs and are being operated by three co-operative societies. 375 schedule tribe families belonging to below poverty line have taken up Citronella cultivation and have started earning.

“Training-cum-field demonstration for cultivation and processing of rose and *Geranium* for their commercial essential oils in Almora district of UP hills” implemented by the Central Institute for Aromatic and Medicinal Plants, Lucknow conducted training-cum-demonstration programme at village Purara-Baijnath in district Bageshwar. A group of twenty beneficiaries belonging to SC/ST communities participated in the programme. The participants were apprised of the importance, method of cultivation, economic gains through cultivation and processing of rose and *Geranium* and several filler crops such as *Palmarosa*, *Targets*, lemongrass etc. both through class room lectures and live demonstration at the CIMAP farm in Parara. A booklet prepared in ‘do it yourself style’ was also given to the participants. Sufficient amount of planting material of rose and *Geranium* has also been raised and further multiplied for demonstration as well as for making the same available to the growers. Energy efficient and easy to operate unit for rose and *Geranium* oil extraction was designed and fabricated for installation at the Parara farm. A glass house-cum-small laboratory has been built to facilitate the production of seeds and propagules of aromatic and medicinal plants and organisation of the training programme on regular basis.

Another central processing facility for the distillation of aromatic plants was created and being managed by the society for Environmental and Rural Awakening at village Khundian, distt. Kangra in addition to a multi-purpose essential oil distillation unit of 4-quintal capacity installed at village Jhiri in distt. Mandi by the Institute of Himalayan Bio-resource Technology, Palampur, H.P. This unit has been set up as a

central processing facility for the target community of the region. Another small size experimental unit of 25-30 kg plant material per batch capacity has been tested and commissioned specially for the extraction of delicate and fine essential oils. It is a model unit for training, and demonstration for the target population established at IHBT Palampur. Out of 270 people trained, 30 entrepreneurs are currently involved in collection, cultivation and processing of aromatic plants earning gross sum of Rs. 2,88,300 per annum. 270 beneficiaries have been trained in production of essential oils. Demask Rose and Marigold were introduced successfully at grower's field. Marigold has been adapted as inter-crop with maize also. This is giving additional revenue to farmers.

Under the project on "Multiplication and Field transfer of in-vivo propagated plants of *Chlorophytum borivillaianum* for economic betterment of tribal farmers implemented at Gyan Bharti Trust, Udaipur. 80 demonstration on tribal farmers' field were laid in 10 villages mostly under rain-fed conditions. Seed is now multiplied at Tapovan Ashram in village Nayakheda to provide seed material to about 100 farmers.

Krishi Vigyan Kendra – Raver, Jalgaon implemented project on "Cultivation, Distillation and Fractionation of AROMATIC and Medicinal plants" and under this eleven training camps (2-5 days) duration were organised in which 305 tribal farmers, farm women and youth participated. Two training of 15 days duration were organised for 25 tribal youth for establishing and managing nursery of medicinal and aromatic plants. Out of 25 youths, 15 youths established nurseries in 5 villages. On an average the youth earn Rs. 7,000 / year by selling seed and planting material. Field demonstrations were also conducted on 6.20 ha. land with participation of 16 tribal farmers. In addition to these demonstrations mini-kits of 100 gms. seeds of medicinal plants and 250 slips of aromatic plants were distributed to 60 farmers for producing their own seed/planting material for next session. Seventy-two farmers cultivated medicinal plants such as Ashwagandha (*Withania somnifera*), safed musali (*Chlorophytum tuberosum*) on 3.40 ha. and Seena (*Cassia angustifolia*) on 10.00 ha. while 76 farmers cultivated Citronella grass (*Cymbopogon winterianus*) on 37.50 ha. Palmarosa on 22.00 ha. (*Cymbopogon martini*), Lemon grass (*Cymbopogon flexuosus*) on 1.00 ha. Mentha (*Mentha arvensis*) on 3.00 ha. and Davana (*Artemisia pallens*) on 10.00 ha.

Low cost polyhouse construction is made popular in the demonstration plots at Gulbarga by Gulbarga University for nursery raising and cultivation of *Withania* and banana. Thirty beneficiaries were trained in various aspects of medicinal plant cultivation and were provided with polyhouse, nursery and experimental field.

Ayurved Gramoudyog Sodh Sansthan, Jodhpur has raised *Withania somnifera* and *Cassia angustifolia* plants in 21 ha. land belonging to SC/ST farmers. It has also raised a nursery of nearly 500 plants of *Commiphora wightii*, which would be transferred in fields in next 2-3 months.

Grama Nava Nirman Samithi, Hyderabad has been implementing a project on cultivation and distillation of aromatic plants viz., Palmarosa, Citronella & Mentha for the benefit of SC/ST women. Navalbhau Pratisthan, Navalnagar distt. Dhule (MS) has also undertaken a project on aromatic and medicinal plants.

Floriculture: Guwahati University implemented an income generation programme for SC/ST youth through floriculture. 10 varieties of *Gladiolus* are planted in farmers' field

in Nov., 99 and the plants are growing well. After initial reluctance and curiosity the farmers are now showing avid interest.

Training of SC/ST youths of Manipur in orchid cutflower production at the Central Agricultural University, Imphal. was conducted. The protocol for micropropagation of popular tropical *Dendrobium* spp. was demonstrated to train about 100 unemployed SC/ST youths for commercial cultivation of hybrid orchids. More than 1000 *Cymbidium* plants were distributed free of cost to these trainees. The hybrids developed by the University were distributed to beneficiaries for cultivation in their own field so that they could get higher.

Mushroom cultivation: For the economic benefits of SC/ST families of Wayanad district of Kerala, training for large-scale cultivation of mushrooms by involving the poorest of poor people from tribal and rural families of Wayanad district has been organised. As a result a society called Mushroom Society of Wayanad (MSW) constituting about 80 members has been formed. An average of 10 kg of mushrooms is being produced per day and marked locally by this society. The society has been linked up with the nearby Gramin bank. The Spawn production unit established at the Centre has produced 1500 bags so far and that has accepted to be the best in the district. A total of 800 people were trained in mushroom cultivation on locally available substrate and in the preparation of value-added products. About 60 macro-fungi were collected and identified. A species of *Pleurotus* collected in wild has been domesticated. A small museum has been established with about 60 collections of different macro fungi. During the study an interesting hypogean fungus-Nila manga which, is usually associated with old termite nests under the soil has been collected. This has got wonderful uses in traditional medicine system. Attempts have been initiated to do bio-prospecting programme of this medicinal plant in order to value the traditional knowledge associated with it and for its widespread usage. Several brochures explaining mushroom cultivation, compost production, illustrating the importance of mushroom as a better source of vegetable protein have been prepared and distributed to a wide range of public.

IIT Delhi conducted training for cultivation of button mushroom (*Agaricus bisporus*) as an income generating activity. Self-help groups were constituted in several villages for mushroom cultivation and other income generating activities. Using a small initial investment through the project these groups would generate income by marketing the product. Part of the income generated will be ploughed back for continuous production during the season starting in October and ending March. The producers were encouraged to cultivate both button and *Pleurotus* mushroom. The self-help groups themselves market the produce directly.

K.S. Saket P.G. College, Ayodhya Faizabad conducted training programme for mushroom cultivation. Thirty SC/ST people from fifteen villages each situated around Faizabad (U.P.) have been trained. They took keen interest in learning of the cultivation of Oyster mushroom (*Pleurotus spp.*) Button mushrooms (*Agaricus bisporus*) and paddy straw mushroom (*Volvariella spp.*) and started producing these at commercial level. Out of 450 trained people 150 have come forward to establish 15 mushroom units, which produce 5 kg of mushroom per unit per day. Thus, per capita income of these landless urban and rural labourers has been increased from Rupees 1500.00 to Rupees 2700.00 per month. For monitoring the marketing of their produce a co-operative society named

“Faizabad Mushroom Utpadak Sangh” has been formed which take care of the problems of mushroom growers effectively.

Vermiculture and Vermicomposting: Five hundred persons from the target group in Haryana had been trained in this technology by IIT, New Delhi. The challenge was to ensure that those trained people use the technology continuously and either use the product for their cultivation or market it for income generation. In the year 1999-2000 attention was focussed on organising self-help groups in different villages for this purpose. It was seen that vermicomposting technology in this area was useful for the small farmers essentially in enhancing productivity of their own lands. Income generation was through better productivity. Experiments were undertaken on the use of vermicompost on marigold and other local crops. It was seen that use of vermicompost helps in an early flowering of marigold and (b) increase flower productivity by 10-20%. Around 250 households “angan nurseries” have been established, based on the concept of “homestead horticulture” and “backyard nutrition”. This activity is combined with household level vermicomposting of available solid organic waste in courtyards for application of vermicompost to the horticultural plants. The fruits and vegetables produced are locally consumed and any excess is marketed.

Gandhigram Rural Institute, Gandhigram (TN) is making efforts to popularise the vermicomposting alongwith sericulture (moriculture & silk worm rearing) through field demonstration and training as revenue generation programme in rural areas. The institute has trained 120 persons from 25 villages, who have already set up 10 vermiculutre and 6 sericulture units. Those which are functioning successfully and also encouraged a large of farmers to venture in this area.

Krishi Vigyan Kendra (KVK), Nanded (MS) has trained 100 farmers from nearby 10 villages on the vermicompost production through bioconversion of agro-residues, and its use in agricultural and horticultural crops. Most of these farmers are using vermicompost in their wheat, sugarcane, banana and citrus crops. A vermicomposting biofertilizer production-cum-training project is also being implemented at Kohima in Nagaland. Under this project, 100 unemployed youths have been trained on different aspects of vermicompost production, and its application has been demonstrated in potato crop.

Quail farming: Under the project “ Demonstration of disease free and better quality quail broiler production for meat for the benefit of tribals” implemented at RRL, Jammu. Demonstration and training activities were conducted in the targeted population hailing from three districts namely, Jammu, Udhampur and Kathua. Quail farming for meat & eggs has been proved to be very useful for enhancing the income of the small and marginal farmers with very less or no assets. The trained beneficiaries have been given priority in the establishment of quail farms by way of providing technical know-how and germplasm/brooder stock at subsidized rates so as to enable them to initiate this venture as an additional source of their income. Over 155 beneficiaries from three districts have been imparted extensive training on the various aspects of quail production technology. More than 13 new production units with 100-600 chicks per lot have been established during the period (April 99 to Nov. 1999) and above 4,000 quail chicks have been supplied so far in addition to 700-parent brooder stock. The growth survival ratio, profit margin and consumers demand is increasing and responses for quail farming are gaining its popularity in the area.

Biological control of plant pest and diseases: The “Production and Demonstration of Biocontrol Agents in IPM systems”, has been implemented at K.V.K. Parbhani for mass production of bioagents. *Helicoverpa* were collected from lasi weed and large number of third instar larvae from cotton, pigeon pea and chickpea crops. Total larval collection during this year was 2,80,750. Large-scale field demonstration on farmers field covering 40.00 ha cotton, 35 ha pigeonpea and 32.00 ha chickpea were undertaken to control insects and pests by using biocontrol agents.

For generating awareness and imparting the skill regarding the production and use of bioagents and botanical pesticides, different training programmes and demonstrations were conducted in the selected 15 villages of the targeted SC/ST population by Krishi Vigyan Kendra, Babbleshwar. The demonstrations were undertaken for 560 beneficiaries in the selected villages and about 450 ha area was covered under training and demonstration to show the efficacy of difficult biopesticides and botanicals at field level.

The Tamil Nadu Agricultural University (TNAU) has trained 130 farmers for 15 days in pest and disease identification, collection of crop pests for the production of biopesticides. In addition, 174 farmers were trained in a one-day training programme to create awareness on the hazards of chemical pesticides and benefits of biopesticides in Integrated Pest Management (IPM). The project covers a total of 7 villages of Madurai and Virubhunager districts. in Tamil Nadu

Botanical pesticides from neem, *Pongamia*, *Vitex*, *Ipomea*, *Jatropha*, etc. were used in brinjal, bhindi, tomato and redgram for the control of pests and diseases. In rice fields sprays were given with non-edible oils like neem, *Pongamia* and *Madhuca* at 3% individually and in combination, and compared with one insecticide and untreated control. The rice diseases and pests controlled were demonstrated. TNAU has covered a total of 22 ha. crop area of tomato, brinjal, bhindi, redgram and groundnut under the project for field demonstration on the use of various biological control agents and biopesticides.

KVK, Parbhani (MS) has produced biological control agents viz., *Trichogramma chilonis* (parasite), *Chrysoperla carneia* (predator) and Nuclear Polyhedrosis Virus on laboratory scale. A total of 82 lt. HaNPV, 55 lakhs *Trichogramma* and 10 lakhs *Chrysoperla* have been produced and used in IPM of pigeonpea, cotton and chickpea. KVK has conducted field demonstrations on the use of various bioagents. One-month training was also conducted and 9 persons have been trained on the production of biological control agents.

Shri Dhaneswari Manav Vikas Mandel, Kalamb district. Osmanabad (MS) has also trained around 600 persons from the targeted groups on the production of HaNPV, *Trichogramma card*, *Cryptolemus*, neem powder and urea coating with neem product. It has also conducted field demonstrations on the use of these biological agents in IPM in Jawar & Cotton crops at 12 farmers’ plots, which were visited by about 1000 farmers from nearby areas.

Aquaculture: Krishi Vigyan Kendra, Washim implemented an aquaculture project for the benefit of SC/ST population of the area. Under the project 10 tanks were selected and 10 beneficiaries each tank were assigned for training. Fish culture was undertaken in 8 tanks and two tanks were used for prawn culture. The production of this year was distributed among the trainees. 100 beneficiaries were provided the training and the share in production. Twenty two training programmes were also conducted on various aspects,

like rearing of fish seed, feeding techniques, application of lime, to increase O₂ in the water body by using low cost technology etc.

St. Anthony's College Shillong has established Hatcheries for both major carps and magur. Construction of brood stock pond and rearing tank has been completed with provision for complete circulation of water tank. Brooders were collected locally as well as from the neighbouring state. These fishes are stocked in the brood fish stocking pond and proper balanced food supplied. For the first time induced breeding of carps such as *Labeo rohita*, *Labeo gonius* and *Cyprinus caprio* (European strain) was successfully carried out at Shillong at low temperature. Mortality rate of the hatchlings was comparatively low inspite of prevailing climatic conditions. This achievement was reported by local newspaper. The growth rate of the hatchlings was monitored every fortnight.

An extension programme was conducted in the RiBhoi district. The programme has benefited about 20 rural fish farmers of the Umtrew village. During this programme fish seeds which were produced in the hatchery were also distributed free of cost to the local farmers.

KVK, Karda district Washim (MS) continued its demonstration project on aquaculture in the tribal areas. It procured fish seeds of Indian major carp, grass carp, silver carp and common carp and stocked in the nursery pond at Karda for transferring in the 10 selected seasonal and perennial ponds. A series of training courses conducted on different aspects of the fish and prawn culture. 80 persons were trained during the year. Assistance was also provided to the persons trained in the previous year to start their fish farming activities. With these KVK'S - effort fish production could be raised upto the level of 3000-3500 kg/ha/yr.

Healthcare: Previous study in Kerala had shown that sickle cell gene has a high frequency of 7-30% among different tribal groups. It is a major cause of infant mortality. The present project is the first of its kind in the country to develop a strategy to manage the sickle cell diseases. It is a multicentric project involving scientific institutions (AIIMS and Sir Ganga Ram Hospital, Delhi and Foetal Care research Foundation, Chennai), Local government establishments (District Collector, Departments of Tribal Development and Health, Wayanad and a local NGO (Swami Vivekananda Medical Mission, Muttill, Wayanad). The entire tribal at risk (about 1,50,000) is being screened for their sickle haemoglobin status. Individuals identified as homozygotes are given treatment consistent with recommendations of the World Health Organisation" Carriers are counselled to marry non-carriers while couples where both partners are carriers are offered prenatal diagnosis to avoid the birth of affected children. The appropriate educational material for increasing the awareness of community, tribal development and health workers and professionals has been prepared and distributed widely. Subjects numbering 52,271 belonging to 13 Panchayats have already been covered for screening. Carrier status of the disease was identified in 7986 subjects (15.3%) and 676 subjects (1.3%) have the disease. The second phase of the control program is also running in concurrence with screening programme.

Vivekananda Institute of Medical Science, Calcutta continued the study on the use of biotechnology dietary derived supplements in improving health status of SC population of three villages in West Bengal. The study has covered 3 adjacent villages of

South 24-Pragna district. of West Bengal. During the surveys, it was found that 62 children out of total 229 and 79 mothers out of 151 had sign and symptoms of Vitamin-A deficiency. Of them, 14 children and 26 mothers were found with histological evidence of Vitamin-A deficiency as evident from examination of their conjunctival swabs. It was observed that in case of children after giving Spirulina preparation (500 mg twice daily x one month) the specimen of their conjunctival swabs became normal, and in case of mothers also the swab reverted to normal after one course of *Spirulina* (1g twice daily X one month). Nightblindness also disappeared in case (2) in which it was earlier detected. The study has shown the effectiveness of *Spirulina* in correcting the deficiency of Vitamin A, although more data have to be collected to validate the results. *Spirulina* is being grown in the villages in large earthenware pots and also in tanks. The local people are being encouraged to grow *Spirulina*. The centre has also taken up recently another project on studies of genetic disorders to provide counselling with special reference to haemoglobinopathies in tribal population of Tripura. The project is focussed to screening of the population to assess the extent of genetic diseases (HbE *betathelissimia*) among the tribals and educate them in gene related diseases. A centre for screening of the disease at Dhaleshwar, Agartala has also been set up which would help in containing the spread of the disease in the tribal of the state.

Spirulina Production: The project “Income generating Spirulina Cultivation for SC/ST Women and Youth of Bassi” has moved from the laboratory to the land from the Department of Botany, University of Rajasthan Jaipur to serve SC/ST women below poverty line of rural Rajasthan by providing additional income to their livelihood. The project has become operational at an area of 1600 sq. m. land at Burthal village of Bassi Panchayat Samiti. Ten cement tanks with a capacity of 2x0.75x0.5 m have been fabricated with the provision to drain rainwater, protect from dust storms and also raise the temperature during winter months. A batch of 10 village women belonging to SC/ST community was trained for a period of 10 days. So far 104 ladies have been trained in the batches of 10 each. Using commercial grade has composed a cheap and novel medium.

5.2. BIOTECHNOLOGY BASED PROGRAMME FOR WOMEN AND RURAL DEVELOPMENT

More than 50 proposals were received; eleven selected for support in the areas of Organic Farming, Mushroom Cultivation, Seaweed cultivation, Floriculture, Biofertilizer, Aqua farming, Rearing of Angora Rabbit for wool production and development of technology package for hormone replacement therapy (HRT) to age related problems of women. Significant achievements of about 30 projects are as follows:

Food Technology: Effort was made to preserve and store the horticultural produce grown in UP hills, through a number of training programmes. The process for preservation including packaging was demonstrated for preparation of final products. These products are mango squash, jam, processed citrus, papaya, ginger, green chilli etc. Besides these, squash was also prepared from wild rose, rhododendram, kafal and wild apricot. About 152 women have benefited; 120 have started receiving economic benefit of Rs 10,000 per annum.

Another initiative was taken to empower women with the skill and entrepreneurship development through management and training in food processing viz. Bakery and milk products. In addition to these, they were also trained in fruit processing

at a semi industrial scale. Various industrial organisations were also involved in imparting training. At the commercial processing units. So far 32 women have been trained and 6 of them have started their own manufacturing units of various capacity. It is very encouraging that one of them started supply of mid day meal to the school children under literacy programme.

Waste Land Development Programme: A project was undertaken to cultivate usar land by introducing Emblica (Amla) plantation for income generation. Initially three-hectare usar soil was partially remedied by using Gypsum. Thereafter a nursery was developed where more than 25,000 plants are being grown. 110 Plants already planted in the field and most of them are growing well. The women beneficiaries were trained in specific cultural practices for raising the Amla plantation. Steps are being taken to introduce some vegetable crops as an inter crop for additional income generation.

Utilisation of Agricultural Waste: Effort was made to provide suitable process for converting agricultural waste into compost. The technologies used are: vermicomposting, mushroom production, and composite composting process. The beneficiaries were trained in vermicomposting, mushroom cultivation and liquid compost preparation. A novel composting mini plant has been made which gives a very high nutrient value of the spent liquid. Steps are being taken to find out market for liquid fertiliser in pouches in concentrated form.

A number of training programmes were conducted on vermicomposting in villages of Punjab and West Bengal. A number of trainings were also imparted in these places on Button mushroom cultivation and organic farming of leafy vegetables cultivation for additional income generation for the rural folks.

Floriculture: A conscious effort was made to train women in floriculture in suitable agroclimatic regions particularly in Kerala in view of its high return. Around 350 women were trained in cultivation of Orchid, Anthurium and other Ornamental plants. The beneficiaries were provided with low-cost polyhouse as hardening facility along with training to raise tissue culture orchid and anthurium. A stable marketing tie up has been made with the Federation of Indian Floriculturist at Thiruvananthapuram. In addition to this, a novel project was launched at Sikkim involving school dropout girls for orchid cultivation. The girls were trained in tissue culture techniques and hardening of hybrid as well as local varieties of orchids. Around 30 women have been trained and provided with 50 mature plants to start their activity for income generation.

Human Health: A number of projects were supported to screen the women population for genetic disorders particularly β -thalassemia and also other congenital malformations. Necessary medical advice is being provided. In order to treat the common ailment like cough and cold, indigestion, diarrhoea etc. the rural population is being encouraged to use herbal products. For this purpose, programmes are being undertaken to cultivate locally available plants of medicinal value in Garhwal and East Singhbhum district. The rural and tribal women are being encouraged to conserve endangered and rare herbal medicinal plants species in Purulia, West Bengal. Rural people are also being trained to prepare herbal medicine as per traditional health care system.

Animal Husbandry: The development of Angora rabbit farming unit for wool production, to generate income for the rural poor are implemented in Himachal Pradesh.

Entrepreneurship opportunity for women has been created through a project under which improved packages for Goat and poultry rearing are being offered to these beneficiaries.

Aquaculture: A new technology for Mussel farming in open sea has been transferred to the fisherwoman of coastal region of Goa. Series of demonstrations have been organised for local fisherfolk and the technique of collection and transplantation of the mussel seed on ropes were demonstrated. A process has been standardised for production of high value product namely, mussel hydrolysate for which a patent has been filed. This mussel hydrolysate is pharmaceutically active. Industries have shown interest for commercial exploitation of this process. Efforts are being made to involve local government for allotting the coastal sites to the beneficiaries on lease basis. The beneficiaries are expected to earn RS 7000-8000 per month. The rural people are also encouraged to grow catfish including the endangered fishes through a project being implemented in Bihar. The fish farming including fish seed production is being disseminated among the women farmers of Himachal Pradesh.

Sericulture: Sericulture in non-traditional areas has been taken up in rural belts of Andhra Pradesh for economic upliftment of women. 1.5 Acre of land has been developed so far. Few batches of beneficiaries have been trained in package of practices for mulberry cultivation and chowky rearing of silkworms.

Environment Protection and awareness: For monitoring the organochlorine pesticide load in water and soil, a biosensor technology has been developed for easy handling by the rural women. The identified beneficiaries are being trained for use of the Biosensors. These trained women are also launched awareness campaign on harmful effects of chemical pesticide to soil and drinking water.

Product and Process Development: An ecofriendly mosquito repellent and herbal product formation process has been developed and transferred to the Women folk in UP. 65 women have been trained so far and started earning profit by door to door product selling.

Golden Jubilee Women Biotechnology Park: A novel approach was taken to establish a Women Biotechnology Park as a joint venture with the state Govt. of Tamil Nadu in Chennai. The concept of the park is based on the principle of decentralised production supported by appropriate centralised services to promote a series of high tech biotechnology based enterprises aiming to capture a number of niche markets in the areas of Agri-biotech, Food biotech, Medical biotech etc. When fully developed this Park will consist of industrial incubation centres, ultra modern multimedia information complex, quality verification reference laboratories etc. The R&D institutions, the corporate sector and the financial institutions would assist the women entrepreneurs in achieving the objectives of the Park, which will serve as a model to foster the technological and economic empowerment of women.

The State Government has provided 20 acre of land at Kalambakkam for this venture. Industrial modules are being constructed, 20 perspective entrepreneurs have been selected and 8 of them are ready to start their units in the areas of Food Technology, Herbal Products, Floriculture, Fortified Food Additives, Ornamental Fish, Spirulina production, Vermicomposting and Diagnostics.

Employment opportunities to earthquake victims of Chamoli, Rudraprayag and Tehri: The proposal entitled, "Natural Resource Based Biotechnological Intervention for Earthquake Victims" has been sanctioned to HESCO, at Dehradun to benefit the victims.

Thirteen voluntary organisations / NGOs are associated to get the project implemented. About 700 target population are expected to be benefited through various technologies like fruit processing, organic farming and vegetable production, post-harvesting of agriculture produce, mother-nursery raising, herbal medicines and aquaculture.

5.3. BIOVILLAGE PRORAMME

Biovillage at Mocha-Porbandar: Farmers of target village were trained at Gujarat Agricultural University. The training encompassed knowledge of production and use of bio-fertilisers and bio-pesticides for growing of crops. They were exposed to modern farming practices. The training lasted 2 full days. The farmers were given printed ready reckoner (a book) for their day- to -day use. National Research Centre for Ground-nut, based at Junagarh, a voluntary agency, which was assigned to identify farmers, have since identified farmers to earmark certain portion of their farms for the use of bio-fertilisers and bio-pesticides with improved farm practices. The last crops taken on the portion of these farms are being watched with a view to impressing upon farmers the advantage in new approach. Levelling and digging of pits for wasteland plantation in a fenced-land have commenced. For carcasses disposal unit, CLRI Extension Centre based at Ahmedabad is taking necessary action with CSMCRI to establish the Caracas utilisation unit.