Lemon grass cultivation

Science and Technology

HIGHLIGHTS 2005 – 2006

Aromatic Plant Project, Dehradun

- 204 beneficiaries have undertaken the cultivation of lemon grass, citronella and basil against the projected 150
- Work on establishing a Distillation Unit initiated
- 8 demonstration plots of other aromatic plants (geranium, patchouli, bergamot mint, pepper mint, spear mint, coleus) established
- 18 Master farmers trained to support other farmers in growing aromatic plants by providing techinical inputs

Sustainable food production, secure livelihoods and ecological security are interrelated. Targeted conservation of natural resources and agro-biodiversity will support both food as well as ecological security.

More than 100 families have increased their incomes thanks to lemon grass cultivation.

POVERTY ALLEVIATION THROUGH THE PROMOTION OF AGRICULTURAL MICRO-ENTERPRISES IN THE AROMATIC PLANTS SECTOR

The demand for the oils of aromatic plants is increasing worldwide to meet the needs of cosmetics, confectionery and pharmaceutical manufactures. Within India domestic demand far exceeds production making a strong case for developing this sector.

The State of Uttaranchal with its diverse agro-climatic zones has an untapped wealth of plants with aromatic and medicinal properties in its jungles and meadows. Studies have shown that cultivation of aromatic plants can yield higher returns than traditional crops.

In 2003, the Foundation formed an alliance with the Uttaranchal Government and Agrisud International, a French NGO, to devise interventions to support and encourage aromatic plants cultivation linking it with poverty alleviation. An innovative project was developed to alleviate rural poverty in Sahaspur block of Dehradun district, through a market economy approach. The pilot phase was for a period of three years focusing on creating sustainable Very Small Enterprises (VSE) in the aromatic plants production sector.

Lemon grass, citronella and basil were the three aromatic plants selected for the project activities. They were chosen for the following reasons:

a. The growth rate and productivity of these plants is very high. Cultivation on a large-scale possible for commercial purpose.

b. The products of these plants are widely used in the cosmetics, pharmaceutical, confectionery and beverage industries.

c. They can be cultivated on hill slopes and wastelands, making them accessible even to BPL households.

PROGRAMME VISION

The Foundation promotes programmes that harness science and technology to the every day needs of the people. It focuses on initiatives which use science and technology to:

- Improve the lives of the poor
- Promote rural development
- Protect the environment

d. These plants are environmentally friendly, planting of which helps in preventing soil erosion and retaining the soil fertility.

Sahaspur block of Dehradun district was selected after extensive survey for implementing the pilot phase of the project. Situated in the foothills of the Himalayas, the area falls in sub tropical humid zone with an average rainfall of 2212 mm per annum. The minimum temperature during winters is 3.9°C making it suitable for growing lemongrass & citronella while the maximum summer temperature at 39.8°C makes a favorable case for planting basil during summers.

The key activities taken up during the project were:

- Survey of the Farming Systems
- Survey of the economic environment and market
- Developing models of VSEs
- Selection of direct beneficiaries
- Training of Beneficiaries
- Training of Farmers
- Training of Master farmers
- Economic and Technical Follow up
- Formation a Farmers Federation
- Establishment and handing over of the processing cum distillation Unit

Beneficiaries Training:

Beneficiaries were trained in cultivation and processing techniques such as preparation of farmland, use of fertilizers, pest management, sowing and planting. Lemon grass with its five-year life cycle and minimal maintenance and expenditure proved the most popular.

The trainings were provided both centrally at the Centre for Aromatic Plants (CAP) Selaqui, Dehradun and locally at the farmers fields. Those who had taken good care of the crops and yielded best results were chosen as Master Farmers. Eighteen master farmers were selected and trained to ensure continuity of the interventions and expand the number of farmers by providing technical support.

The project originally aimed at capacitating 150 farmers went on to train 204 farmers. In the reporting year training and support was extended to 97 beneficiaries. Special attention was given to women's participation; women formed 30 percent of the total beneficiaries.

Apart from providing training to the farmers, the project also supported them by providing high quality slips, seeds, pesticides and other material from time to time. A project field team provided them technical support during the cultivation activities.

In order to strengthen the economic activities for profitable distillation, processing and marketing of the aromatic plants and their extracts, a farmer's federation was formed. The federation is managed by a committee of nine farmers. The processing and distillation unit set up at a total cost of Rs 6.0 lakh was handed over to the federation during the reporting period.

Major results and highlights of the project

I. Project Results:

Indicators	Expected results	Effective results	Remarks
Number of beneficiaries	150	204	352 beneficiaries were initially identified
Number of beneficiaries trained	150	220	Out of 220 farmers trained, 204 of them planted aromatic plants in their fields
Number of Master Farmers trained	20	18	
Number of technical/ informative booklets produced		4	On various aspects of aromatic cultivation
Number of booklets distributed		419	The booklets were distributed to the Farmers / Master Farmers
Number of demonstration plots at farmers fields		8	6 crops (Patchouli, Bergamot mint, Pepper mint, Spear-mint, Geranium and Coleus)
Farmers Federation	1	1	To be Registered under Societies Act
Collective distillation unit	1	1	The unit has been installed and handed over to the Federation

II. Farmers Results:

Indicators	Average results / Bigha	Remarks
Yield for Lemongrass up to November 2005	19 Q	Max : 68Q / Bigha Min : 8Q / Bigha
Yield of Lemongrass oil up to November 2005	7.6 kg	Max : 27.2 kg / Bigha Min : 3.2 kg/ Bigha
Income from Lemongrass	2,450	Max : Rs 8,818 / Bigha Min : Rs 1,076 / Bigha
Yield from Basil (1 cycle in 2004)	4 Q	Max : 13 Q / Bigha Min : 1 Q / Bigha
Yield from Basil oil	1.6 kg	Max : 5.2 kg / Bigha Min : 0.4 kg / Bigha
Income from Basil	512	Max : Rs 1805 / Bigha Min : Rs 135 / Bigha
Number of slips sold by farmers	2540 slips	Max : 4750 slips Min : 500 slips
Income from slips to farmers	2540	Max : Rs 4750 Min : Rs 500

- The variations of results between farmers are significant. The best results were obtained by farmers with irrigation facilities and good agricultural practices.
- The economic returns from Lemongrass are higher than traditional crops: e.g. income from Maize or Mustard is about Rs. 25400 per hectare against Rs. 88,180 per hectare from lemon grass.
- Lemongrass cultivation keeps wild animals (monkeys, deer etc.) away from the fields on account of its smell.

III. Test Results:

- Citronella essential oil: conforms to International norms (AFNOR NFT 75-223)
- Lemongrass essential oil: conforms to international norms (AFNOR NF T 75-217)
- Basil essential oil: not in conformity with International norms (ISO 11043)

IV. Other findings:

- Lemongrass was cultivated in 95 Bighas, citronella in 65 Bighas and basil in 35 Bighas of land.
- The economic benefit of lemongrass was almost double from the original estimates.
- The cultivation of citronella requires higher care and is work extensive therefore most of the farmers preferred lemongrass.
- Basil was cultivated in 35 Bighas but got washed out due to heavy rain and farmers did not continue with it.
- The total income recorded from all aromatic plants is Rs. 2, 54,427/-, which is 15 per cent higher than projected.
- Export deals did not materialize on account of the small quantities and low international price.

Conclusion

The Uttaranchal government has continued the subsidy on slips to the new farmers while the Foundation is committed to provide continual support to strengthen and capacitate the Federation in managerial and marketing skills. The distillation unit is an added advantage for the Federation.

The Farmer's Federation now owns a big responsibility for further promotion of these crops. Apart from lemongrass, citronella and basil, eight demonstration plots of other aromatic plants namely geranium, patchouli, bergamot mint, pepper mint, spear mint and coleus have been placed in the farmer's fields, the results of which are still awaited.

Farmers bringing lemon grass to the Distillation Unit at Selaqui

It can be safely concluded however, that with effective trainings to all the beneficiaries, creation of master farmers having technical, managerial and marketing capabilities, formation and establishment of the federation and setting up and handing over of the processing and distillation unit of oil extracts, the primary objective of creating sustainable VSEs (Very Small Enterprises) during the pilot phase has been successfully achieved.

GENE CAMPAIGN

Sustainable food production, secure livelihoods and ecological security are interrelated. Targeted conservation of natural resources and agro-biodiversity will support both food as well as ecological security. Promoting a low chemical input agricultural production system will not only be ecological benign, it will be less resource consuming than intensive agriculture.

RGF and Gene Campaign signed an MoU commencing December 2005 for implementing a two year pilot project in 50 villages of Ramgarh block of Nainital district, Uttaranchal. The project aims at bio-resource conservation for long-term food & livelihood security and empowerment of communities.

The project will establish a farmer resource center. Information materials regarding collection & characterization of agro-biodiversity, conservation practices, legal rights etc would be made available to the farmers. Training programmes on rights-based awareness generation would also be conducted.

In the field a farmer level gene/seed bank will be set up. The farmers will be trained for collection, characterization and conservation of agro-biodiversity of rice, legumes, millets and other under utilized crops.

The project would also work on exploring the use of bio-pesticides to minimize the chemical inputs in agriculture. Use of biological fertilizers (vermin compost) and bio-pesticides will be promoted among the farmers, which help in maintaining good soil fertility and can also be a potential source of income by growing organic food.

SCIENCE & TECHNOLOGY

HIGHLIGHTS 1992 – 2006

COMMUNITY PROJECTS

Barefoot Technicians Programme (1993 – 2001)
- Trained 208 unemployed tribal and rural youth in livestock development and simple veterinary care
- Cover rural areas of Maharashtra, Tamil Nadu, Assam, West Bengal and Orissa
- Significantly helped the economic development of the communities

Mobile veterinary clinic for Van Gujjars, semi nomadic tribe of cattle herders in the foothills of Himalayas (1993 – 1995)
- Drastically reduced cattle epidemics and disease, improved milk yields
- Helped the economic development of the community

Biomass Energy Community irrigation scheme in Karnataka (1994 – 2002)
- Innovative and highly successful in two non electrified villages
- Use biomass energy for irrigation, domestic use and running a flour mill

Mobile Veterinary Clinic in Wardha, Maharashtra (1995)
- Facilitated the expansion of the area's animal husbandry programme
- Provided basic training in diagnosis and treatment of common livestock diseases
- More than 3,200 families availed of the clinic's services
- Currently used in Idukki district, Kerala

Fisheries Development Programme in Chandrapur, Maharashtra gave on-site training to 40 fisheries societies (2000 - 2003)
- Use modern methods of fish farming
- Increase the yield of fish tanks, and the income of the fisher men

Aromatic Plants Cultivation in Dehradun district, Uttaranchal (2003-2006)
- A tripartite project (RGF, Government of Uttaranchal and Agrisud International, France) to develop and promote very small enterprises in the aromatic plants sector
- Three plants – lemongrass, citronella and basil – selected for cultivation, of which lemongrass proves the most popular
- 204 beneficiaries cultivate lemongrass, citronella and basil, obtaining a higher income.
- A Farmers Federation formed and Distillation Unit initiated
- 18 master farmers trained to support other farmers in growing aromatic crops

SCIENCE POPULARISATION

Science laboratory, Sultanpur, Uttar Pradesh (1993)
- Set up and equipped at the Rajiv Gandhi Science College in Gauriganj

HAM Radio (1993 – 2000)
- Training to 330 people to receive HAM radio and amateur radio operators' license
- Published comprehensive training manual

Audio-visual educational materials on science and technology (1994)
- Project collaboration with the Electronics Trade and Technology Development Corporation
- Disseminated material to 44 schools and institutions across the country
- Films on mathematics and the natural sciences were selected from around the world, dubbed in Hindi and English, and made available at a nominal cost

Rajiv Gandhi Design and Technology Centre
- Set up in collaboration with the Doon School, Dehradun
- Students learn to apply scientific and technological methods
- Practical projects involving the community, such as improving hygiene and providing safe drinking water

VOCATIONAL TRAINING

Programme to provide new sources of employment to rural artisans whose traditional trades had become obsolete (1994)
- Partnership with the institute of Engineering and Rural Technology, Allahabad
- Training to 24 master trainers in 4 trades – electrical repair work, motor winding, welding, and tailoring and embroidery

ENVIRONMENT AWARENESS

Environmental awareness campaign (1993-94)
- In partnership with the Environmental Research Laboratory, Lucknow, trained over 1800 youth and children on environmental issues and concerns
- Use of audio-visual aids, demonstrations, and air and water monitoring projects

Delhi Environment Action Network (DEAN) Programme (1996 – 99)
- In collaboration with Development Alternatives, trained students from 12 schools to monitor air and water quality in selected pockets in Delhi
- Conducted awareness campaigns to improve and protect the environment, and identify solutions
- Provided a fully- equipped mobile pollution-monitoring laboratory and audiovisual equipment for the awareness campaigns
- Annual DEAN melas organized to highlight aspects of environment management such as water testing, medicinal plants, and paper recycling

RGF's SCIENCE AND TECHNOLOGY PROGRAMMES