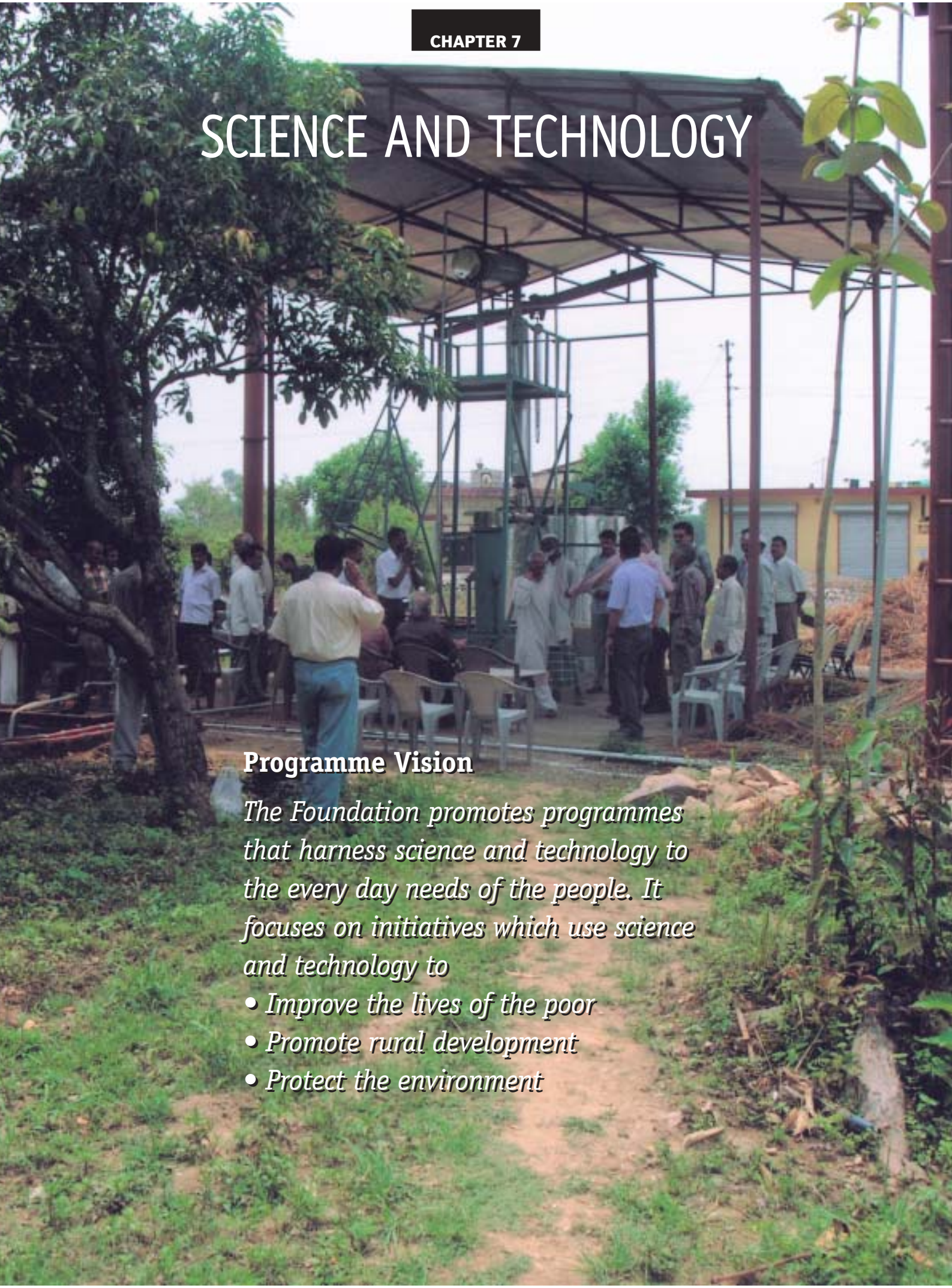
CHAPTER 7

SCIENCE AND TECHNOLOGY



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*

Science and Technology

AROMATIC PLANTS PROJECT

RGF, Agrisud International and the Uttarakhand government have since 2003 implemented a pilot project on "Poverty alleviation through cultivation of aromatic plants" in Sahaspur block of Dehradun district. The project aims at poverty alleviation through a market economy approach by creating very small enterprises (VSEs).

Lemon grass, citronella and basil were the three aromatic plants selected for promotion. Lemon grass with its five-year life cycle and minimal maintenance and expenditure proved the most popular.

Beneficiaries were identified and trained in cultivation and processing techniques of these plants in collaboration with the Centre for Aromatic Plants (CAP) Selaqui, Dehradun and locally at the farmer's fields. Those who had taken good care of crops and got the best results were identified as master farmers. These 18 master farmers were trained

HIGHLIGHTS 2006 – 2007

UTTARAKHAND

Aromatic Plants Project, Dehradun

- A field distillation unit established and handed over to the Farmers Federation.
- Aromatic plants project extended for one more year to strengthen the Farmers Federation.

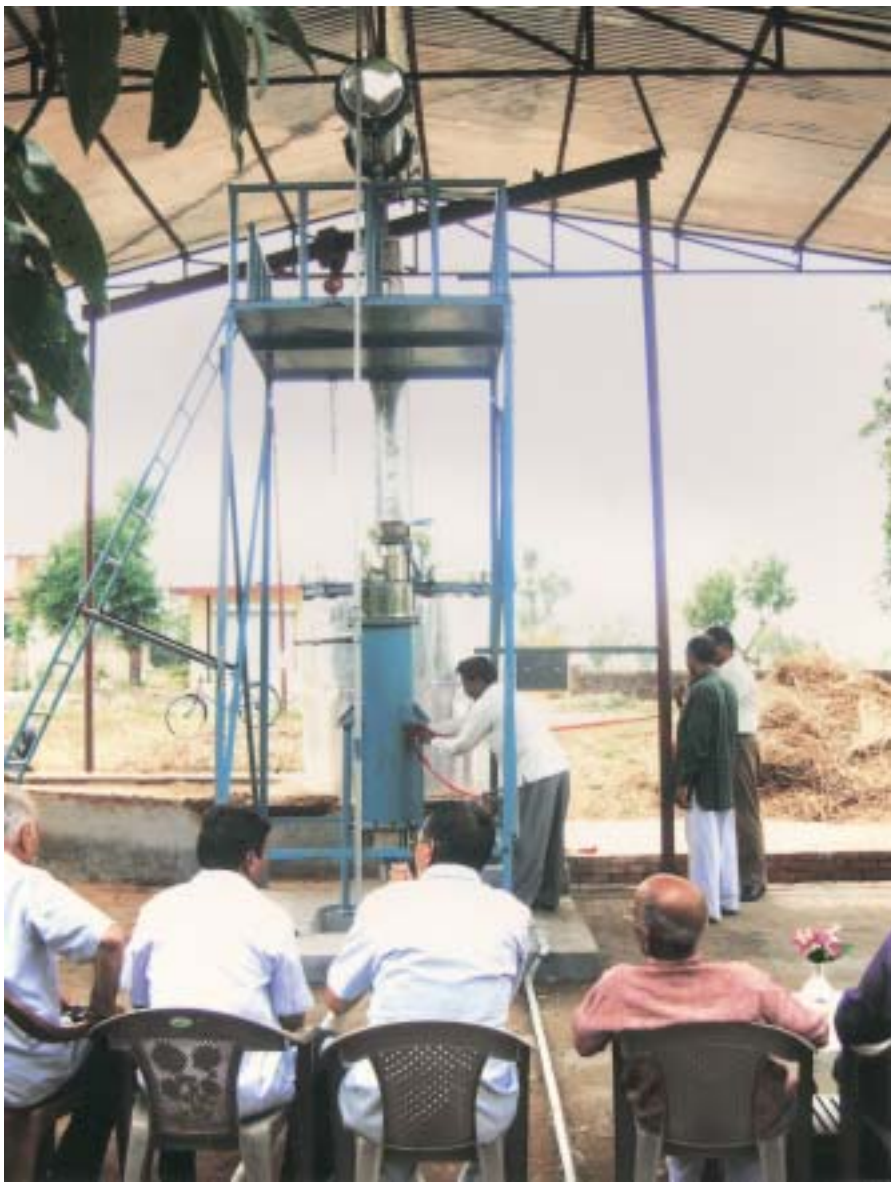
Bio-resource Conservation Project, Nainital

- 370 samples of different agro varities collected from 108 villages of four districts of Uttarakhand.
- Gene / seed bank established in village Orakhan of Nainital district.
- Extracts from six different plants tried and tested as bio-pesticides
- Three booklets in Hindi dealing with farmers' rights, indigenous knowledge and sustainable agriculture prepared and distributed.

Facing page: Handing over of Distillation Unit to farmers

Below: Lemon grass processing at distillation unit

Above and below: Distillation Unit



to ensure continuity of the interventions and expand the number of farmers by providing technical support at their doorsteps. 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 Farmers Federation was formed. A committee of farmers manages the Federation. To extract the essential oil from grass a field processing and distillation unit has been set up at a total cost of Rs. 6 lakhs and handed over to the Federation.

The pilot project ended in November 2005. At the close of the project nearly 200 farmers were growing lemon grass each on 1-1.25 bighas of land. Their income has considerably improved.

In September 2006, RGF and Agrisud conducted a field study to assess the present field situation and the problems encountered by the farmers organisation. It was revealed that while the cultivation of lemon grass was increasing, there were problems in running the distillation unit and processing and marketing the oil.

In order to strengthen the Farmers' Federation and develop its capacity to run the distillation unit effectively, RGF & Agrisud are extending support through the Himalayan Action Research Center (HARC) for the efficient functioning of the Farmers' Federation and the Distillation Unit including putting in place a proper marketing strategy.

BIO-RESOURCE CONSERVATION PROJECT

RGF and Gene Campaign signed an MoU in December 2005 for implementing a pilot project in 50 villages of Ramgarh block of Nainital district, Uttarakhand. The project aims at bio-resource

conservation for long-term food and livelihood security and empowerment of communities through rights-based awareness and training programmes. The project was of two years duration. The progress for the above-mentioned period is given below.

Agro-biodiversity conservation

The preservation of agro-biodiversity is essential for ensuring sustained agricultural development and food security. Agro biodiversity was collected from 108 villages in four districts Nainital, Almora, Pithoragarh and Dehradun.

Crop	Total Collections	No. of Villages
Paddy	112	53
Millets	126	48
Maize	43	32
Wheat	75	45
Pulses	14	-
Oil seeds	22	20

A total 392 varieties have been collected. Characterization of the genetic properties has been done which records the physical and agronomic properties of the variety. These are further processed and characterized and stored in a Gene/Seed bank that has been set up in village Orakhan of Nainital district.

Bio-pesticide

The liberal and continual use of chemical pesticides has disturbing sequences on the farming system, human health, environment and ground water. The project is therefore highlighting and promoting the use of bio pesticides, as they are usually harmless to the environment and human beings and help in maintaining good soil fertility. Local plants with toxic properties like Timur, Bichoo Patta, Tobacco, Akhrot, Rambans were selected from the region and their extract has been tried as a pesticide or insect repellent. Emulsions for spraying were tried out using water extract alone and also water extract with cow urine. These pesticides have shown effectiveness when used in preventive mode rather than when crops are already inflicted with pests. The pesticides are effective against a number of sucking and boring pests. Pesticidal details of two of the most effective bio-pesticides are given in the table below:

Meeting with members of Farmers' Federation

Plant	Plant Part Used	Effective Against
Tobacco *(Nicotiana tabacum)*	Leaf	Aphides, Whiteflies, leafhopper, thrips, red spiders, snails
Karanj *(Pongamia pinnata)*	Leaf, Seed	Diverse pests

Awareness Generation

A training programme has been conducted on the importance of conserving agro biodiversity for future food security in the project villages as well as in those villages from where agro biodiversity collections were made. The discussions include issues like the importance of indigenous knowledge and traditional varieties to future breeding, the adverse impact of the green revolution on the traditional agriculture system and how to reverse it, difference between hybrid, high yielding varieties and traditional crops and the relevance and importance of organic farming.

Information materials

Simple and interesting text in the form of wallpapers in Hindi has been developed containing information on the Convention on Biological Diversity and Indigenous Knowledge, Trade Related Intellectual Property Rights, Patents on seeds, bio-diversity and farmers rights. These posters are distributed in schools to sensitize students about conservation issues.

The following booklets in Hindi dealing with farmers' rights, indigenous knowledge and sustainable agriculture have been prepared and disseminated:

- Poudh Sanrakshan evam Kisan Adhikar Kanoon-2001
- Boudhik Sampada ke Naam par Paramparik Gyan se Khilwad
- Deshi Gyan par Boudhik Adhikar.

SCIENCE AND TECHNOLOGY

HIGHLIGHTS (1992 – 2007)

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, Uttarakhand (2003 –2007)

- 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 established
- 18 master farmers trained to support other farmers in growing aromatic crops.
- Project extended for one more year in collaborations with HARC to strengthen the Farmers Federation.

Bio-resource Conservation Project, Nainital (2005-2007)

- 370 samples of different agro varieties collected from 108 villages of four districts of Uttarakhand.
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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)

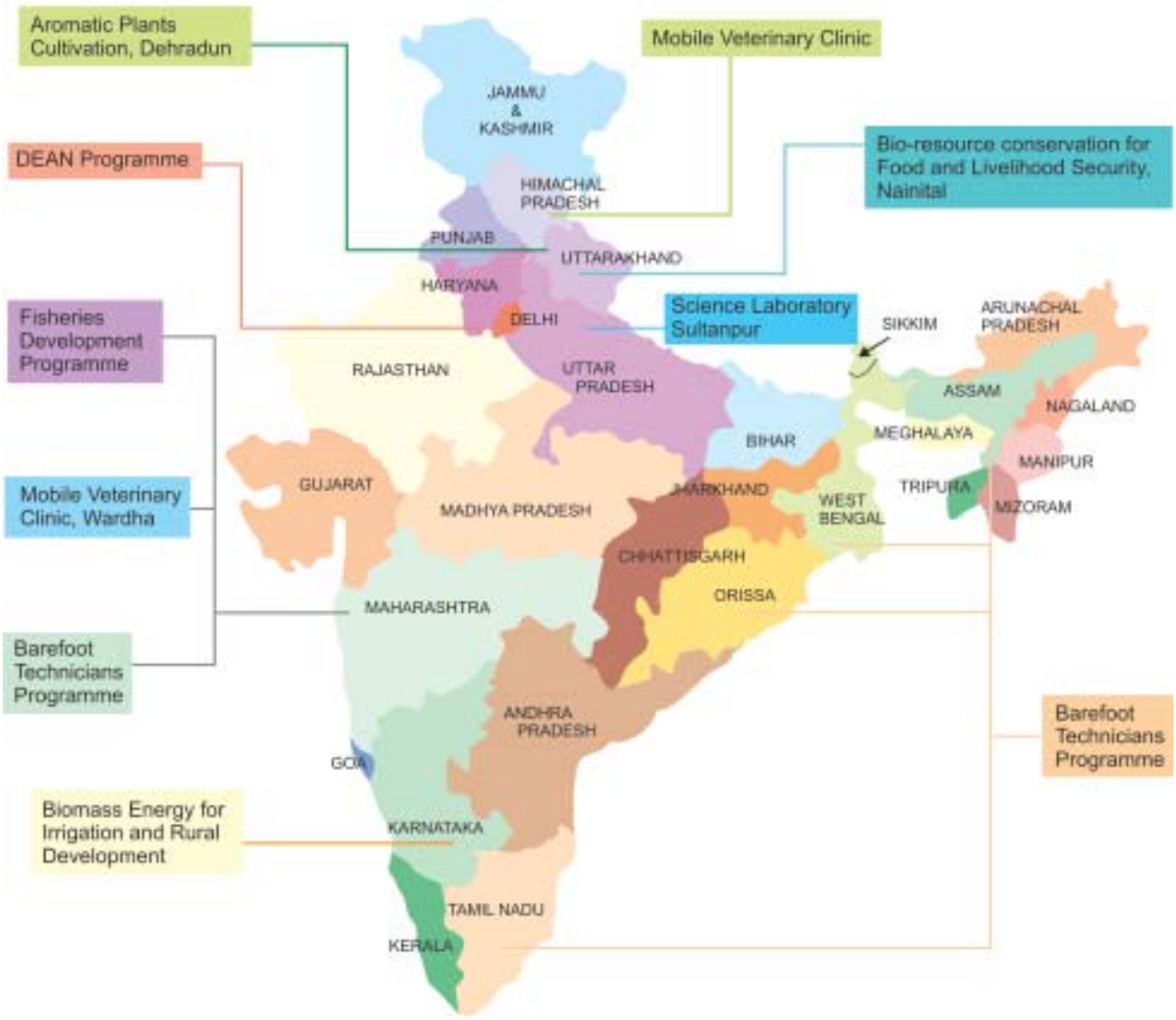
- Partnership with the Institute of Engineering and Rural Technology, Allahabad
- Training to 24 master trainers in 4 trades – electrical repair work, motor winding, welding, and tailoring and embroidery

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 IN INDIA