Technology Intervention
for Mountain Ecosystem-Livelihood
Enhancement through Action Research & Networking
(TIME-LEARN) Programme

of

Science for Equity, Empowerment & Development (SEED) Division,
Department of Science & Technology (DST),
Government of India, New Delhi-110016

Co-ordinating agencies

Himalayan Environmental Studies & Conservation Organization (HESCO), Dehradun

&

Wildlife Institute of India (WII), Dehradun

Government of India
Department of Science & Technology
Ministry of Science & Technology

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

Mountains cover 24% of the global land surface, are home to nearly 12% of human population and provide critical ecosystem services to around 40% of global population. They play a multifaceted role in achieving the Sustainable Development Goals, particularly in developing economies like India, where they form the foundation of the local economy for a large part of the population. However, mountain regions remain one of the most vulnerable ecosystems.

The Himalayas are the youngest chain of mountains harboring complex and diverse ecosystems. For Himalayan communities, forest resources are crucial to poverty alleviation, economic growth and food security. In the Himalayas, where very few livelihood options are available, mountain forests form an essential life-support system for local people. However, dwindling natural resource base, unsustainable agricultural practices and lack of basic amenities create a challenge for the local people living here.

Over a period of time, mountain communities developed technologies to cope with their day to day living. Those technologies were eco-friendly and efficient as per the requirement of the local people. With the course of time, new technologies replaced the older ones, but the new technologies were often not tested for the mountain environment, people lacked capacity for adopting these and sometimes they were not in consonance with the socio cultural context of the region. Therefore, there is a need to develop and internalise the use of appropriate and affordable technologies for the proper utilisation of natural resources of the Himalayan region. This can only be achieved by innovative thinking and human resource development at local level through partnership approach by involving community.

Science for Equity, Empowerment & Development (SEED) Division, Department of Science and Technology, Government of India along with Himalaya Environmental Studies and Conservation Organisation (HESCO) and Wildlife Institute of India (WII), Dehradun developed the concept of Technology Intervention for Mountain Ecosystems (TIME)-Livelihood Enhancement through Action Research & Networking (LEARN) Programme based on the deliberations amongst different stakeholders. Under this programme, an innovative mechanism has been developed for promoting Science and Technology (S&T) by involving premier S&T institutions, field groups/voluntary organizations to develop and implement innovative solutions for mountain specific problems and challenges in the North Western Himalayas in the states of Uttarakhand, Himachal Pradesh and Jammu and Kashmir. In this endeavor 20 projects have been implemented since 2016-17 in action, reseach and networking mode to various centers of excellence and research institutes. The specific areas identified are capacity building in different developmental sectors, sustainable utilization and conservation of local resources.

Vision & Objectives

1. To motivate scientists and technologists to apply their knowledge and expertise in partnership with mountain community for development and implementation of action-oriented, innovative field-based projects for technology development/ demonstration and utilization by S&T Field Groups in partnership with the target groups
2. To strengthen, catalyze and support linkages between field Groups, S&T based Civil societies, Universities and S&T institutions involved in Research & Development (R&D) and application of innovative solutions for development of disadvantaged and economically weaker sections in mountain areas
3. To catalyze and support research, development and adaptation of relevant and appropriate technologies for empowering and improving quality of life of artisans, landless labour, women and SC/ST communities in remote mountain areas.
4. To preserve and upgrade skills of traditional artisans as "natural carriers" of S&T knowledge /capabilities and enable their transition to S&T based production organizations
5. To develop new technologies for improvement and diversification of the local economy, optimum utilization of local resources and to upgrade the skills and efficiency of local people
6. To evolve and demonstrate replicable role models of S&T based development for benefit of communities in harmony with local people of the mountain areas.

Focus of the programme

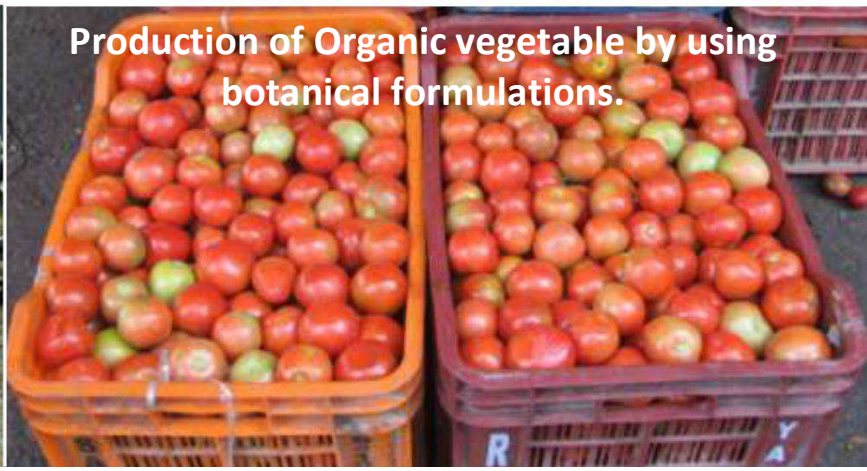
a. To ensure community participation in mountain development process

b. To create opportunities to integrate local traditional knowledge systems with emerging S&T opportunities

c. To develop a vibrant bond between S&T through a strong network of civil society organizations and centres of excellence

d. Demonstrate and disseminate successful examples of environment enriching energy, agriculture, forest and water related technologies


Fabrication work for Solar Panel Technology


Production of Organic vegetable by using botanical formulations.

Thrust Areas of TIME LEARN Programme

Specific areas identified under TIME-LEARN programme for immediate intervention through technology generation/ optimization and adaptation are:

1. Promoting Sustainable Agriculture and Bio-Farming

- Ecology oriented economy generation; land based income -generating activities like:- off-season vegetable production, low cost nursery techniques
- Crop diversification, soil management, seed conservation and micro-irrigation techniques
- Effective use of inputs, integrated farming systems, post-harvest technology including low-cost storage, processing, preservation and packaging with quality control;
- Food, fuel and fodder management and preservation techniques;
- Plant based herbicide and pesticides formulation
- Livestock development in mixed crop farming system

2. Balancing Forest use and Conservation

- S&T based integrated approach to regenerate and manage micro-ecosystems and biodiversity for sustainable livelihood base
- Utilization of unutilized, underutilized and invasive biomass
- Value addition to products including Non Timber Forest Produce (NTFP) based on traditional skills
- Minimizing pressure on forest resources and prevention of forest fire

3. Sustainable Technology for Water Resource Management

- Exploration, harvesting, spring recharge and purification of water resources
- Technology based sustainable watershed development and management focusing on land, water and bio-engineering plantations

4. Sustainable Technologies for Harnessing and Conserving Renewable Energy

- Biogas, watermills, water lifting devices, solar water heater, lantern and dryer, etc.

5. Disaster Management and Landslide Control

- Mountain risk engineering: Botanical cum mechanical treatments;
- Pre & Post Disaster Management: Preparedness for quick relief and rehabilitation.

6. Gender Sensitive Development Approaches

- Women related farm activities and drudgery reduction through S&T interventions
- Women's health and nutritional care

Promotion of Protected Cultivation technology

Onsite interaction with expert group for Mud-Hive Technology

Economic use of water resource in agriculture

Improved solar drier for drying agri-horticultural crops.

Human Wildlife conflict monitoring system

7. Rural Engineering and Technical Support Services

- To help the traditional artisans, e.g. Blacksmiths, Carpenters, Mason, etc. with a view to organise them for better earning/reduced drudgery through innovative skill development, training programme and adaptive R&D
- Use of local resources, skills and techniques for low cost construction with improved ventilation, domestic drainage and waste disposal
- Design, develop, upgrade and maintain farm and non-farm tools and machinery
- Traditional health care system based on local flora and knowledge system
- Capacity building in the field of para-veterinary care
- Low cost sanitation, waste management and recycling

The coordination of all these projects is being carried-out by HESCO and Wildlife Institute of India under the project entitled "Dissemination and evaluation of technologies through networking of various institutes and organization of mountain ecosystem".

Gender Sensitive Approach : Women Empowerment

Nursery Training

Onsite discussion with expert group to improve River Ropeway Technology

Ongoing projects under TIME-LEARN Programme in North Western Himalayas.

1) Jammu & Kashmir:

Title of the Project	Expected outcomes/deliverables	Partner agency/agencies
Demonstration of Technologies for Improving Productivity of Rainfed Area in Jammu District.	Technology package for improving productivity in dry land agriculture.	SKUAST-J, Jammu, J&K.
Appropriate technological interventions for addressing human-wildlife conflict in PirPanjal, J&K.	Technology system for minimizing human-wildlife conflicts.	Western Himalayas Landscape, WWF-India, & Deptt. Of Wildlife Protection, J&K.
Technological intervention to improve production of dairy & poultry in rainfed areas of Jammu district.	Improvement in livelihood opportunities and income generation of farmers through dairy and poultry.	SKUAST-J, J&K.
Innovative technological interventions to address basic household needs of the tribal people of Zanskar valley.	Technology package for drudgery reduction in fuelwood collection, low carbon footprint through provision of solar water/space heating system.	HARE Station of SKUAST-K, J&K & HRG, Shimla.

2) Himachal Pradesh:

Title of the Project	Expected outcomes/deliverables	Partner agencies
Establishment of virus free elite mother block of apple in the tribal areas of Kashmir and Lahual & Spiti in H.P.	Livelihood benefits through improved virus free apple production.	IARI Regional Station, Shimla /CPRI, Shimla/ HARDPS, Shimla.
Mainstreaming Farmer's Varieties in H.P. and Uttarakhand.	Protect farmers' rights with better income.	NBPGR Regional Station, Shimla, CSKHPKV/ CSIR-IHBT, Palampur, H.P.
Development and promotion of Solar drier Technology for drying of Crop products in North-Western Himalayas.	Improved solar drier for drying agri-horticultural crops.	Dr. Y. S. Parmar University of Horticulture & Forestry, Nauni, Solan, H.P.
Application of native botanical formulations for the disease management in tomato, capsicum, and cauliflower.	Developing bio-pesticides formulations for farmers' use.	Dr. Y. S. Parmar University of Horticulture & Forestry, Nauni, Solan, H.P.
Introducing Bee-Keeping Mud Hive Technology in Wet-Temperate Zone (Sadar Mandi area) of H. P.	Improved technology for adoption and promotion of apiculture	Society for Farmers Development, Mandi, & Dr. YSPUHF, Solan, H. P.
Up-gradation of conventional river rope way existing in rural/hilly terrain over main rivers.	Drudgery reduction through safe and secure rope way connectivity.	Society for Technology and Development, Mandi, H. P.

Fortification of Mountain crops for Value Addition.	Value addition in traditional products to support livelihood and nutritional security	CSIR-IHBT, Palampur, H.P.
Technological Interventions and Networking for Basic Community Needs in Mountains of Himachal Himalayas.	Technology package dissemination for clean energy, traditional food and livelihood gain.	HRG & Himalayan Forest Research Institute, Shimla, H.P.

3) Uttarakhand:

Title of the Project	Expected outcomes/deliverables	Partner agencies
Empowering farming communities for conservation of plant genetic wealth of Uttarakhand and pre-breeding through community participation, protection of landraces and farmers varieties and benefit sharing.	Conservation of farmers' varieties and benefit sharing models	G. B. Pant University of Agriculture and Technology, Pantnagar, / HGVS, Gangolihat/ UYRDC, Chamoli, Uttarakhand.
Eco-friendly multi-hazard resistant construction technologies and habitat solutions.	Disaster resistant technology package for housing using local material	Society for Development Alternatives, New Delhi.
Bio-prospecting of Essential oils.	Scalable technology for essential oils extractions from local resources	FRI, Dehradun.
Improving Livelihood and Ecology in Three disaster affected area of Uttarakhand.	Technological empowerment for mountain community	HESCO, Dehradun, UK.
Promotion of Polyhouse Vegetable Production Technology for livelihood security in Champawat and Pithoragarh border districts of Uttarakhand.	Controlled agriculture for livelihood security	G. B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand.
Enhancement of livelihood options based on locally available resources in disaster affected villages in Kedar Valley of Uttarakhand.	Technology package for Livelihood enhancement in disaster affected areas.	GBPNIHED, Garhwal Unit, Srinagar, UK
Dissemination and evaluation of technologies through networking of various institutions and organizations of mountain ecosystem (Co-ordination proposal).	Technological co-ordination, networking, capacity building and impact assessment at field level	HESCO, Dehradun & Wildlife Institute of India, Dehradun
Livelihood Improvement & Drudgery Reduction through Appropriate Livestock Technologies and Biomass Enhancement in Kumaon Himalayas.	Technological Intervention to enhance livelihood and drudgery reduction through improved livestock and biomass enhancement.	Central Himalayan Environment Association (CHEA), Nainital, Uttarakhand

Technical Advisory Expert Group (TAEG) committee of TIME-LEARN Programme:

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