



DR. LAL SINGH

Recipient of the Award for Application of Science and Technology for Rural Development - 2021

Born: September 24, 1964

A Botanist by education Dr. Lal Singh took a tough decision to work in the voluntary sector to make meaningful use of his scientific knowledge and training so as to help in improving the socio-economic conditions of people living in the remote mountainous areas of Himachal Pradesh (HP). He was quick to realize that he needed a platform to give practical shape to his ideas since the small hill state of HP had a very strong presence of Government sector. The only viable option at that time was to set up an NGO with the specific objective of pursuing scientific research and development for enhancing the living conditions and livelihoods of the rural population in the remote and difficult mountain area.

It was a tough call for Dr. Lal Singh, who came from an interior village and did not have any adequate resources to start an NGO. The only assets he had were a Doctorate degree and a postdoctoral, Department of Science and Technology (DST) Government of India (GoI), Young Scientist tag in HP University, Shimla. He went ahead to establish the Himalayan Research Group (HRG) in association with like-minded professionals, in the year 1997. HRG is one of the core groups of the DST, (GoI) since 2005 and supported by other national and international agencies.

The first issue that attracted attention of Dr. Lal Singh was the threat posed to the Himalayan Tree *Taxus wallichiana* (Commonly known as Yew) due to large-scale harvesting of leaves for extraction of raw drug Taxol® for Chemotherapy. Poor natural regeneration and non-availability of multiplication technology hampered conservation status of this tree. Dr. Singh developed a simple and cost effective “rooting of cutting technique” for mass propagation of the tree and was adopted by the Forest Departments of HP and Jammu & Kashmir (J&K). HRG provided rooted cuttings for plantations in HP, Arunachal Pradesh and Uttarakhand.

In order to strengthen the livelihoods, biodiversity conservation, climate change resilience and overall development of communities in rural difficult areas of mountain topography, a basket of need-based technology models were developed for the community in different parts of the North Western Indian Himalayan Region. It comprised of wild edible mushrooms, cultivation of mushrooms, high value medicinal plants, vermicomposting, and fodder, solar energy use in domestic water and room heating, revival of native crops through linkages with tourism and household enterprises. Most of these initiatives were supported by the DST, GoI, Department of Biotechnology (DBT) GoI, National Medicinal Plants Board (NMPB) GoI. Major challenges in implementation of these interventions were technology transfer, capacity building at the community level and marketing. All these requirements were refined while working with the community and convincing skills and expertise of Dr. Lal Singh made these simple, cost effective and easy to follow techniques for adoption.

These community-oriented environment-friendly technology model of clean solar energy, vermicomposting, high value medicinal plants cultivation of two species *Swertia cordata* (Chirayita) and *Picrorhizakurrooa* (Kutki), button mushroom cultivation and revival of native crops earned high returns to the community which sustained these activities for the last two decades. These models were accepted by different developmental projects of the state like Himachal Pradesh State Council for Science Technology and Environment (HIMCOSTE), and international agencies like United Nations

Environment Programme (UNEP), Global Environment Facility (GEF) for demonstration, skills and basic inputs to start these activities in their respective programme areas.

In the recent time, Dr. Singh looked to refine and upscale the facilities for developing community seed bank to conserve native crops and develop community farm products premium line along with Ayush Pharmacy for furnished high value primary health care products of community cultivated Chirayita by establishing Farmer Producer Company.

HRG technology based initiatives directly involves men and women groups organized in 750-900 households, annually with average direct benefits of about Rs. 40-45 lakh/annum through described science & technology activities. Artisan (Carpenter) group of 5 members earned Rs. 15 lakhs through fabrication of HRG designed mountain solar water and room heating systems in last five years. HRG is able to reach to more than 18000 households across states of HP, Uttarakhand, Ladakh and Arunachal Pradesh for demonstration of different need based technology models. Activities in Himachal are in 309 villages of 6 districts of Mandi, Kullu, Kinnaur, Shimla, Chamba, Sirmour in HP, 12 villages in Kargil district of Ladakh, 2 villages of Dehradun in Uttarakhand, and 2 villages in Bomdila districts in Arunachal Pradesh. Technology models were also demonstrated through different exhibitions and conference presentations across the country and foreign venues.

Dr. Lal Singh's efforts were recognized by the state of HP for developing the Mountain Solar Water Heating System (Solar Hamam) in 2018. The system was validated by National Solar Energy Institute (NISE) for efficiency in 2020 and it is scientifically estimated that this system has mitigated average 2.5 tonnes of CO₂ emission/household/annum. Till now more than 1200 mountain solar water heating systems stand installed in HP, Ladakh and Uttarakhand.

HRG started button mushroom compost preparation unit in 2002 with bank term loan. This is a light activity for women in mountain to generate immediate cash through cultivation and wages at HRG unit for preparation and packaging of compost. HRG developed simple farmer oriented model with the supply of ready to cultivate 25000-30000 seeded compost kits with pasteurized casing soil/annum to the individual growers and women groups for natural growing in the six districts of the HP. Annually 125-130 households mainly women members add Rs. 25000-30000/- net returns to their family income from this activity. At the same time 19 organized women groups with 206 women provide vermicompost to HRG for developing casing soil for button mushroom cultivation and add Rs. 2500-3000/annum/women to their income, since 2002.

Success and popularization of community oriented technology models of rural relevance developed by Dr. Singh attracted his participation in different state and national level committees. Dr. Singh is also a Visiting Faculty at various institutions since 2012 till date.

Dr. Lal Singh also worked in hardcore research work related to diseases of forests, climate change mitigation, fungal biotechnology, bio-prospecting over these years in collaboration with national and international institutes and individuals. He visited United States of America, United Kingdom, Canada, Thailand and Finland all these years to deliver invited talks, training and collaborative works.

Dr. Lal Singh and his team have contributed its bit during the Covid – 19 pandemic by covering two Panchayats in Mandi District with a population of 5000. In addition to distributing handmade masks and sanitizer, HRG has also contributed in enhancing the immunity and nutrition by encouraging consumption of native crops. More than 500 households were oriented to consume native crops of Red Rice, Buckwheat, Barley, Kidney Bean and Amaranth rich in Copper, Zinc and other micronutrients to boost immunity.

Dr. Lal Singh is of a firm belief that capacity building of local communities, especially of the women folk in mountains for energy, health, food and nutrition and livelihood through modern science and technology is the only way to achieve self-reliance and see the rural areas developing as was the dream of the Father of the Nation.

Awards & Recognitions:

1985-1987 Session: Gold Medal M.Sc. Botany

2018: Himachal Pradesh State Innovation Award, HP State Innovation Council for Developing Mountain Solar Water Heating System

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