



# RESEARCH AND CAPACITY BUILDING IN FARMING AND ALLIED SECTORS: A CASE STUDY OF HIMACHAL HIMALAYA

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**Abstract:** Capacity building is a multipurpose process, which instills social, economic and cultural awareness in man and encourages life improving values. It awakens man and enables him to realize truth, beauty and righteousness. Education boosts mind and soul for achieving balance which enriches the personality and stimulates mental and spiritual strength. In reality, academics and research are everlasting and open ended processes and their real purpose is to enlighten humankind. Agriculture is the major occupation in the entire Himalayan region and over 90% of the population directly depends on agriculture, which provides employment to nearly 75% of its people. However, farming has to face some limits, particularly in the production of food grains. Farming in the Himachal Himalayan region has exceptional problems pertaining to diverse climatic conditions, terrain, accessibility of water, connectivity, movement, marketability and the stress on biodiversity.

**Keywords –** Capacity building, Climatic conditions, Occupations, Renewable energy, Horticulture, Producers & Consumers etc.

## I. INTRODUCTION

The climatic conditions make the region suitable for growing a wide range of cash crops such as temperate fruits, potatoes and vegetables. The area under cultivation cannot be extended to any considerable extent. Reclamation of land on slopes of hills for cultivation of food grains is not useful and reclamation of land in mountainous regions increases the hazards of soil erosion. Thus, depending upon the agro-climatic suitability and availability of infrastructure, fruit cultivation became popular in some areas and in others the stress was laid on vegetable cultivation. Keeping these problems in mind, the scientific community in the region is developing techniques which can cope up with these problems and prove their effectiveness in the emerging scenario. This has opened new opportunities for research on water harvesting, water storage system and efficient use of water, special farming such as green house for off season cultivation of crops. The research and capacity building programmes have a multiple effect and promote employment opportunities directly as well as indirectly. These programmes release the latent potential of rural people without putting them off from their routine work for longer hours and also benefit the farmers engaged in agriculture/ horticulture. This allows additional growth of entrepreneurship and creates new avenues to utilize the available manpower in the rural areas for income generation and self-employment. In order to boost this sector in the Himachal Himalaya, a number of organizations are undertaking research, academic and capacity building activities. Most of the Institutes have made tremendous progress in imparting education in the related areas. An effort has been made in this paper to analyze the range of activities undertaken by various institutions dealing with farming. Data for the purpose was gathered from these institutions by making personal visit and making use of secondary data available in annual reports, brochures, pamphlets and web sources.

II. To promote agriculture research and extension in state of Himachal Pradesh, the government established Agriculture University in Palampur. It is the State Agricultural University, and owes its origin to Punjab Agricultural University. Punjab University decided to set up its third campus in the erstwhile State of Punjab to cater to the needs of hill people and hence the campus was established at Palampur. The university is making provisions for imparting education in agriculture, horticulture, forestry and other allied branches of learning and scholarship. It is promoting the development of learning and trial of research both basic and applied. The university is undertaking extension of agriculture, especially for the rural people of the State. The university is developing intra-institutional linkages with the various departments of the constituent Colleges and the Regional Research and Extension Centers. The University has a college of Agriculture which was established in the year 1966 and offers B.Sc. Agriculture, M.Sc., Ph.D. and MBA (Agribusiness) programmes. There is a college of Veterinary and Animal Sciences which offers Bachelor of Veterinary & Animal Science, Masters of Veterinary & Animal Science and Doctorate programmes. The college of Basic Sciences was established in the year 1991 and offers B.Sc., M.Sc. and Ph.D. programmes.

III. This university is engaged in the technologies pertaining to rice, maize, pulses, and oil seeds, which are mainly the food crops and are probably consumed within the state wherever these are produced. However, the university is laying emphasis on research, which can make Himachal self-reliant in food crops. The University is conducting research in the field of farm power and machinery, soil and water engineering, renewable energy sources and extension activities. To strengthen these aspects, research is being carried out on application of plastics in agriculture, farm implements and machinery, renewable energy sources, post-harvest engineering and soil water engineering. To face the challenges in production and improvement of vegetables in the state, the University established Department of Vegetable Science and Floriculture to gear up the research on vegetable related problems of the hill farmers. The university developed different varieties of vegetables at state level and at National level. It has done standardization of production technology of different vegetables for mid-hills of the state. To upgrade and enhance research and teaching efforts, the University is establishing intra-institutional linkages with the various departments of the College of Agriculture and five Regional Research and extension centers of the university. The University is imparting training to the farmers and entrepreneurs in the commercial cultivation of vegetables and providing consultancy to public and private entrepreneurs/institutions. Besides this it conducts visit of farmers, extension officers, military officers, school children, entrepreneurs, etc. On one hand, University is trying to promote the technology and at the same time it is making an effort not to lose the prospects of traditional food crops and traditional methods of production. The University is striving hard to improve technology through research and the extension centers, which can touch the remote areas inhabited by the tribal people. The University is also having model cultivation and demonstration-cum-training farm in the remote areas. The state is supplying best variety of potato to the country. It is promoting research, which can evolve low cost preservation and storage methods so that the grower can store sufficient quantity for selling in the market and their own use during off-season. India is a tropical country having moderate climate and hilly regions in Himalayas are benefited from this situation. Horticulture plays an important role in the economic life and prosperity of the people of the state. During the last few decades, state has made remarkable progress in the field of Horticulture. Dr. Yashwant Singh Parmar University of Horticulture and Forestry Nauni, Solan, has grown into its own kind not only in the country but in whole of Asia with new dimensions of education, research and extension in Horticulture and Forestry. The University is playing an important role in increasing horticulture production in the state. It has proved to be an economic boon to the fruit growers of the state. There are vast areas, which are suitable for fruit cultivation. The yield per acre in terms of money is also much higher and apples yield the maximum income. Himachal has earned the name of the 'Apple State of India'. Transition from traditional low value to high value cash crops is visible in the state during the last four decades and the state has witnessed tremendous increase in area and production of horticultural crops. The credit goes to the research institutes, government departments, and agriculture and horticulture universities. The Horticulture University in the state of Himachal is actively engaged in research related to economic aspects of the state economy, particularly economics and policy related aspects of horticulture and forestry sectors. Major emphasis is being made on the hill farming systems with integral components of crops, fruits, trees and grasses. The horticulture sector in the state is making rapid strides in terms of expansion in area, production and productivity along with diversification of horticultural crops. Accordingly, new challenges are emerging mainly in terms of disposal of horticultural produce. The marketing efficiency is increasingly becoming important for bringing economic benefits to the farmers. The University is laying major emphasis on research on post-harvest management and transportation efficiency, marketing of vegetables, fruits, mushroom and flowers, etc., forecasting export potential for major horticultural products from the state and simulating models to assess impact of various marketing strategies on producers and consumers. The Centre for Fruit Breeding & Genetic Resources in the University is carrying research on crop improvement in fruit crops. The department is engaged in breeding and evolution of new cultivars besides collection and evaluation of germ plasm of different fruits and nut crops. The department brings about an improvement in productivity of fruits in Himachal Pradesh and neighbouring states through commercialization of genetically superior varieties and rootstock. It has established gene repositories through collection of germplasm of fruits and nut crops and simultaneously it is making a specialized cadre of qualified and dedicated fruit breeders through teaching/training to meet the national needs. The University has developed many varieties of vegetables and is engaged in developing hybrids besides the disease and insect-pest resistance varieties of vegetable crops. The University has separate department which is recognized as Centre of Advanced Studies in Vegetable Crops by the ICAR.

IV. The state of Himachal Pradesh offers perfect condition for growing good quality mushroom. The technology for production and processing of button mushroom has been demonstrated to the growers. Farmers are producing mushroom in their farms but have to face problem in moving these to market because of small shelf life and non-availability of refrigerated containers/vehicles for carrying these to destination. National Research Centre on Mushroom is undertaking research to develop some varieties of mushroom with long shelf life. The scientists and technologists in all Agriculture Research Institutes are concentrating on developing seeds that would ensure good yield even under constraints of water, diseases and pests. The scientific community is trying to evolve methods to meet the challenges of characterization of soil to the matching of the seed and the composition of the fertilizer, water management and developing new pre-harvesting techniques for such conditions.

## II. Institutional Strengthening for Capacity Building

There is a rich genetic diversity for the vegetable crops and the region also has an advantage of growing off-season vegetables. The Regional Station of National Bureau of Plant Genetic Resources (NBPGR), Shimla, is sincerely making efforts to maintain the Agri-horticultural diversity in the region and identified the hotspots of important food crops in the region. It is undertaking assessment, documentation and valuation of on-farm agro-biodiversity for livelihood and food security. It is developing an information management system to facilitate planned intervention for conservation, sustainable utilization of targeted species/population and enhanced market access. The Station is adding value to targeted species/population through technological interventions for enhancing rural livelihood security. It undertakes capacity building in agro-biodiversity management for livelihood security.

Institute of Himalayan Bio-resource and Technology (IHBT), Palampur, is located in the scenic town of Palampur, in the lap of majestic snow-clad Dhauladhar Himalayas. The Institute is working widely on bio-technological aspects of commercially important plants like bamboo, tea and scented rose. The Institute is playing a lead role in preparing a database of economically important plant species of Western Himalaya. Ethno-botanical surveys carried out in different areas of Himachal have helped in identifying plants used by the natives of Himachal for various purposes. Institute has a herbarium with collection of more than 10,000 specimens. The herbarium houses specimens from the Western Himalayan region. Institute is also undertaking domestication and agro-technology for high value crops.

Agro Economic Research Centre (AERC) at Himachal Pradesh University and Government Institutions such as Central Potato Research Institute, Directorate of Agriculture and regional research stations of IARI set up in various areas of the state are engaged in dissemination of technologies relevant to farming community. Agro-economic Research Centre of Himachal Pradesh University was established by the Ministry of Agriculture, Government of India to carry out research and investigations in the field of Agricultural Economics in Western Himalayan Region consisting of Himachal Pradesh and Jammu & Kashmir. The Centre is conducting ad-hoc investigations into problems relating to agricultural economics of the country and research for the Ministry of Agriculture, Government of India. It conducts impact evaluation and economic feasibility studies on agriculture, horticulture, animal husbandry, forestry and rural development. The Center is conducting research sponsored by the State Departments of Agriculture, Horticulture, Animal husbandry, Forest Farming, Rural Development and Tribal development.

Animal husbandry plays an important role in the development of agriculture. In Himachal, cattle are used for ploughing and various agricultural operations. There is tremendous scope for livestock development including education and research. Need was felt to promote livestock production, control of diseases, conservation of natural germplasm of typical species of Yaks, sheep, goats, hill cattle and wild species of animals and birds in Himachal Pradesh. A College of Veterinary and Animal Sciences was established by the State Government and it was duly accredited by the ICAR and approved by the Board of Management of the University with the six composite departments. The college carries out research on diseases of zoonotic importance, food borne infections and intoxication and also plays important role in Extension education on animal and human health for the farmers, veterinarians, veterinary pharmacists, dairy extension workers. Department has started a number of schemes for cattle development, cattle health and disease improvement in wood production, poultry development, feed and fodder development, dairy improvement and milk supply schemes to improve the livestock in the state. Veterinary hospitals, dispensaries and outlying dispensaries provide veterinary aids and also take measures against various contagious diseases in the state. A number of mobile dispensaries are also in operation. Besides this, the Regional Station of the Indian Veterinary Research Institute, Palampur is investigating the animal feeding problems including disease and diagnosis work in the region. The approach to all research problems continues to be interdisciplinary covering all aspects in a very comprehensive manner from basic work to field applications in a complete continuum. The Institute provides services including referral laboratory for animal disease diagnosis and feed evaluation and formulation.

### III. FOA Capacity-building for sustainable agriculture and rural development

Capacity-building in the food, agriculture, forestry and fisheries sectors chiefly addresses the establishment or strengthening of formal (government) and informal (NGOs, community groups, etc.) institutions, the private sector and individuals. The aim is to enable them to be better able to face their responsibilities in policy and decision-making and in implementing rural development programmes more efficiently. This also implies decentralization down to local level, and providing incentives for local community initiatives and people's participation. To this end, clear rights to resource use have to be established at local level, including those of rural women. Voluntary organizations and those representing the interests of the various parties/interest groups should be involved: they have a capacity to train community leaders (user groups, cooperatives and other rural organizations) and to assist in consolidating grassroots organizations. In-service training of government staff in participatory techniques is an essential complement to the involvement of local groups<sup>2</sup>.

### IV. CONCLUSION

Various organizations including the three Universities and Research Institutions are making efforts to make all the research findings available at grass root level. These institutes are striving hard to study and implement the successful and useful models of effective communication to the farmers through the Information and Communication Technology. These Institutes are focusing their research with an aim to widen the sphere from production to processing of value added products and competitive marketing. These institutes have vision to encourage research on soil conservation, rainwater harvesting, dry land agriculture, cold & stress resistant seeds and crops. All these Institutes are imparting training to the farmers, unemployed youth, officers of the Government Departments of horticulture and agriculture as well as NGO's on horticultural production technologies and nursery management. These transfer technology through Radio and T.V. talks and offer technical guidance to farmers through letters, telephone, field visits. Besides this, these Institutes organize Scientist-Farmers interaction programmes, demonstration of horticultural production technologies at farmer's field. These popularize the extension literature among the farmers to make them technically literate and also coordinate in Agri-festivals and arrange the exhibitions of horticultural activities of the department at various occasions. Thus, these Institutions are effectively rendering their services not only in research and academics but also in the capacity building of the farming communities.

### REFERENCE(S)

[1] <http://www.fao.org/3/T3384E/t3384e07.htm> (accessed on 20-03-2021)

<sup>2</sup> <http://www.fao.org/3/T3384E/t3384e07.htm> (accessed on 20-03-2021)