

Research and Development Strategies for Horticultural Sustainability in Himachal Pradesh: Existing Status, Challenges, and Future Prospects

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Introduction

Among the hill regions of India, Himachal Pradesh is often cited as a model of economic growth through horticultural development. However, in contrast to production, the R&D support for marketing and utilisation of horticultural crops has not been sufficient. A sustainable horticultural model for Himachal Pradesh should support fruit crop diversification through designing location-specific and needs-based models for each group of farmers, village, or niche as the case may be. It therefore requires strategic planning to see if the growth of horticultural R&D in the state is sufficient for attaining sustainable production by meeting the specificities of mountains. Besides the technological problems increasingly faced by state horticulture, other challenges in the form of R&D funding, manpower generation, collaborative research programmes, and lopsided regional development need to be examined if sustainable horticulture is to be developed in the state.

Horticultural Development in Himachal Pradesh

Existing status of R&D in horticulture

The growth and responsibilities of research organisations and development agencies in the hill region have been slightly different from those in the plains. Besides transferring technology, development departments also attend to the input supply through village-level functionaries, while research organisations are involved in technology generation. The most important responsibility of the universities is to create trained manpower for development departments. These research institutes are also responsible for the transfer of technology, but at the nucleus level through localised demonstrations and training. Non-government organisations (NGOs) have also emerged as a link between development departments and farmers for ensuring economic and ecological security through development of farming systems.

Development activities in Himachal Pradesh started in 1948, immediately after its creation from the former princely states. Originally, two separate departments of agriculture and forestry were established, but in 1950 they were merged into a single 'Forest Department' based on the plea that there was more area under forest than under agriculture. Two years later the agriculture department again attained independent status. In 1970, a separate 'Department of Horticulture' was carved out of the Agriculture Department with responsibility for developing ornamental and fruit crops. At present, the state's R&D in horticulture is supported through a well structured R&D network in Dr YS Parmar University of Horticulture & Forestry, with transfer of technology on horticulture as the prime responsibility of the State Development

Department of Horticulture. The Agricultural University at Palampur and the Department of Agriculture also contribute towards vegetables, flowers, and fruits through their limited mandates. The research input that was at one time embodied in the Department of Agriculture and other development departments has either been transferred to the agricultural universities or is the responsibility of the Indian Council of Agricultural Resources (ICAR) and Council of Scientific and Industrial Research (CSIR) laboratories. The primary duty of the developmental departments is to transfer the technology generated by the research institutes and universities at the grass roots level. These departments have to maintain close, effective, and continual linkages with the beneficiaries to obtain necessary feedback, and to establish linkages with research organisations for timely solution of problems posed by the farmers. The developmental departments are efficiently organised to meet the growing requirements of hill farmers, who have shifted from traditional subsistence farming to growing off-season vegetable crops and fruit farming. Over the years ICAR has initiated many projects on technology transfer, mainly through institutional-village linkage projects with the aim of transferring technology based on the participation of farmers, and the National Agriculture Technology Project (NATP) for strengthening of agricultural research, development, and extension. A number of farm science centres (krishi vigyan kendras or KVKs) have also been established to serve as district-level technology demonstration centres with adequate on-campus training facilities for the functionaries of the development departments, NGOs, and farmers. At present four KVKs are at Dr YS Parmar University of Horticulture & Forestry and another eight at Himachal Pradesh Agriculture University, Palampur.

Need for R&D Restructuring/Production Reorientation

Recently the existing R&D strategy module has stumbled due to the emerging challenges of increased interference by world trade and financial institutions, globalisation, financial constraints, market failures, and a variety of production problems. This scenario is putting enormous pressure on the sustainability of horticulture in the Himachal hills, requiring restructuring of production planning. The average productivity and quality of several horticultural crops remains far below the expected potential. Technical and production-based factors contributing to the problem include superior genetic material; senile orchards; inadequate adoption of advanced production technology and plant protection measures; non-availability of critical inputs like fertilisers, herbicides, pesticides, packing boxes, and raw material of the right quality for processing; inadequate post-harvest handling, credit support, marketing facilities, and extension support; and a weak database.

Existing R&D strategies must be modified in the light of new research and development priorities and modern technologies. The institutional set-up needs to be restructured with the advent of demand-driven extension modules, NGOs, and other grass roots institutions. Development of horticulture is also stressed in other regions of the Indian Himalayas. Future R&D strategies demand sectoral complementarity through integration of indigenous knowledge, information technology, scientific back-up, gender equity, and farmers' decision-making, besides the protection of the interests of small and marginal farmers.

R&D Restructuring: Issues and Strategies

The sustainability of horticulture in Himachal Pradesh requires institutional strengthening and restructuring in the wake of increasing world trade competition, paucity of funds, emergence of new R&D sectors like NGOs and industries, and greater emphasis on demand-driven extension modules. The following issues and strategies can help in this effort.

Interactions among institutions

The present state of interactions among the research institutes and developmental departments is not very encouraging and seriously compromises efforts to achieve sustainability through effective dissemination of technologies generated by the research institutes. There are few linkages among the government institutes and the two farm universities working in research and extension. Farmers who follow mixed farming require advice on integrated development of their farming systems. It is obvious that unless there is an intimate cooperation, pooling of resources, joint planning, and execution of programmes, it will be difficult to meet the needs for technology generation and transfer, and to provide advisory services to the farming community and extension departments concerned with development activities. This collaboration should help to avoid unnecessary duplication of research efforts and enhance the pay-off from investment in research and extension. Consultation among these institutes to identify research priorities and strategies will be very useful. Proper linkages should be established among research institutes and universities by formulating joint research programmes wherever feasible.

R&D linkages with industry

There is a great scope for developing R&D linkages with industry because fruits and vegetables can be processed to add value and generate employment. Unfortunately, these linkages have not yet been developed; until now production has received most attention. Often remunerative prices for produce are not realised and farmers have to look to the sales agents of industrial houses for preservation and processing of fruits and vegetables. Therefore, it is of paramount importance to develop extension education strategies for the industrial clientele as well. Fortunately, some state processing institutes like HIMCU (Himachal Canning Unit), HPMC (Himachal Pradesh Horticultural Produce Marketing and Processing Corporation Ltd), and so on are coming up along with farmers cooperative agencies. These processing units need to be encouraged.

Linkages between R&D and NGOs

The new class of enthusiastic social workers should be encouraged by the research organisations as a link between farmers and the development departments. On the one hand, NGOs understand the inherent weakness of the implementation mechanisms of government agencies, and on the other hand they know the pulse and aspirations of the people. Government departments should utilise this vocal and aggressive sector to facilitate technology transfer. The linkages with women farmers can be strengthened through female NGO workers.

Restructuring transfer of technology module

The mechanism of transfer of technology (ToT) is important for disseminating the technology from research institutes to the beneficiaries. Development departments are responsible for the supply of inputs, dissemination of emerging technologies, and providing on-the-spot advice to farmers. Through an organised training and extension system, a two-way chain is formed linking the farmer to the contact farmer to the VLWs (Village Level Workers) to the ADOs (Agriculture Development Officers) to the SMSs (Subject Matter Specialists) and finally to the university research scientists. It seems to be an ideal mechanism, but due to the peculiar specificities of mountains the results have not been encouraging. The planning yardsticks applicable to the plains cannot be applied to the hills owing to the handicaps of difficult terrain, varying topography, diversified niches, and special localised needs. Therefore, the existing transfer of technology module must be restructured if it is to contribute to the sustainability of horticulture in the state. Future extension strategies will have to be based on demand-driven criteria and should be geared towards the transfer of location-specific technology. The needs of the farmers should be considered in a holistic manner. The transfer of technology through 'radio schools' should be made a regular feature due to restricted mobility of hill farmers. The feedback on farmers' problems and their solutions should be better coordinated for broadcast through the AIR (All Indian Radio). Telecast facilities can also serve this purpose. It is very important to include women because they are bound to play an important role in hill farming, and the education extension programmes must be responsive to their needs. Women extension education specialists should therefore be employed to promote direct ToT to women rather than to men, to avoid the dilution of technology when communicated indirectly. Further, the farmers need constant advice on the more remunerative patterns of farming and other newly emerging trends best suited to their requirements and agro-climatic situations. They need strong research and farm advisory support to achieve success.

Conclusions

The sustainability of horticulture in Himachal Pradesh requires that a variety of fruits with domestic marketing and export potential be cultivated in diverse and rich agroecological farming situations of the state. Structural changes in horticultural production systems through diversification, value-addition, harmonious integration of modern and indigenous know-how, organised marketing strategies, and infrastructure development are needed to ensure sustainability. Besides many technological problems increasingly faced by the state's horticulture, many other challenges in the form of R&D funding, manpower generation, collaborative research programmes, and balanced regional development need to be properly examined.

The existing R&D strategies need to be modified in the light of new research and development priorities and modern technologies. The institutional set-up needs to be restructured with the advent of demand-driven extension modules, NGOs, and other grass roots institutions. Future R&D strategies further demand sectoral complementarity through integration of indigenous knowledge, information technology, scientific back-up, gender equity, and farmers' decision-making in addition to the protection of the interests of small and marginal farmers.