NATIONAL AGRICULTURAL INNOVATION PROJECT (NAIP) WITH SPECIAL REFERENCE TO UTTARAKHAND

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Abstract

National Agriculture Innovation Project (NAIP) was launched on 26 July 2006 to further the Government of India's objective as expressed in India's National Policy on Agriculture (NPA) which accords high priority to generation and transfer of agricultural technological and reform in the technological system. The main objective of NAIP is to facilitate the accelerated and sustainable transformation of Indian Agriculture in support of poverty alleviation and income generation through collaborative development and application of agricultural innovation by the public organization in partnership with farmers group, the private sector and other stakeholders. Uttarakhand is the newly formed state and conditions due to its topographical, geographical and subsistence, agriculture, there is immediate need for the projects like NAIP. This paper attempts to analyse the importance and effectiveness of NAIP in Uttarakhand.

Agricultural innovation and diffusion of new technologies are important factors in the country's quest for food security, balanced nutrition, environmental sustainability increase income and employment for the Indian Farming Scenario. Agricultural Research in India has generated outstanding increase in productivity in the past and shall continue to play an important role to support rural livelihoods and accelerating rural growth. However rising

population and percapita income is pushing up the food demand which needs to be addressed through more productivity per unit area, input, time and strategy. The issue of decreasing factor productivity and resource use efficiency has emerged. Further more many promising research findings have not reached the producer due to inadequacies of research design or research results or deficiencies of delivery systems or lack of economic incentives. In order to address poverty and hunger technological breakthrough that are now available for commercial use ,agricultural research priorities and strategies will have to revisited and new approaches need to be developed and adopted.

The NAIP will address the above concerns through a combined effort by changing content and process. Policy and Technology options will be checked or tested by the end user for applicability and for economic, social and environmental sustainability. The overallobjective of NAIP is to facilitate the accelerated and sustainable transformation of Indian agriculture in support of poverty alleviation and income generation through collaborative development and application of agricultural innovations by the public organization in partnership with famers groups, private sector and other stakeholders.

Major Objectives of NAIP

1. To build the critical capacity of ICAR as catalyzing agent for management of change the Indian National Agriculture Research System (component 1).
2. To promote production to consumption system research in priority areas to enhance productivity, nutrition, profitability income and employment (component 2).
3. To improve livelihood security of rural people living in selected disadvantaged regions through innovation, system led by technology and encompassing the wider process of social and economic change covering all stakeholders (component 3).
4. To build capacity and undertake basic and strategic research strategic areas to meet technology development challenges in the immediate and predictable future (component 4)

NAIP is planned for six years to allow time for piloting, learning and then scaling up wherever possible.

Structure of NAIP

Management – The management of the project is efficiently taken care of by the following committees and advisory groups.

Project Management Committee – A PMC will have direct executive responsibilities for sanctioning proposed NAIP financed activities for the overall management of NAIP, including the effective and efficient implementation of the entire project, resource management and use, and monitoring and evaluation (M&E) of all NAIP supported activities. The PMC will also serve as the link with the subject matter related divisions of ICAR for technical liaison and for resolving any management issues. The PMC will be supported by the Project Implementation Unit.

Project Implementation Unit – A PIU headed by the National Director (ND) will be responsible for coordination and facilitation of implementation of the entire NAIP the PIU includes 4 National Coordinators (NCs), one of the each sector the PIC also compromises expertise in administration, finance, procurement, M&E, social and environmental aspects.

Technical Advisory Groups – The TAGs will be responsible for facilitating and synthesizing peer reviews involving scientific and technical assessment for final consideration by RPC of proposals under component 2, 3, 4 respectively. TAG members will participate in the annual workshops, they will also assist in the monitoring process and quality of implementation especially during MTRS, and in case substantial modifications (or cancellation especially during MTRS, and in case substantial modifications (or cancellation are required. The TAGs will frequently call on referees to examine and assess consortium proposals to be supported under component 2, 3 and 4.

NAIP and Uttarakhand

The newly formed state by Uttarakhand is only 12 years young. The state has majority of its population engaged in farming and related activities. Being a hill state employment opportunities are limited. Moreover farming is subsistence farming therefore there is an immediate need for the projects like NAIP to give the state special importance because of its dependence upon agriculture.

The state has very good opportunities for medicinal and herbal farming. Districts like Champawat, Almora and Tehri have the apt environment and could become of vital importance as medicinal plants hub. Farming in mountainous areas deviates substantially from the kinds practiced in lower altitudes. Patters of land ownership subsistence by surplus production and level of market penetration have also been decisively affected. However traditional Himalayan agricultural system and knowledge base are being steadily eroded by market pressures bringing both economic and cultural changes in Uttarakhand. Age old self reliance has given way to dependency on imports from the productive plain with their pesticide/chemical fertilizer enhanced yields. Cultural domination from the plain also threatens Uttarakhands traditional foods as an increasing taste from mill polished in outcompeting mountain crops. Further the youth of state is infact moving out for lucrative jobs leading to rampant migration .Large areas of agricultural land is lying barren and many crops are on the verge of extinction. Activists in the hills have responded with the save the seeds movement and are raising awareness about the need for agricultural development.

Agriculture in practiced in the river valley of Uttarakhand (a small 10-15% of the total land area). Over hundreds of years many of the slopes have been cut into field terraces, a common characteristics of mountain agriculture throughout the world. The regions farmers have also developed advance manure, crop rotation and intercropping systems. Most land on the slopes is unirrigated and have to depend only on rainfall. Three types of agriculture can be found in most river valleys, each particularly suited to the type of land. The three are (i) Katil – forest edge land HOC cultivation with a standard rotation of 3 crops in 5 years. Major crop in this type of cultivation are millets like mandua/khoda, jhangora, amarnath (marsa, chaulai), (ii) Upraon – hillside land permanently terraced but non-irrigated major crops are mandua, jhangora and chaulai, (iii) Talaon – valley bottom land, low lying, irrigated double cropped, major crops, wheat, rice, sugarcane.

Ecological Sub-Region	**Altitude (m)**	**Chief Crops**
Lower Dun, Terai	300-600	Wheat, Rice, Sugarcane
Upper Dun, Bhabar, Lower Shivaliks	600-1200	Wheat, Rice, Mandua, Jhangora, Chaulai, Maize
Middle Garhwal-Kumaon	1200-1800	Wheat, Rice, Mandua, Jhangora, Cheena (Panicum milaiceum), Potato, Barley

Upper Garhwal- Kumaon	1800-2400	Wheat, Barley, Potato, Chaulai, Cheena, 'Phaphra' (Fagopymtataricum)
Cold Zone	2400-3600	Summer – Wheat, Barley, Potato, Phaphra, Chaulai, 'Kauni', 'Ogal, 'Kodo' (Fagopyum esculentum), 'uva' (Hoycleumhimalayanse)

Various pulses (e.g. 'Masur' – Ervum lens; 'Kulat' – Dolichos biflorus) are grown intercropped during the two harvest seasons- early winter after the rainy season (millet) and midsummer before that hot dry season (barley-wheat). Dry and wet rice, taro, pumpkins, beans, corn, ginger, chili, cucumbers, leafy vegetables and tobacco are also grown. Potatoes have become an important cash drop, growing in areas unsuitable for other plants (Berreman, 1963).

Land Distribution

The pattern of land ownership is unlike that found in the rest of India. Most Uttarakhand farmers are owners-cultivators. Tenant farming and sharecropping are rare and landholdings generally small and limited to family farms (Approximately 50% of all landholdings are less than 0.5 hectares in size, and 70% under 1 hectare). As such, the zamindari system of big landholders is limited to the plains. Both geography and Pahari cultural heritage has played a role in maintaining traditionally more equitable, if impoverished, land distribution in Uttarakhand.

Projects Started in Uttrakhand

Protected Cultivation of High Value Vegetables and Cut Flowers : A Value Chain Approach Environmental And Social Safeguards Management

Basic Information

Project Statistics : Component Code

Name of Consortium Leader : Dr. H. S. Gupta (Director IARI)

Name of CPI : Dr. Balraj Singh

Name of Co-PIs : Dr. M. Hasan

Mailing Address : Centre for Protected Cultivation Technology, Indian Agricultural Research Institute, Pusa, New Delhi – 110012 Phone 91-011-2582481 Fax 91-011-258464520, 25842481. Email – drbsingh2000@yahoo.comincharge_cpct@iari.res.in Consortium partners:

1. G. B. Pant University of Agriculture and Technology, GBPUAT, Pantnagar, Uttarakhand
2. Rajasthan Agricultural University, RAU, Bikaner, Rajasthan
3. National Centre for Integrated Pest Management (NCIPM), PUSA Campus, New Delhi

Date of Start : First March 2009

Planned Duration : Three Years Four Months

Project Cost : Rs. 603.3405 Lakh

Project Objectives :

Design and Development – To build infrastructure (greenhouses, net houses, shade nets, nurseries, drip fertigation system) for protected cultivation of high value vegetable i.e.tomato, capsicum, cucumber and flower crops i.e. gerbera and chrysanthemum in different agro-climatic locations with the aim of developing model production systems.

Production and Processing – To standardize production technologies for tomato, capsicum, cucumber, gerbera and chrysanthemum under protected cultivation including IPM, grafting of vegetable seedlings and the use of drip fertigation and super absorbents for improving water and nutrient use efficiency.

Post-Harvest and Value Addition – To standardize post-harvest, on-farm value addition for high value vegetables i.e.tomator, capsicum, cucumber and cut flowers i.e. gerbera and chrysanthemum grown under protected cultivation.

Value Chain and Marketing Linkages – Field level evaluation of the value added products and development of effective linkages of marketing high value horticultural produce including establishment of cool chain management system.

HRD – To strengthen human resources for development of entrepreneurial skilsl for commercialization of protected cultivation technologies.

Brief Project Description

Design and Development – The first objective of the project to build infrastructure for protected cultivation of high value vegetable and flower crops in different agro-climatic locations with the aim of developing model production systems and development of indigenous varieties depending upon the need, budget, climatic conditions of the regions and the crops. The level of technology has also a long term bearing on the overall performance and the economics of the production chain. Integrated nutrient and water management of the protected structures are critical component. The project aims to establish model protected structures and drip fertigation system relevant for different crops in different adopted regions of the project domain. Even the pest situations in these greenhouses/polyhouses may vary depending upon the type of structure planned. For instances, the designs used in the Uttaranchal Region of the country are prevalent with curtains/side windows with large holes which leads to continuous influx of pests mainly the sucking pests which are difficult to manage. Also, the planting beds are not prepared scientifically leading to the establishment of the soil-borne pathogens in the polyhouses. Therefore, if these structures are established with rich supplementation/inundation of bioagents from the beginning will discourage the soil-borne pathogens. Thus, the greenhouses would be able to sustain the pest/pathogens for longer duration reducing the losses due to pests over a period of time.

Production and Processing – The second objective to standardize production technologies for tomato, capsicum, cucumber, gerbera and chrysanthemum under protected cultivation including IPM, grafting of vegetable seedlings and the use of absorbents for effective water and nutrient use efficiency would address the key issues in the standardization of production technologies for these crops. The production technologies for most of these crops have been worked upon in IARI, New Delhi, however, these technologies need to be standardized for different targeted regions- especially that tarai region, where lot of protected cultivation is

coming up in a big way, and semi-arid areas like Rajasthan where such technologies are in fledging state. The need to boost indigenous varieties or suitable and easily available exotic varieties and standardization of the production protocols is the need of the hour as the protected cultivation has already begun in a big way and is definitely going to stay in horticulture crops in times to come. Since the disease and depression situations due to pests in older greenhouses is a major biotic concern and is responsible for high losses would also be addressed in the project. State of art plant protection technologies especially the healthy planting material, appropriate varieties, pest monitoring and need-based integration of various plant protection strategies would be resorted to for minimizing losses due to pests. Currently, the growers of the polyhouses are depending on calendar based pesticide sprays in polyhouses due to grave pest situations and have little choice else than chemicals leading to serious environmental concerns. Thus, pest mitigation in poly houses with minimized pesticide use in terms of need would reduce lot of pesticide load in the prevalent ecosystem. Apart from that, techniques like grafting to obviate soil borne pathogens is one of the latest and dependable technologies against the soil borne pathogens and root-knot nematodes and it has been already applied successfully in several countries especially South Korea and Japan.

The Third objective to standardize post-harvest, on-farm value addition for high value vegetables and cut flowers grown under protected cultivation is equally important as the post harvest losses in high value crops are all the more avoidable. Appropriate and state of art post harvest management protocols would be tested and devised to minimize such losses.

The fourth objective of value chain would involve field level evaluation of the value added products and development of effective linkages of marketing high value horticultural produce including establishment of cool chain management system. The cool chain management and proficient and professional marketing of the produce with the help of established industry as the associated partners would ensure minimized losses and catering to up market through quality produce would definitely spruce up the economic viability of the production to consumption chain.

The fifth and last objective of strengthening human resources for development of entrepreneurial skills for commercialization of protected cultivation technologies is very important in Indian Context. With the shrinking land resources and sizable number of farmers and agri-production houses coming up the need of protected cultivation is not duly and

commensurately compensated with the need of trained human resources. Also, the technology has hitherto centered around a few places in Maharashtra, Karnataka and Uttarakhand. Therefore, the need to develop and standardize the production technologies of protection cultivation of high value crops has to evolve while keeping in view the development of strong human resource and entrepreneurship skills sustain the overall development in favour of holistic development of a paradigm of these production systems in the form of an industry which has growers, technologists, entrepreneurs, labour, market and knowledge in synchronized and mutually profitable and proficient mode.

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