

A Value Chain on Kashmir Saffron

Environmental and Social Safeguards Management in NAIP

A. Basic Information

1. Project Statistics:

Component code	:	2
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Consortium Partners	:	Indian Institute of Integrative Medicine (IIIM), Jammu
2. Date of Start	:	01, March, 2009
3. Planned Duration	:	4 years
4. Project Cost	:	Rs. 300.1235 Lakhs

5. Project Objectives:

- Refinement & on farm testing of cultivation practices for enhancing saffron productivity in traditional & non-traditional areas through in put use efficiency
- Development of viable systems of commercial corm production

- To standardize post-harvest handling & value addition of saffron using low cost commercial solar , hot air dryers & scientific methods of picking , separation of stigmas & packing.
- Development of protocol for quality standards, adulteration, mechanisms for post harvest handling under controlled conditions & food/cosmetic products .
- Conduct market research, analyse and create avenues for market linkage on dynamic basis to enable better returns to stakeholders across the supply chain
- Entrepreneurship development cum capacity building and HRD of stake holders for the technologies

6. **Brief Project Description:**

The proposed project “**A Value Chain On Kashmir Saffron**” will be undertaken by Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir & Indian Institute of Integrative Medicine, Jammu (IIIM), Keeping in view importance of saffron in Jammu & Kashmir all these partners are carefully chosen for manageability and to deal on the identified problems for developing model for higher production and quality with better market. The Indian Institute of Integrative Medicine, Jammu (IIIM) has NABL accredited quality Laboratory with expertise for developing standards for quality, storage and packing material .Developing Departments of Jammu and Kashmir will serve a link between model development and its implementation. The two departments have a vast network of extension officers in the saffron areas for implementation of plans.

First objective aims at enhancing saffron productivity through in put use efficiency. Technologies available ensuring saffron productivity around 5 kg/ha shall be refined and demonstrated through 250 OFT’S in Kashmir .Available technologies shall be refined based on remunerative cropping system ,SKUAST-K shall be responsible for refinement of technologies with the help of concerned production departments .IIIM shall be analyzing saffron samples for quality assurance .Molecular/Biotechnological studies for manipulation of the ploidy level of the cultivated forms, Molecular profiling of the indigenous gene pool utilizing suitable molecular markers for the assessment of existing variability and its further utilization for important genes in respect of - Somatic embryogenesis , corm rot shall be taken up by SKUAST-K .Further, new genotypes suitable for saffron/corm production will be identified through evaluation of available gene pool and registered before sharing with farmers and entrepreneurs .Prototypes for saffron mechanization shall be developed.

Second objective aims at development of viable systems of commercial corm production. Multi-pronged approach shall be followed to achieve this objective .Establishment of public and private sector nurseries in all the saffron growing areas of Kashmir will help in providing a plate form for saffron growers of availability of quality planting material The model thus generated shall be

replicated to ensure availability of sufficient planting material necessary for rejuvenation and area expansion . SKUAST-K shall be responsible for establishing public sector nursery at K D farm .A commercially viable protocol for *In-vitro* corm production shall be exploited for mass scale production of corms. SKUAST-K will devise protocol. Off place corm multiplication under cold arid conditions of Leh shall be attempted as saffron soils are sick with high incidence of corm rot inoculums.

Third objective aims at value addition of saffron using low cost commercial solar, hot air dryers & scientific methods of picking , separation of stigmas & packing .Post harvest technologies shall be popularized for enhancing saffron quality as presently Kashmiri saffron lacks good colouring strength due to poor post harvest practices particularly delayed picking and separation followed by sun drying .SKUAST-K, & IIIM shall be responsible for the activity. Refinement in technologies shall be carried by SKUAST-K and IIIM. Solar dryers/Hot air dryers/Vacuum dryers shall be popularized for establishment of small scale units that will create job opportunities for un-employed educated youth .Better methods of picking, separation and drying shall be developed for quality up gradation. Technologies for improving saffron colouring strength, aroma and bitterness, extending shelf life of saffron through inhibition of degradation process of crocin into crocetin ,better storage and packaging material shall be carried by IIIM and SKUAST-K .

Fourth objective aims at development of quality standards based on ISO 3632 Standards presently under revision. Better saffron quality will ensure safe market and better returns as Iranian saffron is becoming a stiff competitor for Kashmiri saffron. Protocol for value added products of saffron shall be developed for commercial exploitation and its utilization by saffron stake holders .A pilot Pack House unit established at Lead Centre SKUAST-K shall provide opportunities for saffron farmers for controlled processing with authentication and certification of brand 'Shalimar Saffron 'by SKUAST-K & IIIM ,Jammu. Comparative study of saffron samples from Iran ,Spain and Kashmir will establish superior quality of Kashmir saffron. Detection of adulterants and devising methods of on spot detection will ensure quality saffron to the consumers

The fifth objective aims at better returns to stakeholders across the supply chain. Database for market intelligence shall be developed by SKUAST-K .A society of 250 registered farmers from Kashmir , shall be established. The society linked to the re-structured Association shall develop marketing channel both at national and international market. The society shall be linked with ,stake holders and NGO'S

The last objective aims at entrepreneurial development ,human resource development/capacity development which will be brought out by creating awareness through training programmes, literature, and mass media on saffron production ,post harvest value addition and income generation through establishment of nurseries/small scale fabrication units to the targeted populations. Various training programmes for farmers, processors, entrepreneurs, unemployed rural youth, women, small-scale processors, new entrepreneurs, industry personnel interested in manufacture of equipments, and consumers will be organized. The different topics will be discussed are: cultivation of saffron, package of practices and integrated crop management, processing, product preparation, packing, labelling, recipe making, economic assessment of final

products, safety certification, nutritional diets, corm production, importance of quality control aspects, value addition, etc. This will help in empowering stakeholders through entrepreneurship development.

7. Environmental Category Issues in the sub-project:

- Social:
- Environmental

8. Safeguard Policies Triggered (World Bank policies)

Safeguard Policies Triggered (World Bank Policies)		
	Yes	No
Environmental Assessment (OP/BP 4.01)	[X]	[]
Natural Habitats (OP/BP 4.04)	[]	[]
Pest Management (OP 4.09)	[]	[]
Cultural Property (draft OP 4.11-OPN 11.03 -)	[]	[]
Involuntary Resettlement (OP/BP 4.12)	[]	[]
Indigenous Peoples (OD 4.20)	[]	[]
Forests (OP/BP 4.36)	[]	[]
Safety of Dams (OP/BP 4.37)	[]	[]
Projects in Disputed Areas (OP/BP 7.60)	[]	[]
Projects on International Waterways (OP/BP 7.50)	[]	[]

B. Risk Analysis and Related Issues

- Adoption of improved package of practices in a holistic way may be a problem unless saffron farmers are provided with subsidy support under State or Central government schemes and credit for input supply, area expansion , rejuvenation, herbal gardens, marketing including support for developing irrigation sources, mechanization of farm operations, packing, grading and drying devices and structures, market yards, etc as presently no such facility is available to the saffron framers.
- Post Harvest interventions in the un-organized sector is a complex issue. Increase in saffron production under prevailing infrastructure facilities for post harvest handling will lead to further quality deterioration. A visionary approach of developing an integrated system of post harvest handling under controlled conditions is required.
- Enhanced production may lead to further exploitation of the farmers by the unscrupulous traders, thus depriving them of the legitimate returns. Lack of State’s control on ensuring quality of the end product has provided an easy plank for large scale adulteration presently common in saffron, which has harmed its trade prospects and also has been blatantly duping the consumers.
- Small number of stakeholders involved in its production and trade. The only recourse available for this commodity to make an impact and attract attention of the society is to increase the volumes of production and exports, earn valuable foreign exchange and enhance the social status of the stakeholders through their higher earnings.

- Training programmes among un-organized and low educated persons may be a complex problem.
- Logistic problems as these models are going to be tried out for the first time in saffron growing areas.

9. Impact Assessment

Given below, and adequately addressed

10. Potential indirect and/ or long-term Impacts due to anticipated future activities in the project areas (assessment of anticipated conflict/ complimentary with the current as well as those proposed for the next five years in the areas of activities of the sub-project):

- The farm income of the targeted population will be improved through higher productivity keeping many pests and diseases under control.
 - Saffron cultivation with better returns will check crop diversification towards other crops, particularly orchard crops .Abandoned area is expected to regain its glory under saffron
 - Quality up gradation under controlled conditions will ensure stakeholders empowerment through increased incomes & employment generation through post harvest activity cluster
- 1) Reduction of women drudgery through saffron mechanization. Women empowerment and increase in family income through employment generation as envisaged through post harvest activity clusters
 - 2) Higher saffron consumption levels either through direct food or value-added Products
 - 3) Potential direct impact would be up-liftment of socially backward and marginally poor class of people
- The indirect benefits will be sustainability of saffron production under well designed cropping system suitable for karewa conditions
 - Trained and skilled manpower for wider dissemination of the technologies for achieving better returns with improved marketing approaches.
 - Rural entrepreneurship will help in reducing migration to urban areas through enhanced employment and income generation.

11. Identify the key stakeholders and describe mechanisms for consultation with and to them done/ disclosure so far done including pre-project consultations with stake holders workshop before formulating the full proposal, discussing the full proposal with some stakeholders before submission to the PIU:

Public Institutes

1. Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu
2. Indian Institute of Integrative Medicine, Jammu (IIIM)
3. Department of Agriculture Kashmir

4. Department of Agriculture Jammu

Private Partners

1. Kashmir Kessar Mart Khayam Srinagar
2. All J&K Saffron Growers Association Pampore
3. Banday Impex Ltd, Khunmooch

International Institutes

1. University of Castilla La Mancha, Albacete Spain
2. Ferdowsi University Mashad Iran

A stake holders workshop was organized on 22-9-2008 at main campus SKUAST-K Shalimar. They were made aware of NAIP project, objectives and expected outputs and impact. Preliminary discussions were held with few stakeholders ,saffron growers and NGO'S before organizing stake holder's workshop. The final modalities will be worked out after the project approval.

12. Chronology of meetings/ activities held in connection with preparation of the concept note & full proposal

S. No.	Date & Location	Programme	Participants	Remarks
1	26, April, 2007, Jammu	Workshop on saffron Development in J&K	SKUAST-K, SKUAST-J, Horticulture Commissioner Govt. of India, FAO, APC J&K, J&K Bank, DC'S, Officers of Agriculture Department Jammu and Kashmir.	Brain storming session for saffron development in J&K
2	10, August, 2007 Shalimar	Inter Institutional Workshop on saffron Development in J&K State	SKUAST-K, SKUAST-J, CITH, Stake Holders, Officers of Development Department Jammu & Kashmir	Brain storming session for saffron development in J&K
3	1, October, 2007 Lalmandi	Interaction meeting	Director Agriculture, SKUAST-K	Discussion about Saffron Improvement
4	11, December, 2007 Pampore	Interaction meeting	SKUAST-K, Saffron Growers Association, Banday Impex	Discussion about role of Association in NAIP on saffron
5	1, March, 2008 Shalimar	Interaction Meeting	Saffron Framers, Officers of Agriculture Department	Discussion about issues, problems and prospects of saffron
6	22, March, 2008 Pulwama, Kashmir	Interaction Meeting	Saffron Framers, Officers of Agriculture Department	Discussion about issues, problems and prospects of saffron
7	29, March, 2008	Interaction	Saffron Framers, Officers of	Discussion about

S. No.	Date & Location	Programme	Participants	Remarks
	Shalimar	Meeting	Agriculture Department	strategies for saffron improvement
8	6, April, 2008, Jammu	Interaction meeting	SKUAST-J, SKUAST-K	Discussion about saffron in Kishtwar
9	17, September, 2008 (Telephone)	Interaction meeting	IIM, SKUAST-K	Finalization of Technical Programme
10	20, September, 2008 (KD Farm)	Interaction meeting	CITH, SKUAST-K	Finalization of Technical Programme
11	22-September, 2008 Shalimar	NAIP Stake holders workshop	SKUAST-K, SKUAST-J, HPKV, NGO'S, Farmers, CITH, Stake holders	Finalization of Technical programme of consortium partners

13. Measures to Address the Issues:

A document on safe Matrix on the use of IPM and IPNS issues shall be prepared and will be transferred to saffron growers during training that will be conducted under the project. The saffron growers shall be made aware about risk related issues through orientation programmes such as adoption of improved production, protection and post harvest technologies in a holistic manner using INM, IPM, IDM and scientific post harvest technologies such as picking of saffron flowers, separation and drying of stigma to overcome problems of reduced saffron recovery and poor saffron quality and processing/ packing of saffron under controlled environmental condition using pack house facilities to be developed under the project. Market intelligence shall be restructured through establishment of saffron growers society empowered with a saffron brand duly authenticated by SKUAST-K and IIM, Jammu.

14. Consultation/ disclosures to be done in Future:

Local disclosure through mechanisms such as launch workshop, interfaces during the implementation stage of the subproject for sharing the results and soliciting feed-back, one will circulating project brochures and implementation progress from time to time, putting up annual reports on the web site and annual stakeholder workshops wherever feasible.

The consultation/ disclosures will be done as per NAIP guidelines depending on the progress of the project. Training, demonstration programmes and workshops on various themes relevant to

farming, primary processing, post-harvest product preparations, packing, labelling, retrofitting, nutritional benefits awareness, recipe making, marketing aspects *etc.* The project findings (brochures/ CDs/ videos/ literatures) will be disclosed time to time and necessary feed back will be collected for further improvement and better implementation. Assistance of different related organizations will be taken.

1. Dissemination of holistic crop management through demonstrations and extension services to farmers.
2. Demonstration of value addition to stakeholders.
3. Transfer of technology of value-added products to stakeholders.
4. Dissemination of information and sensitization of line departments of state and central governments to policy makers, planners and project partners for enhancement of production/consumption.
5. Information dissemination through mass and print media on medicinal benefits to stakeholders, targeted groups especially urban consumers.
6. Linkages with financial institutions will be enabled so that as when requested the entrepreneurs are adequately financed for their commercial activities. Both print and other media will be fully utilized to attain the desired goals and objectives.
7. Religious places such as mosques will be involved for rapid spread of the message of “scientific saffron cultivation and quality handling”.
8. NGO’s & Saffron growers Association ,SLG’S, Project targeted saffron growers will play a major role institutions in imparting skills to small-scale processors & family run small business units.

Consortium PI

National Coordinator

National Director

Annexure I: Environmental Safeguard: Activities, issues, impact and mitigation measures

Activities ¹	Issues	Anticipated level of Impacts ³		Mitigation measures (Negative Impact) ⁴
		Positive	Negative	
Baseline survey				
Production based on INM, IDM & IPM practices /crop Diversification	Yield increase (Loss of soil nutrients; change in cropping pattern;	4		
	Corn rot (Development of resistance in pests)	4		
Development of irrigation system, water harvesting	Availability of water resources	4		
On farm Value Addition /using solar/hot air dryers	Quality Improvement	4		
Integrated farm extension services	Effective crop management practices in place	5		
Processing and storage function in target regions. under controlled conditions (harvest & storage of produce)	Shelf- life enhanced, quality upgraded	4		
Fine-tune technologies for development saffron				
Packaging and marketing	Packaging material	4		
By-product value addition	By product utilization	4		
Sensitizing line departments of governments for enhancing quality saffron production/consumption	Health security	5		
Entrepreneurship development of stakeholders for intensive cultivation, product development, mechanization	Industrial support	4		
Value-addition through branding of saffron products by training and popularization.	Health/cosmetic brand promotion	4		
Assess socio-economic and environmental impacts of the interventions for uptake plan.	Environmental impacts information will be in place	5		

Annexure II: Social Safeguard: Activities, issues, impact and mitigation measures

Activities ¹	Issues	Anticipated level of Impacts ³		Mitigation measures (Negative Impact)
		Positive	Negative	
Base-line survey				
On Farm Production based on INM, IDM & IPM practices , /crop Diversification	1.Change in occupational patterns	3		Demonstration/ Trg/on farm trials
	2. Unequal access to inputs		2	
	4.Hike in income	4		
Farm mechanization	women drudgery	4		
Integrated farm extension services	Effective crop management practices in place	4		
Aggregation and storage function in target regions (harvest & storage of produce)	Supply- chain management in place for commercialization	4		
Processing of produce				
Development of convenient and ready to eat saffron foods	Gender issue -Womens time is saved due to avoid drudgery in preparation	4		
Packaging and marketing	Good packaging increased role of middle men/contractors	3		
Assessment of nutrient composition in selected saffron foods	Market for saffron foods due to increased consumer awareness on nutritional composition of saffron	4		
Identification of number of potential food/cosmetic products for wide ranging and niche markets through market survey	Few and potential saffron food/cosmetic products are identified and are prioritized for potential markets.	4		
Pricing of the developed food /cosmetic products	Increased profits from saffron	3		
Sensitizing line departments of governments for enhancing saffron consumption	Awareness	2		
Entrepreneurship development of stakeholders for intensive cultivation, product development, mechanization.	Hike in income	3		
Value addition through branding of saffron as health foods/cosmetics by training and popularization.	Health and beauty are linked with saffron	4		
Assess socio-economic impacts	Availability of accurate impact and information on income, employment and nutrition, gender issues	3		

