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Assessing Impact of Vegetable Extension in Mid-hills of Uttarakhand

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ABSTRACT

Uttaranchal hills have been recognized as a hub for off-season vegetables. However, the growers are unable to harness the potential benefits of vegetable cultivation due to lack of improved production technologies, poor access to market and inadequate extension support. To overcome this, extension interventions including market-led extension (MLE) approach were carried out in four villages, situated in mid-hills in Uttarakhand. A total of 150 farmers from six villages (four were adopted and two were non-adopted), 25 from each village, were selected and interviewed personally. After three years, impact data revealed that interventions resulted in increased yields of tomato (116.3 to 186.9 q/ha), capsicum (80.0 to 118.6 q/ha), French bean (54.3 to 83.1 q/ ha), pea (65.3 to 89.2 q/ha). As a result, the income of the adopted farmers increased by 29 -74 percent over existing technology and market strategies practiced by the non-adopted farmers. Results shown that interventions were highly effective and increased awareness about the recent technology (from 32 to 89 %), Visits per month (1 to 8), field days per trimester (0 to 1), linkage (1.0 to 6.5), farmers training/year (1 to 6). Regarding extension efficiency, all three selected indicators showed significant changes, viz., Performance Index (47 to 92%), Penetration index (43 to 71%), and Achievement Index (40 to 66 %).

Hill agriculture is different from that in the plains due to several factors such as undulating topography, elevation, steep slopes, climatic and edaphic conditions and sensitivity to ecological hazards. Hill agriculture also has several constraints, viz., small and fragmented land holdings, low economic development, lack of infrastructure facilities like transport and communication, input supply systems, output marketing systems, etc. In fact, hill agriculture is facing twin challenges of environmental hazards and loss in productivity (Shah, 1996).

Agriculture extension has been considered an essential component for rapid agriculture development in hilly areas. It supports hill farmers for getting income and employment and in securing their livelihood. In fact, it has been considered as the backbone of the rural development in hilly areas where resource-poor farmers with small and scattering holdings are in majority. Hill farmers are practicing agriculture in unfavorable environment with undulated terrains and rainfed situation. And, therefore they need more support for their income and livelihood, otherwise they may migrate from the hills leaving their fields barren. Due to scarcity of food grains the emphasis of extension was higher production and productivity. But with the change in time and situation, need for market-let extension is being felt at national level. An approach like MLE will care not only the production but it will also help in realizing higher net returns from their farming by capacity building in the area of marketing of their farm produce.

Though hill farming is unable to produce marketable surplus of food grains, there is enormous potential for generating additional income and employment by growing horticultural as well as aromatic & medicinal crops. But for earning high income from these high value crops, sufficient knowledge and skill of marketing has been considered as key component, and in prevailing era, marketing is much dependent upon use of various information technologies with the farmers as well as marketing functionaries.

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The major objectives of this study were-

1. To measure the effectiveness of the vegetable extension in the adopted villages,
2. To evaluate the extension efficiency in the adopted villages, and
3. To ascertain the productivity of the vegetable extension.

METHODOLOGY

This study was conducted in six villages, out of which four were adopted villages viz., Tunakote, Tipola, (Almora distt.) and Dolkot, Simalkha (Nainital distt.) in Uttarakhand hills. These villages were adopted during 2003-04 under DBT sponsored project. The study area represents mid-hill conditions and have suitable climate for off-season vegetable cultivation. Before initiating the project, a base-line socio-economic survey was conducted in these areas revealed that despite surplus production of off-season vegetables, farmers are unable to realize the remunerative prices for their farm produce due to selling their produce through long marketing channel. To reduce these exploitations, market-led extension approach was implemented in the adopted villages. For enhancing productivity and additional income from vegetable cultivation; awareness campaign, demonstrations, trainings, field meetings, field days, exposure visits, were organized on selected off-season vegetables. Technical information on vegetable cultivation along with market related information was provided to the adopted farmers using MLE. The approach adopted in the MLE was to facilitate farmers by supplying the latest information regarding input and output market trends, price variations and consumer preferences apart from climatic data. Farmers were also supported in decision process on procurement of quality inputs from the market and sell their produce at better price at distant markets. Total six villages were selected, of which four were adopted and two were non-adopted (control) for assessing the impact of the extension services.

RESULTS AND DISCUSSIONS

1. On-farm demonstration for higher productivity and income

To raise the production of the off-season vegetables at farmers' fields, proven technologies of vegetable production were provided to the farmers so that they can adopt it. Besides availability of market-related information with farmers has further motivated the farmers to grow more off-season vegetables. For better quality of vegetables, farmers changed their varieties from Vaishali to Heemsohna and Manisha in tomato, in capsicum from local seeds of California Wonder to improved seeds; in French bean from locally available seeds of Contender to improved seeds.

With these interventions, yields in demonstrated plots were higher as compared to their existing production techniques (table 1), wherein they procured seeds from unscrupulous sources, their agronomic practices were not at par with the improved agronomic practices, their marketing strategy was not up to the mark due to ignorance about the quality. The benefits of better production techniques were reflected in the prices received and therefore farmers were convinced about the quality aspects too.

2. Training of adopted farmers in vegetable production and marketing

Training need assessment was conducted which revealed that majority of the farmers were in need of raised-bed nursery raising technique, seed treatment and plant protection measures, better way to procure inputs

Table 1: Performance of demonstration on farmers fields (2003-04 to 2005-06).

Crops	No. of demonstrations	Yields (q/ha)		Price received (Rs./kg)	
		Adopted farmers	Non-adopted farmers	Adopted farmers	Non-adopted farmers
Tomato	193	170.20	115.84	6.25	4.75
Capsicum	170	118.33	94.89	8.00	6.75
French bean	204	86.63	69.12	7.50	6.15
Pea	373	86.73	76.40	7.00	5.85

and marketing of vegetables. Keeping in view, the latest market trends and market approach, 14 field trainings were conducted in the adopted villages which not only imparted the skills of the participating farmers but their production was also increased.

3. Conducted tours to Kisan Mela and Sabji Mandis

Keeping the farmers interest in the view, they were taken to the Kisan Mela organized by VPKAS, Almora as well as GBPUA&T, Pantnagar for exposure to the latest technologies in the agriculture and they can adopt the same in their farming practices. Besides, farmers had good opportunity for interacting with the input and market agencies which increased their forward linkages. During four years of project period, 350 farmers visited these places.

4. Effectiveness of the vegetable extension

The effectiveness of vegetable extension was measured by using suitable indicators as suggested by Misra, 1997. The data showed that the awareness of the adopted farmers was 89.0 percent as compared to non-adopted farmers 32.0 percent. Regarding monthly visits, project workers visited more frequently (8-12) as compared to the state extension workers (1 visit). At least one meeting was organized at the project site in each month. For popularizing the proven technology among the farmers, two field days per year were organized. For proper implementation of the project intervention, supervision by the concerned scientists was done four times per month, where as, the agriculture development officials visited hardly once a month. For showing the potential of the technology, 80 demonstrations were laid out at the adopted farmers fields as compared to 20 demonstrations in the non-adopted villages. The extent of research-extension linkage was also high (8) as compared to 1.0 in non-adopted villages (Table 3). This shows that the extent of the extension services was intensive under the project and it was also effective on the above selected indicators.

Table 2: Training of the adopted farmers

S. No.	Topic	No. of farmers trained
1.	Training on selection of improved seed, sources of seed in kharif vegetables	54
2.	Improved production technology for higher productivity, efficient resource-use	45
3.	Training on scientific nursery raising	50
4.	Cooperative input-output marketing	32
5.	Integrated pest and disease management	64

Table 3: Effectiveness of vegetable extension in the project area.

S.No.	Indicators	Response	
		Adopted villages (N = 90)	Non-adopted villages (N = 60)
1.	Awareness about the recent technology (%)	89	32
2.	Visits of extension personnel per month (No.)	10	1
3.	Field meeting conducted (monthly)	1	0
4.	Field days per year (no.)	2	0
5.	Demonstrations per season (no.)	80	20
6.	Supervision per month	4	1
7.	Research.-extension linkage (10-point scale)	8.0	1.0
8.	Farmers training (no.)	6	1

Table 4: Efficiency of the vegetable extension

S. No.	Efficiency indicator	Adopted villages	Non-adopted villages
1.	Performance Index (%) (Actual number of farmers reached out of the target number which should be reached)	92.0	47.0
2.	Penetration Index (%) (Number of farmers adopting the recommended practice out of the actual number reached)	71.0	43.0
3.	Achievement Index (%) (Number adopting the recommended practice out of the target number of farmers)	66.0	40.0

5. Efficiency of Vegetable Extension

The efficiency of the vegetable extension was measured using three indicators, namely performance index, penetration index, and achievement index. The values of these indices were 92, 71, and 66 % in the adopted villages as compared to 67, 43 and 40 % in the non-adopted villages, respectively (Table 4). This shows the efficiency of the vegetable extension services carried out in the adopted villages due to which higher values were obtained on all the selected indicators.

6. Productivity of Vegetable Extension

The productivity of the vegetable extension was measured in term of percentage change in the productivity and additional income of selected vegetable crops. The results showed that there is a considerable change in the productivity of different vegetable crops from first year to third year, viz., tomato (44.65 – 64.78 %), capsicum (31.94 – 48.69 %), french bean (32.69 – 57.89 %) and vegetable pea (23.53 – 28.13 %) over farmers' practices. Regarding additional income, mean value over three years has been Rs. 46906 for tomato, Rs. 30906 for capsicum, Rs. 21600 for frenchbean and Rs. 16753 for vegetable pea, respectively (Table 5). This shows that intensive extension service resulted into additional income

Table 5: Productivity of the vegetable extension

S. No.	Productivity Indicators	Performances			Mean value
		2003-04	2004-05	2005-06	
1.	**Yield (q/ha)**				
	Tomato	189.00	170.0	151.6	170.2
	Capsicum	95.00	136.0	124.9	118.63
	French bean	69.00	90.4	90.0	83.13
	Vegetable Pea	84.00	101.8	82.0	89.27
2.	**Productivity Index (%)**				
	Tomato	63.21	84.78	64.78	70.93
	Capsicum	31.94	61.90	48.69	47.51
	French bean	32.69	67.41	57.89	52.66
	Vegetable Pea	23.53	59.06	28.13	36.91
3.	**Additional Income (Rs.)**				
	Tomato	43920	54600	41720	46747.67
	Capsicum	18400	41600	32720	30906.67
	French bean	12750	27300	24750	21600.00
	Vegetable Pea	11200	26460	12600	16753.33

generation from the selected vegetable cultivation due to adoption of the recommended practices over farmers' practice.

CONCLUSION

On the basis of the above discussions, it is evident that due to on-farm demonstration of the improved vegetable production technology/practices, change has been observed in the adoption of the new varieties as well as improved practices. Due to regular training the skill of the adopted farmers has been increased which is reflected by the increased productivity of the selected vegetable crops over farmers practices. Further, the effectiveness, efficiency and productivity of the extension work was evaluated which showed effective and efficient extension work carried out under the project.

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