Indian Journal of Extension Education
Vol. 53, No. 4, 2017 (90-94)

Economic Empowerment of Farmers through Adoption of Vegetable Cultivation Technology in *Hadoti* Region of Rajasthan

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ABSTRACT

The study was undertaken in Jhalawar district of Rajasthan. Data were solicited from randomly selected 60 beneficiary and 60 non-beneficiary vegetable growers of *Krishi Vigyan Kenddra* (KVK) Jhalawar district, Rajasthan, India. The important interventions extended by KVK Jhalawar among farmers were vegetable varieties, time of sowing, plant protection measures, and fertilizer application. Findings of the study revealed that technological interventions extended by KVK have significantly empowered the vegetable growers technologically and economically. Higher extent of adoption of timely sowing, balanced fertilizer use and plant protection measures by the beneficiary respondents resulted in less cost of cultivation (Rs. 8,350/-) and higher net income (Rs.1,04,200/-) from vegetable cultivation than the non-beneficiary respondents.

Keywords: Adoption, Vegetable Cultivation Technology, Beneficiary, Non-beneficiary.

INTRODUCTION

Vegetables cultivation is a viable short duration commercial practice. Higher income from vegetable cultivation depends upon adoption of recommended practices of vegetable cultivation technology. Small and marginal farmers get increased net return through adoption of improved vegetable production technology over traditional practices despite various physical and natural constraints (Singh *et al.,* 2015). Higher adoption of technology increases with positive attitude, knowledge, and skill. The trained entrepreneurs had more competent skill compared to untrained entrepreneurs (Singh r. and Singh m., 2006). Most of the farmers had favourable attitude towards cultivation of horticultural crops (Kumar r., 2006). Although, rate of pesticides use by vegetable growers is higher, therefore they are facing various health problems (Jana h., 2013); whereas, level of adoption of recommended practices of beneficiary farmers is higher (Dakhore k. m. *et al.,* 2002 and Singh n. *et al.,* 2014).

Krishi Vigyan Kendras are playing a vital role in transferring the agricultural technologies. The trainees feel satisfaction with the course content, physical facilities, lodging, boarding facilities and methodology of KVK using for transferring of technology (Singh n. *et al.*, 2016). Different methods of transfer of technology like on farm trial, front line demonstrations, trainings, and advisory services are very useful for transferring vegetable cultivation technology among farmers. Therefore, the present study was conducted with the specific objectives to find out the extent of adoption of vegetable cultivation technology of the respondents; and to know the extent of income generated through vegetable cultivation among beneficiary and non-beneficiary respondents of KVK.

METHODOLOGY

The study evaluates empowerment of vegetable growers. For knowing the extent of adoption, measuring instrument was developed. Data were solicited on the three point continuum, viz. Always=2, some time=1 and never=0. The instrument consisted of 21 items, for which Karl Pearson's coefficient was 0.88. The minimum and maximum scores were '0' and '42', respectively. The data were collected from randomly selected 60 beneficiary and 60 non-beneficiary vegetable growers of district Jhalawar, comes under *Hatodi* region of Rajasthan. Beneficiary respondents were benefitted through vegetable technology transferred by KVK Jhalawar. The income generated from

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the vegetable cultivation was measured on the basis of response received from the respondents regarding the average cost incurred and average return (in terms of rupees) obtained from vegetable cultivation. The total cost of vegetable cultivation comprises the cost of different aspects *viz.*, cultural practices, inputs, post harvesting, marketing, labour, and miscellaneous expenses. In order to find out the level of income generated through vegetable cultivation the respondents were categorized into three groups i.e., low income group, medium income group and high income group on the basis of mean and standard deviation.

RESULTS AND DISCUSSION

Level of adoption

In the study area, a wide disparity existed between beneficiary and non-beneficiary respondents with regard to adoption of vegetable cultivation technology. Beneficiary respondents possessed higher degree of awareness and knowledge. Data presented in table 1 clearly showed that a majority of beneficiary farmers (71.67%) were in the medium category of adoption of vegetable cultivation technology, whereas, in case of non-beneficiary farmers, more than 50.00 per cent were also observed in medium adoption category. It was appreciable that more than 11.00 per cent beneficiary respondents adopted the vegetable cultivation technology to a high level, while, 16.67 per cent beneficiary farmers were reported in low adoption category. It was also noted that 45.00 per cent non-beneficiary respondents claimed his adoption to the extent as low in the study area.

It may be because of the reason that beneficiary respondents possessed more knowledge about vegetable cultivation practices and have direct contact with scientists of KVK than non-beneficiary respondents. The findings of this study are in accordance with findings of Kumari N. *et al.* (2006) and Parthasarathi and Govind (2006). They found that majority of respondents belongs to medium to high level of adoption category.

Extent of adoption of vegetable cultivation

Data in table 2 indicated that beneficiary and non-beneficiary vegetable growers had maximum adoption about “NPK fertilizers” with mean per cent score 92.22 and 73.33, respectively and assigned rank first by both the categories of respondents. This is due to fact that both the categories of the farmers were aware and having knowledge about benefits of NPK application and soil fertility status for higher vegetable production. The extent of adoption of “micro nutrients” was 88.33 per cent among beneficiary farmers and ranked second, while in case of non- beneficiary farmers, it was adopted with 33.33 MPS

Table 1. Distribution of respondents on the basis of their level of adoption about vegetable cultivation technology

N=120

S.No.	Adoption level	Beneficiary (n=60)		Non-beneficiary (n=60)		Total	
		f	%	*f*	%	*f*	%
1.	Low (< 18.95)	10	16.67	27	45.00	37	30.83
2.	Medium (18.95-28.15)	43	71.67	31	51.67	74	61.67
3.	High (> 28.15)	7	11.67	2	3.33	9	7.50
	Total	60	100.00	60	10.00	120	100.00

Table 2. Extent of adoption of vegetable cultivation technology among beneficiary and non-beneficiary respondents

N=120

S.No.	Technological aspect	Beneficiary(n=60)		Non-beneficiary(n=60)		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1	Varieties	87.78	III	63.33	III	75.56	III
2	Time of sowing	80.56	VII	40.00	VII	60.28	VIII
3	Fertilizer:						
i	NPK	92.22	I	73.33	I	82.78	I
ii	Micro nutrients	88.33	II	33.33	VIII	60.83	VII
4	Disease management:						
i	Dose of chemical	82.78	VI	46.67	VI	64.73	VI
ii	Method of chemical application	78.33	VIII	53.33	IV	65.83	V
iii	Time of chemical application	47.22	IX	23.33	IX	35.28	IX
5	Insect management:						
i	Dose of chemical	85.00	V	52.02	V	68.51	IV
ii	Method of chemical application	86.22	IV	65.07	II	75.65	II
iii	Time of chemical application	36.67	X	20.00	X	28.34	X

MPS =Mean per score.

only and assigned rank eight among all the vegetable cultivation techniques. The scientists of KVK are emphasizing on application of micronutrients in vegetable fields for quality production, resulting higher adoption of micro nutrients among beneficiary farmers. Further, the beneficiary and non- beneficiary respondents were practicing "vegetable hybrid varieties" with MPS 87.78 and 63.33, respectively. The practice "method of chemical application for insect management" was adopted by beneficiary farmers with 86.22 MPS and ranked fourth, whereas, non-beneficiary farmers adopted this practice with 65.02 MPS and ranked second.

Further, least adoption was observed in respect to vegetable cultivation practice "time of chemical application for disease management" as well as "time of chemical application for insect management" among beneficiary and non – beneficiary respondents in the study area. The poor adoption about these aspects may be due to the reason that majority of beneficiary and non-beneficiary respondents practicing application of chemicals for management of insect and diseases without observation or diagnosis of insect or disease. From the above discussion it could be concluded that a significant technological gap in adoption of vegetable cultivation technology was observed. It clearly showed that adoption gap was more in non-beneficiary respondents as compared to beneficiary respondents. The extent of adoption of vegetable cultivation technology among beneficiaries was from 36.67 to 92.22 per cent, whereas in case of non-beneficiary respondents it was from 28.34 to 82.78 per cent in the area under study. The higher adoption of vegetable cultivation technology among beneficiary respondents showed the positive impact of vegetable cultivation technologies transferred by the *Krishi Vigyan Kendra*, Jhalawar. The findings are in accordance with the findings of Sadaphal *et al.* (2002) who reported the onion growers are conscious about using the improved inputs. Sharma and Peshin (2015) reported that IPM practices were not widely adopted by the IMP farmers. Sharma *et al.* (2015) reported high adoption behavior of chilli growers.

Cost of cultivation of vegetables

In the cultivation of vegetables, cost of inputs plays a major role in the net return from the vegetables. Vegetable growers almost purchase seed, fertilizers, herbicides, pesticides from market and their family members are involved fully in the labour work of vegetable cultivation. The cost of cultivation of vegetables depends on the various factors and resources available with the farmers. The results about average cost of vegetable cultivation are presented in table 3.

Table 3. Average cost of vegetable cultivation among beneficiary and non-beneficiary respondents

N=120

S.No.	Items	Beneficiary(n=60)		Non-beneficiary (n=60)	
		Rs./ha	%	Rs./ha	%
1.	Field preparation	4300	8.89	4500	7.94
2.	Nursery	5780	11.95	6300	11.11
3.	Weeding	6450	13.34	8500	14.99
4.	Fertilizer	6800	14.06	8000	14.11
5.	Plant protection	11225	23.22	14500	25.57
6.	Wages	9600	19.86	9000	15.87
7.	Staking, transport & other expenses	4195	8.68	5900	10.41
	Total	48350	100.00	56700	100.00

Perusal of table 3 revealed that the average cost of vegetable cultivation for beneficiary respondents was Rs.48350 /ha in comparison to Rs.56700 /ha for non-beneficiary respondents, thus, indicating an overall average cost gap of Rs.8350/ha between both the categories of the respondents. This was due to fact that a majority of beneficiary respondents were practicing application of fertilizers, herbicides and plant protection measures with the proper consultancy of KVK scientists, whereas, majority of non-beneficiary respondents were found in the grip of agriculture input dealers for application of fertilizers, herbicides and plant protection measures and majority of agriculture input dealers were lacking background of agricultural educational fields. The cost of vegetable cultivation of beneficiary respondents was therefore lower than non-beneficiary respondents.

Further, review of input cost of different items indicated that both the categories of respondents had spent maximum money on plant protection measures. It was found that beneficiary farmers were spending 23.22 per cent (Rs. 11225/ha) of total cultivation cost on plant protection, whereas, it was 25.57 per cent (Rs.14500/ha) for non-beneficiary farmers. It is depicting that non-beneficiary farmers are spending Rs.3275 more money per ha on vegetable cultivation due to lack of proper technological consultancy. The cost of field preparation and wages for both the categories of respondents was more or less similar. Majority of beneficiary farmers were applying fertilizers in vegetable fields on soil test basis and with the consultancy of KVK scientists, they were also practicing application of proper herbicides. In case of non-beneficiary farmers, the quality, quantity and cost of herbicides, fertilizers and plant protection chemicals were decided on the part of agriculture input dealers that was not scientific and it was all meant for profit of agri-input dealers.

Contribution of income of vegetable cultivation to total income of the respondents

Table 4 depicts the net average income per year, net average income from vegetable cultivation per year and per cent contribution of vegetable cultivation in overall income of family per year.

Table 4. Contribution of income of vegetable cultivation to total income of the respondents

(N=120)

S.No.	Aspects	Beneficiaries (n=60)	Non-beneficiaries (n=60)
1.	Net average income from all sources (Rs.)	4,10,500	325620
2.	Net average income from vegetable cultivation (Rs.)	2,60,600	156400
3.	Per cent contribution of vegetable cultivation in overall income per annum (%)	63.48	48.03

The data presented in table 4 showed that average income of beneficiary respondents was Rs.4,10,500 per annum, whereas, in case of non-beneficiary respondents the net average income was Rs.3,25,620 per annum from all sources.

Table further indicated that the net average income from vegetable cultivation were 63.48 per cent and 48.03 per cent of overall annual income in case of beneficiary and non-beneficiary respondents, respectively. This indicates that vegetable cultivation had contributed significantly to the overall income of vegetable growers. It may be further concluded that beneficiary respondents had more income from vegetable cultivation than non-beneficiary respondents.

Percent contribution of income of vegetable cultivation to overall income of the family

To get an overview of contribution level, the respondents were categorized into three groups on the basis of per cent contribution of vegetable cultivation in overall income of family. The data presented in Table 5 showed that 66.67 per cent of total vegetable growers could fall under medium contribution level while 20.83 per cent of respondents belonged to low contribution group and the balance 12.50 per cent in high contribution group. It is significant that the beneficiary respondents are generally earn higher income from vegetable cultivation compared to non-beneficiary farmers. Alternatively, the skew in income earning from vegetable cultivation is more prominent in the KVK beneficiary farmers. This could possibly be attributed to higher knowledge level, better understanding about timely sowing and marketing practice, overbid and fairness in vegetable income.

CONCLUSION

This study concludes that *Krishi Vigyan Kendra* has significant impact on transferring vegetable cultivation technology. The extent of adoption of vegetable cultivation technology among beneficiaries was 36.67 to 92.22 per cent, whereas, in case of non-beneficiaries it was observed between 28.34 to 82.78 per cent. Non-beneficiary vegetable cultivators were financially dependent on agriculture input dealers, therefore, also lacking technical know-how as well as their cost of vegetable cultivation was higher (Rs.8350 per ha) than the KVK beneficiaries. Per cent contribution of income of vegetable cultivation to overall income of the family was higher for beneficiary respondents (63.48%) as compared to non-beneficiaries (48.03%). It shows the positive impact of KVK efforts, put for empowering vegetable growers technically and economically.

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Table 5. Distribution of respondents on the basis of per cent contribution of income of vegetable cultivation to overall income of the family

N=120

S.No.	Contribution level (per cent)	Beneficiaries(n=60)		Non-beneficiaries (n=60)		Total	
		f	%	*f*	%	*f*	%
1.	Low (< 38.40)	4	6.67	21	35.00	25	20.83
2.	Medium (38.40-71.35)	43	71.66	37	61.67	80	66.67
3.	High (> 71.35)	13	21.67	2	3.33	15	12.50
	Total	60	100.00	60	100.00	120	100.00

F = Frequency

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