Asian Journal of Agricultural Extension, Economics & Sociology

40(5): 72-78, 2022; Article no.AJAEES.84382
ISSN: 2320-7027

Factors Determining the Impact of Krishi Vigyan Kendra Interventions and Farmers Constraints in Adoption

H. J. Pooja [a*≡], S. S. Dolli [aφ] and J. S. Sonnad [bφ]

[a] Department of Agricultural Extension Education, College of Agriculture, UAS, Dharwad (Karnataka) India.
[b] Department of Agribusiness Management, College of Agriculture, UAS, Dharwad (Karnataka) India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2022/v40i530888

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/84382

Original Research Article

Received 17 January 2022
Accepted 22 March 2022
Published 28 March 2022

ABSTRACT

The study was conducted in the jurisdiction of Krishi Vigyan Kendra (KVK), Sirsi of Uttara Kannada district during 2019-2021. Thirty beneficiary farmers of frontline demonstration (FLD) each from arecanut and pepper, thirty farmers trained in dairy management were selected forming a sample of 90 farmers. The farmers were interviewed using pre-tested schedule. It was found that education, family annual income, area under commercial crop, ICT utilization, extension participation, information seeking behavior, scientific orientation, resource base and nature of intervention had influenced the adoption behavior of the farmers. These variables together explained adoption to the extent of 81 per cent in case of arecanut, 79 per cent in pepper and 76 per cent in case of dairy farmers. The study revealed that majority (74.44 %) of the beneficiary farmers expressed climate change as major constraint followed by high cost of inputs (56.67 %), disease infestation (50.00 %), difficult to adopt (48.89 %), labor shortage (43.33 %), less clarity in technology (32.22 %), no person to guide while adopting (24.44 %) improved practices.

≡ P.G Student,
φ Professor,
**Corresponding author: E-mail: poojajayappa7@gmail.com;*

Keywords: Factors; constraints; KVK; adoption; FLD.

1. INTRODUCTION

In the realm of agriculture and allied sectors, the improved and modern scientific technologies are moving at a faster pace. On the other hand, effective transmission of these technologies to end users is a challenging task. KVK in India plays an important role in transfer of Agricultural technology. The progress in agriculture to a large extent depends on the quick and effective dissemination of new agricultural practices among the farmers and feeding back the farmer's problems to the research station for their solution. KVK performs on-farm testing, frontline demonstration, vocational training and in-service training of grass root level field functionaries. In spite of all these efforts, a considerable technological gap still lies between the technology recommended and the technology adopted by the ultimate users. This could be owing to the constraints faced by the farmers in adoption of technologies recommended by Krishi Vigyan Kendra. Among various interventions, FLD is more effective as it is conducted in farmers' field under the supervision of scientists. Hence, the study was taken up to identify the factors determining the impact of FLD as well as training conducted by KVK and constraints that farmers encounter in adoption of improved methods.

2. METHODOLOGY

The study was conducted in the jurisdiction of KVK, Sirsi, Uttara Kannada district of North Karnataka. Two interventions namely frontline demonstration and trainings conducted during 2019-2021 were considered for the study. Ninety beneficiary farmers including 30 each FLD beneficiaries of arecanut and black pepper crops and 30 farmers trained under dairy management training were selected by purposive simple random procedure. The data was collected by pre-tested interview schedule through personal interview method. Previously developed scales were used to measure the independent variables. The correlation and regression analysis was carried out to understand the association of independent variables with adoption. To know the constraints faced by the farmers, the possible responses were listed in consultation with the experts. The farmers were asked to indicate various constraints faced by them and were also asked to mention other constraints they were facing in adoption of improved practices. Later, the responses were enlisted and expressed in frequency, percentage and ranks.

3. RESULTS AND DISCUSSION

3.1 Profile Characteristics of the Beneficiary Farmers of KVK

An insight into Table 1 revealed that most of the respondents had basic education which comprises of high school (34.44 %), PUC (24.44 %) and graduation and above (18.89 %). The probable reasons could be availability of free basic education and educational infrastructure in the study area. These findings are in conformity with the findings of Sahoo *et al.* [1] and Gorfad *et al.* [2]. Further nearly half (48.89 %) of the farmers had small landholding followed by, equal per cent (23.33 %) of the beneficiary farmers were in marginal and semi-medium landholding category. The landholding in the selected district is usually smaller, moreover the fragmentation of landholding resulted in smaller holdings. These findings were in accordance with Chhodvadia *et al.* [3], Obaiah *et al.* [4] and Sivabalan *et al.* [5]. Over half (53.33 %) of the respondents belonged to medium category of family size and 41.11 per cent of them belonged to small family size category. It is observed that nuclear families exist in rural areas and manage their farm independently. The findings are supported by Ranjan *et al.* [6] and Singhal and Vatta [7]. Over half (65.56 %) of the beneficiary farmers found in medium level (₹ 5,08,000 to ₹ 20,08,000) of family annual income category and only 21.11 per cent and 13.33 per cent of the respondents belonged to low (< ₹ 5,08,000) and high (> ₹ 20,08,000) income category. It is fact that beneficiary farmers are mostly cultivating plantation crops like arecanut and pepper and on an average they get 6.46 quintal per acre in arecanut and 2.06 quintal per acre in pepper which gives them high gross returns. The findings are in line with the results of Chavai [8] and Vinoda [9].

Over one third of the farmers were found in medium (38.89 %) ICT utilization category and low (35.56 %) ICT utilization category. Most of the farmers possess smart phones and had access to telephones, radio and TV. It was observed that they make use of WhatsApp for getting advice and use apps related to agriculture. They were well educated, innovative

and progressive in nature. The results are in line with the findings of Rajiv [10]. Most of (45.56 %) the beneficiary farmers belonged to medium level of extension participation followed by, low (30.00 %) and high (24.00 %) level of extension participation categories. FLD was conducted in the fields of sample farmers and one group had undergone training in dairy management. They had good contact with KVK and other institutions. Majority of the farmers were regularly participated in '*Krishimela'*. The findings are in conformity with Sushma [11]. It was observed that one third of the beneficiary respondents (38.89 %) had found in medium information seeking behavior category followed by, high (31.11%) and low (30.00 %) category. It was observed that majority of the farmers had found in higher education, medium family income and ICT utilization behavior categories. Plantation crop growers need to be alert and seek information from various sources hence, farmers not only depend on progressive farmers, friends and neighbors to seek information but also seek information from relevant agriculture and horticulture departments, KVKs and SAUs. They had also participated in extension activities like trainings, demonstrations and '*Krishimelas'* frequently. The findings are in accordance with Yashaswini [12]. It was found that, 42.22 per cent of farmers belonged to medium level of scientific orientation category followed by, high (33.33 %) and low (24.44 %) category respectively. Nearly seventy percent of the respondents had medium to high scientific orientation. Vohra [13] and Katole *et al.* [14] observed the similar results. Further, 64.44 per cent of farmers were having medium level of resource base followed by, high (2.11 %) and low (14.44 %) levels of resource base. Most of the farmers were small to medium farmers, they had good irrigation facilities but do not own farm machineries and equipment. Small holdings resulted in low and medium resource base of farmers. Further, the results showed that 41.11 per cent of farmers were located at low distance of farm from KVK followed by, medium (31.11 %) and high (27.78 %) distance from KVK. This means that farmers located closer to KVK participate more in the programmes and it is convenient to the KVK scientists to visit.

3.2 Factors Determining the Adoption of Improved Practices

The Table 2 indicated that education was found to be positive and significant with adoption of improved practices with respect to arecanut, pepper and dairy management. Higher level of education helped farmers in understanding the improved management practices and resulted in higher adoption. The results are similar to the findings of Joitabhai [15], Verma *et al.* [16] and Prashanth [17]. Family size was found to be positive and significant in case of pepper and dairy. As the family size increases, member available for work is more, that helped in adoption of labor intensive technologies. Hence resulted in higher adoption. The results are in line with the findings of Verma *et al.* [16]. Family annual income was found to be positive and significant in all the three categories of farmers' adoption behavior. Technology adoption requires financial support as inputs are expensive. Higher incentives increases farmers' ability to invest and adopt new practices. The results are in line with the findings of Verma *et al.* [16]. ICT utilization and information seeking behavior, were positively significant with the adoption of improved practices in all the three cases. ICT utilization and information seeking behavior is indicator of higher access to technological information and also farmers' exposure towards ICT provides timely and adequate information on various production technologies. This enables farmers to adopt more improved practices. The results are in accordance with the findings of Rajeswari [18]. Extension participation influences the adoption of recommended practices as it provides an opportunity for the farmers to interact with other farmers which helps in acquisition of knowledge and understanding by sharing each other's experience regarding the innovations, further by participating *'Krishimela'*, trainings, demonstrations and field visits will motivate the farmers to adopt more recommended practices. The results are in line with the findings of Sahoo *et al.* [1] and Joitabhai [15]. Scientific orientation had significant association with adoption of improved practices in all the three cases. Scientific orientation give them insight of science and its applications. Hence, farmers with more scientific orientation were logical, reasonable and optimistic in utilization of different resources like land, labor, capital etc. This made them to adopt improved practices. Similar findings were reported by Sahoo *et al.* [1]. Resource base had significant association with adoption of improved practices. More resource base indicates higher opportunity to adopt and take risk. The results are in line with the findings of Dayal and Mehta [19]. Nature of intervention had significant association with adoption of improved practices of arecanut and pepper. FLD and trainings give farmers good

knowledge and exposure on improved practices. The technologies transformed to farmers by KVK through different interventions in the form of information, input supply and field visits.

Table 1. Profile of KVK beneficiary farmers n=90

Sl. No.	Categories	Frequency	Percentage
1	**Education**		
	Illiterate (do not read and write)	3	3.33
	Primary school (1^{st}- 4^{th})	5	5.56
	Middle school (5^{th}- 7^{th})	12	13.33
	High school (8^{th}-10^{th})	31	34.44
	PUC (11^{th}- 12^{th})	22	24.44
	Graduation and above	17	18.89
	Mean:3.28 SD:1.26		
2	**Landholding**		
	Marginal farmer (up to 2.50 acres)	21	23.33
	Small farmer (2.51-5.00)	44	48.89
	Semi-medium farmer (5.01-10.00)	21	23.33
	Medium farmer (10.01-25.00)	3	3.33
	Big farmer (> 25.00 acres)	1	1.11
	Mean: 4.97 SD: 4.14		
3	**Family size**		
	Small family (<5 members)	37	41.11
	Medium family (5-8 members)	48	53.33
	Large family (>8 members)	5	5.56
	Mean:5.26 SD:1.95		
4	**Family annual income**		
	Low (<₹ 508000)	19	21.11
	Medium (₹ 508000- ₹ 2008000)	59	65.56
	High (>₹ 2008000)	12	13.33
	Mean: 1258000 SD: 1764000		
5	**ICT Utilization**		
	Low (<9.28)	32	35.56
	Medium (9.28 to 16.19)	35	38.89
	High (>16.19)	23	25.56
	Mean: 12.73 SD: 8.12		
6	**Extension participation**		
	Low (<3.67)	27	30.00
	Medium(3.67 to 5.20)	41	45.56
	High (>5.20)	22	24.44
	Mean: 4.43 SD: 1.80		
7	**Information seeking behavior**		
	Low (<19.19)	27	30.00
	Medium (19.19-22.68)	35	38.89
	High (>22.68)	28	31.11
	Mean: 20.93 SD: 4.10		
8	**Scientific orientation**		
	Low (< 21.39)	22	24.44
	Medium (21.39-24.17)	38	42.22
	High (>24.17)	30	33.33
	Mean: 22.73 SD: 3.16		
9	**Resource base**		
	Low (<7.96)	13	14.44
	Medium (7.96 to 9.09)	58	64.44
	High (>9.09)	19	2.11
	Mean: 8.52 SD: 1.33		
10	**Location of farm from KVK**		
	Low (<14.44 KM)	37	41.11
	Medium (14.44 KM to 24.29 KM)	28	31.11
	High (>24.29 KM)	25	27.78
	Mean: 19.36 SD: 11.58		

The results presented in the Table 3 revealed that, coefficient of determination (R^2) was 0.81 which revealed that 81 per cent of variation in adoption of production technology of arecanut farmers was explained by all the independent variables selected for the study. Further, education, family annual income, area under commercial crops, ICT utilization, extension participation, information seeking behavior, scientific orientation, resource base and nature of intervention (5.00 % level) contributed significantly towards the adoption of production technology in arecanut farmers.

Similarly, the coefficient of determination (R^2) was 0.79 in case of pepper which revealed that 79 per cent of variation in adoption of improved pepper production technology by FLD farmers was explained by all the independent variables selected for the study. Further, education, size of family, family annual income, ICT utilization, extension participation, information seeking behavior, scientific orientation, resource base and nature of intervention (5.00 % level) contributed significantly and land holding was negatively significant (5.00 % level) towards the adoption of production technology in pepper growing farmers.

As for adoption of improved dairy management practices, the coefficient of determination (R^2) was 0.76 which revealed that 76 per cent of variation in adoption was explained by all the independent variables selected for the study. Further, education, size of family, family annual income, area under commercial crop, ICT utilization, extension participation, information seeking behavior, scientific orientation, resource base (5.00 % level) contributed significantly towards the adoption of management technology in dairy farmers.

Table 2. Association of independent variables with adoption of improved practices by farmers n=90

Sl. No.	Independent Variables	'r' Value		
		Arecanut (n=30)	Pepper (n=30)	Dairy (n=30)
1.	Education	0.68**	0.55**	0.36*
2.	Land holding	0.20^{NS}	0.36*	0.03^{NS}
3.	Size of family	0.29^{NS}	0.03^{NS}	0.01NS
4.	Family annual income	0.36^{*}	0.38^{*}	0.40*
5.	Area under commercial crop	0.44*	0.07^{NS}	0.02^{NS}
6.	ICT Utilization	0.60**	0.37*	0.40*
7.	Extension participation	0.46^{*}	0.39^{*}	0.39^{*}
8.	Information seeking behavior	0.13^{NS}	0.46**	0.01^{NS}
9.	Scientific orientation	0.43*	0.52**	0.47**
10.	Resource base	0.38*	0.40*	0.04^{NS}
11.	Marketing behavior	0.22^{NS}	0.03^{NS}	0.005^{NS}
12.	Location of farm from KVK	0.06^{NS}	0.41^{NS}	0.30^{NS}
13.	Nature of intervention	0.05^{*}	0.35*	-

Table 3. Relationship between adoption of improved practices with independent variables n=90

Sl. No.	Independent Variables	'b' Value		
		Arecanut (n=30)	Pepper (n=30)	Dairy (n=30)
1.	Education	1.54*	3.63*	0.25*
2.	Landholding	-1.62^{NS}	1.34^{NS}	1.26^{NS}
3.	Size of family	0.96^{NS}	1.00*	0.91*
4.	Family annual income	0.57*	0.87*	0.27*
5.	Area under commercial crop	0.89*	0.006^{NS}	1.09*
6.	ICT Utilization	0.72*	1.23*	1.08*
7.	Extension participation	0.43*	0.87*	0.13*
8.	Information seeking behavior	0.07*	0.20*	0.39*
9.	Scientific orientation	1.14*	0.45*	0.74*
10.	Resource base	0.73*	0.37*	0.60*
11.	Marketing behavior	0.17^{NS}	0.004^{NS}	0.20^{NS}
12.	Location of farm from KVK	-1.72^{NS}	0.23^{NS}	-1.77^{NS}
13.	Nature of intervention	1.45*	1.22*	-
	R^2	0.81	0.79	0.76

Table 4. Constraints in adoption of technologies through KVK interventions n=90

Sl.No.	Constraints	Frequency	Percentage	Rank
A	**Technological Constraints**			
1.	Less clarity in technology	29	32.22	VI
2.	Difficult to adopt	44	48.89	IV
3.	No person to guide while implementing	22	24.44	VII
4.	Technology not suits locality	08	8.89	XIV
5.	Disease infestation	45	50.00	III
B	**Financial Constraints**			
6.	High cost of inputs	51	56.67	II
7.	Poor economic condition	18	20.00	XI
8.	Labor intensive technology	22	24.44	VII
9.	Lack in credit facility	20	22.22	X
10.	No remunerative price	18	20.00	XI
11.	Lack of investment	01	1.11	XIX
C	**Input and Infrastructural Constraints**			
12.	Non availability of inputs	16	17.78	XIII
13.	Lack of irrigation	21	23.33	IX
14.	Infrastructural problem	08	8.89	XIV
15.	Labor shortage	39	43.33	V
16.	Input availability	07	7.78	XVI
D	**Other Constraints**			
17.	Feed availability	07	8.89	XVI
18.	Climate change	67	74.44	I
19.	Lack of market information	06	6.67	XVIII

3.3 Constraints Faced by Farmers in Adoption of Improved Practices

The results in Table 4 confirms that, 'climate change' was the major constraint in adoption of technologies by the farmers (74.44 %). Since the climate change is the burning issue in recent times which is affecting the farming operations of the farmers. Extreme temperature and prolonged rains is common in Uttara Kannada district which makes plants susceptible to many diseases and pests. The other constraint was 'high cost of inputs' (56.67 %). 'Technologies were difficult to adopt' (48.89 %) and 'less clarity in technology' (48.89 %) were the other constraints expressed by respondents. This is because some of the practices shown during FLD or training are complex in nature to understand by the farmers and to practice them in the practical situation. 'Labor shortage' (43.33 %) was another constraint in adoption of improved technologies by the farmers which is commonly observed in many phases. This may be due to the fact that migration to nearby cities in search of better opportunities might have led to shortage of labor. The results are in accordance with the results of Jaganathan [20] in his study on organic practices in arecanut.

4. CONCLUSION

The study assessed that education, family annual income, area under commercial crop, ICT utilization, extension participation, information seeking behavior, scientific orientation, resource base and nature of intervention together explained adoption to the extent of 81 per cent in case of arecanut, 79 per cent in pepper and 76 per cent in case of dairy farmers. Farmers experienced constraints in adoption of improved technologies that includes climate change, high cost of inputs, disease infestation, technologies are difficult to adopt, labor shortage, less clarity in technology, no person to guide while adopting improved practices.

ACKNOWLEDGEMENT

We sincerely acknowledge the farmers for providing data to carry out the research work. We would also thank staff of KVK, Sirsi for their cooperation and support.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Sahoo PR, Ananth PN, Dash AK, Patil BK, Barik NK, Jayashankar. Institution based intervention on promoting composite fish culture in rural Odisha: a case of KVK Khodha. International J. Fisheries Aquatic Stud. 2016;4(4):190-195.

2. Gorfad PS, Thaker JN, Baraiya KP. Impact of Krishi Vigyan Kendra in operational villages. Guj. J. Ext. Edu. 2018;41-45.
3. Chhodvadia HC, Joshi NS, Bariya MK, Parakhia AM. Impact of Krishi Vigyan Kendra in Amreli district of Gujarat state. Int. J. Agric. Sci. 2016;8(27):1576-1579.
4. Obaiah MC, Pullamraju K, Reddy DK. Impact assessment of Krishi Vigyan Kendra, Nellore on income generation of rural youth through training programs. J. Pharma. Phytochem. 2018;7(5): 217-219.
5. Sivabalan KC, Latha MR, Anandaraja N. Effectiveness of the portray vegetable nursery training conducted by Krishi Vigyan Kendra, Pudukkoati, Tamil Nadu. International Journal of Chemical Studies. 2019;SP6:644-646.
6. Ranjan R, Ansari MA, Verma AP, Shekhar S, Rashit S. Farmers' perception towards effectiveness of Krishi Vigyan Kendra (KVKs): a study in Uttarakhand, India. Int. J. Curr. Microbiol. App. Sci. 2017;*6*(3): 878-890.
7. Singhal S, Vatta L. Impact of Krishi Vigyan Kendra on adoption of improved agricultural production practices. Int. J. Sci. Environ. Tech. 2017;6(2):993-1000.
8. Chavai AM, Yamagar AS, Barange PK. Knowledge and adoption of turmeric growers about post harvest technology. J. Agric. Res. Tech. 2015;40(3):476-480.
9. Vinoda VS. Technological gap in adoption of recommended cultivation practices of arecanut farmers. M. Sc. (Agri.) Thesis. Univ. Agric. Sci., Dharwad, Karnataka (India); 2016.
10. Rajiv NA. Comparative study to access role of information and communication technology (ICT) among livestock owners. M. V. Sc. Thesis. College of Veterinary science and animal husbandry, DUVASU, Mathura, Uttara Pradesh (India); 2016.
11. Sushma V. Impact of Udyogini scheme on rural women in Kolar district. M. Sc. (Agri.) Thesis. Univ. Agric. Sci., Bangalore, Karnataka (India); 2015.
12. Yashashwini MA. Effectiveness of Front Line Demonstrations of Krishi Vigyan Kendra on FLD farmers of Mandya district. M. Sc. (Agri.) Thesis. Univ. Agric. Sci., Bengaluru, Karnataka (India); 2013.
13. Vohra F. Attitude of farmers towards Krishi Vigyan Kendra, Navsari of South Gujarat. M. Sc. (Agri.) Thesis. Navsari Agricultural University, Gujarat (India); 2016.
14. Katole SB, Bhatt JH, Patel GG. Impact analysis of activities of Krishi Vigyan Kendra. Guj. J. Ext. Edu. 2017;28(2):267-270.
15. Joitabhai CP. Impact of Krishi Vigyan Kendra, Vejalpur of Panchamasals district of Gujarat state. B. Sc (Hons. Agri.) Thesis. Anand Agricultural University, Anand, Gujarat (India); 2018.
16. Verma J, Kumar A, Dhakad RK. Adoption level of soybean growers about improved production technology under the guidance of Krishi Vigyan Kendra in Sehore district of M.P. Bull. Env. Pharmacol. Life Sci. 2019;8(7):88-90.
17. Prashanth S. Impact of Front Line Demonstration of TS-3R red gram on beneficiary farmers of Krishi Vigyan Kendra, Vijayapura. M. Sc. (Agri.) Thesis, Univ. Agric. Sci., Dharwad, Karnataka (India); 2021.
18. Rajeshwari N. Analysis of information technology (IT) enabled comprehensive farm advisory services on farmers' perception, acceptance and adoption of best management practices. *Ph.D. (Agri.) Thesis.* Univ. Agric. Sci., Dharwad, Karnataka (India); 2020.
19. Dayal BL, Mehta BM. Study on knowledge and adoption of green gram production technology by farmers in Chhotaudaipur district of Gujarat. Agric. Update. 2015;10(4):318-322.
20. Jaganathan D. Analysis of organic farming practices in arecanut (Areca catechu) in South India. J. Comm. Mobil. Sustain. Develop. 2016;11(2): 206-214.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/84382