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Impact of KVK training in enhancing adoption of apiculture and crop protection technologies

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Abstract

The present study entitled "Impact of KVK Training Programme on Farm Women" was undertaken in Satara district of Maharashtra to assess the role of Krishi Vigyan Kendra (KVK), Borgaon in enhancing the knowledge and adoption of agricultural technologies among farm women. The investigation concentrated on two major training areas namely apiculture and crop protection, which are vital for skill development, self-employment, income generation and sustainable farm practices. A total of 150 farm women who had received training within the last five years were selected through purposive sampling from 15 villages across Satara, Jaoli, and Wai tehsils. The study employed an ex-post facto research design, using a structured interview schedule to collect data. Findings reported that, both apiculture and crop protection trainings significantly improved the knowledge and adoption levels of farm women, leading to enhanced farm productivity and livelihood security. The study also documented constraints faced and suggestions offered by the respondents to improve the effectiveness of training programmes.

Keywords: Krishi Vigyan Kendra, farm women, agricultural training, apiculture, crop protection

Introduction

Across the world, agriculture is more than just a way to produce food it's the foundation of life and livelihoods, especially in developing countries. In many rural areas, it's women who are at the heart of this foundation. Whether it's planting crops, managing livestock, processing food, or selling produce at local markets, women do it all. In fact, according to the Food and Agriculture Organization (FAO, 2023), nearly 43% of the agricultural labor force in developing nations is made up of women. Yet, despite their hard work and vital contributions, women often face a tough reality: limited access to land, credit, technical training, and modern farming tools. These barriers not only hold them back but also restrict the potential of rural development as a whole.

In India, agriculture remains a major source of employment, with nearly 45 per cent of the workforce engaged in the sector. Women form the backbone of agricultural and allied activities, contributing over 60 per cent of the labor. Yet their work often goes unrecognized and unsupported. To address this gap, the Indian government has rolled out several initiatives like the National Rural Livelihood Mission (NRLM), the Mahila Kisan Sashaktikaran Pariyojana (MKSP), and programs under the Indian Council of Agricultural Research (ICAR). These aim to provide women farmers with the technical skills, entrepreneurial know-how, and tools they need to succeed.

Objectives of the Research study

1. To find out the extent of adoption of apiculture and crop protection technologies by the farm women as a result of training imparted through KVK.
2. To find out the constraints faced by farm women with respect to training programme and suggestions thereof.

Methodology

The present study was conducted in Satara district of Maharashtra to assess the impact of Krishi Vigyan Kendra (KVK), Borgaon, on farm women. An ex-post facto research design was adopted for the study. A total of 150 farm women who had undergone training within the last five years were selected through purposive sampling from 15 villages across Satara, Jaoli, and Wai tehsils. The study focused on two major training areas conducted by KVK: apiculture and crop protection. A structured and pre-tested interview schedule was used for data collection.

The 15 adoption statements were prepared for each training. Responses were categorized as complete adoption, partial adoption, and no adoption with scores of 2, 1, and 0 respectively. Frequencies were multiplied by their scores, summed to get the obtained score, and converted to percentage using:

Adoption (%) = (Obtained Adoption Score / Obtainable Score) × 100

Percentages were computed for both before and after training, and the increase in adoption was derived by subtracting the before training percentage from the after-training percentage. Constraints encountered by the respondents and their suggestions for improvement of KVK training programmes were collected through a structured schedule. The responses were analyzed by calculating frequency and percentage, and both constraints and suggestions were ranked according to the magnitude of responses.

Results and Discussion

Extent of Adoption by Respondents in Apiculture before and after Training

The data in the below table 1 highlights the change in adoption of beekeeping practices after KVK training. Before training, adoption was low: 13.67 percent maintained colonies using lifecycle knowledge, 6.33 percent correctly set up hives, 11.33 percent managed bee diseases, and 15.00 percent used protective gear. After training, adoption increased sharply: 91.33 percent fed bees in the off-season, 87.67 percent selected suitable species, 86.33 percent practiced hygienic honey processing and proper packaging, 80.33 percent handled bees safely, 79.33 percent managed bee enemies, 68.67 percent multiplied colonies, and 82.67 percent marketed honey and by-products. Increases ranged from 36.67 percent to over 80 percent, except for availing government schemes 44.00 percent. Training significantly improved skills, confidence, and adoption of scientific beekeeping.

Extent of Adoption by Respondents in Crop Protection before and after Training

The analysis in table 2 highlights the substantial improvement in crop protection practices adopted by farm women following the training imparted by the KVK.

Adoption of scientific crop protection practices rose sharply after KVK training. Pest identification and control increased from 12.67 percent to 79.67 percent, disease detection from 10.67 percent to 78.33 percent, and climate-based pest planning from 14.33 percent to 72.67 percent. Biological control rose from 9.33 percent to 75.33 percent, safe pesticide handling from 11.33 percent to 81.67 percent, and botanical pesticide use from 6.33 percent to 72.00 percent. Key methods like correct dosage, crop rotation, and resistant varieties exceeded 70.00 percent adoption post-training. Government pest/weather service use rose from 3.67 percent to 66.33 percent, and Integrated Pest Management from 4.67 percent to 69.33 percent. PPE kit use reached 56.00 percent, and beneficial insect preservation 79.67 percent. The largest gain was in availing government crop protection support, up from 9.33 percent to 84.33 percent.

The crop protection training conducted by KVK significantly enhanced scientific awareness, safety, and sustainable practice adoption among farm women. These improvements are crucial for both crop health and human safety.

Table 1: Extent of Adoption by Respondents in Apiculture before and after Training

Sr.no	Statement	Before Training (n=150)				After Training (n=150)				
		Complete	Partial	No	%	Complete	Partial	No	%	Increase in Adoption%
1	Are you maintaining bee colonies based on lifecycle knowledge?	08	25	117	13.67	38	112	0	62.67	49.00
2	Have you selected suitable honeybee species for your area?	06	22	122	11.33	113	37	0	87.67	76.34
3	Have you set up and maintained beehives correctly?	03	13	134	06.33	99	51	0	83.00	76.67
4	Is the apiary located at a suitable site?	03	17	130	07.67	73	77	0	74.33	66.66
5	Are you using standard beekeeping equipment?	03	06	141	04.00	49	71	30	56.33	52.33
6	Have you practiced colony division and multiplication?	0	06	144	02.00	56	94	0	68.67	66.67
7	Do you feed bees during the off-season?	06	18	126	10.00	124	26	0	91.33	81.33
8	Are you managing bee enemies (mites, ants, etc.) effectively?	08	23	119	13.00	88	62	0	79.33	66.33
9	Do you identify and treat bee diseases?	07	20	123	11.33	73	77	0	74.33	63.00
10	Are bees handled safely using protective measures?	10	25	115	15.00	91	59	0	80.33	65.33
11	Have you extracted honey using proper techniques?	07	22	121	12.00	62	88	0	70.67	58.67
12	Is honey filtered and processed hygienically?	06	05	139	05.67	109	41	0	86.33	80.66
13	Is honey stored and packaged correctly?	06	05	139	05.67	109	41	0	86.33	80.66
14	Are you selling honey and by-products in the market?	06	24	120	12.00	98	52	0	82.67	70.67
15	Have you availed any govt. schemes or support for beekeeping?	05	18	127	09.33	48	36	66	44.00	36.67

Table 2: Extent of Adoption by Respondents in Crop Protection before and after Training

Sr.no	Statement	Before Training (n=150)				After Training (n=150)				
		Complete	Partial	No	%	Complete	Partial	No	%	Increase in Adoption%
1	Are you able to identify pests and apply control measures?	05	28	117	12.67	93	53	04	79.67	67.00
2	Do you detect diseases and take timely action?	04	24	122	10.67	88	59	03	78.33	67.66
3	Are you using weather updates for pest control planning?	08	27	115	14.33	82	54	14	72.67	58.34
4	Have you implemented natural predators or trap crops?	05	18	127	09.33	88	50	12	75.33	66.00
5	Are pesticides stored and handled safely?	06	22	122	11.33	98	49	03	81.67	70.34
6	Are you using botanical/organic pesticides effectively?	03	13	134	06.33	83	50	17	72.00	65.67
7	Is the dosage and timing of pesticide use accurate?	07	09	124	11.00	88	54	08	76.67	65.67
8	Are you aware that KVKs or agriculture departments provide pest	0	11	139	03.67	71	57	22	66.33	62.66

	and weather forecast messages?									
9	Is IPM (Integrated Pest Management) being practiced?	03	08	139	04.67	77	54	19	69.33	64.66
10	Are pheromone/light traps used in your fields?	04	12	134	06.67	46	93	11	61.67	55.00
11	Are you using resistant crop varieties or rotating crops?	04	19	127	09.00	80	64	06	74.67	65.67
12	Are PPE kits used during pesticide spraying?	06	22	122	11.33	31	106	13	56.00	44.67
13	Do you apply soil health practices to manage pests?	06	21	123	11.00	82	60	08	74.67	63.67
14	Can you identify and preserve beneficial insects?	07	18	125	10.67	93	53	04	79.67	69.00
15	Have you accessed government support for crop protection?	04	20	126	09.33	103	47	0	84.33	75.00

Table 3: Distribution of the respondents based on constraints faced in training programmes

Sr. No	Constraints	Frequency	Percentage	Rank
1	Farm women are burdened with household responsibilities, limiting time for attending training sessions.	120	80.00	I
2	Inflexible training timings; the sessions clash with household or farm duties.	110	73.33	II
3	Inability to invest in tools, inputs, or equipment needed for crop-protection.	98	65.33	III
4	Family or community did not support participation.	90	60.00	IV
5	Lack of regular visits or assistance after training affects adoption of practices.	85	56.67	V

The data in table 3 reveals that, major constraints reported by farm women in adopting technologies after KVK training are shown in the table. The most common challenge, cited by 80.00 per cent, was the burden of household responsibilities, which limited their ability to attend sessions. This was followed by inflexible training timings 73.33 per cent, as many programmes clashed with household or farm duties. Financial limitations, such as the inability to invest in necessary tools, inputs, or equipment for crop protection, were reported by 65.33 per cent of respondents. A lack of family or community support was identified by 60.00 per cent, while 56.67 per cent felt the absence of regular follow-up visits or assistance after training hindered the adoption of practices.

Suggestions for improvement

Table 4: Distribution of respondents based on suggestions to improve training programmes

Sr. No	Suggestions	Frequency	Percentage	Rank
1	On-site or village-level training should be organized to avoid travel-related challenges.	125	83.33	I
2	Trainings should be held during non-peak agricultural periods or convenient times (e.g., afternoons).	118	78.67	II
3	Ensure post-training follow-up and handholding support.	110	73.33	III
4	Give starter kits for apiculture or crop protection (e.g., bee boxes, safety gear).	105	70.00	IV
5	Facilitate direct market linkages for processed products to ensure fair prices	100	66.67	V

The data in the table 4 shows that, to enhance training effectiveness, respondents shared practical suggestions. The most common suggestions provided by respondents offer practical ways to enhance the effectiveness of KVK training programmes. A majority (83.33 per cent) recommended conducting on-site or village-level trainings to reduce travel-related difficulties. About 78.67 per cent suggested scheduling sessions during non-peak agricultural periods or convenient times, such as afternoons, to avoid clashes with daily duties. Post-training follow-up and handholding support were emphasized by 73.33 per cent to ensure better implementation of learned practices. Providing starter kits for apiculture or crop protection, such as bee boxes or safety gear, was suggested by 70.00 per cent to help initiate activities without delay. Additionally, 66.67 per cent stressed the need for direct market linkages for processed products to guarantee fair prices and improve sustainability.

Conclusion

The study clearly demonstrated that KVK trainings significantly enhanced the adoption of apiculture and crop protection technologies among farm women. A remarkable improvement was observed in scientific beekeeping practices, honey processing, and marketing, as well as in crop protection measures such as pest and disease management, safe pesticide handling, and Integrated Pest Management. The findings highlight that training programmes not only improved technical knowledge and skills but also empowered farm women to adopt sustainable practices for better productivity and income. However, constraints like household responsibilities, inflexible training timings, financial limitations, and lack of family support limited wider participation and adoption. Practical suggestions such as organizing on-site training, scheduling sessions at convenient times, ensuring post-training support, providing starter kits, and establishing direct market linkages were emphasized by respondents. Overall, the results underline the vital role of KVK in promoting skill development, self-reliance, and socio-economic empowerment of farm women through need-based and accessible training programmes.

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