



# Knowledge Gained during Bee Keeping Training and its Impact on Farmers of Chamba district of Himachal Pradesh

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## ABSTRACT

The present study was conducted during 2018 and 2019 at Krishi Vigyan Kendra, Chamba with the objective to study the impact of trainings on the gain in knowledge of the farmers. Male participants outnumbered the female participants as out of 2,441 trainees only 775 were women and others were men (1,666). About half of the trainees (48.30%) belonged to younger age group (18-35 yr) including both male (215) and females (27). Least number of respondents belonged to the age group above 50 yr. The data regarding their education levels revealed that majority of the participants were up to senior secondary (61.08%) followed by graduates (21.36%). Majority of the participants were farmers (72.65%) either small, marginal or large farmers and most satisfied that the training was need based and helped to sort out the problems and questions which were in their minds before the start of the training. Majority of the participants were most satisfied with the practical (92.87%) and exposure visits to the apiary (84.26%). The data revealed that 70.26per cent trainees gained knowledge on the importance of bees for pollination of crops and conservation of biodiversity and hence showed their eagerness to adopt bee keeping for pollination services whereas 28.14per cent were interested in honey production and its sale. The gain in knowledge ranged between 42.12 to 72.46 per cent .

**Key Words:** Beekeeping, Chamba, Gain in knowledge, Impact, Perception, Response, Trainings.

## INTRODUCTION

India is vast country where more than 80 per cent of the population lives in rural areas. Economy of its people largely depends upon agriculture for livelihood (Lal *et al*, 2012). A beekeeping enterprise exhibits a great potential to uplift the economy of Indian farmers in view of depleting natural resources and profitability in traditional agriculture (Singh *et al*, 2010). A beekeeper keeps bees in order to collect honey and beeswax, to pollinate crops, or to produce bees for sale to other beekeepers (Qaiser *et al*, 2013). Singh (2000) and Monga and Manocha (2011) reported that the honey bees increased the agricultural productivity to the tune of 30- 80 per cent annually through cross pollination. The distinctive feature of beekeeping is the small capital investment required as compared to other industries. Furthermore, beekeeping does not need raw material in usual sense as nature provides the

same in the form of nectar and pollen (Sharma and Dhaliwal, 2014).

Beekeeping has predominant role to play in pollination, honey and wax production. Pollination benefits can be evaluated at higher level as compared to by products produced by the bees (Lal *et al*, 2012). However, the future of bees and pollination is severely threatened. Changes in land use, pesticide applications, agricultural monocultures and the spread of non-native species and pathogens all contribute to this threat, which is likely to be exacerbated by climate change (Settele *et al*, 2016). In order to meet food security challenges for a growing global population, it will be necessary to safeguard and sustainably manage pollination services against the backdrop of increasing climate unpredictability and a changing world. Krishi Vigyan Kendra (KVKs) was introduced by Indian council of Agricultural Research to ameliorate the

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poor socio-economic conditions of the farmers by raising the level of farm productivity, income and employment with application of agricultural innovation generated at research station (Dubey *et al*, 2008 and Barjesh and Ajay, 2012). Sharma *et al* (2018) reported that integration of gobhi sarson with bee keeping proved to be more economical than the cultivation of sole wheat crop. Therefore, farmers must replace some area from wheat crop and put under gobhi sarson alongwith. Further, Singh and Sharma (2017) inferred that majority of the farmers enquired about management of wax moth and varroa mite which revealed that these were the most important pests of honey bees and their products and cause serious losses in commercial beekeeping. In this direction, KVK, Chamba conducted training programmes on beekeeping for rural people to uplift their socio-economic status.

## MATERIALS AND METHODS

The study was conducted in Chamba district and the selection of the trainees was done after taking into consideration their interest in beekeeping vocation. A total of 2,441 respondents (501 on campus and 1,940 off campus trainees) attended the training programme. The data has been collected from the trainees participated in on-campus trainings only (22 trainings, n= 501). Each training program was concluded with the evaluation test of the participants. The data collected on age, sex, cast, education level, occupation, landholding etc. was collected and presented in terms of its number and percentage. To assess the impact of the on-campus trainings, pre and post training evaluation were conducted. Before the training the participants were asked about the reasons to attend the training covering various aspects like whether they were interested in conserving the local bees; whether having concern about the reduced pollination or whether they are interested in adopting beekeeping as entrepreneur. Similarly data were collected on various aspects of impact of training on the participants and evaluated and tabulated. The interested farmers were also distributed honey

bee colonies, handling tools and equipments free of cost, Sponsored by NABARD, Chamba, for the development of the beekeeping and creating awareness among them about importance of honey bees for the pollination in fruit crops especially apple, a highly cross pollinated fruit crop. For the conservation of indigenous bees, mud hives were also constructed free of cost.

## RESULTS AND DISCUSSION

The results of the beekeeping trainings conducted at KVK, Chamba were presented in Tables 1 to 6 and Figure 1. It was evident that off-campus trainings outnumbered on campus trainings in both number of trainings conducted and also in number of trainees as 22 on campus trainings with 501 participants were conducted in both years as compared to 43 off-campus trainings with 1,940 participants. In total, 65 trainings were conducted in these two years having participation of 2,441 participants. It can be seen from Figure 1 that male participants outnumbered the female participants as out of 2,441 trainees only 775 were women and others were men (1,666). The probable reason for low number of women participants could be attributed to their engagement in domestic works, thus could not afford to attend on campus trainings and social limitations/ barriers for rural women to venture out for attending trainings.

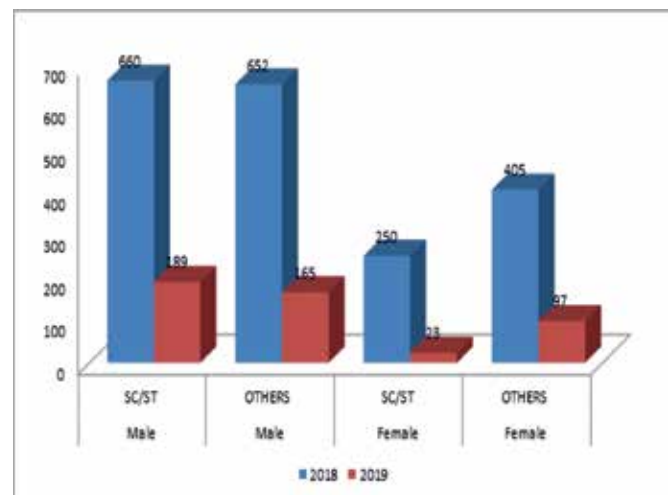


Figure 1. Number of male and female participants attending the beekeeping trainings

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**Table 1. Beekeeping trainings conducted during different years.**

Year	Number of off-campus trainings	Number of participants	Number of on-campus trainings	Number of participants
2018	39	1,797	6	710
2019	4	143	16	331
Total	43	1,940	22	501

The data (Table 2) revealed that about half of the trainees (48.30 %) belonged to younger age group (18-35 yr) including both male (215) and females (27). Least number of respondents belonged to the age group above 50 yr meaning thereby that the older people did not evince much response in this entrepreneur. These results were in line with the findings of Lal *et al* (2012), Verma *et al* (2018) and Bhupender and Singh (2019), which revealed the active participation of younger groups as

compared to the age group above 50yr. Information with respect to caste showed that there was active participation of all castes. The data regarding their education levels reveals that majority of the participants were up to senior secondary (61.08 %) followed by graduates (21.36 %). There was least participation from participants who were post-graduates (3.39%). Finally, regarding occupation of the participants, data highlights that majority of the participants were farmers (72.65 %) either

**Table 2. Response of the trainees on the basis of age, caste, education, and occupation (n=501)**

Sr. No.	Particular	Male	Female	Total (M + F)
		Percentage	Percentage	Percentage
1.	<b>Age</b>			
	Young (18-35 yr)	42.91	5.39	48.30
	Middle (36-50yr)	35.53	9.18	44.71
	Old (> 50yr)	5.39	1.60	6.99
2.	<b>Caste</b>			0.00
	Schedule Cast	23.35	4.79	28.14
	Schedule tribe	24.75	3.79	28.54
	OBC	3.59	1.40	4.99
	General	32.14	6.19	38.32
3.	<b>Education</b>			0.00
	Illiterate	8.38	5.79	14.17
	Upto senior secondary	51.30	9.78	61.08
	Graduate	20.96	0.40	21.36
	Post Graduate	3.19	0.20	3.39
4.	<b>Occupation</b>			0.00
	Government Service	3.59	-	3.59
	Farmers	72.65	-	72.65
	Housewives	-	16.17	16.17
	Others (Students, retiree, un-employed)	7.58	-	7.58

**Table 3. Reasons for participation in on-campus Beekeeping trainings (n=501).**

Sr. No.	Reason	Number of trainee	Percentage
1.	To conserve indigenous bees	107	21.36
2.	Winter management of indigenous bees	98	19.56
3.	To improve pollination in fruits	204	40.72
4.	To adopt beekeeping as entrepreneur	69	13.77
5.	To improve existing skills and knowledge	12	2.40
6.	To know seasonal management, migration cycle and insect and disease management	7	1.40
7.	Honey extraction	4	0.80

small, marginal or large farmers (Table 2). These results were in support to the earlier works of Mujini *et al* (2012) and Lal *et al* (2012). The results thus revealed that the rural youth was taking keen interest in beekeeping as entrepreneur. The active participation of literate youth is excellent for the promotion and adoption of beekeeping vocation.

The data (Table 3) regarding reasons of the participations in on-campus training ion beekeeping reveals that 40.72 per cent respondents joined the training to improve pollination of fruit crops especially apple in Chamba district. Apple is main cash crop of this district and orchardists/ farmers are concerned about low fruit set and less production. The other major reason for joining the trainings is to conserve and get acquainted with the indigenous bee, *A. cerana* in this district. Participants were more concerned about the conservation of indigenous bees

(21.36 %) and their winter managements like sugar feeding and packing of their traditional bee hives (19.56%). Only 13.77 per cent participants were interested to adopt beekeeping as an occupation.

After conducting trainings, the impact of the raining was analyzed by asking questions on the following points as presented in Table 4. Most of the participants (86.55 %) were most satisfied that the training was need based and helped to sort out the problems and questions which were in their minds before the start of the training. Majority of the participants were most satisfied with the practical (92.87%) and exposure visits to the apiary (84.26%). The participant's response to theoretical potion was low as 31.46 per cent participants were only satisfied. Efforts were made for the handling of honey bees by each participant during exposure visits and practical session so that they may be

**Table 4. Impact of on-campus Beekeeping trainings.**

Sr. No.	Aspect of training	Most satisfied (per cent)	Satisfied (per cent)	Not Satisfied (per cent)
1.	Need Based training	86.55	13.45	-
2.	Theoretical part of training	68.54	31.46	-
3.	Practical part of training	92.87	7.13	-
4.	Exposure visit to apiary	84.26	15.74	-
5.	Training content	Excellent 2.46	Very Good 85.40	Good 12.14
6.	Rating of training	Excellent 86.48	Very Good 12.45	Good 1.07

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**Table 5. Perception of trainees regarding importance of adopting beekeeping entrepreneur.**

Sr. No.	Particular	Perception (per cent)
1.	Importance of honey bees in Pollination	70.26
2.	Honey production	28.14
3.	Bee products	1.60

comfortable with the handling of bees and should not fear of the bee stings while handling bees in future.

It was evident (Table 5) that 70.26 per cent trainees gained knowledge on the importance of bees for pollination of crops and conservation of biodiversity and hence showed their eagerness to adopt bee keeping for pollination services whereas 28.14 per cent participants were interested in honey production and its sale. Only 1.60 per cent participants were interested in other bee products like wax, pollen, venom, propolis etc. The results were in line with the findings of Lal *et al* (2012).

The bee keeping trainings proved effective in increasing the knowledge of the participants. It was evident (Table 6) that the pre evaluation data ranged between 13.57 per cent for winter management of indigenous bees to 48.10 per cent for indiscriminate use of insecticides and its effect on honey bees. The knowledge regarding insects

and disease and their management was also very low (14.77%). The gain in knowledge ranged between 42.12 to 72.46 per cent. Post-evaluation data reveals that 95.41 per cent participants came to know about the importance of bees in pollination of crops and maintain biodiversity followed by 93.01 per cent participants who gained knowledge about general beekeeping aspects. Increase in knowledge in honey extraction and its processing was 79.44 per cent. The increase in gain in knowledge of the participants may be contributed to the reason that most of the participants were educated and thus they showed keen interest during training program. These results were in accordance to earlier works of Kaur (2016), Dalmia and Kumar (2018) and Barjesh and Singh (2019).

### CONCLUSION

It was evident that the KVK has made a positive contribution and significant changes in the knowledge gained by the participants. This will help

**Table 6. Knowledge gained through on-campus bee keeping trainings.**

Sr. No.	Particular	Pre evaluation (per cent)	Post evaluation (per cent)	Gain in knowledge (per cent)
1.	General information on beekeeping	25.55	93.01	67.47
2.	Bee stings and its importance	16.97	89.42	72.46
3.	Winter management of indigenous bees	13.57	81.24	67.66
4.	Conservation of indigenous bees	24.95	91.42	66.47
5.	Migration cycles and Honey bee flora	31.14	91.82	60.68
6.	Insects, diseases and their management	14.77	76.85	62.08
7.	Role of bees in Pollination	24.15	95.41	71.26
8.	Bee products	17.76	78.84	61.08
9.	Honey extraction and its processing	19.56	79.44	59.88
10.	Indiscriminate use of insecticides during apple flowering and its effect on bees	48.10	90.22	42.12

in the development of beekeeping entrepreneurship as well as proved effective in the conservation of indigenous bees which are otherwise under threat. Some of the participants have adopted beekeeping as entrepreneur with *A. mellifera* and are earning above Rs. 5 lakh per annum with minimum of 100 bee hives. Thus beekeeping is useful in generating employment for rural-unemployed youth. Scientific bee keeping with indigenous bee *A. cerana* is being practiced in these areas with improved mud hives and movable frames. Participants are also keen to grow mustard during winter as bee flora for honey bees. The pesticides use was also decreased in these areas especially in apple during flowering period, hence helpful in conservation of bees. Besides this, orchardists are also hiring bee boxes during flowering period of apple for improved pollination and increased fruit set. Honey collected by the local indigenous beekeepers is sold in the local markets.

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