

## **Knowledge and Adoption Level of Improved Technology among Rural Women owing to Extension Programmes**

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### **Abstract**

The study has assessed the impact of extension programmes on the adoption level of improved technologies in agriculture and animal husbandry in the Kullu district of Himachal Pradesh for the agricultural year 2002-03. A significant difference has been observed in the knowledge and adoption levels among SHG-beneficiary and non-beneficiary groups. The study has revealed that the importance or ranking attached to various agricultural practices has been almost the same by both the groups, though with a significant gap in the extent of their adoption. In cereals, timely harvesting, followed by seed selection and seed treatment are the most adopted practices by beneficiary group while seed selection, followed by timely harvesting and timely sowing are the preferred practices by non-beneficiaries. Chemical weed control, pre-sowing soil treatment, sowing in lines at proper spacing have been the most ignored practices, although the level of their adoption has been found higher among beneficiaries than non-beneficiaries. In the case of vegetables, use of HYVs and sowing in lines are commonly practised by both the groups. Seed treatment, soil treatment and proper spacing are the practices where maximum chasm has been observed among the two groups. Similarly, in the case of animal husbandry, a significant gap in the adoption level of various practices has been observed among both the groups. The study has inferred that the extension programmes organized by various extension agencies for SHGs constitute appropriate educational tools for the transfer of technology and raising the socio-economic status of rural people.

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## **Introduction**

It is said that ‘the fundamental problem of agricultural growth is of education’ (Wharton, 1965). There is a need of education for the rural development, in general, and agricultural development, in particular. In this context, the education has two components: a) research in agriculture to develop newer technologies and new inputs of production, and b) educating farmers to improve their skills, replace their traditional attitudes with modern ones and improve their innovative and allocative abilities, etc. The farmers’ education and extension contacts enable them to acquire, access and avail new information, and evaluate benefits of alternative sources of economically useful information besides higher allocative and productive efficiencies. Further, the impact of education and extension is higher under the low technology than higher technology conditions, and this impact is not instantaneous; it is sequential.

The research systems have though generated highly useful results for synthesis of appropriate technologies for farmers, most of these have been either not adopted or adopted partially by the farmers. Since, adoption is a decision to make full use of a new technique as the best alternative available, it is affected by many factors like farming situation, resource availability, needs and aspirations of the farmers having different socio-economic and cultural backgrounds, etc. Further, inadequate extension services, high illiteracy among farmers, socio-cultural background, low paying-capacity, lack of skill, etc. may be the barriers for non-adoption or low adoption of various improved technologies.

The rural women play a pivotal role in agriculture in India. Besides sharing abundant responsibilities in maintaining the household, they attend to various farm-operations like seed bed preparation, levelling, clod breaking, sowing, transplanting, earthing-up, weeding, fertilizer application, watering, harvesting, threshing, winnowing, packaging and storage, attending to cattle, fodder collection, milking, etc. They constitute about 55 per cent to the total agricultural labour and 60 per cent of the labour engaged in livestock. Therefore, educating rural women about modern technologies in agriculture, animal husbandry and allied fields can go a long way in enhancing their knowledge and skill and ultimately, the productivity of the system and farm incomes. In the present study, the impact of various extension programmes on the adoption pattern of improved practices in agriculture and animal husbandry has been assessed. Precisely, the objectives of the study were: (i) to assess the level of knowledge of rural women subsequent to extension programmes, and (ii) to determine the extent of adoption of improved practices in agriculture and animal husbandry, among beneficiary and non-beneficiary groups.

## Methodology

The study was conducted in the Kullu district of Himachal Pradesh. Out of five development blocks of the district, three namely, Kullu, Nagar and Banjar were selected randomly. As most of the extension programs/activities are being extended to rural women through Self-Help Groups (SHGs), the sample of rural women was selected from the women SHGs formed by the State Department of Agriculture. There were some other government agencies like District Programme Office, Block Development Office, Child Development Project Office, Krishi Vigyan Kendra, Bajaura, and non-governmental agencies like Christians' Auxillary for Social Advancement (CASA), Society for Advancement of Village Economy (SAVE), World Vision, Jagriti Mahila Manch, etc. which were engaged in forming the SHGs for providing extension services to the rural folk. These SHGs worked as credit societies as well as provided a convenient and sound platform for different developmental and extension agencies to launch their programmes effectively. A list of villages having SHGs was prepared for all the three selected blocks. Five SHGs were selected randomly in each block. Ten beneficiaries in each SHG were again selected randomly. In order to compare the knowledge and adoption level of SHG beneficiaries, ten non-beneficiary rural women were also selected from the same village so that the other factors influencing knowledge and adoption level remain the same. Thus, in all 150 beneficiary and 150 non-beneficiary rural women were selected for the sample. Data for the agricultural year 2002-03 were collected through personal interview, using a well-designed questionnaire. Simple tabular analysis using ranks and percentages was conducted. Rank order correlation co-efficients were worked out to compare the adoption level among beneficiaries and non-beneficiaries, using Eq. (1):

$$\text{Rank order correlation co-efficient } (r_s) = 1 - \frac{6 \sum d^2}{n^3 - n}$$

where,  $d$  = Difference in ranks assigned to a particular operation in two different situations, and  $n$  = Number of operations under consideration/highest rank.

## Results and Discussion

### (A) Knowledge-level of Rural Women Regarding Improved Techniques

To perceive an overall view of the knowledge level of respondents, a questionnaire was developed regarding the scientific/improved techniques in agriculture and animal husbandry. On the basis of the mean score obtained by the respondents in this questionnaire, they were grouped into three

categories: (i) below average knowledge, (ii) average knowledge, and (iii) above average knowledge. The distribution of respondents under these three knowledge groups has been summarized in Table 1.

A perusal of Table 1 indicates that a majority (68.67%) of the women belonging to self-help groups (SHGs) were in 'average knowledge', about 10 per cent were in 'above average knowledge', and a double of it were in 'below average knowledge' groups. Among the non-SHG beneficiary group, on the contrary, 58 per cent of the respondents were in the 'below average' and 42 per cent in the 'average knowledge' categories; no one qualified for 'above average' group. This difference in the knowledge level might be attributed to various extension programmes organized for SHGs, by the farm agencies, in collaboration with institutions like CSKHPKV, Regional Research Station and KVK, Bajaura, Regional Horticultural Research Station, Bajaura, Departments of Horticulture and Animal Husbandry, Kullu, District Youth and Social Organization, Kullu and Department of Health etc. These extension programmes included various short-duration and long-duration training programmes on agriculture and allied fields, organized in the villages as well as at the campuses of these centres. The participating members were provided a daily allowance of up to Rs 50 alongwith some inputs, viz. seeds, agricultural implements, fertilizers, pesticides, seed bin, animal feed, etc. as incentive to attend the training programmes. The members were also facilitated by the parent agencies to participate in the programmes like Farmers' Day, Field Day, Farmers' Fair, field demonstrations, awareness programmes, group discussions, exposure visits and various state, national and international exhibitions. All these certainly enhanced their knowledge about the improved technologies available in agriculture and allied fields and provided encouragement and guidance to adopt these technologies.

However, a few non-beneficiary respondents accepted that they gained knowledge and skill about improved techniques from their friends, neighbours and relatives, who were SHG members.

**Table 1. Distribution of respondents according to their knowledge level**

Sl No.	Level of knowledge	Mean score range	SHG-beneficiaries		Non-beneficiaries	
			Frequency	Percentage	Frequency	Percentage
1.	Below average	< 12	31	20.67	74	58
2.	Average	12 < 24	103	68.67	76	42
3.	Above average	24-34	16	10.66	00.00	00.00
4.	Overall		150	100.00	150	100.00

### **(B) Extent of Adoption of Improved Package of Practices in Agriculture**

With the transformation of agriculture from cereals-dominated agriculture to cashcrops-dominated agriculture, it was observed that increasing number of farmers were replacing the cereals with vegetable crops. A majority of the farmers took vegetables as commercial crops and were more cautious for proper management of vegetables than cereals. Hence, the extent of adoption of improved techniques varied for cereals and vegetables. It was studied separately and has been presented in Table 2.

In the case of cereal crops, the timely harvesting, proper seed selection (i.e. the selection of bold, disease-free and pure seed), seed treatment and timely sowing were the practices with highest mean per cent score (MPS) followed by the beneficiary group. Among the non-beneficiary group, proper seed selection ranked first with MPS 75.33, followed by timely harvesting (MPS 48), and proper time and method of fertilizer application (MPS 44). Chemical weed control, irrigation and proper spacing were the least adopted practices among both the groups. A considerable difference in the magnitude of adoption, among two groups, was observed for practices like seed treatment, pre-sowing soil treatment, use of HYVs and balanced use of fertilizers.

It was also observed that line sowing of vegetables was completely adopted by both the categories of farm. The use of HYVs was adopted by a majority of the farmers. Local varieties of spinach, coriander, chillies, etc. were used for specific preference. Proper seed selection, timely sowing and seed treatment were ranked third, fourth and fifth among beneficiaries, while timely harvesting, timely sowing and proper irrigation management were attached the corresponding ranks by the non-beneficiary group. It can be emphasized that the operations which were female-dominated and where women could directly implement their practical knowledge, showed immediate and comparatively higher magnitude of adoption. Proper plant protection, control of rats and rodents and pre-sowing soil treatment in vegetables were accorded the least importance even by the beneficiary group. This might be attributed to the fact that these operations were not in the domain of female workers. However, MPS for this group was considerably higher than that for non-beneficiary group. Highest gap in adoption level among two groups was observed for seed treatment, soil treatment and proper spacing. According to the study conducted by Podikunju *et al.* (2003), in the Ajmer district of Rajasthan, 82.50 per cent and 97.50 per cent of the beneficiaries of IVLP had above average knowledge regarding seed rate and balanced use of nutrients in groundnut against 12.50 per cent and 5 per cent in the non-beneficiaries, respectively. Another study

Table 2. Extent of adoption of improved package of practices in agriculture

Sl No.	Improved practices	Cereal crops				Vegetable crops			
		Beneficiaries		Non-beneficiaries		Beneficiaries		Non-beneficiaries	
		MPS	Rank	MPS	Rank	MPS	Rank	MPS	Rank
1.	Use of HYVs	58.00	7	26.00	8	98.67	2	97.33	2
2.	Proper seed selection	90.00	2	75.33	1	97.33	3	68.67	6
3.	Seed treatment	86.00	3	28.00	7	92.00	5	38.00	10
4.	Pre-sowing soil treatment	40.00	10	-	15	44.00	13	5.33	17
5.	Timely sowing	78.67	4	48.00	3	94.00	4	82.00	4
6.	Line sowing	29.33	12	8.00	12	100.00	1	100.00	1
7.	Proper spacing	20.00	13	4.00	14	54.00	10	20.00	12
8.	Recommended seed rate	56.00	8	30.00	6	52.00	11	40.00	9
9.	Fertilizer application								
	(i) Balanced dose	45.33	9	12.00	11	46.00	12	24.00	11
	(ii) Proper time and method	70.67	5	44.00	4	80.00	8	64.00	7
10.	Chemical weed control	5.33	15	-	15	-	-	-	-
11.	Proper irrigation management	16.00	14	7.33	13	89.33	7	72.00	5
12.	Plant protection								
	(i) Identification of disease or insect								
	(ii) Use of appropriate chemicals	-	-	-	-	25.33	17	6.00	16
	(iii) Proper time and method	-	-	-	-	42.00	14	18.00	13
13.	(i) Timely harvesting	91.33	1	74.00	2	90.00	6	86.00	3
	(ii) Proper storage	68.00	6	40.00	5	-	-	-	-
	(iii) Use of chemicals	56.00	8	24.00	9	-	-	-	-
14.	Control of rats & rodents	34.00	11	14.00	10	28.00	16	11.33	15
15.	Proper marketing	-	-	-	-	64.00	9	49.67	8
16.	$F_s$			0.91**				0.90**	

MPS = Mean per cent score; \*\*Denotes significance at 1% level

by Dattari (1980) had also reported that there was a vast difference in the extent of knowledge of contact and non-contact farmers under T and V system.

A study conducted by Goswamy *et al.* (2003) in Rajasthan on the impact of T.V. programs on rural women, has revealed that the adoption level for the practices like timely harvesting and storage, spacing and use of weedicides was high for the programme viewers than non-viewers. Chundi and Srivastava (1999) have also reported similar results. A study by Duriasamy (1992) had shown that extension had a positive and significant effect on agricultural production. The study had revealed that the value of output increased by 9-10 per cent if the farmers contacted the extension service for guidance, whereas Feder *et al.* (1987) had found this effect up to 15 per cent. Similarly, Girija (2002) has emphasized that the SHGs and similar farmers' organizations, when properly guided, empowered the members to direct their individual and cooperative powers towards the use of local resources and outside facilities meant for their upliftment. Further, in a study conducted in the Matara district of Sri Lanka, Wijeratne and Abeydeera (1994) have found that there was a significant knowledge gap about the use of agrochemicals between the village extension workers and rice farmers which could be bridged through intensive training programmes and effective extension techniques.

It is also pertinent to mention that the adoption is affected by the access to support mechanisms, viz. inputs, technical know-how, credit and market, etc. It has been observed that the parent agencies provide all types of support services to SHG members. For instance, the SHGs under study were trained for vermicomposting and bee-keeping, and were provided with earthworms, bee colonies, technical know-how as well as the market knowledge for the sale of compost, honey and renting of colonies for pollination purpose. Moreover, when the farmers were organized on a common platform, they could easily arrange various inputs, technical and financial help and other support services like transportation, storage and marketing of produce. Thus, the farmers' organizations were found to be very effective in enhancing bargaining power in the market and exerting pressure on prices and market supplies.

### **(C) Extent of Adoption of Improved Package of Practices in Animal Husbandry**

The adoption pattern for various improved practices in animal husbandry, presented in Table 3, reveals that the practice of artificial insemination ranked

**Table 3. Adoption level of improved practices in animal husbandry**

Sl No.	Improved practices	Beneficiaries		Non-beneficiaries	
		MPS	Rank	MPS	Rank
1.	Improved breeds	80.00	2	42.00	4
2.	Balanced feeding	65.33	3	25.33	6
3.	Castration	46.00	6	18.67	7
4.	Artificial insemination	90.67	1	60.00	1
5.	Vaccination	42.00	7	30.67	5
6.	De-worming	39.33	8	6.00	9
7.	Improved grasses /fodder trees	58.00	5	52.00	2
8.	Proper disposal of dung	62.00	4	49.33	3
9.	Safety against internal & external parasites	37.33	9	10.00	8
10.	$r_s$			0.76**	

MPS = Mean per cent score

first in both beneficiary and non-beneficiary groups, although 40 per cent of the non-beneficiaries still practised natural insemination of animals. Improved breed (MPS 80), balanced feeding (MPS 65.33) and proper disposal of dung (MPS 62) were positioned at second, third and fourth ranks by the beneficiary group, while growing of improved grasses/ fodder trees, proper disposal of dung and improved breeds were the practices ranked correspondingly by the non-beneficiaries. Deworming and safety against internal and external parasites were the least adopted practices by both the groups. As women were directly involved in feeding of cattle, training and education of SHG members had really made a difference. Maximum adoption gap was observed in the balanced feeding, followed by improved breeds while the gap was minimum in the use of improved grasses and trees as green fodder.

The calculated values of rank order correlation coefficient ( $r_s$ ) between beneficiaries and non-beneficiaries were quite high for cereals, vegetables crops and animal husbandry which were estimated to be 0.91, 0.89 and 0.76, respectively. This indicated that almost similar ranks were assigned to various practices by beneficiaries and non-beneficiaries, inspite of a high significant difference in the magnitude of mean score. These results were in accordance with those of Goswamy *et al.* (2003), who showed that TV viewers and non-viewers attached similar importance to various practices in agriculture and animal husbandry, despite significant difference in magnitudes of their adoption.



## Conclusions

The study has clearly pointed out that there exists a significant knowledge gap regarding adoption of improved technology between SHG-beneficiary and non-beneficiary groups. Timely harvesting, followed by seed selection and seed treatment are the most adopted practices among beneficiary group, while seed selection, followed by timely harvesting and timely sowing are the preferred practices among non-beneficiary group. Chemical weed control, pre-sowing soil treatment and sowing in lines at proper spacing are the most ignored practices, although the extent of their adoption among beneficiaries has been a bit higher. In the case of vegetables, line sowing, use of HYV seeds and timely sowing are the practices with highest MPS; however, the proper plant protection has been found the most lacking factor among both the groups. Seed treatment and pre-sowing soil treatment are the practices where maximum adoption gap has been observed between the two groups. Artificial insemination among animals is practised by both the groups while the practices like improved breeds and balanced feeding have been adopted more by the beneficiary than non-beneficiary group. The overall extent of adoption in agriculture as well as animal husbandry has been found higher among SHG beneficiary than non-beneficiary group; thus, registering a significant impact of the extension and other support services provided by various extension and developmental agencies to the beneficiaries through this convenient platform.

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