ADOPTION OF POST HARVEST TECHNOLOGY OF CEREALS BY THE FARM WOMEN OF HANUMANGARH DISTRICT OF RAJASTHAN

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ABSTRACT

Post-harvest technology has become very important part of the farming now a days because this deals with final product of their labour i.e., the farm families. In India 10 to 15 per cent losses have been reported during the post harvest period and this quantity of food grains is sufficient to feed India's population for 45 days. The wheat and paddy crop were the main crops of the selected area for the study.

Key Words : Adoption, Constraints and Post-harvest technology.

INTRODUCTION

Foods grains losses occur at various stages after a crop has harvested and before the food is consumed. Losses may be reduced at any stage of post harvest system by improved harvesting, drying, processing or handling methods. The effectiveness of any action undertaken to reduce losses must be economically justifiable and also practiced with the prevailing post-harvest system.

The introduction of technologies reduces food grain losses and improves the income of farmers. They are concerned with improved handling, storage and primary processing of grains.

The existing technologies may not be compatible to the local conditions. There is also a need to locate these technological thrust areas, where refinement for suitability and adaptability by farm women is needed because it is generally observed that storage of produce is prime responsibility of farm women. Therefore, the present study entitled "Adoption of Post Harvest Technology of Cereals by Farm Women of Hanumangarh District (Rajasthan)" has been taken up with following objectives:

1. To study the level of adoption of post-harvest technology of cereals by the farm women.
2. To find out the factor associated with adoption practices of farm women.
3. To identify the constraints being faced by the farm women in adoption of post-harvest technologies of cereals.

METHODOLOGY :

The present study was conducted in purposively selected Hanumangarh district of North Rajasthan because production of major cereals crop like wheat and paddy is highest in this region. Hanumangarh district consists of three panchayat samiti. Among these Hanumangarh panchayat samiti was selected for the present investigation because it has highest production of major cereals crops wheat and paddy among three panchayat samities of identified district.

The Hanumangarh panchayat samiti consist of four tehsil. The tehsils are namely; Hanumangarh and Tibbi with highest cereal production were selected for present investigation. Four villages from each tehsils in different directions within the radius of 20 kms from the tehsil headquarters were selected. Thus total eight villages were selected.

The sample consisted of 150 respondents from these tehsils, four villages from each tehsil (total eight villages) were selected. Relevant data were collected with the help of personal interview technique. The data were analyzed by using appropriate statistical measures.

RESULTS AND DISCUSSION :

The adoption level of the respondents about post-harvest technology was measured. The respondents were categorized into three groups. These groups were formulated on the basis-calculated mean and standard deviation. The data has been presented in table 1.

Table 1. Distribution of respondents according to their overall adoption of post-harvest technology

N=150

Adoption level with mean score	n	%	Mean Score	Mean per cent score
Low (0 to 42.73)	21	14.00	37.66	25.10
Medium (42.73 to 64.85)	98	65.33	52.16	34.77
High (64.85 to 150)	31	20.66	69.87	46.58

Table 1 and fig 1 indicates that majority of the respondents 98 (65.33 per cent) were observed in the category of medium level of adoption with mean per cent score 34.77 and mean score 52.16. Whereas 31 (20.66 per cent) respondents were found in the category of high level of adoption with mean per cent score 46.58 and mean score 69.87 and only 21 (14 per cent) respondents possessed low level of adoption with mean per cent score 25.10 and mean score 37.66.

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Component wise adoption of post-harvest technology of cereals by the respondents–Component wise adoption of post-harvest technology was measured. The respondents were categorized into three group on the basis of adoption score obtained in particular component. These groups were formulated on the basis of calculated mean and standard deviation.

Threshing Component–Table 2 reveals that 104 (69.33 per cent) respondents were observed in the category of medium level of adoption with mean score 12.69 followed by 24 (16 per cent) respondents in the low level of adoption with mean score 8.08 and only 22 (14.67 per cent) respondents possessed high level of adoption about threshing component of post-harvest technology with mean score of 18.09

Table 2. Adoption level of respondents regarding threshing component of post-harvest technology

N = 150

Adoption level with mean score	n	%	Mean Score
Low (0 to 9.47)	24	16.00	8.08
Medium (9.47 to 16.01)	104	69.33	12.69
High (16.01 to 30)	22	14.67	18.09

Winnowing Component–Table 3 depicts that more than half 97 (64.67 per cent) respondents possessed medium level of adoption with mean score 1.75 followed by 33 (22 per cent) respondents with low level of adoption and only 20 (13.33 per cent) respondents possessed high level of adoption regarding winnowing component of post-harvest technology with mean score 3.

Table 3. Adoption level of respondents regarding winnowing component of post-harvest technology

N = 150

Adoption level with mean score	n	%	Mean Score
Low (0 to 0.97)	33	22.00	0
Medium (0.97 to 2.11)	97	64.67	1.75
High (2.11 to 3)	20	13.33	3

Drying Component–Table 4 visualizes that more than half 106 (70.67 per cent) of the respondents were from medium level of adoption with mean score 6.23 followed by 27 (18 per cent) respondents who possessed low level of adoption with mean score 1.33 and only 17 (11.33 per cent) respondents had high level of adoption about drying component of post-harvest technology with mean score 9.47.

Table 4:Adoption level of respondents regarding drying component of post-harvest technology

N = 150

Adoption level with mean score	n	%	Mean Score
Low (0 to 3.18)	27	18.00	1.33
Medium (3.18 to 8.26)	106	70.67	6.23
High (8.26 to 21)	17	11.33	9.47

Storage Component–Table 5 shows that 99 (66 per cent) respondents were observed in the category of medium levels of adoption with mean score 8.47 where as 29 (19.33 per cent) respondents were in the low level of adoption with mean score 4.41 and only 22 (14.67 per cent) respondents had high level of adoption regarding storage component of post-harvest technology with mean score 14.04.

Table 5. Adoption level of respondents regarding storage component of post-harvest technology

N = 150

Adoption level with mean score	n	%	Mean Score
Low (0 to 5.34)	29	19.33	4.41
Medium (5.34 to 11.66)	99	66.00	8.47
High (11.66 to 27)	22	14.67	14.04

Use of Fumigants–Table 6 reveals that majority of the respondents 111 (74 per cent) had medium level of adoption with mean score 9.45 while 24 (16 per cent) respondents had high level of adoption with mean score 13.79 and only 15 (10 per cent) respondents were having low level adoption regarding use of fumigants with mean score 3.46.

Table 6. Adoption level of respondents regarding use of fumigants component of post-harvest technology N = 150

Adoption level with mean score	n	%	Mean Score
Low (0 to 5.91)	15	10	3.46
Medium (5.91 to 12.11)	111	74	9.45
High (12.11 to 18)	24	16	13.79

Rat Control Component: Table 7 indicate that 91 (60.67 per cent) respondents possessed medium level of adoption with mean score 4.09 followed by 36 (24 per cent) respondents with low level of adoption and only 23 (15.53 per cent) respondents were found in the category of high level of adoption with mean score 8.

Table 7. Adoption level of respondents regarding rat control component of post-harvest technology

N = 150

Adoption level with mean score	n	%	Mean Score
Low (0 to 0.95)	36	24	0
Medium (0.95 to 6.49)	91	60.67	4.09
High (6.49 to 15)	23	15.33	8

Marketing Component–Table 8 reveals that majority of the respondents were found to have medium level of adoption with mean score 12.66 followed by 25 (16.67 per cent) respondents had low level of adoption with mean score 8 and only 23 (15.53 per cent) respondents possessed high adoption regarding marketing component of post-harvest technology with mean score 17.26.

Table 8. Adoption level of respondents regarding marketing component of post-harvest technology
N = 150

Adoption level with mean score	n	%	Mean Score
Low (0 to 9.51)	25	16.67	8
Medium (9.47 to 16.01)	102	68	12.66
High (16.01 to 30)	23	15.53	17.26

Adoption of post-harvest technology by the respondents in different components–Table 9 and Fig 2 depicts that the respondents had maximum adoption regarding winnowing component ranked at first with mean per cent score 51.33 followed by use of fumigants, threshing, marketing, storage and drying with second, third, fourth, fifth and sixth ranks along with their mean per cent score 50.05, 42.48, 35.11, 31.50 and 27.23, respectively. Least adoption was reported by the respondents in rat component of post-harvest technology with mean per cent score 24.8.

Table 9. Adoption of post-harvest technology by the respondents in different components N = 150

Components	S.D.	Mean Score	Mean per cent Score	Rank
Threshing	3.27	12.74	42.48	III
Winnowing	0.57	1.54	51.33	I
Drying	2.54	5.72	27.23	VI
Storage	3.16	8.50	31.50	V
Use of Fumigants	3.10	9.01	50.05	II
Rat Control	2.77	3.72	24.8	VII
Marketing	3.13	12.64	35.11	IV

The above results are in confirmation of that of Meena (2001) where he observed that out of six aspects of post-harvest technology that is threshing, winnowing and drying, storage, use of fumigants, marketing and rat control, selected for assessing extent of adoption, maximum was reported in winnowing aspect.

Association between personal attributes and level– Table 10 indicates calculated chi-square value at 5 per cent level of significance with degree of freedom. Further it shows that family income and size of land holding were significantly associated with adoption level of the respondents whereas age, caste, type of family, education, social participation and mass media exposure were found not significantly associated with adoption level of the respondents.

Constraints in adoption of post-harvest technology: There is still wide gap between the technology generation, its diffusion and technology adoption by the people in the field of post-harvest technology.

The farmer derived actual benefit from any technology only when it is efficiently utilized by them in the local conditions. Due to number of problem that are operating, the improved technologies are not adopted. The most crucial problem of the present age is the ineffective dissemination of new technology and its utilization by the vastly scattered rural masses, especially the rag-tag strata of society, which is responsible for non-adoption of technology.

Table 10. Adoption of post-harvest technology of cereals

Factor Association	Chi-square Value
Age	0.20
Caste	0.21
Family (Type of Family)	2.59
Family Income	14.50*
Education	6.75
Social Participation	2.74
Size of Land Holding	6.58*
Exposure to Radio	2.63
Exposure to Television	0.02
Exposure to Film	0.02
Exposure to Print Media	2.05

* Significant at 5 per cent level of significance with degree of freedom.

** Significant at 1 per cent level of significance with degree of freedom.

As mentioned earlier, the level of adoption of scientific practices related to post-harvest technology was low to moderate among respondents. This necessitates to know and understand reasons for partial or non-adoption of technologies. Therefore, in the present investigation, an effort was made to identify the causes hindering the adoption regarding different components of post-harvest technology viz., threshing, winnowing, drying, storage use of fumigants, rat control and marketing.

Constraints related to threshing, winnowing and drying components of post-harvest technology cereals: Table 11 depicts that all the respondents i.e., cent per cent of them used thresher as use of combined thresher was limited to big farmers. The use of combined thresher was limited as the major constraints in using a combine thresher was, as its use resulted in “wastage of straw”. This constraint was ranked first by respondents with mean score of 2.36. “The improper harvesting by combine thresher” ranked at second position with mean score of 1.32. “The fear of accident” while using thresher ranked at number three in constraints list of respondents with mean score 124. “The farmer” and “the cost of combine thresher is more” ranked as fourth and fifth in the constraint list of the respondents with mean score 0.88 and 0.78, respectively.

The table further, reveals that “The practical cleaning of the grains” and “Breaking the seed grains” caused by thresher were ranked number sixth and seventh in the list of constraints by the respondents with mean score 0.63 and 0.60, respectively. “The non-availability of

thresher in time" and "the cost of thresher is more" were ranked eighth and ninth, respectively with mean score of 0.54 and 0.48, respectively.

Table 11. Constraints related to threshing, winnowing and drying component of post-harvest technology of cereals

Constraints (Threshing winnowing and drying)	Mean Score	Ranks
Non availability of thresher in time	0.54	8
Cost / rent of thresher is more	0.48	9
Role of middle man in carrying thresher to farm	0.17	13
Inconvenience in carrying thresher to farm	0.28	12
Non availability of electricity	0.32	11
Fear of accidents	1.24	3
Partial cleaning of grain	0.63	6
Breaking of grains	0.60	7
Non-availability of solar dryer	0	14
High cost of combine thresher	0.78	5
Not suitable for uneven fields	0.33	10
Not suitable for marginal and small farmers	0.88	4
Wastage of straw	2.36	1
Improper harvesting by combine thresher	1.32	2

The investigator also observed that "The non-availability of the combine thresher for uneven field" was ranked tenth with mean score 0.33, "The non-availability of electricity", "Inconvenience in carrying thresher to farm" and "Role of middle man in carrying thresher to farm" ranked number eleven, twelve and thirteen in the constraints list of the respondents with mean score 0.32, 0.28, 0.17, respectively.

Constraints with regard to storage and use of fumigants components of post-harvest technology of cereals: Storage of product food grains for use in the time of scarcity or otherwise is most important component of post-harvest technology.

Table 12 reveals that "Use of fumigants due to fear that it may cause toxicity", "lack of money for purchasing scientific structures" topped the list of constraints faced by respondents in storage and use of fumigants they ranked first and second in the constraints list with mean score 1.23 and 1.02, respectively. "Lack of storage facility" i.e., bags and bins, "Non-availability of fumigants in time", "lack of adequate place of storage" and "lack of technical knowledge about use of fumigants followed next in the order of third, fifth and sixth, respectively in the list of constraints faced by respondents.

While storage and use of fumigants with mean score 0.94, 0.46, 0.45 and 0.36, respectively while "Lack of knowledge about recommended fumigants", "Unawareness about place of availability of fumigants" and "High rent of godown for storage" followed the above list of constraints in order of seventh, eighth, ninth with mean score 0.32, 0.20 and 0.06, respectively.

Table 12. Constraints related to storage and use of fumigants components of post-harvest technology of cereals

Constraints (Storage and use of fumigants)	Mean Score	Ranks
Lack of adequate place for storage	0.45	5
Lack of storage facility	0.94	3
High rent of godown for storage	0.06	9
Lack of money for purchasing scientific structures	1.02	2
Lack of knowledge about recommended fumigant	0.32	7
Non availability of fumigant in time	0.46	4
Unawareness about place of availability of fumigants	0.20	8
Lack of technical know how / trainings (fumigants)	0.36	6
Fear in use due to its toxicity	1.23	1
Difficulty in getting permission letter for purchasing fumigants	0.03	10

Constraints related to rat control component of post-harvest technology of cereals: To save the produce from rodents in the storage area is one of the complex and difficult tasks of the post-harvest operation.

Table 13 indicate that "Fear in use of poison to kill rats" as they may cause poisoning in human. "Difficulty in searching dead rats" were together ranked number one by the respondents with mean score of 1.12, while "Doubt about effectiveness of rodents" followed them at rank number two with rank score 0.60.

Table 13. Constraints related to rat control component of post-harvest technology of cereals

Constraints (Rat Control)	Mean Score	Ranks
Lack of knowledge about rodenticides	0.31	4
Unawareness about place of availability	0.11	6
Non availability in time	0.22	5
Doubt about effectiveness of rodenticides	0.60	2
Fear in use of poison to kill rats	1.12	1
Not killing rats due to religious belief	0.53	3
Difficulty in searching dead rats	1.12	1

"Not killing rats due to religious beliefs" and "lack of proper knowledge about the rodenticides" followed the list of constraints faced by respondents in rodent control were ranked at third and fourth positions, respectively with mean score 0.53 and 0.31 respectively.

The table further reveals that "Non-availability of rodenticides in the time" and "unawareness about the place of availability" followed the constraints list of the respondents in rodent control with mean score of 0.22 and 0.11 respectively.

Constraints related of marketing component of post-harvest technology of cereals–Marketing is important component of the post-harvest operation. The respondents face a lot of constraints while marketing the produce. Table 14 shows that "Lack of transportation facilities", "Lack of storage facilities near village" and "non profitability in grading the produce" were the major constraints faced by the respondents in the order first,

second and third, respectively with mean score of 0.93, 0.42, 0.41, respectively "unawareness about minimum support price", "selling of produce to local money lender due to debtness" followed the above constraints list in the order of fourth, fifth, respectively with mean score 0.23, 0.18, respectively.

Table 14. Constraints related to marketing component of post-harvest technology of cereals

Constraints (Marketing)	Mean Score	Ranks
Lack of transportation facility	0.93	1
Unawareness about minimum support price'	0.29	4
The failure of the government to announce the minimum support price	0.15	6
Lack of information about regulated market	0.14	7
Lack of storage facility near village	0.42	2
Non profitability in grading the produce	0.41	3
Selling of produce to local money lenders	0.18	5

The table further visualize that "The failure of the government to announced the minimum support price" and "Lack of information about regulated market" followed the constraints list in order of sixth and seventh respectively with mean score 0.15 and 0.14, respectively.

CONCLUSION :

It can be concluded that the majority of the respondents had medium level of adoption. Among all the respondents the maximum adoption was for winnowing component and the minimum adoption was for winnowing component and the minimum adoption was for the rat control aspect of the post-harvest technology of cereals crops i.e., wheat and the paddy. The finding shows that family income level and size of land holding has a significant association with the level of adoption by the respondents.

Wastage of straw and improper harvesting by combine thresher were the major constraints related to threshing, winnowing and drying component of post-harvest technology faced by respondents.

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