Knowledge and Adoption Level of Grain Storage Technologies among Farm Women of Deesa Taluka, Gujarat, India

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A B S T R A C T

Keywords Grain storage practices, Knowledge, Adoption, Farm women **Article Info** *Accepted:* 15 February 2020 *Available Online:* 10 March 2020	Post-harvest grain storage operation is a concluding activity in agriculture and mostly performed by rural women to secure the food grains and reduce the post-harvest losses. Post-harvest losses occur from farm to ultimate consumption. These losses might be either due to lack of awareness on the part of rural women about the scientific grain storage methods, improved storage practices and improved storage structures. Hence, the present study was planned with the specific objective of assessing the knowledge and adoption level of farm women about grain storage technologies. Two hundred farm women were selected from ten villages of Deesa taluka in Banaskantha district of Gujarat. It was found that farm women had more knowledge about indigenous grain storage practices while they do not have much knowledge about modern grain storage practices. Adoption level of recommended grain storage practices was found medium. Despite of having knowledge of practices, they do not adopt few of the grain storage practices.

Introduction

Rural women play a crucial role in agricultural activities including post-harvest operations. Post-harvest grain storage operation is a concluding activity in agriculture and mostly performed by rural women to secure the food grains and reduce the post-harvest losses. Post-harvest losses occur from farm to ultimate consumption. These losses are quantitative and qualitative in nature and leads to loss in marketing opportunities and nutritional value. Under certain conditions; qualitative losses may pose a serious health hazard also.

These losses might be either due to lack of awareness on the part of rural women about the scientific grain storage methods, improved storage practices and improved storage structures. Traditional methods and practices are less effective to give desired and adequate protection against various storage pests, insects, and rodents etc. usually responsible for post-harvest losses and are more prone to pest invasion. The post-harvest losses could be minimized to a greater extent if the scientific and recommended grain storage technologies are disseminated among rural farm women. It will help in strengthening the capacity of rural women in conducting post-harvest activities more scientifically, in reducing postharvest losses of food grains, improving their food security and to maintain the nutritional value of stored food grains. Only availability of improved technology alone may not work unless communities are sensitized and level of awareness is enhanced. The present study was planned and conducted to verify the existing knowledge and adoption level among farm women about grain storage technologies. The specific objectives were as follows-

To study the socio-economic status of farm women
To assess the types of grain storage technologies being adopted by rural women
To assess the knowledge and adoption level of farm women about grain storage technologies.
To find correlation of socio-economic status of farm women with the knowledge and adoption level of grain storage technologies

Materials and Methods

Location of study: The study was conducted in Deesa taluka.

Selection of villages: Out of one hundred fifty villages of Deesa taluka, ten villages were selected by simple random sampling procedure

Selection of Respondents: Twenty farm women from each selected village were selected randomly.

Sample size: Two hundred farm women involved in farming and post-harvest grain storage activities were selected randomly.

Independent variable and measurement: Socio-Economic status of farm women was studied as independent variable. A scale developed by Aggarwal *et al.,* (2005) for measuring the Socio-Economic Status of a family was used to measure Socio-Economic Status of rural farm women.

Dependent variables and measurement: knowledge and adoption level of grain storage technologies among farm women were studied as dependent variables**.** A knowledge test developed by Parvathi *et al.,* (2001) was used for assessing knowledge level. Two point scale response pattern i.e. correct and incorrect was used for recording responses of respondents on the knowledge items. Score of 2 was assigned to the correct answer and 1 to the incorrect answer. Similarly for recording responses on adoption of grain storage technologies score of 2 was assigned to adoption and 1 to no adoption. For assessing the knowledge level and adoption level, scores obtained by each respondent were summed up and three categories of knowledge and adoption level i.e. high, medium and low were made by calculating the means and deviations.

Statistical tools used

For data analysis descriptive type of statistical tools i.e. frequencies, percentage, ranks and coefficient of correlation (r) were applied and the results were obtained.

Results and Discussion

Results regarding socio-economic status of farm women

It is evident from the figures given in Table.1 that majority (65.00 %) of the farm women belonged to medium level of Socio-Economic Status followed by medium (18.50 %) and low (16.50%) level of Socio-Economic Status.

It can be concluded that majority of farm women included in the present study belonged to medium level of Socio-Economic Status. One of the major reasons of finding majority of respondents into medium level of socio-economic status might be; because majority of farm women belonged to the families, who possessed small size of land holding, had low level of annual income, belonged to SEBC category, their family members and they themselves had low level of education.

Overall knowledge level of farm women about grain storage technologies

Level of overall knowledge followed by low (22.00 %) and high level (9.50%) of knowledge about grain storage technologies. Possible reasons of medium level of overall knowledge among majority of farm women about grain storage technologies as expresses by the respondents during data collection was their low level of education, no exposure to such training and their believes regarding grain storage practices.

Results revealed in a study conducted by Parvathi *et al.,* (2001) are in tune with the present study that more than half of the farmwomen (58.33%) possessed medium level of knowledge on post-harvest technologies. About one-fourth of the respondents had high level and less than one-fourth had low level of knowledge on PHTs.

Technology wise knowledge of farm women about grain storage technologies

It can be clearly observed from the ranks given in Table 3 that the farm women were most informed about the indigenous recommended practice of using Neem leaves as pest repellent followed by practice of keeping old and new grains separately during grain storage and also about an important precaution of cleaning as well as drying of gunny bags in sunlight before their reuse for grain storage. Majority of farm women were also well-versed about the practice of drying of grains to remove the excess moisture from grain before storing as well as about metal bins as less pest susceptible grain storage structure in comparison of simple gunny bags as indicated by the 4th and 5th ranks.

The grain storage technologies about which farm women had least knowledge as revealed by ranks no 18th, 17th and 16th were use of oil during grain storage followed by name of recommended fumigant for control of pest during grain storage and duration of fumigation and about name of material used to plug the micro perforation of the earthen pot for grain storage.

It can be inferred from the findings that farm women had more knowledge about the indigenous type of grain storage technologies and least knowledge about modern grain storage technologies.

Overall adoption level of grain storage technologies by farm women

It is visible from the Table.4 that majority (73.50%) of farm women had medium level of adoption of grain storage technologies followed by high (15.50%) and low level (11.00%). Sahu (2015) analyzed in the study that 64 per cent respondents fell under the category of medium level adopters while 20 per cent were in the category of high adopter

of the grain storage technologies in Chhattisgarh.

One of the possible reasons of medium level of adoption of grain storage technologies by the majority of farm women were their own traditional precautions. Like not to put down the grains in storage structures on some traditional dates of months to which the word "Rus" is suffixed like "Agayarus" "Baarus" and "Terus", storing of grains during the "waxing moon days (Shukal pax) and avoiding storage of grains by a pregnant woman. Majority of farm women believed strongly that if such precautions are taken, stored grains can be kept safe throughout the year without any kind of pest infestation. Farm women were taking such precautions for grain storage however; they were not able to tell any scientific reason for having such believes. They just told that such practices were being followed by their ancestors hence; they were also adopting the same.

Technology wise adoption of grain storage technologies by the farm women

It can be seen from the ranks given in Table. 5 that the grain storage technologies which were adopted by the majority of farm women were "Placing of polythene sheet under gunny bags during storage" followed by "Using dhal mill to reduce milling loss of pulses", "Use of Neem leaves as pest repellent", "Cleaning and drying gunny bags in sunlight before reuse as an important precaution" and "Use of stick as important precaution to take during mixing poison bait / powder". Whereas, the technologies which were not adopted by farm women were "Use of double polythene lined storage bags", "Use of Zinc Phosphide chemical to control house rats", "Sun drying as widely advocated method of drying grains before storage", "Keeping distance between wall and gunny bags while stacking the grain bags as an important precaution" and "Use of recommended fumigant for control of pest during grain storage and its duration".

Table.1 Distribution of farm women according to the Socio-economic Status

Sr. No	Socio-Economic Status levels	F	%
1	Low	33	16.50
2	Medium	130	65.00
3	High	37	18.50
	Total	200	100. 00
	$\bar{X}$ = 42.01 SD=6.27		

Table.2 Distribution of respondents according to the knowledge level

Sr.No	Knowledge Levels	F	%
1	Low	44	22.00
2	Medium	137	68.50
3	High	19	9.50
	Total	200	100. 00
	$\bar{X}$ = 27.12 SD= 1.95		

Table.3 Technology wise knowledge of respondents about grain storage technologies

n=200

S. No.	Name of Grain Storage Technologies	Mean Scores	Ranks
1	Use of Neem leaves as pest repellent	2.00	1
2	Use of oil during grain storage	1.00	18
3	Use of clay to have controlling effect on storage pest.	1.15	16
4	Use of red earth as material used to plug micro perforation of earthen pots during grain storage	1.21	13.5
5	Metal bins as less susceptible storage method to pest damage in comparison of simple gunny bags	1.76	5
6	Use of double lined polythene storage bags	1.37	11
7	Use of Zinc Phosphide as chemical is banned to control house rats	1.19	15
8	Drying of grains to remove excess moisture from grains	1.80	4
9	Making grain storage structure airtight during fumigation	1.28	12
10	Placing polythene sheet under gunny bags during storage	1.71	7
11	Sun drying as widely advocated method of drying grains before storage	1.69	8
12	Keeping old and new grains separately as recommended method of grain storage	1.97	2
13	Aluminum phosphate for storage pest control is banned	1.21	13.5
14	Using stick as important precaution to take during mixing the poison bait	1.73	6
15	Using dhal mill to reduce milling loss of pulses	1.40	10
16	Cleaning and drying gunny bags in sunlight before reuse as an important precaution	1.94	3
17	Keeping distance between wall and gunny bags while stacking the grain bags as an important precaution	1.58	9
18	Use of recommended fumigant for control of pest during grain storage and duration of fumigation	1.12	17

Table.4 Distribution of respondents according to overall adoption level of grain storage technologies

Sr.No	Adoption Levels	F	%
1	Low	22	11.00
2	Medium	147	73.50
3	High	31	15.50
	Total	200	100. 00

$\bar{X}$ =   25.20   SD= 1.46

Table.5 Technology wise mean scores of adoption level of respondents about grain storage Technologies

S. No.	Name of Grain Storage Technologies	Mean Scores	Ranks
1.	Use of Neem leaves as pest repellent	1.85	3
2.	Use of oil during grain storage	1.05	11
3.	Use of activated clay having more controlling effect on storage pest.	1.00	15.5
4.	Use of red earth as material to plug micro perforation of earthen pots during grain storage	1.04	12
5.	Metal bins as less susceptible storage method to pest damage in comparison of simple gunny bags	1.60	8
6.	Use of double lined polythene storage bags	1.00	15.5
7.	Use of Zinc Phosphide as chemical is banned to control house rats	1.00	15.5
8.	Drying of grains to remove excess moisture from grains	1.44	9
9.	Making grain storage structure airtight during fumigation	1.69	7
10.	Placing polythene sheet under gunny bags during storage	2.00	1.5
11.	Sun drying as widely advocated method of drying grains before storage	1.00	15.5
12.	Keeping old and new grains separately as recommended method of grain storage	1.18	10
13.	Aluminum phosphate for storage pest control is banned	1.73	6
14.	Using stick as important precaution to take during mixing the poison bait / powder	1.80	5
15.	Using dhal mill to reduce milling loss of pulses	2.00	1.5
16.	Cleaning and drying gunny bags in sunlight before reuse as an important precaution	1.81	4
17.	Keeping distance between wall and gunny bags while stacking the grain bags as an important precaution	1.00	15.5
18.	Use of recommended fumigant for control of pest during grain storage and its duration	1.00	15.5

Table.6 Coefficient of Correlation between socio-economic status of farm women and their knowledge and adoption level of grain storage technologies

n=200

Sr.No	Dependent Variables	Independent Variable (Socio-Economic Status)
		"r" values
1	Knowledge level of Grain storage technologies	0..020 NS
2	Adoption level of grain storage technologies	0.105 NS
NS= Non Significant		

Farm women expressed that they were using fertilizer's bags for storing grains therefore, they did not felt the need of purchasing new double lined polythene bags from market for grain storage. Majority of Farm women also expressed that they did not use any chemical to control house rats because killing rats is a sin and in most of houses they had cats for this purpose. Further farm women also said that they never dry grains before storage. They usually stack it as it comes from field. However, they dry it after rainy season only if it gets infested. Farm women did not feel any need to keep distance between wall and gunny bags because of no fear of entering moisture from cemented walls and to avoid the use of more space for grain storage. Farm women did not feel any need of using any fumigant for control of pest during grain storage because most of them were using neem leaves and few of them were using either castor oil or boric powder.

It can be inferred from the results of adoption of different grain storage technologies that only few indigenous technologies were being adopted by farm women. Whereas, majority of grain storage technologies were either least adopted or not adopted by the farm women.

Coefficient of correlation between socio-economic status of farm women and their knowledge and adoption level of grain storage technologies

It is evident from the "r" values given in Table. 6 that Socio-Economic Status of farm women showed non - significant correlation with their knowledge level and adoption level of grain storage technologies.

It can be inferred from above findings that socio- economic status makes no significant difference for gaining knowledge about grain storage technologies as well as for the adoption of grain storage technologies.

The findings of study lead to conclude that majority of farm women had medium level of Socio-Economic status, medium level of knowledge as well as adoption level of grain storage technologies.

Further, technology wise results reveals that farm women had more knowledge about the indigenous type of grain storage technologies than modern grain storage technologies. Results also lead to conclude that in spite of having knowledge of most of the grain storage technologies; the farm women had adopted only few grain storage technologies. Farm women did not realize the need of using such technologies because they still follow some traditional believes regarding grain storage technologies.

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