Adoption Level of Rural Women about Storage Structure and Practices for Storing Grains

ABSTRACT

The study was carried out during the year 2013-2014 in Faizabad district because of its location nearer to university campus. Out of 11 CD block in Faizabad, the Sohaval block was selected purposively 4 villages were selected randomly for this study. A complete list of all the farmers in selected village was prepared on the basis of 4 categories i.e. marginal, small, medium and large. A sample of 100 respondents was selected from said categories through proportionate random sampling techniques and the author herself had collected data with help of presented interview schedule. The result of the study depicted majority of respondents (95%) was found to be adopting gunny bags. None of the respondents was found to be adopting modern storage structures. Majority of respondent (59%) were found having medium level of adoption about food grain storage structure. Maximum numbers of respondents (50%) were having medium level of adoption about food grain treatment. Maximum numbers of respondents (72%) were found in medium level of overall average adoption score category.

Key words: adoption, grain storage, storage structures and modern storage.

INTRODUCTION

A grain saved means grain produced for the growing population. An estimate indicates that between150-500 million people of the world do not have enough food to eat. Population has been doubled and it is estimated that it will go to 8.9 billion by 2050. The number of hungry people is likely to increase with the increase in population. It is estimated that 10 to 25 per cent of total food grains worth Rs. 1500/- crore is lost due to defective storage every year. The problem of more losses in storage of food grains may increase with the increase in the food production. So it becomes imperative to minimize the losses in the best interest of the Country's food economy. According to a survey conducted by Indian Grain storage Institute, Hapur in different Agro-climatic zones, it was found that 82 per cent of the storage structures used by the farmers were primitive and therefore, vulnerable to insect infestation, mould attack, rodent and bird damage causing sustainable losses With the enormous amount of production, *why is there*

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still shortage of food for consumption? Response to this question is the loss of food grains during the entire post harvest system and thus the food grains worth Rs.350 crones is lost every year due to absence of adequate storage facilities and transport bottle necks. The post harvest losses of not only the food grains but also of fruits and vegetables have an impact both at the micro and macro levels of economy. Total loss to the extent of 9.33 per cent in post harvest operations which include the loss in storage to the extent of 6.58 per cent. Union Minister of state for steel, Mr. Brajakishore Tripathy has said the use of metallic and non metallic food storage bins and silos would help to save valuable food grains and increase steel consumption in the country. Addressing the inaugural function of a 10 days artisan's training workshop, the Union Minister said that there was an urgent need to ensure proper storage of food grains to provide food security to the people as nearly five per cent of food grains in the country is wasted due to lack of storage facilities. Jointly organized by the Joint plant committee of the Union Steel Ministry, Ministry of Consumer Affairs, Food and Civil supplies, Tata steel and the Orissa university of Agriculture technology (OUAT), the workshop is meant to train rural artisans to produce metallic and non-metallic storage bins. Speaking on the occasion OUAT, Vice Chancellor Sahadev Sahoo said that there was need for an intensive campaign to create awareness among the rural people to do away with the misconceptions and traditional myths. More and more farmers should be taught the use of modern method of storing food grains. The purpose of workshop was also to ensure that the trained artisans will start individual units to manufacture storage bins and silos to meet rural needs. These bins are also cost-effective in terms of transformation. There has been a tendency to overestimate storage losses, and to base estimates on extreme cases or guess work rather than on sound empirical testing. 30 percent or more are not uncommon. Contrast, the results of detailed field studies suggest that under traditional storage systems in tropical countries, losses are typically around 5 per cent over storage season. Food grain storage continued to be an important problem from the time man learnt to grow crops. Millions tones of food grains are either damaged or lost due to lack of knowledge of scientific methods of storage. This problem is also a challenge to the scientists who are called upon to tackle it. The loss is not merely in terms of quantity but also in quality of the food grains. In most countries grains are among the important staple foods. However they are produced on a seasonal basis and in many places there is only one harvest in a year, which itself may be subject to failure. It means that in order to feed the world's population, most of the global production of

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maize, wheat, rice, sorghum and millet must be held in storage therefore occupies a vital place in the economics of developed and developing countries. Storage involves substantial costs and risks as well as potential benefits for farmers, storage compares with other activities valued by farm family members, and it is necessary to understand where storage fits into the entire farming system and household economy in order to assess the need for interventions and the probability of their uptake. Storing farm produce is an important function by which a farmer preserves. It is an exercise of human foresight by means of which commodities are protected from deterioration. According to an estimate, about 35 per cent food grain gets spoiled every year due to improper storage practices or bad handling. Two major risks are involved in storing the form produce. These are quality loss-caused by commensally rodent, insects and pests, quality loss which is caused by excessive moisture and temperature during storage. In rural areas, storage of farm produce are generally, the work of woman folk. These women use some defective traditional practices of food grain storage. The storage structures used in villagers are very faulty leading to high storage losses and, thus, they are required to the replaced by the innovated or new storage techniques. In the recent past, the scientists have developed modified storage techniques but they are still not used by most of the rural woman, since they are not well versed with the techniques Losses of food grains are reported due to attack of insects, pests and rats in storage. Rats damage the crop at every stage of production and storage, it is reported that an adult rat consumes 5 gm. Of grain per day and spoils 10 times what he eats. A loss of about 40 crore quintal grain per annum due to rats is estimated in India. If we succeed to control rats we can save grains 60 crore quintal/annum. Therefore, control of become inevitable in the crop fields, go downs, residential premises etc.(Ramesh, 2005)according to a report 69-70 per cent of woman help in labour input such as operation of harvesting, threshing and storing. These woman face the problem of deterioration of food grains arising from improper storage devices and methods which ultimately result in colossal wastage of money. To arrest these losses, knowledge on recent technological know-how on efficient preservation methods for food grains such as application of modern and improved techniques of insect and rodent control, introduction and construction of modern and scientific storage structures, and to scientifically modify the traditional structures to minimize moisture, rodent and insect loss and maximum benefits must be imparted to these woman and their families. Since woman can be used as effective disseminators and communicator for simple agricultural and post harvest technologies, appropriate training to the famers particularly the

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woman folk in rural areas is absolutely essential. An insect clearing device has been developed by Tamil Nadu Agricultural University for removing insect from stored grain/seed. It is a bin of 25 kg capacity. It has 4 parts, outer container, inner perforated (2mm) container, pitfall mechanism and collection device. In the inner perforated container a perforated tapering cone (2mm) is fixed to clear the insects quickly from the grains. The grains are to be stored in the inner perforated containers. The insects in the grain, while wandering here and there enter the perforation, slip and hit the pitfall mechanism and get trapped in collection device. Preliminary study with this new model showed nearly 100% removal of insects like red flour beetle *Tribolium castaneum*, Rice weevil *Sitophilus oryzae* and lesser grain boarer. *Rhyzopertha dominica* can be removed within 5 days. This bins is a modification of earlier bin developed by Mohan in 2008. Over the past two decades the need for economic and social analysis in the planning and design of storage inventions has become more widely recognized. This stems from the realization that any improvements in storage will only be attractive to farmers, traders, or governments if the perceived benefits substantially outweigh the costs. Technical superiority is generally insufficient (although it can be attractive for its prestige values) and farmers and traders are likely to tolerate quite high storage losses before undertaking complex or expensive changes to their storage systems, an understanding of the reasons why people store, and the systems within which storage occurs, is necessary in order to estimate how the benefits and costs of innovations are likely to be assessed by the intended users of technology. Women play a very productive role in rice seed management and make significant contributions to rice production. The pre and post harvest such as visual examination of seed, for seed health and purity, conducting tests for germination and vigour, seed treatment against insects and diseases, selection and harvest of plants for seed purpose and threshing, drying and storage of seed. In India, women have a crucial role to play in post harvest technology (PHT), particularly that relating to winnowing and grain storage. However, little attention has been paid to food losses, it is suggested that proper handling and management needs to be taught systematically to rural woman.

METHODOLOGY

The study was conducted in Faizabad district because of its location nearer to university campus.. Out of 11 CD block in Faizabad, the Sohaval block was selected purposively 4 villages were selected randomly for this study. A complete list of all the farmers in selected village was

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prepared on the basis of 4 categories i.e. marginal, small, medium and large. A sample of 100 respondents was selected from said categories through proportionate random sampling techniques and the author herself had collected data with help of presented interview schedule. The 'percentage' 'average' standard error (SE) and correltion coefficient were used for making simple interpretation.

1. Percentage (%):

The frequency of a particular cell was divided by the total number of respondents in that particular category and multiplied by 100 for calculating the percentage.

2. Average ($\bar{x}$): The average ($\bar{x}$) was calculated by adding the total scores obtained by the respondents and divided it by the total number of respondents using the following formula.

$$\bar{x} = \frac{\sum x}{n}$$

Where,

$\bar{x}$ = Average or mean

$\sum x$ = Total number of scores obtained by respondents

n = Total number of respondents

3. Standard error:

S.D. is the square root of mean of the squares of all deviations. The direction being measured from the arithmetic mean of the distribution. The standard error (SE) is given by

$$\text{S.E.}(\sigma) = \frac{\sigma}{\sqrt{n}}$$

Where,

σ = standard deviation

n = Total number of items.

4. Correlation coefficients:

The coefficient of simple correlation(r) is a measure of the mutual linear relationship between two variables *i.e.* X and Y, the relationship is measured by the commonly termed as products moment. Correlation coefficient was computed by the following formula:

$$r = \frac{\Sigma (x_i - \bar{x})(y_i - \bar{y})}{\quad}$$

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$$\sqrt{(x_i - \bar{x})^2 (y_i - \bar{y})^2}$$

Where,

r = correlation in coefficient

$\bar{x_i}$ = observation of the variable

x = mean of all the observation

y_i = observation of the variables

$\bar{y}$ = mean of all the observation

RESULTS AND DISCUSSION

Table 1: Distribution of the respondents about adoption extent of indigenous food grain structure

S.No.	Category	Respondents	
		Number	Percentage
1	Gunny bags	95	95.00
2	Plastic bags	68	68.00
3	Pucca kothi	22	22.00
4	Kuccha kothi	30	30.00
5	Handis/ Kuna/ Khona/ Matka/ Gagri	55	55.00
6	Storage drum	15	15.00
7	Bukhari	20	20.00
8	Khatti	0	0.00

The data depicted from the Table 1 shows maximum respondents (95%) used gunny bags. whereas the respondents (68%), (55%), (30%) used plastic bags, Handis/ Kuna/ Khona/ Matka/ Gagri followed by respondents (22%) pucca kothi, (20%) bukhar, and (15%) Storage drum used respectively.

Table 2: Distribution of the respondents about adoption extent of indigenous food grain treatment

S.No.	Category	Respondents	
		Number	Percentage

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1	Use of neem leaves	44	44.00
2	Sand/ ash mixing	0	0.00
3	Covering onion bulbs	0	0.00
4	Putting onion bulbs	10	10.00
5	Oil mixing (veg oil) for dal	0	0.00
6	Putting salt along with neem leaves in paddy	2	2.00
7	Rusa (plant) for wheat	1	1.00
8	Only salt mixing with foodgrain	10	10.00
9	Maize khukhri mize foodgrains	0	0.00

Table. 2 focus that most of the respondents (44%) were found to be used neem leaves followed by the respondent putting onion bulbs and only salt mixing with food grain as a same response, 2.00%, putting salt along with neem in paddy and only 1.00% mixing with food grains and Rusa (Plant) for wheat used respectively.

Table 3: Distribution of the respondents about modern food grain treatment.

S.No.	Category	Respondents	
		Number	Percentage
1	EDB ampule	07.00	07.00
2	Celphos	30.00	30.00
3	Parad tablet	60.00	60.00
4	Zinc phosphide	03.00	03.00

Table 3 reflects that majority of respondents (60%) were found to be using parad tablets followed by (30%) celphos, (70%) EDB ampule and (3.00%) zinc phosphide using respondents respectively.

Table 4: Distribution of respondents about adoption extent of food grain storehouse treatment

S.No.	Category	Respondents

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		Number	Percentage
1	Sanitation of storehouse	69	69.00
2	Plastering of wall and floor of storehouse	25	25.00
3	Closing of cracks and cervices	24	24.00
4	Sun drying of grain for proper moisture content	98	98.00
5	Cleaning, screening and grading of food grains	95	95.00
6	Keeping the storehouse structure airtight by closing the window, doors and outlets	75	75.00
7	Treating gunny bags/ plastic bags against malathian	10	10.00
8	Fumigation godowns against lindane smoke	0	0.00

Table 4 it is clear that overwhelming majority of respondents (98.00%) and (95.00%) were found to be using sundrying of grain for proper moisture content, cleaning, screening and grading of foodgrains followed by the respondents (75%), (69%), (25%) and (24%) and (10.00%) were found to be adopting the practice, keeping the store house structure airtight by closing the window,door and outlets sanitation of store house, Plastering of wall and floor of storehouse and \closing of cracks and crevices and Treating gunny bags/ plastic bags against malathian using respectively.

Table: 5: Correlation coefficient between different independent variables and knowledge extent

S. No.	Variable	Correlation coefficient
1	Age	-0.08955
2	Education	0.132602
3	Cast	0.026435
4	Family Type	-0.10801
5	Family Size	-0.13641
6	Housing Pattern	0.201121*

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7	Land holding	-0.01363
8	Social Participation	-0.07702
9	Material Possession	0.117526
10	Extension contact	-0.15772
11	Economic motivation	0.318036**
12	Scientific orientation	0.235647*
13	Risk orientation	0.101023
14	Value orientation	0.027037

* Significant at 5 probability level 0.1946

**Significant at 0.01 probability level= 0.2540

It is evident from the values of correlation coefficient (r) as appeared in Table 5 that out of 14 variables. The 1 that is economic motivation was found to be highly significant and positively correlated with the extent of knowledge about food grain storage practices. The variables that are economic motivation was found to be moderately significantly and positively correlated with extent of knowledge about grain storage practices.

Table 6. Correlation coefficient between different variables and adoption extent

S. No.	Variable	Correlation coefficient
1	Age	0.127824
2	Education	0.067184
3	Cast	0.112823
4	Family Type	-0.061
5	Family Size	-0.12031
6	Housing Pattern	0.052963
7	Land holding	0.03115
8	Social Participation	-0.07835
9	Material Possession	-0.05633
10	Extension contact	-0.13612
11	Economic motivation	0.517052**

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12	Scientific orientation	0.330215**
13	Risk orientation	0.108256
14	Value orientation	-0.05264

*****Significant at 5% probability level

****** Significant at 1% probability level

Table 6 focuses that among 14 variables, two variables that is economic motivation and scientific orientation was found to be highly significant and positively correlated with extent of adoption. The variable that is age, education, caste, housing pattern, land holding, ad positive correlated with extent of adoption grain storage practices. The variables viz., family type, family size, social participation, material possession and extension contact economic motivation and knowledge were found to be negatively correlated with extent to adoption of food grain storage practices.

Table 7: Correlation coefficient (r) between different variables and Employment.

S. No.	Variable	Correlation coefficient
1	Age	0.085422
2	Education	-0.08205
3	Caste	0.036544
4	Family Type	-0.11592
5	Family Size	-0.09756
6	Housing Pattern	0.099836
7	Land holding	0.031358
8	Social Participation	-0.04819
9	Material Possession	-0.15779
10	Extension contact	-0.0115
11	Economic motivation	0.384445**
12	Scientific orientation	0.149014
13	Risk orientation	0.088572
14	Value orientation	-0.05264

*****Significant at 5% probability level

****** Significant at 1% probability level

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Table 7. Focuses that among 14 variables, two variables that is education and scientific orientation was found to be insignificant and negatively correlated with extent of adoption. The variable that is age, caste, family type, housing pattern, land holding, occupation pattern, Annual income, social participation, communication media possession, farm materials possession, household possession were found grain storage practices. The variables viz., economic motivation and knowledge were found to be highly significant and positively correlated with extent to adoption of food grain storage practices. The variables i.e. Risk orientation was to be in moderately significant and positively correlated with extent of adoption about foodgrain storage practices.

Overall average adoption extent about food grain storage practices

Table 8: Distribution of respondents according to overall adoption extent about food grain treatment

S.No.	Category	Respondents	
		Number	Percentage
1	Below 13 (Low)	52	52.00
2	14-19 (Medium)	32	32.00
3	20 and above (High)	16	16.00
Total		100	100.00

Mean=16 SD =3.12 Min = 9 Max =21

Table.8 focuses that 52% respondents were found having below adoption score (below13) low level category followed by 32% medium adoption (14-19) and 16% in high level with (20 and above) adoption score categories, respectively.

CONCLUSION

It may be concluded on the basis of finding that the majority of respondents (95%) was found to be adopting gunny bags. None of the respondents was found to be adopting modern storage structures. Majority of respondent (59%) were found having medium level of adoption about food grain storage structure. Maximum numbers of respondents (50%) were having medium level of adoption about food grain treatment. Maximum numbers of respondents (72%) were found in medium level of overall average adoption score category.

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