Research Article

Indian Journal of Extension Education
Vol. 60, No. 2 (April–June), 2024, (22-26)

ISSN 0537-1996 (Print)
ISSN 2454-552X (Online)

Women's Involvement Pattern in Grain Management Activities in Deoghar District of Jharkhand

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ARTICLE INFO

Keywords: Drying, Post-harvest management, Storage methods and structure, Threshing, Women Participation

https://doi.org/10.48165/IJEE.2024.60204

Conflict of Interest: None

Research ethics statement(s): Informed consent of the participants

ABSTRACT

Post-harvest losses in India posed a significant challenge, resulting in food wastage, reduced income for farmers, and increased pressure on resources. In the context of agriculture and food security, women played a crucial role in post-harvest operations, performing tasks such as cleaning, sorting, drying, storage, processing, and marketing of agricultural products. The study was conducted in the year 2023 with a sample of 120 randomly selected farmwomen in the Deoghar district of Jharkhand. The study aimed to recognize the involvement pattern of farm women in various post-harvest activities in rural areas. The findings indicated major participation of farm women was in activities like the sowing of seeds (67.5%), decision-making regarding pre-storage treatment (66.7%), drying of threshed grains (60.8%), mid-storage/intermediate treatment of grains (60.8%) and drying before threshing (49.2%) etc. The study also highlighted various drying and storing related practices carried out by farm women like sun drying of grains, threshing of major cereal crops by beating etc. which were mostly manual job required heavy physical energy.

INTRODUCTION

Post-harvest losses refer to the reduction in the quantity and quality of agricultural produce that occurs after the crops are harvested and during subsequent stages of handling, transportation, storage, and processing. These losses can occur at various points in the food supply chain, from the moment the crops are gathered from the field until they reach consumers or industrial facilities for further processing. The food production of the country has to be increased manifold to feed its increasing population. Approximately one-third of the total produce is being wasted due to post-harvest losses. One of the most feasible ways to increase food availability to the whole population is to minimize post-harvest losses (Kumar & Kalita, 2017). The importance of minimizing post-harvest loss can be expressed with the saying that foods saved during the post-harvest are the food produced without any investment in production.

Among all the farming activities where women take part, post-harvest management is the oldest one. These activities are essential for the preservation, processing, and distribution of the harvested produce. In the context of agriculture and food security, the involvement of women in post-harvest operations means that women play a significant role in tasks such as cleaning, sorting, drying, storage, processing, and marketing of agricultural products. Women's involvement plays an important role in post-harvest management and was highlighted in the study of Nain & Kumar (2010). Especially for food grains like cereals, which are often stored by farmers for the long term to meet family consumption needs, the farm women traditionally bear the whole responsibility of maintenance of stored grain. Women's involvement in post-harvest activities such as threshing was found to be around 50 per cent, in drying about 33 per cent, and in parboiling about 67 per cent, in retention for seed-81.77 per cent, in threshing-79.96 per

Received 29-02-2024; Accepted 22-03-2024

cent, and in winnowing (72.73%) etc., (Saikia et al., 2021). Also, with the increased feminization of agriculture rural women's role in managing agriculture operations getting enlarged along with all other supporting roles they used to play historically in farm management. Agriculture is also the primary employment provider for the vast majority of rural women. The workforce participation rate for rural females is significantly higher at 41.8 per cent against the urban women participation rate of 35.31 per cent (MoSPI, 2017). Rao (2006), in a study "Role of Women in Agriculture: A Micro-Level Study" reported that women comprise 33 per cent of the agriculture labor force and 48 per cent of the self-employed farmers in India. About 60–80 per cent of the food produced in India can be attributed to the efforts of rural women. Rural women are also engaged in allied fields including livestock rearing, horticulture, post-harvesting operations, agro/social forestry, fishing, etc. At present, agriculture employs more than 80 percent of rural women (Patel & Sethi, 2021).

Given the traditional as well as increasing importance of women for managing the farm activities in general and in post-harvest activities in particular, the present study was designed to analyze the women's involvement pattern in grain management in selected study area.

METHODOLOGY

Present study was conducted in the Deoghar district of Jharkhand. Out of the ten blocks, Mohanpur and Madhupur blocks were selected randomly. From both blocks, two village panchayats were chosen, and from each panchayat, four villages were selected randomly using the lottery method. Fifteen women respondents were then randomly chosen from each village, totaling 120 women farmers for the study. A structured and semi-structured interview schedule was used to collect the data for the study. The collected data underwent a systematic process, including coding, classification, analysis, and tabulation. To ensure accurate and meaningful interpretation of the results and to draw meaningful conclusions, statistical tools and techniques, such as frequency (count of occurrences) and percentage (relative proportions), were utilized.

RESULTS

A comprehensive analysis of women's contributions in seed and grain management has been presented here. It covers diverse aspects, from procuring the seeds for sowing to applying indigenous knowledge to preserve grain quality. This study revealed the diverse responsibilities shoulder by women in post-harvest management, shedding light on their vital contributions.

Methods of drying of grains (Rice) followed by farm women

Sun drying at the field itself immediately after harvest was most common followed by additional drying at shade for rice grain as per the convenience of farm women as found in the study area. Sometimes paddy crops were stalked for some time before drying followed by one-tenth of farmers (10.80%). Mostly farmers with higher landholding followed the practice especially due to labour shortage. The majority of farmers (55.80%) used to keep their harvested grain in sunlight for more than 6 hours. Thus, it can be concluded that the drying operation of major food crops like rice in the study area was mostly manual, nature-dependent and labour-intensive activity.

Table 1. Drying procedure followed by the respondents for grains (n=120)

Procedure (Rice)	Percentage
Drying Place	
Dried in the field immediately after harvest (Sun drying)	60.00
Stalked for some time then dried	10.80
Shade drying followed by sun-drying	17.50
Field dried then harvested	9.20
Any other	2.50
Methods of drying grains	
Mechanical drying	2.50
Shade drying	2.50
Shade drying followed by sun-drying or vice-versa	6.70
Sun drying	85.80
Any other	2.50
Time duration of drying (hour/day)	
0-2	15.80
2-4	10.80
4-6	17.50
>6	55.8

Table 2. Use of grain for seed purpose: Seed sources for farmers (n=120)

Sources	Percentage
Farm saved seed	16.60
From block/Panchayat office	1.70
From co-operatives	0.80
Exchange between families (barter)	1.70
From private seed companies	1.70
Nearby Research Institutions	1.70
Private retail shop (local market)	75.00
Any of the above	0.80

Table 2 depicts the use of grain for seed purposes. It was found that only 16.60 per cent of farmers still use farm-saved seed. Two-thirds of farmers use fresh seeds every year mostly procured from local retail shops. The declining use of indigenous varieties was the main reason for using retail-sourced high-yielding variety seeds more in the study area.

Methods of threshing of commonly cultivated crops followed by farm women

Rice, wheat, Arhar and Horse gram were the commonly cultivated crops in the study area. Threshing methods for these crops varied as well as the nature of the crop. For rice beating the dried and harvested crop to loosen the paddy grains from the stem was the most commonly used practice (used by three-fourths of farm women) with a gradual increase in the use of the mechanical drying method (used by 12.50% of farm women). This pattern was the opposite in the case of the wheat crop where more than two-thirds of farm women reported using mechanical threshing (71.70%). In the case of pulse crops like Arhar and Horse gram half of the farm women (51.70%) use mechanical threshers, while

Table 3. Threshing methods preferred by the farm women for commonly cultivated crops in study areas

Methods	Rice Frequency (%)	Wheat Frequency (%)	Arhar Frequency (%)	Horse gram Frequency (%)
Bullock trading	13 (10.80)	10 (8.30)	10 (8.30)	12 (10.00)
By beating	90 (75.00)	24 (20.00)	45 (37.50)	44 (36.70)
By mechanical thresher	15 (12.50)	86 (71.70)	62 (51.70)	62 (51.70)
Any other	2 (01.70)	0 (0.00)	3 (2.50)	2 (1.70)

one-third of farm women are still dependent on labour-intensive beating methods for threshing.

Methods of storage for commonly cultivated crops followed by farm women

It was found that the pre-storage processing of grains was mostly done at the farmer's homes itself (Table 4). Thus, higher farm women's involvement in the pre-processing of grain before storage may be the reason or cause of such a trend. Preprocessed grains were stored in the pucca bin by slightly more than one-third of farmers (35.00 %) whereas the use of iron bins and gunny bags as storage apparatus was used by 20.00 per cent of respondents. Attacks by storage insects followed by attacks by rats were found to be major problems during storage as reported by 53.30 and 29.20 per cent of farm women, respectively.

For both commonly cultivated cereals and pulses the stored grains were mostly kept on the ground as reported by 40 to 42 per cent of farmers. A portion (10-15%) of respondents use traditional straw structures constructed at home backyards for storage of grains. The use of concrete structures was very limited and used by up to 1 per cent of farmers (Table 5).

Table 4. Distribution of respondents based on various aspects of storage (n=120)

Aspects	Percentage
Places of crop processing	
Home	60.80
Field	32.50
Any Other place (processing units)	6.70
Type of storage structure	
Iron bin	20.00
Kachha bin	6.70
Left open after putting in bags	20.00
Pacca bin	35.00
Any other specific structure/method	18.30
Statement of problem	
Attack by moulds	4.20
Attack by rats	29.20
Attack of storage insects	53.30
No problem	2.50
Seed moisture increase	3.30
Any other	7.50

Involvement pattern of farm women in seed and grain management

The activities related to the management of seed and grain for consumption as well as crop cultivation purposes were probed for the involvement pattern of farm women as well as their male counterparts (Table 6). The highest involvement of farm women was found in the case of sowing of seed and decision regarding pre-storage treatment where more than two-thirds of farm women (67.50% and 66.70%, respectively) reported it as their sole responsibility and 11.70 and 20.00 per cent, respectively as the dual responsibility. Activities like mid/intermittent storage treatments (60.8%), decisions regarding the construction of grain storage structure (51.7%), seed drying (49.2%), and decisions regarding grain storage methods (48.3%) also saw higher women participation and control as reported by farm women. The decision

Table 5. Distribution of respondents based on Storage Place of grains of commonly cultivated crops in study areas

Place of storage	Rice Frequency (%)	Wheat Frequency (%)	Arhar Frequency (%)	Horse gram Frequency (%)
In bamboo structure	6(5.00)	2(1.70)	2(1.70)	2(1.70)
In straw structure	11(9.20)	14(11.70)	18(15.00)	17 (14.20)
On concrete structure	2(1.70)	01(0.80)	1(0.80)	2(1.70)
On the ground	55(45.80)	51(42.50)	47(39.20)	51(42.50)
On the ground any other	01(0.80)	00(0.00)	1(0.80)	00(0.00)
On the ground in bamboo structure	1 (0.80)	0(0.00)	0(0.00)	0(0.00)
On the ground, In straw structure	2 (1.70)	1 (0.80)	0(0.00)	0(0.00)
On the ground, On wooden planks	4 (3.30)	2 (1.70)	2 (1.70)	1(0.80)
On wooden	0 (0.00)	0(0.00)	1(0.80)	0(0.00)
On wooden planks	38(31.70)	40(33.30)	39(32.50)	40(33.30)
On wooden planks, Any other	0(0.00)	1(0.80)	1(0.80)	1(0.80)
On wooden planks in straw structure	0(0.00)	1(0.80)	1(0.80)	0(0.00)
On wooden planks, On concrete structure	0(0.00)	1(0.80)	0(0.00)	0(0.00)
Any other	0(0.00)	6(5.00)	7(5.80)	6(5.00)

The figure in parentheses indicates the percentage (%).

Table 6. Involvement pattern in seed storage and management

Involvement pattern in seed storage	Women Frequency (%)	Men Frequency (%)	Both Frequency (%)
Procurement of the seed	20(16.70)	72(60.00)	28(23.30)
Seed treatment process	44(36.70)	39(32.50)	37(30.80)
Sowing of seed	81(67.50)	25(20.80)	14(11.70)
Drying before threshing	59(49.20)	24(20.00)	37(30.80)
Threshing activities	43(35.80)	45(37.50)	32(26.70)
Drying of threshed grains	73(60.80)	18(15.00)	29(24.20)
Decision regarding Pre-storage treatment	80(66.70)	16(13.30)	24(20.00)
Mid-storage/intermediate treatment of grains	73(60.80)	15(12.50)	32(26.70)
Decision to construct storage structure for grains	15(12.50)	62(51.70)	43(35.80)
Decision on grain storage method	58(48.30)	18(15.00)	44(36.70)
Decision on put off the stored grains for sale	19(15.80)	19(15.80)	82(68.30)

*Figure in parentheses indicates percentage (%).

regarding the sale of stored grain was reported by more than two-thirds of respondents (68.30%) as a joint responsibility thus showing a healthy cultural trend in the household of farm women as an equal partner for their farm enterprise and family.

DISCUSSION

Drying of harvest in the field immediately after harvesting was the most preferred drying method followed by shade drying. Also, drying activities were carried out more than 4 hours/day in homestead by farm women as reported by almost three-fourths of women. Thus, though the choice of drying procedure mostly depended on crop type, local climate, and individual preferences, as found in similar findings by Siagian et al., (2017) but it also indicates the plight of farm women as they were the main operators of these mostly manual activities. In the case of threshing, another very important post-harvest activity, farm women are still dependent on age-old practices like beating for cereal crop like rice. rains. Though the present study found that three-fourth (75.0%) of respondents used the beating method for threshing, which may be due to differences in place, knowledge level, and available resources but it contradicts with findings of Nath et al., (2017); Singh et al., (2018) where a considerable amount (80.95%) of farm women reported use of machinery for threshing of rice. But in the case of pulse crop use of mechanical thresher was found considerably high. The maximum number of farm households, 60.8%, performed threshing and processing activities in the home and the use of pucca bins was most common to store the threshed grains. Only about 6.67 per cent of households used kachha bins for seed storage, referring to temporary or less durable storage containers. People used kachha structures because they couldn't afford to use big or iron structures, but some farmers linked it with the preservation of their culture. Different regions (States) of the country used different structures for storage based on local (traditional) facilities and resources available. The choice of storage location depended on factors such as local resources, convenience, and the need to protect the rice crops from environmental conditions (Dai et al., 2019).

The findings indicated that the main problems faced by respondents during storage were seed loss through rodents, insects, moulds and moisture spikes, etc. These findings aligned with Kumari (2018), who reported most farm women (77.03%) faced grain losses primarily caused by storage pests and disease attacks. The keeping of stored rice on the ground may be the cause of such a problem.

In the case of involvement and decision-making patterns, farm women played a dominant role in seed sowing (67.5%). Similar percentage of women's involvement in seed sowing was reported by Kumari (2018). 49.20 per cent of women reported sole involvement in drying of seeds before threshing. These findings were found aligned with Kabir et al., (2023). King (2017) revealed in his study "Impact of Reduced Drudgery of Women in Production and Post-harvest Processing of Small Millets" that (52.05%) of farm women performed the threshing process, 60.27 per cent of farm women performed the cleaning and drying of the threshed grains. Women took the lead in making decisions about pre-storage treatment (66.7%). Jhansi & Kala (2022) found that the majority of farm women are involved in post-harvest management activities, including pre-storage treatment. Similar to drying, 60.80 per cent of women were solely responsible for mid-storage treatment. The findings aligned with Nath et al., (2022) who reported women were actively involved in making decisions about grain storage methods (48.3%). In economic decisions *i.e.,* for deciding about the sale of the stored grains 68.30 per cent of farm women reported a joint decision-making. But carrying the actual sale in the market is mostly carried out by male counterparts as reported by Amin et al., (2009), who revealed that 67.97 per cent of males were responsible for the transportation and selling of the grains in the market.

These findings highlighted the varied roles and responsibilities of women and men in seed storage and management activities, emphasizing the need for gender-sensitive approaches and the involvement of both genders in decision-making processes.

CONCLUSION

Women play very crucial role in various postharvest operations, particularly in the seed treatment, seed sowing, seed drying, threshing activities, drying of threshed grains, decision-making regarding pre-storage treatment, mid-storage treatment of grains, and decisions on grain storage methods. However, their involvement is relatively less in the procurement of seeds &

decisions on constructing storage structures for grains. Also, it can be concluded that most of the post-harvest operations where women participation was more was mostly manual, nature-dependent and labour-intensive activity. As women are actively participating in different postharvest management activities, it is crucial to provide them with proper technical knowledge at various stages through different methods like training to ensure their effective contribution to these processes.

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