

# Knowledge and Operations Performed by Farm Women in Postharvest Management Activities

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## Highlights

- Seed Collection Timing: 70% of respondents collect seeds just before sowing
- Seed Treatment Preferences: 84.2% purchase treated seeds; 36.84% use chemicals, while 26.31% prefer natural treatment methods.
- Seed Crop Storage: 58.3% store the same grain for future seeding
- Grain Storage Containers: 45% use bamboo baskets, 37.5% use gunny bags

## Abstract

Postharvest management of agricultural produce was vital for food security and economic stability in rural areas, with farm women playing a key role. A study conducted in 2023 assessed the knowledge of farm women regarding postharvest grain management in Deoghar district, Jharkhand. The sample consisted of 120 farm women randomly selected from 8 villages using a lottery method. Data were collected through personal interviews. The study revealed that one-third of the women bought seeds before sowing, with 84.2% purchasing treated seeds. After harvest, 58.3% saved part of the crop for future seeds. About 65.8% of women were familiar with threshing machines, and 44.2% used them, mainly based on information from neighbors. Additionally, 60.0% used insecticides, and 27.5% applied Indigenous Technical Knowledge (ITK) for grain treatment before storage. During storage, 42.5% engaged in redrying, winnowing, and packing. Most farm women stored cereals for 1-2 seasons (72.5%), while 88.34% sold vegetables immediately. The findings indicated varied knowledge and practices, with reliance on treated seeds, neighbors' advice, and traditional methods. The study suggested that targeted training programs could help reduce food losses and improve food security by empowering farm women with better postharvest management skills.

**Keyword** Postharvest operation, Information, Storage, Treatment, Empowering, Training, Food security

## Introduction

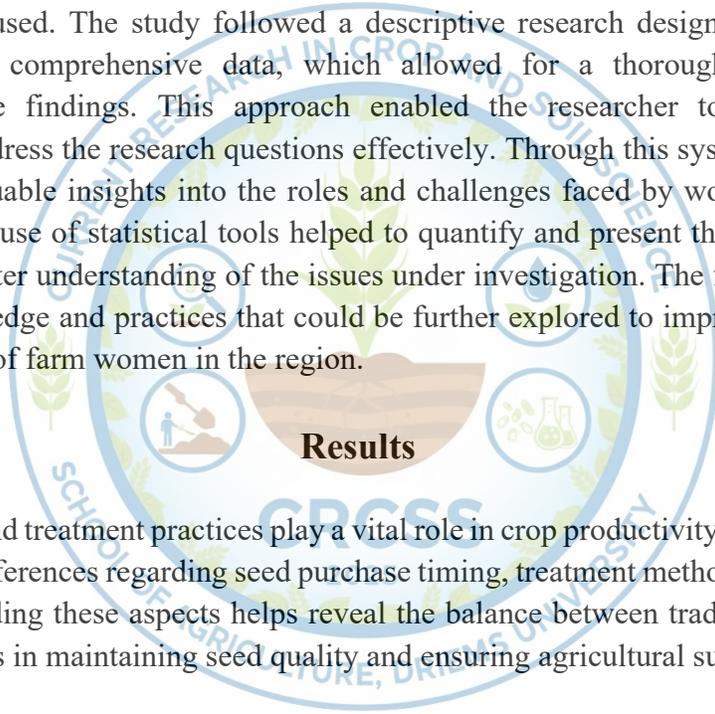
The postharvest management of agricultural produce is a critical aspect of farming that significantly influences both food security and economic stability in rural communities. Meeting

the food requirements of a rapidly growing population emerges as a significant challenge for humanity (Kumar & Kalita, 2017). Significant postharvest losses in fruits and vegetables persist, primarily due to inadequate food processing capacity, insufficient infrastructure, and the weak financial status of most farmers. These losses intensify due to ineffective pre- and postharvest practices, along with limited access to appropriate processing and marketing systems (Etefa et al., 2023; Kumar et al., 2023). A study by (Gupta et al., 2024) indicates that farm women play an integral role in agricultural production and are often responsible for seed procurement, treatment, management, and storage. (Katumbi et al., 2021) find that although women farmers demonstrate greater awareness of postharvest hygiene compared to their male counterparts, they continue to rely on traditional handling practices due to insufficient infrastructure and lack of training opportunities. Although women predominantly manage postharvest operations, training programs tend to be directed toward men, leaving women with limited access to scientific knowledge and innovations. Their knowledge is often informal, experiential, and excluded from institutional training programs and technology transfer initiatives (Kaur et al., 2017; Ragasa et al., 2019). Methods and knowledge among farm women vary widely depending on local traditions, available resources, and their exposure to modern technologies. Understanding these practices is essential for identifying intervention points that can enhance efficiency, reduce postharvest losses, and improve overall food security. This approach not only strengthens the economic well-being of individual women but also contributes to broader community development (Das et al., 2023). Technological and logistical support enhances the shelf life of agricultural products, thereby increasing farmers' income (Kumar et al., 2022). Cultural gender norms continue to limit women's participation in agricultural training programs and hinder their ability to apply newly acquired knowledge (Mudege et al., 2016; Mudege et al., 2017). Postharvest management encompasses a range of activities performed after harvest, including the handling, processing, storage, and distribution of produce. Women's expertise, shaped by a blend of traditional knowledge and contemporary practices, directly impacts the quality, safety, and shelf life of agricultural goods. By systematically analyzing these components, this study aims to highlight the need for targeted training and support programs tailored to the specific needs of farm women, thereby contributing to the development of more effective postharvest management strategies. This research focuses on evaluating the knowledge and operational practices of farm women in postharvest management. Key aspects of the study include examining their understanding of seed procurement and treatment, the methods they use for grain storage, and the balance between traditional and modern techniques. In the Deoghar district of Jharkhand, India, farm women play a important role in managing postharvest activities, yet their knowledge and practices in this domain remain under-explored. This study seeks to fill this gap by critically evaluating the knowledge and operational practices of farm women in postharvest grain management.

## **Methodology**

The study was conducted in the Deoghar district of Jharkhand, focusing on the Mohanpur and Madhupur blocks. These blocks were randomly selected using a simple random sampling method

from a total of ten blocks. To ensure the sample was representative, two gram-panchayats were chosen from each selected block, and from each gram panchayat, two villages were randomly selected using the same sampling technique. From these villages, 15 women farmers were randomly selected as respondents, leading to a total of 120 participants in the study. Before finalizing the study variables and interview schedule, a pilot study was conducted. This helped refine the methodology and gather insights from about 20 additional respondents who were not part of the main sample. The data collection process involved both structured and semi-structured interview schedules, which were administered through face-to-face interviews. This method allowed for a flexible approach to capturing detailed information from the respondents. Once the data were collected, they went through a systematic process of coding, classification, analysis, and tabulation. To ensure the accuracy and meaningful interpretation of the data, statistical tools like frequency counts (for recording occurrences) and percentages (for showing relative proportions) were used. The study followed a descriptive research design, utilizing a survey method to collect comprehensive data, which allowed for a thorough examination and presentation of the findings. This approach enabled the researcher to draw meaningful conclusions and address the research questions effectively. Through this systematic process, the study provided valuable insights into the roles and challenges faced by women farmers in the selected areas. The use of statistical tools helped to quantify and present the data in a way that contributed to a better understanding of the issues under investigation. The findings highlighted key areas of knowledge and practices that could be further explored to improve the postharvest management skills of farm women in the region.



## Results

Seed procurement and treatment practices play a vital role in crop productivity. This study explores women farmers' preferences regarding seed purchase timing, treatment methods, and procurement patterns. Understanding these aspects helps reveal the balance between traditional practices and scientific approaches in maintaining seed quality and ensuring agricultural success.

### **Aspects of seed treatment and procurement**

The study reveals that the majority of farm women (70%) prefer to collect seeds just before sowing, indicating a practical approach that ensures seed freshness and suitability for the upcoming crop cycle. The majority of respondents (70%) preferred to buy seed before sowing the crops. This indicated that most believed the timing of this action was crucial right before planting the new crop. Some respondents (22.5%) favored different timing options, choosing to buy seeds immediately after the previous crop's harvest. This suggested that some respondents valued the importance of purchasing seeds as soon as the previous crop was harvested. The choice of timing was likely influenced by factors such as crop type, local agricultural practices, and individual preferences or circumstances. Regarding seed treatment, 36.84% used chemical methods, such as coating seeds with pesticides or fungicides to protect them from pests and diseases. Another

36.84% used untreated seeds, meaning they did not apply any treatment to the seeds before planting. A smaller percentage (26.31%) opted for natural methods of seed treatment, preferring to use non-synthetic substances or techniques such as bio-control agents or organic compounds to protect their seeds. These preferences reflected a mix of traditional, organic, and chemical approaches to managing seed quality and protection, influenced by individual practices and available resources.

**Table 1: Distribution of respondents according to different aspects of seeds procurement and treatment**

(n = 120)

Aspects	Percentage
<b>Time for collection of seed</b>	
Immediately after harvest of the previous crop	22.50
Just before sowing of the crop	70.00
Whenever it is available	07.50
<b>Type of seed purchased</b>	
Treated	84.20
Untreated	15.80
<b>Types of treatment of untreated seeds</b>	
Use chemical method for seed treatment	36.84
Use natural methods for seed treatment	26.31
Whether you use untreated seed	36.84
<b>Treatment procedure of grown seed crops</b>	
Crop kept for seed purpose is treated as special	25.80
It is the same grain crop, after harvesting some portion is kept separately for seed	58.30
Some plants are selected and seeds collected from them	06.70
Any other	09.20

### Knowledge about a threshing machine

The majority of respondents (65.8%) were familiar with threshing machines, while a significant proportion (34.2%) were not familiar with this agricultural machinery used for separating grains from harvested crops. The most common source of information about threshing machines was interactions with neighbors, as 59.49% of respondents learned about them from their neighbors. This suggested that most respondents acquired knowledge from peer groups or local residents who were using or familiar with threshing machines. A smaller proportion (16.45%) obtained their knowledge about threshing machines from Krishi Vigyan Kendra (KVK), while 8.86% learned from a company. This indicated that a small number of respondents gained their knowledge from agricultural companies or manufacturers. Additionally, 11.39% of respondents acquired knowledge from an NGO. Regarding the use of threshing machines, the majority of respondents (55.8%) indicated that they did not have knowledge about how to operate them. On the other hand, 44.2% of respondents reported that they possessed the knowledge and skills to operate this agricultural machinery. This reflected a significant gap in the practical knowledge required to efficiently use threshing machines for separating grains, suggesting the need for more widespread training or access to resources to improve the use of such equipment.

**Table 2: Distribution of respondents according to different aspects of threshing machine**  
(n = 120)

Aspects	Percentage
<b>Knowledge about a threshing machine (Response)</b>	
Yes	65.80
No	34.20
<b>Source of knowledge about threshing machine</b>	
KVK	16.45
NGO	11.39
Company	08.86
Neighbor	59.49
Others	03.79
<b>Threshing machine used by farm women (Response)</b>	
Yes	44.20

No	55.80
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### Operations performed and containers used for storage by farm women

The majority of respondents (60.0%) used insecticides as a pre-storage treatment method for grains. Insecticides are chemicals that help control or prevent insect infestations in stored grains, preserving their quality and preventing damage. Approximately one fourth (27.5%) of respondents relied on traditional or locally developed knowledge and practices for pre-storage treatment. Indigenous technical knowledge often involved traditional methods of grain preservation and protection from pests. Around 10.0% of respondents used fungicides as a pre-storage treatment method. Fungicides are chemicals used to control or prevent fungal growth on grains, helping to protect their quality during storage. A significant number of respondents (42.5%) performed "redrying, winnowing, and packing" operations on the stored seed. These operations included drying the grains if moisture levels increased, separating unwanted materials through winnowing, and repacking the grains to maintain their quality during storage. About 25.8% of respondents carried out "hydration and dehydration" operations on stored grain, indicating that they adjusted the moisture content of the stored grains by adding or removing moisture to preserve their quality. On the other hand, 17.5% of respondents did not perform any specific operations during grain storage, suggesting that they simply stored the grains without undertaking additional measures. Around 14.2% mentioned using pest control measures during storage. The choice of post-harvest operations appeared to be influenced by factors such as the type of grain, local practices, and individual preferences for preserving the quality of the grains. Regarding storage containers, 45.0% of respondents used "bamboo baskets" for grain storage. Bamboo baskets were popular due to their durability, ventilation properties, and easy availability in the village. Gunny bags were used by 37.5% of respondents, as they are commonly used for bulk storage of grains and other agricultural products. About 5.0% of respondents used cloth bags for smaller quantities of grains or seeds, while another 5.0% used earthen structures, such as clay containers, for grain storage. A smaller portion (2.5%) of respondents used metal bins for storage, likely due to their durability and ability to protect grains from pests and moisture. These findings indicated varied approaches to grain storage, with respondents using a combination of chemical, traditional, and practical methods to preserve their grains and maintain their quality. The choice of storage container and treatment methods were influenced by factors like availability, local knowledge, and the specific needs of the grains being stored.

**Table 3: Distribution of respondents according to different aspects of storage of grains**

(n = 120)

Aspects	Percentage
<b>Methods of pre-storage treatment</b>	
Indigenous Technical Knowledge	27.50

Fungicides	10.00
Inert material	02.50
Insecticides	60.00
<b>Operation during storage</b>	
Do not perform any operation	17.50
Hydration and dehydration of the stored grain	25.80
Redrying, winnowing and packing of the stored seed	42.50
Pest control measures	14.20
<b>Containers used for storage of grains</b>	
Bamboo basket	45.00
Cloth bag	05.00
Earthen structure	05.00
Gunny bag	37.50
Metal bin	02.50
Any special structure	05.00

#### **Practices followed by farm women before storage of the grains**

The majority of respondents (46.7%) prioritized storage spaces that were dry, cool, and well-ventilated to maintain the quality and prevent spoilage of stored grains. Factors like compactness were also important, as 20.8% of respondents preferred a "compact room" for storing grains. This indicated a preference for small, tightly sealed storage areas, which helped protect grains from pests and moisture. Additionally, some respondents considered the avoidance of damp places to ensure successful grain storage. Around 9.2% of respondents specifically sought "dry and cool" storage locations, indicating a preference for areas that were both dry and had a cool temperature to protect their grains from deterioration. These findings highlighted the importance of proper storage conditions in maintaining grain quality and minimizing the risk of spoilage.

**Table 4: Respondents' distribution according to the checklist followed by farm women before storage** (n = 120)

Checklist followed by farm women before storage	Percentage
Damp place	23.30
Dry and cool	09.20
Dry, cool and ventilated	46.70
Compact room	20.80

### Duration of storage of crops practiced by farm women

The table provided showed the storage duration preferences for pulses, vegetables, and cereals. For pulses, the majority of respondents (58.3%) stored them for long durations, typically one or two seasons, while 20.8% stored them moderately. A smaller proportion (15.0%) stored pulses for a short time, and 3.3% used other methods. Only 2.5% of respondents sold pulses immediately. For vegetables, a significant majority (88.34%) preferred to sell them immediately due to their perishable nature. A smaller percentage (11.67%) stored vegetables moderately, and no respondents chose to store vegetables for a short time or for long periods. In the case of cereals, 72.5% of respondents stored them for long durations, one or two seasons, while 7.5% stored them moderately, and 15.8% stored them for a short time. Only 3.3% sold cereals immediately. These storage preferences highlighted the differences in how different types of crops were managed based on their perishability and market demand.

**Table 5: Distribution of respondents according to the duration of storage**

(n = 120)

Storage duration	Pulses	Vegetable	Cereals
	Percentage	Percentage	Percentage
Sell immediately	02.5	88.34	03.3
Store moderately	20.8	11.67	07.5
Store short time	15.0	00.00	15.8
Stores long/one season/two seasons	58.3	00.00	72.5
Any other	03.3	00.00	00.0

## Discussion

The study reveals that the majority of farm women (70%) prefer to collect seeds just before sowing, my findings allenes with Erickson & Halford (2020) that majority of farmers collect seeds just before sowing, indicating a practical approach that ensures seed freshness and suitability for the upcoming crop cycle. Treatment procedure of grown seed crops concludes the majority, comprising (58.3%), follow the practice of keeping the same grain for seed purposes. This approach indicates that most respondents use a portion of their regular crop for seed purposes while keeping it separate after harvest of the crop. (6.7%) choose specific plants for seed collection. They prefer a selective approach to seed collection, possibly choosing plants with desirable traits for seed production. The choice of pre-storage treatment method may depend on factors such as the type of grains, local practices, and individual preferences for grain preservation and pest control. Through the present study found that (10%) of respondents use fungicides my findings oppose the findings of Kaur et al. (2017), they concluded that (86.67%) respondents used fungicides for storage. The operation performed during storage of grains my findings opposes the findings of Mwangi et al (2017), majority uses pest control measure to control whereas in my finding's women perform Redrying, winnowing and packing of the stored seed this shows that they perform traditional knowledge to control. Majority of the respondents plan to store cereal crops for an extended duration, often spanning one or two seasons or more, before using or selling them. The choice of storage duration may depend on various factors, including market conditions, perishability of the vegetables, type of cereal crops, transportation facility available, crop type, individual farming objectives, their needs etc. Pulse crops are used to be stored for long duration often spanning one or two seasons or more, before using or selling them and sell the produce as and when they require money. The majority of respondents prefer not to store vegetables for an extended period as it is perishable in nature

## Conclusion

This study examines seed procurement, treatment, and storage practices among farm women in the Deoghar district. Key findings reveal a strong preference for purchasing seeds just before sowing, with most women choosing treated seeds. Despite this, many still use untreated seeds and apply a mix of chemical and natural treatments. For seed storage, most women use insecticides and traditional methods, favoring bamboo baskets and gunny bags. The use of threshing machines varies, with local knowledge playing a significant role. Farm women typically store cereals and pulses for extended periods, while vegetables are sold immediately. These insights highlight the impact of local practices and individual preferences on agricultural methods. The findings offer valuable information for improving seed management and storage practices. Support for seed treatment and storage education is essential, modern technologies should be encouraged, and resources should be provided to integrate effective practices while respecting local traditions.

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