



From Harvest to Market: How Odisha's Groundnut Farmers Are Adopting Post-Harvest Technologies

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Groundnut (*Arachis hypogaea* L.) is an important oilseed and commercial crop in Odisha, contributing to farm income, nutritional security and rural livelihoods. Despite improvements in production technologies, a considerable proportion of yield and quality losses occur during post-harvest operations such as drying, storage, shelling and marketing. These losses are largely attributed to inadequate knowledge and low adoption of scientific post-harvest practices. This article synthesizes findings from published research and institutional studies to highlight the status of post-harvest management in groundnut, examine factors influencing adoption of improved practices, and discuss the role of extension services, including digital and virtual extension approaches. Strengthening awareness, promoting low-cost technologies and improving advisory services can help farmers move efficiently from harvest to market while ensuring better quality, reduced losses and higher returns.

Keywords: Groundnut, post-harvest management, adoption, extension services, digital advisory, Odisha

Introduction

Groundnut is among the principal oilseed crops grown in Odisha, especially in rainfed and tribal-dominated areas. It serves as an important source of edible oil, protein-rich food, livestock feed and cash income for small and marginal farmers. While sustained efforts have been made to increase productivity through improved varieties and better agronomic practices, comparatively less emphasis has been placed on post-harvest management.

Available research indicates that post-harvest losses in oilseed crops range between 10 and 25 per cent, depending on handling and storage practices (FAO, 2019). In groundnut, such losses not only reduce the volume of marketable produce but also adversely affect quality attributes such as kernel appearance, oil content and freedom from aflatoxin contamination. With markets increasingly prioritising quality and food safety, inadequate post-harvest management can substantially limit farmers' access to markets and depress farm-gate prices. Consequently, understanding the adoption of post-harvest technologies and the role of extension systems in facilitating this transition is crucial for strengthening the groundnut value chain in Odisha.

Importance of Post-Harvest Management in Groundnut

Post-harvest management encompasses all operations carried out from the time of harvesting until the produce reaches the consumer. In the case of groundnut, these operations include harvesting at the appropriate stage, drying, curing, shelling, cleaning, grading, storage, transportation and marketing.

Scientific evidence highlights that improper post-harvest handling is a major contributor to quality deterioration and aflatoxin contamination in groundnut (Pandey et al., 2019). High moisture levels during drying or storage create favourable conditions for fungal growth, leading to toxin production that poses serious risks to human and animal health. In addition, poorly dried or physically damaged kernels generally attract lower prices in the market. Therefore, effective post-harvest management is essential for protecting both farmer income and food safety.

Knowledge of Groundnut Farmers on Post-Harvest Practices

General Awareness Levels

The literature suggests that most groundnut farmers have a reasonable understanding of traditional post-harvest practices such as sun drying and local storage methods. Awareness of the appropriate harvesting stage and basic drying techniques is relatively high, as these practices have been passed down over generations. However, farmers' knowledge of improved and scientific post-harvest technologies remains inadequate. Studies report limited awareness regarding recommended moisture levels for safe storage, improved drying techniques, measures for aflatoxin prevention and the use of scientific storage structures (Behera et al., 2021). This knowledge gap often leads to incomplete or improper adoption of recommended practices.

Factors Affecting Knowledge

Research indicates that farmers' knowledge levels are shaped by factors such as educational attainment, frequency of contact with extension personnel, participation in training programmes and exposure to information and communication technologies (Panda & Mishra, 2020). Farmers who regularly engage with extension services or attend training programmes generally exhibit greater awareness of improved post-harvest practices.

Adoption of Post-Harvest Technologies

Extent of Adoption

Adoption of post-harvest technologies in groundnut cultivation is commonly reported to be low to medium. Simple and low-cost practices, including harvesting at physiological maturity and traditional sun drying, are widely adopted. In contrast, technologies that require higher investment, specialised skills or collective action show comparatively lower adoption levels.

| Post-Harvest Practice | Adoption Level |
|---|----------------|
| Harvesting at proper maturity | High |
| Traditional sun drying | High |
| Drying on tarpaulin or raised platforms | Low to Medium |
| Improved storage structures | Low |
| Grading before marketing | Medium |
| Use of digital market advisories | Low to Medium |

(Compiled from published studies and institutional reviews)

Reasons for Low Adoption

Several studies identify high initial costs, inadequate technical support, limited access to institutional credit and weak market incentives as key reasons for the poor adoption of improved post-harvest technologies (Singh et al., 2019). Farmers are often hesitant to invest in post-harvest infrastructure unless the economic advantages are clearly demonstrated.

Aflatoxin Management: A Critical Post-Harvest Challenge

Aflatoxin contamination represents one of the most serious challenges in groundnut post-harvest management. Research findings indicate that aflatoxin development is strongly influenced by post-harvest conditions such as delayed drying, elevated moisture content, poor storage environments and pest infestation (Pandey et al., 2019). Scientific evidence shows that practices such as timely harvesting, rapid drying to safe moisture levels, use of clean drying surfaces and proper storage methods can substantially reduce the risk of aflatoxin

contamination. Nevertheless, adoption of aflatoxin management practices remains limited, largely due to insufficient awareness and the absence of diagnostic facilities at the farm level.

Role of Extension Services in Improving Adoption

Conventional Extension Approaches

Traditional extension approaches, including method demonstrations, farmer trainings, field days and exposure visits, have played a significant role in disseminating post-harvest technologies. Krishi Vigyan Kendras and line departments have been particularly important in demonstrating improved drying and storage practices. However, the effectiveness of conventional extension is often constrained by shortages of manpower and resources, especially in remote and inaccessible areas.

Emerging Role of Digital and Virtual Extension

Digital and virtual extension approaches are increasingly recognised as effective means of improving farmers' access to timely and location-specific information. Tools such as mobile-based advisories, voice messages, WhatsApp groups and online videos facilitate rapid dissemination of post-harvest recommendations.

Studies on ICT-based advisory platforms reveal that digital extension can enhance farmers' decision-making capacity, improve the timeliness of farm operations and complement conventional face-to-face extension methods (Meena et al., 2022). When combined with physical demonstrations, digital tools can significantly accelerate the adoption of improved post-harvest practices.

Constraints in Post-Harvest Technology Adoption

Despite the availability of suitable technologies, farmers encounter several constraints, including inadequate village-level drying and storage facilities, limited access to quality testing and grading services, weak linkage between extension advisories and market demands, and low awareness of quality-based price incentives. Addressing these challenges requires coordinated efforts involving research institutions, extension agencies, market actors and policymakers.

Way Forward: Strengthening the Harvest-to-Market Continuum

Based on available research evidence, several strategies are essential for improving post-harvest management in groundnut. These include promoting affordable drying and storage technologies, strengthening training programmes focused on aflatoxin prevention, integrating digital advisory services with conventional extension approaches, encouraging collective action through farmer producer organizations, and linking quality enhancement with assured market incentives. Such interventions can improve adoption rates and contribute to sustainable increases in farm income.

Conclusion

Post-harvest management continues to be a crucial yet relatively neglected aspect of groundnut cultivation in Odisha. Although farmers possess basic knowledge of traditional practices, the adoption of improved post-harvest technologies is constrained by economic, technical and institutional factors. Evidence from research and institutional studies demonstrates the potential of improved drying, storage and digital advisory services to reduce losses and enhance quality. Strengthening extension systems—particularly through digital and virtual platforms—can help bridge the knowledge-adoption gap and enable groundnut farmers to successfully move from harvest to market with better-quality produce and higher returns.

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