

International Journal of Agriculture Extension and Social Development

Volume 9; Issue 9; September 2026; Page No. 666-669

Received: 05-07-2026
Accepted: 09-08-2026

Indexed Journal
Peer Reviewed Journal

Marketing cost, price spread and post-harvest losses of onion: Evidence from Ghazipur district, Uttar Pradesh

¹ Divyanshu Singh and ² Pritesh Dwivedi

¹ M.B.A. (Agribusiness Management) Scholar, Department of Agricultural Economics, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India

² Assistant Professor, Department of Agricultural Economics, Naini Agricultural Institute, SHUATS, Prayagraj, Uttar Pradesh, India

DOI: <https://www.doi.org/10.33545/26180723.2026.v9.i9i.4252>

Corresponding Author: Pritesh Dwivedi

Abstract

The present study examines the marketing cost, price spread, producer's share, and marketing efficiency of onion across alternative marketing channels, alongside the extent of post-harvest losses across farm-size categories, in Ghazipur district of Uttar Pradesh. Primary data were collected from 120 stratified sample farmers selected through a multi-stage random sampling procedure across ten villages of Saidpur and Zamanian blocks, along with 23 market intermediaries (commission agents, wholesalers, and retailers). Three marketing channels were identified Channel I (Producer-Consumer), Channel II (Producer-Retailer-Consumer), and Channel III (Producer-Wholesaler-Retailer-Consumer). Results reveal that marketing cost rose from Rs. 70/quintal in Channel I to Rs. 175/quintal in Channel III, while price spread widened correspondingly from Rs. 70/quintal to Rs. 575/quintal. The producer's share in the consumer's rupee was highest in Channel I (95.24%) and lowest in Channel III (67.61%), and marketing efficiency followed the same pattern, declining from 21.00 in Channel I to 3.09 in Channel III. Post-harvest losses were estimated to be highest among marginal farmers (14.0%) and lowest among large farmers (6.7%), driven predominantly by storage-stage losses. The study recommends strengthening direct marketing linkages, promoting farmer producer organisations (FPOs), and expanding cost-effective storage infrastructure to improve producers' income realisation and reduce post-harvest wastage in the onion value chain.

Keywords: Onion, marketing channels, price spread, producer's share, marketing efficiency, post-harvest losses, Ghazipur, agribusiness

Introduction

Onion (*Allium cepa* L.) is among the most widely cultivated and commercially important vegetable crops in India, serving as a staple ingredient across virtually every regional cuisine and forming a critical component of household food expenditure. India is the second-largest producer of onion in the world, and Uttar Pradesh contributes a significant share of national production, with eastern districts such as Ghazipur emerging as important commercial pockets owing to favourable alluvial soils and irrigation access.

Unlike many other agricultural commodities, onion marketing in India continues to be dominated by a chain of intermediaries village traders, commission agents, wholesalers, and retailers each of whom adds to the marketing cost and margin before the produce reaches the final consumer. This layered structure widens the price spread between the price received by the farmer and the price paid by the consumer, and correspondingly depresses the producer's share in the consumer's rupee. Small and marginal farmers, who dominate onion cultivation numerically, are particularly disadvantaged by weak bargaining power and limited access to organised or direct marketing outlets.

Compounding this marketing inefficiency is the semi-perishable nature of onion, which renders it vulnerable to post-harvest losses at the stages of harvesting, curing,

storage, and transportation. In the absence of scientific storage structures, farmers are frequently compelled to sell immediately after harvest, often during periods of peak market glut, resulting in distress sales and depressed price realisation. Post-harvest losses tend to vary systematically across farm-size categories, with resource-constrained marginal and small farmers typically experiencing the highest losses due to inadequate storage infrastructure and limited access to improved post-harvest technologies.

While the broad contours of vegetable marketing inefficiency and post-harvest wastage in India are well documented at the national level, empirical, channel-wise and farm-size-disaggregated evidence at the district level remains comparatively scarce, particularly for eastern Uttar Pradesh. The present study addresses this gap by evaluating the marketing cost, price spread, producer's share, and marketing efficiency of onion across the major marketing channels operating in Ghazipur district, and by quantifying post-harvest losses across the five recognised farm-size categories, using primary survey data collected during 2024-26.

Materials and Methods

Study Area and Sample Design

The study was conducted in Ghazipur district of Uttar Pradesh, an important onion-producing district in the eastern

part of the state characterised by fertile alluvial soil and well-developed marketing networks. Two blocks Saidpur, known for intensive onion cultivation and better market access, and Zamanian, representative of traditional small-scale farming were purposively selected. From these two blocks, ten villages were selected, and a total of 120 onion growers were selected through stratified random sampling across five landholding categories: marginal (<1 ha), small (1-2 ha), semi-medium (2-4 ha), medium (4-10 ha), and large (>10 ha). To capture the marketing side of the value chain, 23 market intermediaries were purposively selected from the Ghazipur APMC market and the Saidpur local market, comprising 7 commission agents (of 20 operating in the market), 6 wholesalers (of 15), and 10 retailers (of 30). Primary data were collected through a structured, pre-tested interview schedule covering marketing practices, costs, margins, and post-harvest handling, supplemented by secondary data from the District Agriculture Office, APMC market records, and government publications. The study period covered the agricultural years 2024-26.

Analytical Tools

Marketing cost for each channel was computed as the sum of all expenses incurred in moving the produce from the producer to the final consumer, including packing, transport, labour, market charges, and commission. Price spread was calculated as the difference between the price paid by the consumer and the price received by the producer. Producer's share in the consumer's rupee was estimated as:

$$\text{Producer's Share (\%)} = (\text{Producer's Price} / \text{Consumer's Price}) \times 100$$

Marketing efficiency was estimated following the modified Shepherd's method as the ratio of the value of goods sold to the sum of total marketing cost and total marketing margin:

$$\text{Marketing Efficiency} = \text{Value of Goods Sold} / (\text{Total Marketing Cost} + \text{Total Marketing Margin})$$

Post-harvest losses were estimated as the percentage loss in quantity reported by sample farmers at the harvesting, storage, and transportation stages, disaggregated across the five farm-size categories, using simple percentage and averaging techniques. All primary data were processed and tabulated using MS Excel.

Results and Discussion

1. Marketing Channels of Onion

Three major marketing channels were identified in the study area through which onion moves from producer to consumer:

- **Channel I:** Producer → Consumer (direct sale)
- **Channel II:** Producer → Retailer → Consumer
- **Channel III:** Producer → Wholesaler → Retailer → Consumer

Channel II was found to be the most commonly used by sample farmers owing to its convenience and proximity to local markets, while Channel I, though offering the highest returns, remained limited by farmers' restricted access to direct consumer outlets. Channel III was primarily used for bulk disposal of marketable surplus, particularly by medium and large farmers.

2. Marketing Cost across Channels: It could be seen from Table 1 that marketing cost rose consistently with the number of intermediaries involved, from Rs. 70 per quintal in Channel I to Rs. 100 per quintal in Channel II and Rs. 175 per quintal in Channel III. Commission charges, absent in the shorter channels, emerged as a distinct cost component in Channel III, alongside proportionately higher transport and labour costs reflecting the additional handling stages.

Table 1: Marketing Cost of Onion across Channels (Rs./Quintal)

Channel	Packing	Transport	Labour	Market Charges	Commission	Total Cost
Channel I	20	30	15	5	—	70
Channel II	25	45	20	10	—	100
Channel III	35	65	25	15	35	175

Source: Primary survey data, 2024-26.

3. Price Spread across Channels

Table 2 shows that price spread the gap between the price paid by the consumer and the price received by the producer widened sharply with channel length, from Rs. 70 per quintal in Channel I to Rs. 300 per quintal in Channel II and Rs. 575

per quintal in Channel III. This widening spread reflects the cumulative effect of rising marketing cost and margin retained by successive intermediaries, and directly erodes the price realisation available to producers in longer channels.

Table 2: Price Spread of Onion across Marketing Channels (Rs./Quintal)

Channel	Producer Price	Marketing Cost	Margin	Consumer Price	Price Spread
Channel I	1400	70	—	1470	70
Channel II	1300	100	200	1600	300
Channel III	1200	175	400	1775	575

Source: Primary survey data, 2024-26.

4. Producer's Share in Consumer's Rupee

As presented in Table 3, the producer's share in the consumer's rupee declined systematically as the number of intermediaries increased from 95.24 percent in Channel I to 81.25 percent in Channel II and 67.61 percent in Channel III.

This confirms that direct or short marketing channels allow farmers to retain a substantially larger proportion of the final consumer price, underscoring the income advantage of reducing intermediation in the onion value chain.

Table 3: Producer's Share in Consumer's Rupee across Channels

Channel	Producer Price (Rs./q)	Consumer Price (Rs./q)	Producer's Share (%)
Channel I	1400	1470	95.24
Channel II	1300	1600	81.25
Channel III	1200	1775	67.61

Source: Primary survey data, 2024-26.

5. Marketing Efficiency across Channels

Table 4 indicates that marketing efficiency, computed as the ratio of the value of goods sold to the combined marketing cost and margin, was highest in Channel I (21.00) and declined sharply to 5.33 in Channel II and 3.09 in Channel

III. The inverse relationship between channel length and marketing efficiency mirrors the pattern observed in producer's share and price spread, reinforcing that shorter, less intermediated channels deliver a more efficient outcome for both farmers and, ultimately, consumers.

Table 4: Marketing Efficiency of Onion across Channels

Channel	Value of Goods Sold (Rs./q)	Cost + Margin (Rs./q)	Marketing Efficiency
Channel I	1470	70	21.00
Channel II	1600	300	5.33
Channel III	1775	575	3.09

Source: Primary survey data, 2024-26.

6. Post-Harvest Losses across Farm-Size Categories

It could be seen from Table 5 that post-harvest losses declined consistently with an increase in farm size, from 14.0 percent among marginal farmers to 6.7 percent among large farmers. Storage-stage losses constituted the dominant component of total loss across all categories, ranging from

8.5 percent for marginal farmers to 4.0 percent for large farmers, reflecting the comparatively weaker access of small and marginal holders to scientific storage structures. Harvesting and transportation losses followed a similar, though less pronounced, declining trend with increasing farm size.

Table 5: Post-Harvest Losses of Onion across Farm-Size Categories (%)

Farm-Size Category	Harvesting Loss (%)	Storage Loss (%)	Transport Loss (%)	Total Loss (%)
Marginal	3.0	8.5	2.5	14.0
Small	2.5	7.0	2.0	11.5
Semi-Medium	2.0	6.0	1.8	9.8
Medium	1.8	5.0	1.5	8.3
Large	1.5	4.0	1.2	6.7

Source: Primary survey data, 2024-26.

Discussion

The integrated reading of marketing performance and post-harvest loss estimates offers two connected insights for the onion value chain in Ghazipur district. First, the consistent inverse relationship between channel length on the one hand, and producer's share and marketing efficiency on the other, demonstrates that intermediation, while offering farmers convenient and immediate market access, comes at a direct cost to income realisation. Farmers selling through the wholesaler-retailer chain (Channel III) retained only about two-thirds of the final consumer price, compared with over ninety-five percent for farmers able to access consumers directly. This finding lends empirical support to policy efforts aimed at strengthening direct marketing platforms, farmer producer organisations (FPOs), and farmer-retailer linkages that can shorten the value chain without displacing the market access that intermediaries currently provide.

Second, the declining gradient of post-harvest losses with increasing farm size highlights that storage infrastructure, rather than harvesting or transportation practices alone, is the principal driver of loss differentials across farm categories. Since marginal and small farmers together dominate onion cultivation numerically in the study area, their disproportionately higher losses translate into a substantial aggregate loss of marketable surplus and farm income at the district level. Addressing this gap through affordable, small-

scale storage technologies and community or cooperative storage facilities would likely yield a larger overall reduction in post-harvest loss than interventions targeted only at larger farms.

Taken together, the results suggest that improving farmer income and reducing wastage in the onion value chain requires a combined strategy: reducing the effective length of marketing channels available to small and marginal farmers, and simultaneously expanding their access to storage infrastructure. Neither intervention in isolation is likely to substantially improve outcomes for the majority of onion growers in the district, given that both marketing inefficiency and post-harvest loss are shown here to be systematically linked to farm size and market access.

Conclusion

This study provides channel-wise and farm-size-disaggregated evidence on the marketing performance and post-harvest losses of onion in Ghazipur district, India's important onion-growing region of eastern Uttar Pradesh. The evidence establishes that marketing cost and price spread rise, while producer's share and marketing efficiency decline, as the length of the marketing channel increases, with Channel I (direct sale) delivering the most favourable outcomes for farmers and Channel III (producer-wholesaler-retailer-consumer) the least favourable. Post-harvest losses,

dominated by storage-stage wastage, were found to be inversely related to farm size, disadvantaging marginal and small farmers most acutely.

The findings support a two-pronged policy approach: (i) promoting shorter, farmer-friendly marketing channels through direct marketing platforms and farmer producer organisations to improve producer's share and marketing efficiency; and (ii) expanding access to affordable storage infrastructure for small and marginal farmers to reduce post-harvest losses. Such measures would jointly enhance farmers' income realisation and strengthen the overall efficiency of the onion marketing system in the district.

Declarations

- **Conflict of Interest:** The authors declare no conflict of interest.
- **Funding:** This research received no external funding. It was conducted as part of the M.B.A. (Agribusiness Management) thesis at SHUATS, Prayagraj.
- **Data Availability:** The primary survey data supporting the findings of this study are available from the corresponding author upon reasonable request.

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