

International Journal of Agriculture Extension and Social Development

Volume 9; SP-Issue 7; July 2026; Page No. 116-121

Received: 16-04-2026
Accepted: 18-05-2026

Indexed Journal
Peer Reviewed Journal

Marketing channels, price spread and marketing efficiency of mushroom in Banda district of Uttar Pradesh

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DOI: <https://doi.org/10.33545/26180723.2026.v9.i7Sb.3947>

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Abstract

The present study was conducted to analyze the disposal pattern, marketing channels, price spread, and marketing efficiency of mushroom marketing in the study area. Primary data were collected from selected mushroom growers using a structured interview schedule, and the data were analysed using tabular analysis, percentages, price spread analysis, and Acharya's marketing efficiency model. The findings revealed that the average mushroom production was 12.56 qtl per farm, of which 97.13 per cent constituted the marketable surplus, while 95.54 per cent was marketed. Only 2.07 per cent of the production was retained for family consumption and 0.80 per cent was utilized for other household purposes, indicating that mushroom cultivation is highly market-oriented. Two major marketing channels were identified, namely Channel-I (Producer → Consumer) and Channel-II (Producer → Retailer → Consumer). About 40.00 per cent of the marketed surplus was sold through Channel-I, whereas 60.00 per cent was marketed through Channel-II. In Channel-I, the producer received a net price of ₹4,665/qtl, representing 93.30 per cent of the consumer's purchase price, with a marketing cost of ₹335/qtl. In Channel-II, the producer received a net price of ₹4,845/qtl, while the total marketing cost and marketing margin were ₹605/qtl and ₹550/qtl, respectively, resulting in a consumer purchase price of ₹6,000/qtl and a price spread of ₹1,155/qtl. The marketing efficiency analysis indicated that Channel-I recorded the highest marketing efficiency (13.93), whereas Channel-II recorded a marketing efficiency of 4.19. The higher efficiency of Channel-I was mainly due to the absence of intermediaries, lower marketing costs, and direct sale to consumers. However, most producers preferred Channel-II because retailers ensured quick disposal of the highly perishable produce and provided regular market access. The study concludes that strengthening direct marketing channels, improving market infrastructure, establishing farmer producer organizations (FPOs), promoting digital marketing platforms, and developing cold-chain and storage facilities would reduce marketing costs, increase marketing efficiency, enhance the producer's share in the consumer's rupee, and improve the profitability of mushroom cultivation.

Keywords: Mushroom, Disposal Pattern, Marketable Surplus, Marketing Channels, Price Spread, Marketing Cost, Marketing Efficiency, Producer's Share, Consumer's Rupee, Acharya's Model

Introduction

Mushroom cultivation has emerged as one of the fastest-growing enterprises in the horticultural sector because of its high nutritional value, short production cycle, efficient utilization of agricultural residues and strong income-generating potential. Mushrooms are rich in high-quality protein, essential amino acids, vitamins, minerals and dietary fibre, while containing low fat and cholesterol. Owing to these characteristics, mushrooms are increasingly recognized as a functional food that contributes to nutritional security and sustainable agriculture. Among the cultivated species, button mushroom (*Agaricus bisporus*) accounts for nearly 85 per cent of the total mushroom

production in India, followed by oyster, paddy straw and milky mushrooms. Globally, mushroom cultivation has expanded rapidly over the last two decades due to increasing consumer preference for healthy foods and the commercial adoption of improved cultivation technologies. Asia dominates global mushroom production, with China contributing the largest share. India has also witnessed steady growth in mushroom cultivation because of favourable agro-climatic conditions, abundant availability of crop residues and increasing consumer awareness. However, compared with developed countries, per capita mushroom consumption in India remains relatively low, indicating considerable scope for expansion of production and

marketing. Sharma *et al.* (2018) ^[22] reported that India's mushroom production was approximately 0.13 million tonnes, with white button mushroom contributing about 73 per cent of total production.

Mushroom cultivation has become an attractive enterprise for small and marginal farmers, rural youth and women entrepreneurs because it requires comparatively less land, generates employment throughout the year and provides quick economic returns. In addition, mushroom production promotes the recycling of agricultural wastes such as wheat straw, paddy straw and sugarcane bagasse into value-added food products, thereby contributing to environmental sustainability. The National Horticulture Board has also emphasized mushroom cultivation as a viable commercial enterprise owing to its high economic potential and growing domestic demand. Although production technology has improved significantly, marketing continues to be one of the major constraints affecting the profitability of mushroom cultivation. Fresh mushrooms are highly perishable commodities with a shelf life of only a few days under ambient conditions. Consequently, producers are often compelled to sell their produce immediately after harvest, sometimes at lower prices. Inadequate cold-chain facilities, lack of organized markets, poor transportation infrastructure and the presence of intermediaries increase marketing costs and reduce the producer's share in the consumer's rupee. The National Horticulture Board has also reported that mushroom marketing in India is largely unorganized, with producers frequently selling directly to retailers or consumers. Marketing efficiency plays a crucial role in determining the economic viability of mushroom cultivation. An efficient marketing system minimizes marketing costs, reduces unnecessary intermediaries, narrows the price spread and increases the producer's share in the consumer's rupee. According to Acharya and Agarwal (2016) ^[2], marketing efficiency is an important indicator for evaluating the performance of agricultural marketing systems because it reflects the relationship between the value received by producers and the total marketing cost and margin.

Several researchers have highlighted the importance of efficient mushroom marketing in India. Sharma *et al.* (2018) ^[22] reported that despite favourable production conditions, the Indian mushroom industry faces challenges related to weak market linkages, inadequate infrastructure and low domestic consumption. Sachan *et al.* (2013) ^[19] observed that producers adopting direct marketing channels realized a higher share of the consumer's rupee than those selling through intermediaries. Similarly, Biswas *et al.* (2024) ^[6] reported that direct marketing significantly reduced marketing costs and improved marketing efficiency in mushroom cultivation. Koundal and Kumar (2025) ^[14] also concluded that the Producer–Consumer marketing channel was more efficient than channels involving retailers because intermediary margins increased the overall price spread. Sengar *et al.* (2021) ^[20] explained that agricultural marketing efficiency depends on the selection of appropriate marketing channels, efficient transportation, reduced marketing costs and better market information. They emphasized that minimizing unnecessary intermediaries enhances producers' income and improves the overall performance of agricultural marketing systems. Likewise,

Shepherd (1965) ^[23] suggested that lower marketing costs and efficient movement of produce from producers to consumers are the fundamental characteristics of an efficient agricultural marketing system.

In Uttar Pradesh, mushroom cultivation has expanded steadily owing to increasing awareness among farmers, availability of training programmes and growing demand from urban consumers. Banda district possesses favourable conditions for commercial mushroom cultivation; however, systematic information on disposal patterns, marketing channels, price spread and marketing efficiency is limited. An assessment of the existing marketing system is therefore essential to identify constraints and formulate strategies for improving farmers' income.

Keeping these facts in view, the present study entitled, “Marketing Channels, Price Spread and Marketing Efficiency of Mushroom in Banda District of Uttar Pradesh” was undertaken with the following objectives: (i) to analyse the disposal pattern of mushroom production, (ii) to identify the major marketing channels, (iii) to estimate marketing costs, marketing margins and price spread, and (iv) to evaluate the marketing efficiency of different marketing channels. The findings of the study are expected to provide useful information for researchers, extension personnel, policy makers and mushroom growers for improving the marketing system and enhancing the profitability of mushroom cultivation.

Methodology:

Marketing Analysis of Mushroom

The marketing analysis of mushroom in Banda District of U.P. was carried out to examine the disposal pattern, marketing channels, marketing costs, price spread, marketing margins, producer's share in consumer's rupee, and marketing efficiency. Primary data on production, quantity sold, prices received, marketing costs, and marketing channels were collected from the selected mushroom growers through a pre-tested interview schedule. The collected data were analysed using simple averages, percentages, and standard marketing formulas.

Disposal Pattern

The disposal pattern of mushroom was estimated by classifying the total production into family consumption, other uses, marketable surplus, and marketed surplus.

Marketable surplus:

Marketed Surplus = Total Production – (Family Consumption + Other Needs)

Marketed surplus:

Marketed surplus is the quantity actually sold in market.

Total marketing cost

Total marketing cost = Producer marketing cost + Trader/Retailer marketing cost

Trader/Retailer Net Margin (MM)

Marketing Margin (MM) = Sale price – (Purchase price + Marketing cost)

Price Spread (PS)

Price spread = Price paid by consumer – price received by farmer

Producer's Share in Consumer's Rupee (PSCR)

$$\text{Producer share} = \frac{\text{Net Price received by producer}}{\text{consumer purchase price}} \times 100$$

Percentage share

$$\text{Percentage share} = \frac{\text{Particular cost}}{\text{consumer purchase price}} \times 100$$

Net Price Received by Producer (NPRP)

The net price received by the producer was calculated by deducting the producer's marketing cost from the sale price. Net Price Received by Producer (NPRP) = Producer sale price – producer marketing cost

Marketing Efficiency:

Marketing efficiency calculated by using Acharya's Marketing Efficiency (ME) formula

Acharya's Marketing Efficiency (ME)

$$ME = \frac{\text{Net Price Received by Producer}}{\text{Total marketing cost} + \text{total marketing margin}}$$

Where:

- **ME** = Marketing Efficiency
- **Net Price Received by Producer** = Price received by the producer after deducting producer's marketing cost

Total Marketing Cost = Sum of producer's and intermediary's marketing costs

Total Marketing Margin = Net margin earned by the intermediary

A higher value of marketing efficiency indicates a more efficient marketing system, whereas a lower value indicates relatively lower marketing efficiency due to higher marketing costs and intermediary margins.

Results and Discussion**Disposal Pattern of Mushroom**

The disposal pattern of mushroom production revealed that the average production was 12.56 quintals. Of the total production, only 0.26 quintals (2.07%) were retained for family consumption, while 0.10 quintals (0.80%) were utilized for other household purposes. The remaining 12.20 quintals (97.13%) constituted the marketable surplus. Out of the marketable surplus, 12.00 quintals (95.54%) were actually sold in the market as marketed surplus (table-1).

The high proportion of marketable and marketed surplus indicates that mushroom cultivation in the study area is primarily market-oriented rather than subsistence-oriented. Since mushrooms are highly perishable with a short shelf life, producers dispose of their produce immediately after harvesting to minimize quantitative and qualitative losses.

Consequently, only a negligible quantity is retained for home consumption.

These findings agree with Biswas *et al.* (2024) ^[6], who reported that mushroom growers marketed most of their production because of perishability and limited storage facilities. Similar observations were also reported by Koundal and Kumar (2024) ^[14], who found that direct disposal of fresh mushrooms immediately after harvest, minimizes losses and increases producers' returns.

Marketing Channels of Mushroom

The study identified two major marketing channels used by mushroom growers:

- **Channel-I:** Producer → Consumer
- **Channel-II:** Producer → Retailer → Consumer

Out of the total marketed surplus of 12.00 quintals, 4.80 quintals (40.00%) were sold through Channel-I, whereas 7.20 quintals (60.00%) were disposed of through Channel-II (table-2).

Although direct marketing provided higher returns to producers, a larger proportion of mushroom was marketed through retailers because retailers ensured regular purchase, quick disposal of produce and easier access to consumers. The highly perishable nature of mushroom compels producers to depend upon intermediaries whenever direct marketing opportunities are limited.

Similar marketing behaviour was observed by Koundal and Kumar (2024) ^[14] and Biswas *et al.* (2024) ^[6], who reported that mushroom growers generally use both direct and retailer-based marketing channels depending on market accessibility and the urgency of selling fresh produce.

Price Spread Analysis**Channel-I**

In Channel-I, the consumer purchase price was ₹5,000 per quintal. The producer incurred a total marketing cost of ₹335 per quintal, representing 6.70 percent of the consumer's purchase price. Consequently, the producer realized a net price of ₹4,665 per quintal, accounting for 93.30 percent of the consumer's rupee (table-3).

Since no intermediary participated in this channel, no marketing margin was observed and the price spread remained minimum. Direct marketing enabled producers to retain a major share of the consumer's expenditure. According to Sengar *et al.* (2021) ^[20], direct marketing channels reduce the role of intermediaries, increase producer's share in the consumer's rupee and improve marketing efficiency, which is consistent with the findings of the present study.

Channel-II

Under Channel-II, the producer sold mushroom at ₹5,200 per quintal and incurred marketing expenses amounting to ₹355 per quintal. Thus, the producer received a net price of ₹4,845 per quintal (table-4).

The retailer incurred additional marketing costs of ₹250 per quintal and earned a net marketing margin of ₹550 per quintal. Consequently, the consumer purchase price increased to ₹6,000 per quintal. The total marketing cost amounted to ₹605 per quintal, while the overall price spread was ₹1,155 per quintal (table-4).

The higher price spread in Channel-II clearly indicates that the involvement of intermediaries increases both marketing

cost and marketing margin, thereby reducing the producer's share in the consumer's rupee.

The present findings corroborate those reported by Koundal and Kumar (2024) ^[14], who observed that direct marketing recorded the highest producer's share in consumer's rupee, whereas channels involving intermediaries resulted in wider price spreads and lower producer returns. Similar findings were also reported by Biswas *et al.* (2024) ^[6].

Marketing Efficiency

Marketing efficiency was estimated using Acharya's formula. The results indicated that Channel-I recorded a marketing efficiency of 13.93, whereas Channel-II recorded only 4.19 (table-5).

The considerably higher efficiency of Channel-I was attributed to lower marketing costs and the complete absence of intermediary margins. On the contrary, Channel-II involved retailer participation, which increased both marketing cost and marketing margin, thereby reducing marketing efficiency. These findings demonstrate that direct marketing is economically more advantageous for mushroom growers and enables them to receive a higher share of the consumer's rupee. However, the dependence on retailers continues because of perishability, inadequate storage facilities and the need for immediate disposal of

fresh mushrooms. The findings are in close agreement with Koundal and Kumar (2024) ^[14], who reported the highest marketing efficiency in the Producer–Consumer channel and substantially lower efficiency in channels involving intermediaries. Biswas *et al.* (2024) ^[6] also concluded that direct marketing channels provide greater marketing efficiency due to lower marketing costs and absence of intermediary margins. The higher marketing efficiency observed in Channel-I is in agreement with the concepts of agricultural marketing and price spread explained by Sengar *et al.* (2021) ^[20]. The overall findings indicate that mushroom marketing in the study area is highly commercialized. Direct marketing (Producer → Consumer) proved to be the most efficient marketing channel because it minimized marketing costs, eliminated intermediary margins and maximized the producer's share in the consumer's rupee. Nevertheless, a majority of growers continued to market their produce through retailers because of the perishable nature of mushroom and the absence of adequate storage, transportation and organized marketing infrastructure. Strengthening direct marketing facilities, producer organizations, collection centers and cold-chain infrastructure would improve marketing efficiency and enhance farmers' income.

Table 1: Disposal Patterns of Mushroom consumption

Sl. No:	Total production (Qtl)	Family needs and home consumption (Qtl)	Other needs	Marketable surplus(Qtl)	Marketed surplus(Qtl)
1.	12.56	0.26	0.10	12.20	12.00

Table 2: Marketing Channels Disposal for Mushroom

Sl. No.	Marketing Channel	Quantity sale
	Channel-I (Producer – consumer)	4.80
	Channel –II(Producer –Retailer –Consumer)	7.20
	Total	12.00

Table 3: Price Spread, Marketing margin, Marketing cost and marketing efficiency of Mushroom in Banda District in channel-I

Sl. No.	Particulars	Channel-I	
		₹/qtl	% share
1	Net price received by producer	4,665.00	93.30
2	Expenditure incurred by producer	335.00	6.70
	a. Preparation charges	60.00	1.20
	b. packaging and packaging material charges	90.00	1.80
	c. loading and unloading charges	25.00	0.50
	d. transportation charges	80.00	1.60
	e. weighing charges	10.00	0.20
	f. marketing cost	40.00	0.80
	g. losses	30.00	0.60
3	consumer purchase price	5,000.00	100.00

(Note: Figure in parenthesis show the per cent to corresponding consumer's price)

Table 4: Price Spread, Marketing margin, Marketing cost and marketing efficiency of Mushroom in Banda District in channel-II

Sl. No.	Particulars	Channel-II	
		₹/qtl	% share
1	Net price received by producer	4,845.00	80.75
2	Expenditure incurred by producer	355.00	5.92
	h. Preparation charges	60.00	1.00
	i. packaging and packaging material charges	100.00	1.67
	j. loading and unloading charges	30.00	0.50
	k. transportation charges	90.00	1.50
	l. weighing charges	15.00	0.25
	m. marketing cost	35.00	0.58
	n. losses	25.00	0.42
3.	Producer sell price/ trader purchase price/ retailer purchase price	5,200.00	86.67
4.	Expenditure incurred by Trader/ Retailer	250.00	4.17
	a. Grading and cleaning charges	50.00	0.83
	b. Market fees	25.00	0.42
	c. Loading unloading	30.00	0.50
	d. weighing charges	10.00	0.17
	e. Transportation cost	95.00	1.58
	f. losses	40.00	0.67
5	Trader Net Margin or Retailer Net Margin	550.00	9.17
6	Price Spread	1,155.00	19.25
7	Total Marketing margin	550.00	9.17
8	Total marketing cost	605.00	10.08
9	Trader's sale price/ retailer sale price/ consumer purchase price	6,000.00	100.00

(Note: Figure in parenthesis show the per cent to corresponding consumer's price)

Table 5: Marketing Efficiency of Different Marketing Channels for Mushroom in Banda District

Sl. No.	Marketing Channel	Net Price Received by Producer (₹/qtl)	Total Marketing Cost (₹/qtl)	Total Marketing Margin (₹/qtl)	Marketing Efficiency (ME)
1	Channel-I	4,665	335	0	13.93
2	Channel-II	4,845	605	550	4.19

Conclusion:

The present study revealed that mushroom cultivation is predominantly a commercial enterprise, as the average production was 12.56 qtl per farm, of which 97.13 per cent constituted the marketable surplus and 95.54 per cent was marketed. Only a small proportion of the total production was retained for family consumption and other household purposes, indicating that mushroom is mainly grown for income generation.

Two major marketing channels were identified in the study area, namely Channel-I (Producer → Consumer) and Channel-II (Producer → Retailer → Consumer). Among these, 60.00 per cent of the marketed surplus was sold through Channel-II, while 40.00 per cent was marketed directly through Channel-I. Although direct marketing provided higher economic returns, most growers preferred Channel-II because retailers ensured quick disposal of the highly perishable produce and provided easier access to markets.

The price spread analysis indicated that the producer received 93.30 per cent of the consumer's rupee in Channel-I due to the absence of intermediaries. In contrast, the involvement of retailers in Channel-II increased marketing costs and marketing margins, thereby widening the price spread and reducing the producer's share in the consumer's expenditure.

The marketing efficiency analysis further demonstrated that Channel-I was the most efficient marketing channel, recording a marketing efficiency of 13.93, compared with 4.19 in Channel-II. The higher efficiency of Channel-I was mainly attributed to lower marketing costs and the

elimination of intermediary margins. However, despite its higher efficiency, the use of direct marketing remained limited because of inadequate market infrastructure, lack of organized marketing facilities, limited cold storage, and the highly perishable nature of mushrooms.

Overall, the study concludes that strengthening direct marketing systems through farmer producer organizations (FPOs), farmers' markets, online marketing platforms, collection centre's, and cold-chain infrastructure would reduce marketing costs, improve marketing efficiency, enhance the producer's share in the consumer's rupee, and ultimately increase the profitability of mushroom cultivation. These interventions would contribute to sustainable income generation and promote the commercial development of mushroom farming in the study area.

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