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Study on value chain of mustard in Sultanpur District of Uttar Pradesh

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Abstract

The present study was undertaken to identify the major marketing channels, analyze marketing cost, price spread and to evaluate marketing efficiency in the mustard value chain in the study area. The study was based on primary data collected from 120 mustard growers and market intermediaries through personal interviews using a structured schedule. The study revealed that majority of respondents (farmers) farmers were engaged in agriculture as their primary occupation (41.67%), while others supplemented their income through dairy, business, or service activities. The study identified three major marketing channels in the mustard value chain. Among these, Channel II comprising of the Producer, Retailer and Consumer, was most commonly used, due to ease of access to local markets, while Channel I comprising of Producer and Consumer was the most profitable but limited in practice. Channel III, comprising of the Producers, Wholesaler, Retailer and Consumer was mainly used for bulk marketing and distant markets. The analysis of marketing cost indicated that costs increased with the number of intermediaries. The total marketing cost was ₹80/q in Channel I, ₹110/q in Channel II, and ₹190/q in Channel III. Similarly, price spread increased from ₹80/q in Channel I to ₹890/q in Channel III, reflecting higher intermediary margins and reduced farmer share in longer channels. The producer's share in the consumer's rupee was found to be highest in Channel I (98.48%), followed by Channel II (91.57%), and lowest in Channel III (84.08%), indicating that shorter marketing channels provide better returns to farmers. Marketing efficiency analysis revealed that Channel I was the most efficient (66.00), followed by Channel II (11.87), while Channel III (6.28) was the least efficient due to higher marketing costs and intermediary involvement. This clearly demonstrates that efficiency declines as the number of intermediaries increases.

Keywords: Value chain, intermediaries, price spread, retailer, producer's share, better

Introduction

Oilseeds like mustard play a crucial role in ensuring nutritional security and economic stability, as edible oils are an essential component of daily diets. Mustard, in particular, is rich in essential fatty acids, vitamins, and antioxidants, which contribute to human health by improving heart health, boosting immunity, and aiding digestion. Due to its multiple uses and high demand, mustard cultivation has become an integral part of the agricultural economy in India, especially for small and marginal farmers.

Globally, mustard and rapeseed crops are cultivated on approximately 35–37 million hectares, with total production exceeding 70–75 million tonnes annually. Over the past decade, global production has shown a steady growth rate of around 2–3% per year, driven by increasing demand for edible oils and biofuel production. The average productivity of mustard varies across countries, ranging from 1.0 to 2.0 tonnes per hectare, depending on climatic conditions, varieties, and cultivation practices.

Major Producing Countries Globally

The global production of mustard (rapeseed-mustard group)

is concentrated in several countries

Rank	Country	Production (Approx.)
1	Canada	~18–20 million tonnes
2	China	~13–14 million tonnes
3	India	~11–12 million tonnes
4	European Union	~15–17 million tonnes
5	Australia	~5–6 million tonnes

Canada and the European Union dominate global exports due to advanced production systems and efficient value chains. India is one of the largest producers but consumes most of its production domestically. Mustard (*Brassica juncea* L.) is one of the most important oilseed crops in India and plays a significant role in the country's agricultural economy. It is widely cultivated for its oil-rich seeds, which are used for edible oil extraction, as well as for industrial and medicinal purposes. Mustard oil is a major cooking medium in northern and eastern India, and the crop also contributes to livestock feed through its oil cake. Due to its adaptability to diverse agro-climatic conditions and relatively low input requirements, mustard is predominantly

grown by small and marginal farmers.

Mustard is cultivated over an area of approximately 6–7 million hectares in India. The average productivity ranges between 1200–1400 kg per hectare, though it varies across states depending on irrigation, soil fertility and management practices.

The crop is mainly grown during the rabi season, requiring cool temperatures and moderate rainfall. Despite its importance, productivity remains lower compared to global standards, indicating the need for improved technology adoption and better input management. The major mustard-producing states in India include: Rajasthan, Uttar Pradesh, Haryana, Bihar, Madhya Pradesh and West Bengal. Among these, Uttar Pradesh plays a vital role in mustard cultivation, particularly in districts such as Sultanpur, where the crop is an important source of livelihood. Despite being the strong production base, farmers in Sultanpur continue to face several challenges in production and marketing of the crop. These challenges lead to lower price realization and reduced income for farmers.

Therefore, a systematic study on the market structure and its dynamics in Sultanpur District of Uttar Pradesh for maize crop is essential. The study also helps in identifying key challenges suggesting suitable measures to improve the overall efficiency of the mustard value chain. Improving the value chain of mustard will not only enhance farmers' income and livelihood security but also contribute to strengthening the oilseed sector, reducing import dependency, promoting agro-based industries, and supporting sustainable agricultural development in the region.

Objectives of the study

1. To identify the major marketing channels involved in the movement of mustard from farm to consumers.
2. To analyze the market price structure, marketing efficiency, price spread & marketing cost of mustard in the study area.

Research Methodology

A stratified random sampling technique was adopted to select respondents, ensuring proper representation of the study area. The sampling process was carried out in several stages:

Stage I - Selection of District

Stage II - Selection of Block

Stage III – Selection of Villages

Stage IV – Selection of Respondents

Stage V – Selection of Market and Market Functionaries

The study was conducted in Sultanpur district. The district was selected purposively because it is one of the important mustard-producing districts in Uttar Pradesh. Mustard cultivation is widely practiced in the district and plays a significant role in the livelihood of small and marginal farmers. The district also has well-established local markets and linkages with regional mandis, making it suitable for value chain analysis. Two blocks of Sultanpur district were selected purposively based on higher area under mustard cultivation and active participation in marketing activities. These blocks were Lambhua Block and Kadipur Block. From each selected block, five villages were selected

randomly based on the extent of mustard cultivation and farmer participation in markets.

From the selected villages, 120 mustard growers were picked randomly for detailed investigation regarding production, marketing channels, marketing cost, price spread, and marketing efficiency. A list of all mustard growers in the selected villages was obtained from the District Agriculture Office. From this list, 120 mustard growers were selected randomly for the study.

Selection of Markets

For studying marketing channels, costs, margins, and price spread, two markets were selected:

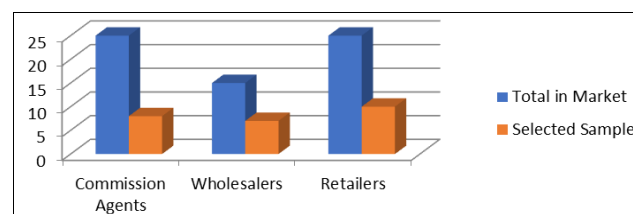
- **Sultanpur APMC Market:** Major market receiving mustard from surrounding villages.
- **Kadipur Local Market:** Important for small farmers selling directly to traders and retailers.

Selection of Intermediaries

Intermediaries involved in mustard marketing were selected randomly from the selected markets for studying marketing costs, marketing margins and price spread.

The sample distribution is as follows:

Type of Intermediary	Total number in Market	Selected Sample
Commission Agents	25	8
Wholesalers	15	7
Retailers	25	10



These intermediaries were interviewed to collect information on marketing practices, cost, margin, and price realization.

Nature and Sources of Data

The study was based on both primary data and secondary data.

Primary data were collected directly from farmers and market intermediaries through personal interview method using a pre-tested and structured schedule.

Secondary data were obtained from published sources and official reports such as District Agriculture Office, Sultanpur, Directorate of Agriculture, Uttar Pradesh, APMC records etc.

The study was conducted for the agricultural year 2024–2026.

Analysis of data

To fulfill the specific objectives of the study, the following analytical tools and techniques were adopted.

Descriptive statistics

For analyzing the data percentage was calculated and this was shown with the help of tables and charts. Tabular and

chart presentation was adopted. Simple statistical tools like averages and percentages were used to compare, contrast, and interpret the results properly.

Chi-Square Test

The Chi-Square Test as a goodness of fit has been used to analyze the magnitude of difference in opinion of respondents between observed outcome and the expected outcome under the assumption that it is equally distributed on a 5-point scale.

Formula used:
$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where, χ^2 = chi square

O_i = Observed value

E_i = Expected value

Marketing Cost

The total cost, incurred on marketing either in cash or in kind by the producer seller and by the various intermediaries involved in the sale and purchase of the commodity reaches the ultimate consumer.

$$C = C_f + C_{m1} + C_{m2} + C_{m3} + \dots + C_{mn}$$

Where,

C = Total cost of marketing of commodity

C_f = Cost paid by the producer from the time of produce leave farm till he sale it

C_{mn} = Cost incurred by the nth middleman in the process of buying and selling the product.

Price spread

Price spread is defined as the difference between the price paid by the consumer and the net price received by producer for an equivalent quantity of farm produce.

$$\text{Price spread} = \frac{\text{Consumer price} - \text{Net price of producer}}{\text{Consumer price}} \times 100$$

Marketing Efficiency

The ratio of price paid by the consumer's (total value of goods) to total marketing cost is used as a measure of marketing efficiency.

$$ME = \frac{V}{I} - 1$$

Where,

ME = Marketing efficiency

V = Price paid by consumer (value of goods purchased)

I = Total Marketing Cost (Cost + margins)

Producer's share in consumer's rupee

It is the price received by the farmer expressed as a percentage of the retail price (i.e., price paid by the consumer)

$$P_s = \frac{PF}{Pr} \times 100$$

Where,

P_s = Producer's share

PF = Price received by the farmer

Pr = Retail price paid by the consumer

Results and Discussion

The results of the present study are discussed herewith. Three major marketing channels were identified in Sultanpur district: direct sales, sales through retailers, and sales through wholesalers and retailers.

Channel I - Producer → Consumer

Channel II - Producer → Retailer → Consumer

Channel III - Producer → Wholesaler → Retailer → Consumer

Channel II (Producer → Retailer → Consumer) is the most commonly used due to ease of access and proximity to local markets. Channel I offers higher profits but is limited by lack of direct market access and infrastructure.

Channel III is used for bulk sales and distant markets but involves more intermediaries, increasing costs and reducing farmers' share. The analysis suggests that shorter marketing channels are more beneficial for farmers as they reduce intermediaries and improve price realization. Promoting direct marketing can enhance farmers' income and efficiency.

Marketing Cost, Marketing Margin, and Price Spread

Table 4.8: Marketing Cost in Different Channels (Rs/q)

Channel	Packing Cost	Transport Cost	Labour Charges	Market Charges	Commission	Calculation	Total Cost
Channel I	25	35	15	5	0	25 + 35 + 15 + 5	80
Channel II	30	50	20	10	0	30 + 50 + 20 + 10	110
Channel III	40	70	25	15	40	40 + 70 + 25 + 15 + 40	190

Channel I (Producer → Consumer)

In Channel I, no intermediary is involved hence no commission charges are demanded. Additionally, there is lower transport and handling costs. The total marketing cost is 80 Rs./q.

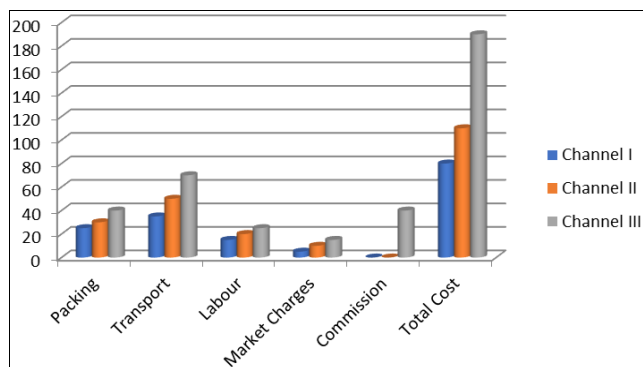
Channel II (Producer → Retailer → Consumer)

In Channel II, there is a moderate increase in the marketing cost due to involvement of the retailer. Transportation and labour charges are slightly higher. Total marketing cost

accrued is 110 Rs./q.

Channel III (Producer → Wholesaler → Retailer → Consumer)

In Channel III, the marketing cost is highest due to Longer transportation distance, Multiple handling stages and Commission charges. The total marketing cost accrued is 190 Rs./q. Hence, Marketing cost increases with the number of intermediaries involved in the channel.

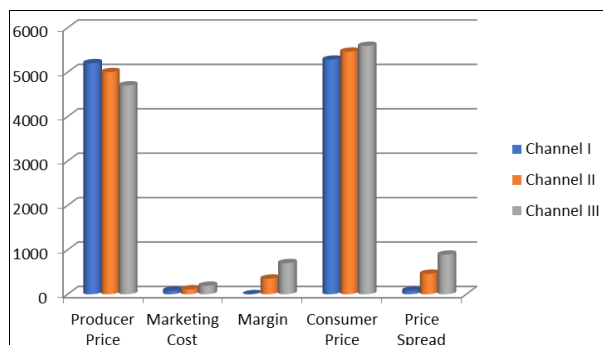


Marketing cost analysis shows that total cost increases from Rs. 80/q in Channel I to Rs. 190/q in Channel III. The increase is mainly due to higher transport costs, labour charges, and commission fees in longer channels. Channel I has the lowest cost as it eliminates intermediaries and reduces handling expenses.

Channel III has the highest cost due to multiple stages of handling and involvement of wholesalers and retailers. This clearly indicates that marketing efficiency decreases as the number of intermediaries increases. Reducing marketing costs through better infrastructure and collective marketing can significantly improve farmers' profitability.

Table 4.10: Consumer Price and Price Spread in different Marketing Channels (Rs./q)

Channel	Producer Price	Marketing Cost	Margin	Calculation of Consumer Price	Consumer Price	Calculation of Price Spread	Price Spread
Channel I	5200	80	0	$5200 + 80 + 0$	5280	$5280 - 5200$	80
Channel II	5000	110	350	$5000 + 110 + 350$	5460	$5460 - 5000$	460
Channel III	4700	190	700	$4700 + 190 + 700$	5590	$5590 - 4700$	890



Price spread analysis shows a significant increase from Rs. 80 in Channel I to Rs. 890 in Channel III. This indicates that a large portion of the consumer price is absorbed by intermediaries in longer channels. Direct marketing minimizes price spread and ensures better returns to farmers.

Higher price spread in longer channels reflects inefficiencies in the marketing system, including high transport costs and intermediary margins. Reducing the number of intermediaries and improving market access can help minimize price spread and enhance farmers' income.

Table: Producer's Share in Consumer's Rupee

Channel	Producer Price	Consumer Price	Producer Share (%)
Channel I	5200	5280	98.48
Channel II	5000	5460	91.57
Channel III	4700	5590	84.08

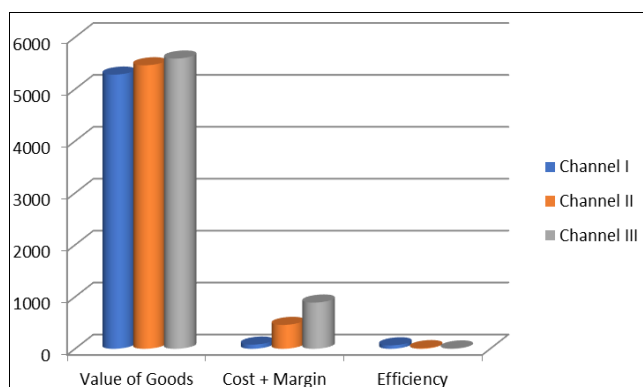


Producer's share is highest in Channel I (98.48%) and decreases to 84.08% in Channel III. This clearly shows that farmers benefit more when they sell directly to consumers. The involvement of intermediaries reduces the share received by producers.

Improving producer share requires strengthening direct marketing channels and farmer organizations. Collective marketing through Farmer Producer Organizations (FPOs) can enhance bargaining power and reduce dependency on middlemen, thereby increasing farmers' income.

Table 4.13: Derivation of Marketing Efficiency in different Marketing Channels (Rs./q)

Channel	Producer Price	Marketing Cost	Margin	Total Cost + Margin	Consumer Price (Value of Goods Sold)	Marketing Efficiency (ME)
Channel I	5200	80	0	80	5280	$5280 \div 80 = 66.00$
Channel II	5000	110	350	460	5460	$5460 \div 460 = 11.87$
Channel III	4700	190	700	890	5590	$5590 \div 890 = 6.28$



Marketing efficiency is highest in Channel I (66.00) and lowest in Channel III (6.28). This indicates that shorter marketing channels are more efficient due to lower costs and absence of intermediaries. Higher efficiency means better utilization of resources and higher returns to farmers. The decline in efficiency in longer channels highlights the need for improving marketing infrastructure and reducing unnecessary intermediaries. Promoting direct sales and cooperative marketing can significantly enhance overall efficiency in the mustard value chain.

Summary and Conclusion

The study identified three major marketing channels for mustard in the study area. Among the three channels, Channel II was the most commonly used, as farmers preferred selling to nearby retailers due to convenience and assured sales. However, Channel I (direct marketing) proved to be the most beneficial, offering the highest returns to farmers.

The analysis of marketing cost revealed a clear increase with the number of intermediaries. The total marketing cost was ₹80 per quintal in Channel I, ₹110 per quintal in Channel II, and ₹190 per quintal in Channel III. Higher costs in Channel III were mainly due to transportation, labour charges, and commission fees, indicating inefficiencies in longer supply chains.

Similarly, the price spread increased significantly across channels, from ₹80 per quintal in Channel I to ₹460 in Channel II and ₹890 in Channel III. This shows that a substantial portion of the consumer price is absorbed by intermediaries, reducing the net income received by farmers. The producer's share in consumer's rupee was highest in Channel I at 98.48%, followed by 91.57% in Channel II, and lowest at 84.08% in Channel III. This clearly indicates that shorter marketing channels enable farmers to retain a larger share of the final price, thereby improving their profitability.

The study also assessed marketing efficiency using Shepherd's formula. The results showed that Channel I had the highest efficiency (66.00) due to minimal costs and absence of intermediaries. Channel II recorded moderate efficiency (11.87), while Channel III had the lowest efficiency (6.28) due to high marketing costs and margins. This confirms that efficiency decreases as the number of intermediaries increases.

Suggestions for policy implications

Improving the mustard value chain requires strengthening market infrastructure, developing storage and warehousing

facilities, reducing transportation costs, and promoting direct marketing systems such as farmer markets and Farmer Producer Organizations (FPOs). Additionally, timely dissemination of market information, access to institutional credit, and promotion of local processing units (oil extraction) can significantly enhance value addition and farmer income.

Furthermore, support from government agencies, extension services, and agricultural institutions in the form of training programs, subsidies, and policy interventions can encourage adoption of improved practices and efficient marketing systems. Strengthening the mustard value chain will not only improve farmers' profitability but also enhance market efficiency, ensure price stability, and contribute to the sustainable development of the agricultural economy in the region.

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