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Economic analysis of Rabi tomato in Akola District

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Abstract
The present study entitled "Economic analysis of rabi tomato in Akola District" was undertaken to examine the economic analysis of rabi tomato in Akola district for the year 2022-2023. The present study was based on primary data. For the study, 40 vegetable growers were selected from Barshitakali, Patur and Balapur tahsils of Akola district. The price spread is the difference between consumer's price and net price received by the producer. The price spread was observed highest in channel- II (Producer- Village trader- Wholesaler-Retailer- Consumer). For tomato it was Rs. 688.47. Producer's share in consumer's rupee was highest in channel I for tomato 90.18 respectively.
The major constraints faced by tomato growers in production high cost of fertilizers and other inputs, high wage rate, infestation of insect and pest, lack of financial facility, poor source of irrigation, non-availability of storage facility and high cost of pesticide. And in marketing, major constraints faced by tomato growers were delay in sale and payments, high transportation charges, high commission charges and involvement of large number of intermediaries.

Keywords: Tomato, price spread, Producer's share in consumer's rupee

Introduction
The tomato (*Solanum lycopersicum* L.) is the edible, often red berry-type fruit of the nightshade Solanum Lycopersicon, commonly known as a tomato plant. Tomato is an important commercial vegetable crop grown on large scale in India. It gives good profit to the farmer. The tomato seeds are costly and small, hence require nursery for due care in production of seedlings. Tomato ranks second in priority after Onion in India. In Akola district the area of tomato is 460ha and production was 6543 metric ton.

Materials and Methods
Marketing of selected vegetables
Marketing of selected vegetables was studying by identify the marketing channels, channel wise marketing cost, marketing margin and price spread was calculated marketing efficiency was estimated.

Marketing cost
Total marketing cost incurred by producer and various intermediaries involved in the sale and purchase of commodity till the commodity reaches to the ultimate consumer.

Marketing channels
A marketing channels are the route through which produce moves from producer to ultimate consumer. In respect of selected vegetables there are four marketing channels were found in the study area.

Producer
The most important channel of distribution was producer-wholesaler-retailer-consumer. Producer directly sale their produce to the wholesaler or retailer or consumer. The small producer did not find it convenient to take a small or marketable surplus to the distance market because of long distance and heavy transportation charges.

Village trader
Village trader purchases selected vegetables in the village itself. Generally small and marginal farmers sold their produce to village trader as quantity is less.

Wholesaler
Wholesaler purchases the selected vegetables in market itself after harvesting. The wholesaler offer the price according to the quality and quantity of the produce on cash payment and sum of the amount pay by check at small intervals. The wholesaler or his representative also purchases the selected vegetables from villages. Wholesaler sales in the retail market. Wholesaler have their own storage facilities.

Retailer
Retailers purchase the selected vegetables from the wholesaler and also from the producers. The retailers generally purchase the quantity required for the sale within the short period according to the sell requirement. The retailers sale the purchased selected vegetables in their own shops which are in weekly and daily market.

Consumer
Consumer purchase required quantity of selected vegetables directly from the cultivator at the local place for their own consumption, through the year. The consumer purchases the selected vegetables as per the availability in the weekly and daily market from the retailer at the prevailing market price.

Market margin
It refers to net share availed by the different intermediaries in marketing after deducting marketing cost from gross market margin at each stage of marketing for handling the commodity.

Price spread
Price spread indicates the difference between net price received by producer of selected vegetables in market and price paid by ultimate consumer for equivalent quantity of produce in retail market. The study of price spread involves ascertainment of the actual price at various stages of the marketing and the cost incurred in the process of the movement of selected vegetables from the farm to consumer and the margin of various intermediaries.

Producer's share in consumer's rupee (P_s)
It is the ratio of net price received by producer to the price paid by consumer and can be calculated as follows

$$P_s = \frac{P_f}{p_c} \times 100$$

Where,
P_f = Net price received by the producer
P_c = Price paid by the consumer

Marketing Efficiency
Ratio of output to input method/ Conventional Method
Conceptually, efficiency of any activity or process is defined as the ratio of output to input. If 'O' and are respectively output and input of the marketing system and E is the index of marketing efficiency; then

$$E = \frac{O}{I} X\ 100$$

Where,
O= Value added (Difference between consumers price and price received by farmers)
I= Total marketing cost.

Shepherd's Method
The marketing efficiency is measured with the help of the following formula given by Shepherd:

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

Where,
ME = Index of Marketing Efficiency,
V = Value of goods sold or consumer price and
I = Total marketing cost or marketing cost per unit

Acharya and Agarwal's Method:
The marketing efficiency was worked out by using modified method suggested by Acharya and Agrawal:

MME = RP ÷ (MC + MM)

Where,
MME= Modified measures of marketing efficiency.
RP=Price paid by consumers or retailers sale price.
MC=Total marketing cost.
MM=Net marketing margin.

Constraints in production and marketing
The constraints in production and marketing of selected vegetables was analysed by using Garrett's ranking technique. The ranks given by each respondent was converted into per cent position by using the formula:

$$Per\ cent\ position = \frac{100 \times (R_{ij} - 0.5)}{N_j}$$

Where,
R_{ij} = Rank given to i^{th} constraint by the j^{th} individual and
N_j = Number of constraints ranked by the j^{th} individual.
The mean score values estimated for each factor was arranged in the descending order. The constraints with the highest mean value were considered as the most important one and the other followed in that order.

Results and Discussion
Channels of Distribution
Marketing channels are the root through which produce move from producer to consumer.
In marketing, following Important channels of distribution have been observed while studying the marketing of tomato under study area.
Channel I: Producer → Consumer.
Channel II: Producer → Village trader →Wholesaler →Retailer →Consumer
Channel III: Producer → Wholesaler → Retailer → Consumer
Channel IV: Producer → Retailer → Consumer.

Marketing of tomato
Table 1 revealed that information on marketing of tomato through marketing channel-I (Producer to Consumer).
Amongst the four identified channels, it was the channel-I i.e., producer- to- consumer. In which the farmer got the highest

share of tomato were 90.18 per cent to the consumer price. This is mainly due to the non- intervention of middle man. The share of total marketing cost of tomato were Rs.73.45. The total price spread through this channel was Rs. 73.45 per quintal.

Table 1: Marketing of selected vegetable growers through channel- I (Channel- I. Producer – Consumer)

Sr. No	Particulars	Channel- I (P-C) Tomato
A)	**Marketing cost incurred by producer**	
1)	Cost of gunny bag	22.15
2)	Cost of packing	5.00
3)	Cost of loading	8.45
4)	Transportation	23.00
5)	Weighing charges	1.90
6)	Commission Charges	0.00
7)	Hamali	4.85
8)	Unloading	8.10
9)	Marketing Cost of Producer	73.45
10)	Net price received by farmer	1852.40
11)	Selling Price of producer	1925.85
12)	Price Spread	73.45
13)	Producer Share in consumer's rupee(%)	90.18

Table 2: Marketing of selected vegetable growers through Channel- II (Channel-II. Producer - Village trader - Wholesaler - Retailer – Consumer)

Sr. No	Particulars	Channel- II (P- VT-W-R-C) Tomato
A)	**Marketing cost incurred by producer**	
1)	Cost of gunny bag	23.00
2)	Cost of Packing	5.00
3)	Cost of loading	9.70
4)	Transportation	27.50
5)	Weighing	2.00
6)	Commission	115.47
7)	Hamali	5.00
8)	Unloading	9.20
9)	Marketing cost	196.87
10)	Purchasing price of village trader	1924.60
B)	**Marketing Cost incurred by village trader**	
1)	Storing	7.70
2)	Transportation	23.50
3)	Gunny bag	21.10
4)	Weighing	2.30
5)	Loading	7.40
7)	Unloading	7.15
8)	Hamali	4.80
9)	Marketing cost	73.90
10)	Village Trader Margin	106.00
11)	Purchasing price of wholesaler	2104.50
C)	**Marketing Cost incurred by Wholesaler**	
1)	Storing	7.80
2)	Transport	23.80
3)	Weighing	2.00
4)	Gunny bag	21.10
5)	Hamali	5.00
6)	Marketing cost	59.70
7)	Wholesaler market margin	103.00
8)	Purchasing price of retailer	2267.20
D)	**Marketing cost incurred by Retailer**	
1)	Transport	23.20
2)	Storing	7.80
3)	Hamali	5.00
4)	Weighing	2.00
5)	Marketing cost	38.00
6)	Total Marketing Cost	368.47
7)	Retailer marketing margin	113.00
8)	Purchasing Price of Consumer	2418.20
9)	Net Price received by Producer	1727.72
10)	Price spread	688.47
11)	Producer Share Consumer rupees%	71.04

Table 2 revealed that information on marketing of tomato through marketing channel-II Producer - Village trader - Wholesaler - Retailer- Consumer.

It was best channel through which the farmer got 71.04 percent share of consumer price of tomato. Marketing cost borne by the retailer accounted for Rs. 38.00 per quintal for tomato. The total price spread through channel was Rs.688.47 percent to the consumer price. In this marketing channel, the total marketing cost of tomato was Rs. 368.47 per quintal. The net price received by producer Rs.1727.72 for tomato.

Table 3: Marketing of selected vegetable growers through channel- III (Channel-III. Producer - Wholesaler -Retailer – Consumer)

Sr. No	Particulars	Channel –III (P -W- R -C) Tomato
A)	**Marketing cost incurred by producer**	
1)	Cost of gunny bag	21.10
2)	Cost of packing	5.00
3)	Transportation	22.30
4)	Loading	8.30
5)	Weighing Charges	2.00
6)	Hamali	4.80
7)	Unloading	8.05
8)	Commission	115.68
9)	Marketing Cost	187.23
10)	Price received by wholesaler	1928.00
B)	**Marketing Cost incurred by wholesaler**	
1)	Storing	7.80
2)	Transport	21.02
3)	Gunny bags	21.80
4)	Weighing Charges	2.35
5)	Hamali	5.00
6)	Marketing Cost	57.92
7)	Purchasing price of retailer	2144.90
8)	Wholesaler Market margin	158.97
C)	**Marketing Cost incurred by Retailer**	
1)	Storing	7.80
2)	Transport	22.60
3)	Hamali	4.70
4)	Weighing Charges	2.00
5)	Marketing Cost	37.10
6)	Retailer Marketing Margin	117.00
7)	Consumer Purchase price	2299.00
8)	Total Marketing Cost	282.25
9)	Total market margin	371.00
10)	Net price received by farmer	1740.77
11)	Price spread	371.00
12)	Producer share consumer rupees %	76.65

Table 3 revealed the information on marketing of tomato through marketing channel-III Producer – Wholesaler -Retailer – Consumer.

The producer shares in consumer rupee of tomato were 76.65

per cent. In this marketing channel, the total marketing cost of tomato was Rs.282.25 per quintal.

The margin of wholesaler through this channel of tomato was Rs.158.97 per quintal. The total price spread through this channel of tomato was Rs. 371.00 per quintal. The marketing cost incurred by producer of tomato through this channel was Rs.187.23 percent to the consumer price.

Table 4: Marketing of selected vegetable growers through Channel-IV (Channel-IV Producer - Retailer – Consumer)

Sr. No	Particulars	Channel- IV (P – R - C)
		Tomato
A)	**Marketing cost incurred by producer**	
1)	Cost of gunny bag	23.70
2)	Cost of Packing	4.80
3)	Cost of Loading	8.40
4)	Transportation	23.80
5)	Weighing Charges	2.00
6)	Unloading	8.00
7)	Hamali	4.70
8)	Commission	115.57
9)	Marketing Cost of Producer	190.97
10)	Price paid by retailer to producer	1926.20
B)	**Marketing Cost incurred by Retailer**	
1)	Transport	23.70
2)	Hamali	4.30
3)	Weighing	2.32
4)	Storage	7.50
5)	Retailer market margin	278.14
6)	Marketing cost	37.82
7)	Total marketing Cost	228.79
8)	Net price received by farmer	1735.23
9)	Purchase price of consumer	2242.17
10)	Price Spread	506.94
11)	Producer Share in consumer's rupees (%)	77.34

Table 4 revealed that information on marketing of tomato through marketing channel-IV Producer- Retailer- Consumer

It was last channel through which the farmer got 77.34 percent share of consumer price of tomato. The marketing cost borne by the retailer accounted for Rs. 37.82 per quintal for tomato and the retailer sold the produce to the final consumer with a marginal profit of tomato was Rs. 278.14 per quintal. The total price spread through channel was Rs. 506.94 percent to the consumer price. In this marketing channel, the total marketing cost of tomato was Rs. 228.79 per quintal.

Thus, out of these four channels under study, the price spread in tomato were found to be high in channel –II i.e., Rs. 688.47. The producer share to consumer rupee was found to be highest in channel-I i.e., 90.18 per cent as the farmer directly sold the produce to the ultimate consumer.

Table 5: Marketing efficiencies of tomato through different Marketing channels

Channels	Conventional Approach	Acharya Approach	Modified Shephard Approach
Tomato			
Channel – I	1.00	26.29	25.29
Channel – II	1.33	4.43	8.78
Channel – III	1.31	3.50	5.56
Channel– IV	1.38	4.12	6.02

Table 5 revealed that marketing efficiency in tomato by Conventional, Acharya and Modified Shephard approaches in the channel I was 1.00 per cent, 26.29 per cent and 25.29 per cent in case of channel II, was 1.33 per cent, 4.43 per cent and 8.78 per cent, in case of channel III, it was 1.31 per cent, 3.50 per cent and 5.56 per cent, and in case of channel IV, it was 1.38 per cent, 4.12 per cent and 6.02 per cent, respectively.

Table 6: Constraints in production and marketing of tomato growers.

Sr. No	Problems	Score	Rank
A.	**Constraints in Production**		
1	High cost of fertilizer and other input.	61.23	I
2	High wage rate.	57.60	III
3	Infestation of insect and pest.	60.57	II
4	Lack of Financial Facility.	48.41	IV
5	Poor source of irrigation.	42.05	V
6	Non availability of storage facility.	32.35	VII
7	High cost of pesticide.	36.90	VI
B.	**Constraints in Marketing**		
1.	Delay in Sale and payment.	49.19	I
2.	High Transportation charges.	48.58	II
3.	High commission charges.	48.40	III
4.	Involvement of large number of intermediaries.	47.57	IV

The information regarding the significant issues faced by the growers is presented in Table 6 All of the chosen tomato growers were questioned about the challenges they face in growing and marketing rabi vegetables. The farmers are analysed with the Garrett's ranking technique, and the overall results are shown in the following table. The farmers face a variety of issues, such as high cost of fertilizer and other inputs, infestation of insect and pest, poor sources of irrigation.

High cost of fertilizer it was expressed by 61.23 per cent of selected growers. The high cost of labour was the major problem, which was expressed by 57.60 per cent farmers, as this can affect timely cultivation and harvesting. Non availability of storage facility, Infestation of insect pests, poor source of irrigation, high cost of pesticide which was expressed by 32.35 per cent, 60.57 per cent, 42.05 per cent, 36.90 per cent.

In regarding to marketing of tomato, the high transportation charges by farmer were expressed by 48.58 per cent. Other marketing problems faced by farmers were delay in sale payment, high commission charges and involvement of large number of intermediaries expressed by 49.19 per cent, 48.40 per cent, 47.57 per cent, respectively.

Conclusions

1) Channel II: Producer → Village trader →Wholesaler →Retailer →Consumer was major channel of distribution and maximum farmers sold their produce through this channel.
2) The producer's share in consumer's rupee was highest in channel I (Producer Consumer) for tomato i.e. 90.18 per cent respectively, followed by channel IV (Producer-Retailer- Consumer), channel III (Producer- Wholesaler-Retailer - Consumer) and channel IV (Producer- Village Trader-Wholesaler- Retailer- Consumer) From this it was concluded that channel I was most profitable than other channels.
3) The high cost of fertilizer and other inputs and high wage rate were major problem in production. High

transportation charges, delay in sale payment, high commission charges were major problems in marketing.

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