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Analysis of marketing cost, price spread and marketing efficiency of onion in Nalanda district of Bihar

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Abstract
An investigation into the marketing of onions was carried out in the Bihar district of Nalanda, and the results are tabulated. A multi-stage stratified sampling strategy was employed to select marketing functionaries, such as primary and secondary market. The study conducted by market functionaries was taken into account in order to determine the different marketing channels that are employed in the marketing of onions as well as information on producer share in consumer rupees, price spread, marketing efficiency, and overall marketing costs. Using this data, all of these marketing-related computations were made. Three marketing channels were used to sell onions: producer to consumer, producer-wholesaler-retailer-consumer, and producer-commission agent-wholesaler-retailer-consumer. The highest number of growers (74) chose Channel III followed by Channel II (10) and channel I was more profitable for farmers as compared to other channels.

Keywords: Price spread, marketing channel, marketing margin, marketing cost and producer share in consumer rupees

Introduction
An essential vegetable utilized in all relationships, onions are used for their flavor and taste worldwide, most notably in the preparation of masala. An all-year crop is the onion. Rabi onions have thin layers and are picked in the summer. It has a six- to eight-month lifespan. Onions for kharif are harvested in October to November. Onions are quite perishable due to their high moisture content and thin skin layer. The harvest of onions is perishable, and storing onions might be dangerous. In the wholesale and retail onion markets, prices rise due to weight loss and a 10%–15% decrease in the number of onions (Subha *et al.* 2019) [5]. One of the most significant vegetables farmed and consumed commercially is the onion (*Allium cepa* L.). Since at least 4000 BC, it has been grown and consumed practically everywhere in the world. It originated in the region that is now part of Afghanistan, Kazakhstan, Uzbekistan, Western Tianshan, North and West India, and Western Asia. It first spread to other regions of the world in the region surrounding the Mediterranean Sea. Dehydrated onions can be used as spices; they are available as flakes and powder. In addition, onions are a great source of phosphate, calcium, carbohydrates, proteins, and vitamins B and C. They are also used to manufacture oil and pectin. Numerous illnesses and ailments can be treated with onions. The most common ones are dropsy, heart disease liver, cirrhosis, diabetes, tuberculosis and heart attacks (Kumar *et al.*, 2016) [6].

India is largest producer of onion in the world. The total onion production in 2022-2023 was 26738 metric tonnes. (FAO stats 2024). The onion production in Bihar was 1375000 tonnes in (2021-2022) (NBH).

Bihar's onion production is 178,970 tonnes and covers an area of 68,800 hectares. Among these, the largest area of onion is Nalanda with production of 0.080 million tonnes spread over an area of 13,700 hectares, followed by Agra with a production of 0.043 million tonnes spread over an area of 4300 hectares (Ministry of Horticulture and Food Processing). Bihar 2022-2023).

Materials and Methods
Multistage sampling was utilized in this study to choose participants, blocks, villages, and districts. Using a random sampling technique, 90 farmers in total were chosen from 6 villages in the Harnaut block of the Nalanda district. Five categories of growers were selected based on the ownership of land. Marginal farmers with less than 1 hectare of land fell into the first category; small farmers with 1 to 2 hectares of land fell into the second category; and semi-medium-sized farmers with 2 to 4 hectares of land fell into the third category. Large-sized farmers with more than 10 hectares of land fell into the fifth group, while medium-sized farmers

with 4 to 10 hectares of land fell into the fourth. Preliminary interviews and qualitative interviewing methods were employed to get comprehensive data from producers regarding many facets of the onion marketing

10% of the marketing functionaries from each primary and secondary market were chosen at random from a group of marketing functionaries that had been organized from Gulabbagh mandi Nalanda and Barbigha sabzi mandi, Barbigha. In order to obtain information about the overall cost of marketing, the marketing margin, and the various marketing channels employed in onion marketing, the market functionaries observation was taken into account. Price spread, total marketing cost, marketing margin, marketing efficiency, and producer share in consumer rupee were all computed with the aid of this data. (Table 1).

Table 1: Selection of market functionaries

SI. No.	Market (Primary & Secondary)	Market Functionaries no.	Total
1	Gulabbagh mandi, Nalanda	Village Merchants	6
		Dealer/agents	9
		Retailers	8
2	Barbigha Sabji mandi, Barbigha, Bihar	Village Merchants	5
		Dealer/agents	6
		Retailers	11

Analytical tools
Techniques such as arithmetic mean, tabular analysis and formulae were used to calculate different marketing concept like marketing cost, marketing efficiency, marketing margin, price spread and producer share in consumer's rupee.
The marketing efficiency was calculated by using Acharya's approach given by Acharya in 2011. This is the most common method used to measure marketing efficiency

$$MME = \frac{FP}{MM+MC}$$

Where,
MME = modified measure of marketing efficiency.
FP = Net price received by producer.
MC = Total marketing cost.

MM = Total marketing margin.

Results and Discussion
The marketing channels were identified in Nalanda district.
Channel I: Producer-consumer.
Channel II: Producer-Wholesaler-Retailer-Consumer.
Channel III: Producer-Commission Agent-Wholesaler-Retailer-Consumer.

Distribution of Onion in different marketing channels by sample respondents
Table 2 revealed that 74 of growers sold their produce through channel III followed by channel II (10) and 6 growers sold their produce through channel I. Growers do not have marketing skills and marketing knowledge due to which they did not get better price for their produce that why they choose channel III to get better price.

Table 2: Distribution of onion through different channels by sample respondents

S. No.	Channels	Number of intermediaries involved	Number of farmers sold through this channel	Percentage
1	Channel I	Producer à Consumer	6	6.66
2	Channel II	Producer à Wholesaler à Retailer à Consumer	10	11.11
3	Channel III	Producer à commission agent à Wholesaler à Retailer à Consumer	74	82.22
	Total		90	100

Marketing Cost involved in channel I (1 Quintal)
Table 3 revealed that total marketing cost involved in channel 1 was Rupee 53 per quintal. In total marketing cost major cost involved in spoilage (50.94%) followed by packing material cost (22.64%), transportation cost (16.98%) and labour cost (9.43%).

Table 3: Marketing cost involved in channel I (1 Quintal)

S. No.	Channel-I (6)		
	Particulars	Rs/Qtl.	Percentage
I			
1	Packing material cost	12	22.64
2	Transportation cost	9	16.98
3	Labour cost	5	9.43
4	Spoilage	27	50.94
		53	100

Marketing cost involved in channel II (1 quintal)
Table 4 showed that the producer's marketing expenses in channel II amounted to Rs. 54 per quintal (26.21%). Transporting costs the most (6.31%), then packing (5.82%), labour (3.88%), commission charges (5.33%), loading and unloading (3.88%), and other expense (0.97%). In channel II, the wholesaler's marketing expense was Rs. 73 per quintal (35.43%). Spoilage costs accounted for 8.73 percent of the total cost, with market fees (5.82%), loading and unloading (4.85%), and grading (3.88%) following. Wholesalers transfer produce from local markets to nearby or remote retailers, incur handling losses, and are responsible for paying market fees on transaction amounts, personal costs, and losses incurred in the process.
The total marketing cost incurred by the retailer in channel-II was Rs. 79 per quintal (38.35%). Spoilage constituted as major component (17.47%) followed by transportation cost (6.31%), loading and unloading (4.85%), weighing charges (3.88%), labour charges (1.94%), respectively. The produce is spoiled at retailer level due to poor handling during transportation and overstocking in retail shops followed by personal expenses, as the standard of living is increasing and loading and unloading due lack of labour and high labour charge.

Table 4: Marketing cost involved in channel II (1 quintal)

	Channel - II (10)		
SI. No.	Particulars	Rs/Qtl.	Percentage
I	Producer/Sellers		
1	Labour Charges	8	3.88
2	Packing Charges	12	5.82
3	Transportation	13	6.31
4	Commission Charge	11	5.33
5	Loading and unloading	8	3.88
6	Other expenses	2	0.97
	Sub total	54	26.21
II	Wholesaler		
1	loading and unloading	10	4.85
2	grading	8	3.88
3	Packing	8	3.88
4	market fee	12	5.82
5	Commission charge	11	5.33
6	Spoilage	18	8.73
7	Other Expenses	6	2.91
	Sub total	73	35.43
III	Retailer		
2	weighing charges	8	3.88
3	Labour Charges	4	1.94
4	Transportation Cost	13	6.31
5	Loading & unloading	10	4.85
6	Spoilage	36	17.47
7	Other expenses	8	3.88
	Sub total	79	38.35
	Total Marketing Cost	206	100

Marketing cost incurred in channel III (1 quintal)
Table 5 revealed that the cost incurred in the marketing of onion by the Pre harvest contractors was Rs. 61 per Qtl (35.67%) Major of cost was spoilage (11.6%) followed by packing material (5.85), loading and unloading (4.68%), other expenses (4.68%), commission charge (4.09 labour (2.33%), transportation (2.33%), respectively. Here the village trader sells through commission agent to wholesaler,

so he incurs commission charge of 5-10 percent of value of the produce. Transportation is other cost, as he sells produce in the distant market and the packaging specification differs from one market to other.
The total marketing cost incurred by commission agent cum wholesaler in channel-III was Rs.55 per Qtl (32.16%). Among various components spoilage constituted (8.18%), followed by market charges (5.26%), other expenses (5.85%), loading and unloading (3.5%), labour charges (2.33%), transportation (2.33%), shop rent (2.92%). license fee (1.75%), and in channel-III, commission agent also acts as wholesaler, so he incurs less cost compare to wholesaler and commission agent. The total marketing cost incurred by retailer was Rs.55 (32.16%). Among various components spoilage constituted major, which was 14.61 per cent, followed by other expenses (4.69%), loading & unloading (3.5%), transportation cost (2.33%), labour charges (2.33%), shop rent (2.92%) and licence fee (1.75%), respectively. The table revealed that spoilage of produce at retailer level is more when compared to other intermediaries in channel-III and cost incurred due to poor handling and over stocking of the produce at retail level.

Table 5: Marketing cost involved in channel III (1 quintal)

	CHANNEL - III (74)		
SI. No.	Particulars	Rs/Qtl	Percentage
I	**Producer/Seller**		
1	Transportation	4	1.96
2	Packing material	10	4.90
3	Spoilage	17	8.33
4	Loading & unloading	8	3.92
5	Other expenses	4	1.96
7	Labour Charge	4	1.96
	Sub total	47	23.03
II	**Commission Agent**		
1	Commission charge	47	23.03
III	**Wholesaler**		
1	Shop rent	5	2.45
2	License Fee	3	1.47
3	Labour salary	4	1.96
4	Market charges	9	4.41
5	Spoilage	14	6.86
6	Other expenses	10	4.90
7	Loading & unloading	6	2.94
8	Transportation	4	1.96
	Sub total	55	26.96
IV	Retailer		
1	Shop rent	5	2.45
2	License Fee	3	1.47
3	Labour salary	4	1.96
4	Transportation	4	1.96
5	Loading & unloading	6	2.94
6	Spoilage	25	12.25
7	Other expenses	8	3.92
	Sub total	55	26.96
	Total Marketing cost	204	100

Total marketing cost, Marketing margin, marketing efficiency and producer's share in consumer rupee in different marketing channels (1 quintal)
Table 6 revealed that marketing efficiency was highest in channel-I (27.30) followed by channel-II (1.29) and channel-III (1.15) because the net price received by growers

in channel-I was highest and marketing cost is lower. There was a no marketing margin involved in channel-I because growers sold their produce directly to consumer. Total marketing cost in channel-I, channel-II and channel-III was 53, 206 and 204 per quintal respectively. Total marketing margin in channel-I, channel-II and channel-III was rupee 0, 448 and 491 per quintal respectively. Price spread was highest in channel-III (Rupee 695 per quintal) followed by channel-II (Rupee 654 per quintal) and channel-I (Rupee 53 per quintal). The producer's share in consumer rupee was highest in channel-I (96.46%) because there were no intermediaries involved followed by channel-II (56.40%) and channel-II (53.33%).

Table 6: Marketing efficiency of onion in Nalanda district

SI. No.	Particulars	Channel		
		I	II	III
1	Net price received by onion grower	1447	846	800
2	Marketing cost incurred by onion grower	53	54	47
3	Price paid by commission agent	-	-	847
4	Commission of commission agent	-	-	5
5	Net margin of commission agent	-	-	-
6	Price paid by Wholesaler	-	900	852
7	Market cost Incurred by wholesaler	-	73	75
8	Net Margin of Wholesaler	-	100	118
9	Price paid by Retailer	-	1073	1045
10	Marketing cost incurred by retailer	-	79	82
11	Net margin of retailer	-	348	373
12	Price paid by consumer	1500	1500	1500
13	Total marketing cost	53	206	204
14	Total marketing margin	0	448	491
15	Price spread	53	654	695
16	Marketing efficiency (Acharya's formula)	27.30	1.29	1.15
17	Producer's share in consumer's rupee (%)	96.46	56.40	53.33

Conclusion

Based on the information provided, it can be inferred that 82.22% of producers sell their produce through channel-III. Because there were more middlemen in channel-II, the overall marketing expense expended there was the highest (Rupee 206 per quintal). Farmers sold their produce straight to consumers in channel I, therefore there was no marketing margin. In channels II and III, there was a marketing profit of rupee 448 and 491 per quintal, respectively. Channel-III had the largest price spread (695 per quintal). Because producers in channel I made more money by selling their produce directly to customers, their share of the consumer rupee was also higher than in channels II and III.

Acknowledgement

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