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Price Variation Analysis of Vegetables in Agartala, Tripura

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Abstract

The study analyses the price variation of vegetables in the Agartala market in Tripura. For the analysis of the growth trend in area, production and productivity, regions of Karnataka, Maharashtra and the whole country were selected. The primary data has been used to study the price variation of vegetables. The analysis indicated that vegetables such as ginger, garlic, lady's finger, ridge gourd, and cucumber exhibit the most significant price variation from retailers to consumers. The study also shows that the producer's share in the consumer price decreases as the number of intermediaries increases. Notably, producers receive higher absolute net returns in tomato, followed by cauliflower, cabbage, brinjal and local beans in all channels. It is worth mentioning that producers receive a higher net price by selling produce directly to consumers.

***Key words*:** Price variation, Vegetable market, Producer share, Consumer rupee

India's economy is mainly based on agriculture. According to Neil [1], the primary sector employs 41.49% of the total workforce in India. Following this, the service sector employs 32.33% of the workforce, while the industrial sector employs 26.18%. However, it is essential to note that a significant portion of the land, specifically 96.4 million hectares, which accounts for approximately 29.32 per cent of the total land area, faces the risk of degradation in various forms [2]. In the long run, it can lead to multiple negative costs, such as food insecurity, environmental degradation, migration, and poverty. In this particular situation, giving more attention to enhancing the primary sector is essential. This is because India holds the position of being the second-largest producer of food grains globally. It contributes to about 25% of global production, with China being the only country ahead of it [3]. According to the Oxfam Food Availability Index Report 2018, India is ranked 97th out of 125 countries regarding food grain production, which contradicts India's claim of self-sufficiency in this area [4]. Approximately 40% of the food produced in India goes to waste each year. This wastage happens before the food reaches the consumer [5].

Because of these worries, there are a lot of questions about how the processes after harvest, storage facilities, food grain distribution system, and especially agricultural marketing in India work. In the 1960s and 1970s, however, the government started a lot of significant changes to improve farm marketing and give farmers and customers more power with the Agricultural Produce Marketing Committee (APMC) Act 2003, the old system of traders taking advantage of farmers has been changed [6]. These rules were made to ensure that farmers could get fair prices for their crops and that buyers could get food grains at affordable prices. But the act couldn't do what it was supposed to, so over time, it has been changed in different ways. Later, the Government of India launched the electronic National Agriculture Market (e-NAM) system in 2016 to improve the efficiency of agricultural marketing. This was based on the idea of "One Nation, One Market."

Vegetable crop agriculture requires intense cultural activities from seeding through commercialization, creating many rural job possibilities. Rural residents are encouraged to grow and sell vegetables, which they may do by cultivating, grading, packaging, collecting, transporting, and marketing. While marketing facilities may boost vegetable growing, the lack of a compelling connection between farmers and markets limits economically viable vegetable agricultural systems. Vegetable price fluctuations have been a major economic issue in recent years. Poor marketing channels and infrastructure are thought to create high and changing consumer prices and low consumer revenue for farmers. Indian farmers depend significantly on intermediaries, especially in vegetable marketing, giving producers and customers an unfair bargain while intermediaries dominate the market without providing value. Massive waste, inconsistent quality and geographical and temporal demand-supply mismatches are also common. Price changes are caused by environmental, supply, demand, social, cultural, and political variables. Vegetable costs rise when agricultural regions have little supply and fall when they have a high supply. Vegetable prices fall when supply exceeds demand under the principles of free market activity. Price increases when demand exceeds supply. When costs are high, year-round availability of frozen, tinned, and dried veggies may limit demand for fresh vegetables. Changes in comfort expectations and urbanization affect what families eat. Vegetable perishability requires careful transport, storage, processing, and distribution planning. The commercial expansion of the vegetable sector relies on related businesses, including storage,

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processing, marketing, and maintenance and service businesses that promote vegetable production.

Pawar and Misal [7] examined Western Maharashtra pomegranate pricing and arrivals. They wanted to identify peak and slack times, examine the link between market arrivals and pricing, and estimate trends. The research found that APMC pomegranate market arrivals were highest in August, December, July and September and lowest in May. February had the highest prices, and April had the lowest. The arrival-price correlation coefficient was negative. Arrivals climbed 9.80% per year and cost 8.20% annually throughout the research. Kumar *et al*. [8] studied vegetable crop market arrivals and pricing in four Indian urban marketplaces and found that Bangalore had less arrival fluctuation than Mumbai. Prices were constant in Mumbai but variable in Bangalore and Kolkata. The price variation was greater in Delhi. The analysis found a negative correlation coefficient between market arrivals and prices across years and months in all four urban marketplaces, with some positive correlations. Siddique [9] examined "Price variation of vegetables in different seasons regarding organized Retailers". The research identified seasonal variations in production, packaging and pricing. The post-monsoon season had the most significant productivity, production, transportation, and packaging costs for all veggies. Monsoon and post-monsoon output was much greater than pre-monsoon. This research examines the price variance of vegetables from farmers to consumers via intermediaries, wholesalers and organized retailers, particularly cauliflower, cabbage, beans, bottled gourd, brinjal and tomato. Post-monsoon AP, APC, ATC, and APC were highest for all vegetables, matching monsoon levels. Monsoon and post-monsoon production was much greater than pre-monsoon. The total cost of production, farmer selling price, and organized retailer selling price vary by per cent in two seasons.

This study is based on the observation that commodity prices, especially vegetable prices, change across time and geography. The Indian Department of Urban Affairs classifies Tripura's capital, Agartala, as a C-category city. This 62-square-kilometre city has several marketplaces and is mainly occupied by tertiary workers. These markets, located across the city, serve 500,000 inhabitants and have developed a particular clientele. These distinct marketplaces may have different vegetable prices at other times. So, the overall goal of this research is to examine variances in regularly eaten vegetables in Agartala. The study aims to analyze the price variance of vegetables in Agartala, evaluate the vegetable marketing channel, and estimate the price spread of producers, wholesalers, and retailers.

MATERIALS AND METHODS

Data was gathered from Maharajgunj bazaar marketplaces in Agartala to achieve the stated aims. Gol Bazar, known as Maharajganj Bazaar, is Tripura's commercial hub. Its enormous length is a busy centre where dealers and merchants around the area sell products and services. This prestigious market exports excellence throughout India and beyond. The Tripura king's foresight in building this great market before India's freedom is remarkable. The data was analyzed using standard statistical methods. Further price spread was determined using the (Producers share/Consumers share) formula*100. Literature has extensively examined the price spread, the difference between producer pays and consumer spending.

RESULTS AND DISCUSSION

Vegetables prices variation in different weeks (Farmer to wholesaler)

For potato

Data in (Table 1) states the maximum Price of potato charged by the farmer in week week-4 (March), week 1 (April) and week 2 (May) as compared to other weeks in the Maharajganj market in the studied period. Conversely, the maximum selling price for the whole seller is highest in week 4 (March) and weeks 1 and 3 (May). Moreover, price difference is highest in week-2 (May), week-4 (March), week-2 (April), and while least in week-1 and 3 (March), week-1 (April) and week-2 (May).

For onion

Data depicted in (Table 1) states the maximum price of onion charged by the farmer in the week-2 and 3 (May), Week-3 (March) compared to other weeks in the Maharajganj market in the studied period. Conversely, the maximum selling price for the whole seller is highest in week 2 (March), week 1 and 3 (May). Moreover, price difference is highest in week-1, 2 and 3 (May), week-4 (March), week-2 (April), and while least in week-1 and 3 (March), week-1 (April) and week-2 (May).

Table 1 Farmers selling price, whole seller price and price variation of potato and onion across weeks

Month	Weeks	Potato			Onion		
		Farmers selling price (Rs/kg)	Wholesaler selling price (Rs/kg)	Price variation of vegetables (Rs/kg)	Farmers selling price (Rs/kg)	Wholesaler selling price (Rs/kg)	Price variation of vegetables (Rs/kg)
March	Week 1	11.5	13.5	2	8.75	14.5	5.75
	Week 2	11.25	13.75	2.5	7.75	12.5	4.75
	Week 3	11.75	13.5	1.75	14	14.5	0.5
	Week 4	13.5	18	4.5	11.75	15.5	3.75
April	Week 1	13.5	15.5	2	11.75	17.5	5.75
	Week 2	11.5	15.5	4	12.5	17.5	5
	Week 3	12	15	3	12.5	12.75	0.25
	Week 4	11.5	15.5	4	7.5	17.5	10
May	Week 1	11.5	16.5	5	12.5	21	8.5
	Week 2	13.5	16	2.5	16	19	3
	Week 3	12.5	16.5	4	16	22	6
	Week 4	12.5	16	3.5	17.5	21	3.5

For chili

Data in (Table 2) illustrates the maximum price of chilli charged by the farmer in the week-1, 2 and 4 (March) and Week-1 (April) compared to other weeks in the Maharajganj market in the studied period. Conversely, the maximum selling price for the whole seller is highest in weeks 1 and 2 (March),

weeks 1, 2 and 3(May). Moreover, the price difference is most heightened in weeks 1, 2, 3 and 4 (May).

For ginger

Data in (Table 2) states the maximum price of ginger charged by the farmer in weeks 3 and 4 (March), Week 1, 2 and 3 and 4 (April) and all the weeks of May compared to other weeks in the Maharajganj market in the studied period. On the flipside, the total seller's maximum selling price is highest in all weeks-March, April, May. Moreover, price difference is highest in week-1 (May).

Table 2 Farmers selling price, whole seller price and price variation of chilli and ginger across weeks

Month	Weeks	Chilli			Ginger		
		Farmers selling price (Rs/kg)	Wholesaler selling price (Rs/kg)	Price variation of vegetables (Rs/kg)	Farmers selling price (Rs/kg)	Wholesaler selling price (Rs/kg)	Price variation of vegetables (Rs/kg)
March	Week 1	32.5	45	12.5	33.5	42.5	9
	Week 2	39	45	6	36	42.5	6.5
	Week 3	28.5	35	6.5	53	62.5	9.5
	Week 4	32.5	37.5	5	53.5	62.5	9
April	Week 1	32.5	35	2.5	53.5	62.5	9
	Week 2	22.5	37.5	15	52.5	62.5	10
	Week 3	22.5	25	2.5	59.5	64	4.5
	Week 4	22.5	27.5	5	52.5	72.5	20
May	Week 1	18.5	75	56.5	62.5	130	67.5
	Week 2	12.5	72.5	60	95	105	10
	Week 3	12	75	63	85	110	25
	Week 4	16	90	74	100	125	25

For garlic

The data depicted in (Table 3) states that the maximum price of garlic charged by the farmer in the week-1,2,2 and 4 (March), Week-1,2,3 and 4 (April) and week-2 (May) as compared to other weeks in the Maharajganj market in the studied period. On the flipside, the maximum selling price of the whole seller is highest in all the weeks of March, April, and May. Moreover, price difference is highest in week-2 and 3 (May), week-4 (April), and while least in week-1 (March) and week-3 (April).

Table 3 Farmers selling price, whole seller price and price variation of garlic and tomato across weeks

Month	Weeks	Garlic			Tomato		
		Farmers selling price (Rs/kg)	Wholesaler selling price (Rs/kg)	Price variation of vegetables (Rs/kg)	Farmers selling price (Rs/kg)	Wholesaler selling price (Rs/kg)	Price variation of vegetables (Rs/kg)
March	Week 1	70	75	5	12.75	19	6.25
	Week 2	67.5	75	7.5	12.25	17.5	5.25
	Week 3	55	62.5	7.5	9.75	13	3.25
	Week 4	57.5	75	17.5	13.75	19	5.25
April	Week 1	57.5	75	17.5	13.75	19	5.25
	Week 2	67.5	77.5	10	17	19	2
	Week 3	60.5	67.5	7	13	21	8
	Week 4	52.5	75	22.5	13	21	8
May	Week 1	57.5	75	17.5	17	21	4
	Week 2	42.5	75	32.5	12.75	19	6.25
	Week 3	42.5	75	32.5	15	21	6
	Week 4	43.5	77.5	34	13	20	7

For tomato

Data in (Table 3) states that the maximum price of tomato charged by the farmer in the Week-2 (April) and Week 1 (May) compared to other weeks in the Maharajganj market in the studied period. Conversely, the maximum selling price for the whole seller is highest in week 4 (March), week-1 and 3 (May). Moreover, the price difference is most heightened in week-1 and 2 (March), all weeks of May and April, and least in week 2 (April).

For brinjal

Data in (Table 4) states that the maximum Price of brinjal charged by the farmer in all the weeks of March, week-1,2 and 3 (April) compared to other weeks in the Maharajganj market in the studied period. On the flipside, the total seller's maximum selling price is highest in all the weeks of March, week-1, 2 and 3 (April). Moreover, price difference is highest in week-2 (May), week-4 (March), week-2 (April), and while least in week-4 (May)

For pumpkin

The (Table 4) states that the maximum price of pumpkin charged by the farmer in the week-1 (March) and Week-1, 2 and 3 (April) as compared to other weeks in the Maharajganj market in the studied period. On the flipside the maximum selling price whole seller is highest in all the weeks of the concerned month. Moreover, price difference is highest in week-2 (March) and all the weeks of May and while least in week-1 (March), week-3 (April).

For lady's finger

Facts represented in (Table 5) states the maximum price of lady's fingers charged by the farmer in the weeks of March

and April in the Maharajganj market in the studied period. On the flipside, the maximum selling price for the whole seller is highest in all weeks of March). Moreover, price difference is highest in week-2 (May), week-4 (March), week-2 (April), and while least in week-1 and 3 (March), week-1 (April) and week-2 (May).

Table 4 Farmers selling price, whole seller price and price variation of brinjal and tomato across weeks

Month	Weeks	Brinjal			Pumpkin		
		Farmers selling price (Rs/kg)	Wholesaler selling price (Rs/kg)	Price variation of vegetables (Rs/kg)	Farmers selling price (Rs/kg)	Wholesaler selling price (Rs/kg)	Price variation of vegetables (Rs/kg)
March	Week 1	17.5	32.5	15	11.25	12.75	1.5
	Week 2	17.25	37.5	20.25	8.75	17.5	8.75
	Week 3	13.75	32.5	18.75	7.5	12.75	5.25
	Week 4	18.5	32.5	14	11	15	4
April	Week 1	18.5	22.5	4	11	14	3
	Week 2	12.5	28.5	16	11.5	14.5	3
	Week 3	12	20	8	11.75	13.5	1.75
	Week 4	8	14.25	6.25	8.5	12.5	4
May	Week 1	8	13.5	5.5	7.5	14.5	7
	Week 2	8.75	11	2.25	7	14	7
	Week 3	8.75	15	6.25	7	14.5	7.5
	Week 4	10	13.5	3.5	6	15	9

For papaya

The (Table 5) states the maximum price of papaya charged by the farmer in the week-1 and 2 (March), Week-3 (April) and week-1, 2 and 3 (May) as compared to other weeks in the Maharajganj market in the studied period. On the flipside the maximum selling price for the whole seller is highest in weeks of May. Moreover, price difference is also highest in all the weeks of May.

Table 5 Farmers selling price, whole seller price and price variation of lady's finger and papaya across weeks

Month	Weeks	Lady's finger			Papaya		
		Farmers selling price (Rs/kg)	Wholesaler selling price (Rs/kg)	Price variation of vegetables (Rs/kg)	Farmers selling price (Rs/kg)	Wholesaler selling price (Rs/kg)	Price variation of vegetables (Rs/kg)
March	Week 1	55	62.5	7.5	9	11	2
	Week 2	55	62.5	7.5	9	11	2
	Week 3	47.5	57.5	10	5.5	7.5	2
	Week 4	57.5	62.5	5	8.5	11	2.5
April	Week 1	27.5	42.5	15	8.5	12.5	4
	Week 2	37.5	45	7.5	5	12.5	7.5
	Week 3	25	32.5	7.5	11.25	12.5	1.25
	Week 4	24.5	27.5	3	5	12.25	7.25
May	Week 1	20	30	10	9.75	20	10.25
	Week 2	11	16	16	9.25	20	10.75
	Week 3	11	17.5	6.5	9	17.5	8.5
	Week 4	13	20	7	8.25	19	10.75

Table 6 Farmers selling price, whole seller price and price variation of cucumber and ridge gourd across weeks

Month	Weeks	Cucumber			Ridge gourd		
		Farmers selling price (Rs/kg)	Wholesaler selling price (Rs/kg)	Price variation of vegetables (Rs/kg)	Farmers selling price (Rs/kg)	Wholesaler selling price (Rs/kg)	Price variation of vegetables (Rs/kg)
March	Week 1	34.5	45	10.5	42.5	55	12.5
	Week 2	32.5	37.5	5	34.5	55	20.5
	Week 3	32.5	37.5	5	34.5	42.5	8
	Week 4	37.5	42.5	5	46	55	9
April	Week 1	37.5	37.5	0	30	45	15
	Week 2	34.5	37.5	3	32.5	42	9.5
	Week 3	34.5	42.5	8	32.5	45	12.5
	Week 4	32.5	50	17.5	32.5	40	7.5
May	Week 1	37.5	37.5	9	17.5	22.5	5
	Week 2	28.5	35	6.5	8.5	13.5	5
	Week 3	22.5	33.5	11	7	15	8
	Week 4	22.5	40	17.5	7	17.5	10.5

For cucumber

Data incorporated in (Table 6) reveals the maximum price of cucumber charged by the farmer in the week-all the weeks of March, April and May in the Maharajganj market in the studied period. On the flipside, the maximum selling price whole seller is highest in all weeks of March, April and May.

Moreover, price difference is highest in week-1 (March), week-4 (April), week-4 (May), and while least in week-1 & 3 (April).

For ridge gourd

The (Table 6) states that the maximum price of ridge gourd charged by the farmer in all the weeks of March and April in the Maharajganj market in the studied period. On the flipside the maximum selling price whole seller is highest in all the weeks of March and April. Moreover, price difference is highest in week-1 and 2 (March) and week-3 and 4 (April), and while least in week-1 and 2 (May).

Vegetables Prices variation in different weeks (Wholesaler to Retailer)

For potato

Data incorporated in (Table 7) divulges that the maximum price of potato charged by the whole seller in the week-4 (March), week-1, 2, 3 and 4 (April) and week-1, 2, 3 and 4 (May) in the Maharajganj market in the studied period. On the flipside the maximum selling price retailer is highest in 3 and 4 (March), week-1, 2, 3 and 4 (April), week-1, 3 and 4 (May). Moreover, price difference is highest in week-3 (May), and while least in week-2 (May).

For onion

The (Table 7) states that the maximum price of onion charged by the whole seller in the week--1, 2 and 4 (May) and week-1, 2, 3 and 4 (April) and week-1 and 4 (May) as compared to other weeks in the Maharajganj market in the studied period. On the flipside the maximum selling price whole seller is highest in week-1 and 4 (March), week-1 and 3 (May). Moreover, price difference is highest in week-week-3 (April), and while least in week-2 (March).

Table 7 Whole seller price, retailer selling price and price variation of potato and onion across weeks

Month	Weeks	Onion			Potato		
		Wholesaler selling price (Rs/kg)	Retailer selling price (Rs/kg)	Price variation of vegetables (Rs/kg)	Wholesaler selling price (Rs/kg)	Retailer selling price (Rs/kg)	Price variation of vegetables (Rs/kg)
March	Week 1	13.5	17.5	4	14.5	20	5.5
	Week 2	13.75	17.5	3.75	12.5	17.5	5
	Week 3	13.5	20	6.5	14.5	20	5.5
	Week 4	18	22.5	4.5	15.5	22.5	7
April	Week 1	15.5	20	4.5	17.5	27.5	10
	Week 2	15.5	21	5.5	17.5	20	2.5
	Week 3	15	20	5	12.75	27.5	14.75
	Week 4	15.5	21	5.5	17.5	27.5	10
May	Week 1	16.5	25	8.5	21	30	9
	Week 2	16	17.5	1.5	19	26.5	7.5
	Week 3	16.5	25	8.5	22	30	8
	Week 4	16	22.5	6.5	21	27.5	6.5

Table 8 Whole seller price, retailer selling price and price variation of chilli and ginger across weeks

Month	Weeks	Chilli			Ginger		
		Wholesaler selling price (Rs/kg)	Retailer selling price (Rs/kg)	Price variation of vegetables (Rs/kg)	Wholesaler selling price (Rs/kg)	Retailer selling price (Rs/kg)	Price variation of vegetables (Rs/kg)
March	Week 1	45	57.5	12.5	42.5	65	22.5
	Week 2	45	55	10	42.5	65	22.5
	Week 3	35	42.5	7.5	62.5	75	12.5
	Week 4	37.5	50	12.5	62.5	80	17.5
April	Week 1	35	55	20	62.5	100	37.5
	Week 2	37.5	55	17.5	62.5	102.5	40
	Week 3	25	45	20	64	102.5	38.5
	Week 4	27.5	40	12.5	72.5	105	32.5
May	Week 1	75	95	20	130	190	60
	Week 2	72.5	100	27.5	105	175	70
	Week 3	75	110	35	110	165	55
	Week 4	90	110	20	125	180	55

For chili

(Table 8) states that the maximum price of chilli charged by the whole seller in the weeks of March, April and May and reach the maximum in week-4 (May) compared to other weeks in the Maharajganj market in the studied period. Conversely, the maximum selling price retailer is highest in all weeks of (May). Moreover, price difference is highest in week-1, 2 and 3 (April), all weeks of May and while least in week-3 (March).

For ginger

The (Table 8) reveals that the maximum price of ginger was charged by the whole seller in the week-3 and 4 (March), Week-1, 2, 3 and 4 (April) and week-1, 2, 3 and 4 (May) in the Maharajganj market in the studied period. On the flipside the maximum selling price whole seller is highest in all weeks of March, April and May. Moreover, price difference is highest in week-1 and 2 (March), week-2 (April), all weeks of May, and least in week-3 (March).

For garlic

Data in (Table 9) states that the maximum price of garlic charged by the whole seller in the week-4 (March), Week-1 (April) and week-2 (May) as compared to other weeks in the Maharajganj market in the studied period. Conversely, the

maximum selling price retailer is highest in week-4 (March), week-1 and 3 (May). Moreover, price difference is highest in week-2 (May), week-4 (March), week-2 (April), and while least in week-1 and 3 (March), week-1 (April) and week-2 (May).

Table 9 Whole seller price, retailer selling price and price variation of garlic and tomato across weeks

Month	Weeks	Garlic			Tomato		
		Wholesaler selling price (Rs/kg)	Retailer selling price (Rs/kg)	Price variation of vegetables (Rs/kg)	Wholesaler selling price (Rs/kg)	Retailer selling price (Rs/kg)	Price variation of vegetables (Rs/kg)
March	Week 1	75	95	20	19	27.5	8.5
	Week 2	75	95	20	17.5	27.5	10
	Week 3	62.5	87.5	25	13	17.5	4.5
	Week 4	75	110	35	19	22.5	3.5
April	Week 1	75	110	35	19	27.5	8.5
	Week 2	77.5	110	32.5	19	27.5	8.5
	Week 3	67.5	112.5	45	21	27.5	6.5
	Week 4	75	110	35	21	30	9
May	Week 1	75	110	35	21	32.5	9
	Week 2	75	100	25	19	30	11
	Week 3	75	115	40	21	27.5	6.5
	Week 4	77.5	120	42.5	20	30	10

For tomato

Numbers mentioned in (Table 9) reveals that the maximum price of tomato charged by the whole seller in the week-1 and 4 (March), and all weeks of April and May as compared to other weeks in the Maharajganj market in the studied period. On the flipside the maximum selling price retailer is highest in week-1, 2 and 3 (March) all weeks of April and May. Moreover, price difference is highest in week-week-2 (March), week-1, 2 and 4 (April), week-1, 2 and 4 (May), and while least in week-4 (March).

Table 10 Whole seller price, retailer selling price and price variation of brinjal and pumpkin across weeks

Month	Weeks	Brinjal			Pumpkin		
		Wholesaler selling price (Rs/kg)	Retailer selling price (Rs/kg)	Price variation of vegetables (Rs/kg)	Wholesaler selling price (Rs/kg)	Retailer selling price (Rs/kg)	Price variation of vegetables (Rs/kg)
March	Week 1	32.5	56.5	24	12.75	20	7.25
	Week 2	37.5	57.5	20	17.5	20	2.5
	Week 3	32.5	56.6	24.1	12.75	20	7.25
	Week 4	32.5	56.6	24.1	15	20	5
April	Week 1	22.5	35	12.5	14	20	6
	Week 2	28.5	35	6.5	14.5	21	6.5
	Week 3	20	22.5	2.5	13.5	21	7.5
	Week 4	14.25	20	5.75	12.5	20	7.5
May	Week 1	13.5	25	11.5	14.5	27.5	5.5
	Week 2	11	25	14	14	22.5	8.5
	Week 3	15	27.5	12.5	14.5	20	5.5
	Week 4	13.5	20	6.5	15	17.5	2.5

For brinjal

The (Table 10) states that the maximum price of brinjal charged by the whole seller in the week-1, 2, 3 and 4 (March) and Week-1 and 2 (April) compared to other weeks in the Maharajganj market in the studied period. Conversely, the maximum selling price retailer is highest in week-4 (March), week-1 and 3 (May). Moreover, price difference is highest in week-1, 2, 3 and 4 (March), and week-1 and 2 (April), and while least in week-4 (May).

For pumpkin

Data depicted in (Table 10) states that the maximum price of pumpkin charged by the whole seller in the week-4 (March), Week-1 (April) and week-2 (May) as compared to other weeks in the Maharajganj market in the studied period. On the flipside the maximum selling price retailer is highest in week-1, 2, 3 and 4 (March), week-1, 2, 3 and 4 (April) and week-1, 2 and 3 (May). Moreover, price difference is highest in week-1 and 2 (March), week-3 and 4 (April), week-2 (May), and while least in week-1 and 3 (March), week-1 (April) and week-2 (May).

For lady's finger

Information in (Table 11) reveals that the maximum price of lady's finger charged by the whole seller in the all weeks of March, week-1 and 2 (April) and week-2 (May) as compared to other weeks in the Maharajganj market in the studied period. On the flipside the maximum selling price retailer is highest in the all weeks of March, and week-1, 2 and 3 (April). Moreover, price difference is highest in week-3 (April) and least in week-4 (May).

For papaya

Data presented in (Table 11) revealed that the maximum price of papaya charged by the whole seller in the week-1 and 2 (May), Week 4 and 3 (May) and week-1 and 2 (April) as compared to other weeks in the Maharajganj market Tripura's commercial hub in the studied period. On the flipside the maximum selling price retailer is highest in week-1 (May), week-4 (May) and week-3 (April). Moreover, price difference is highest in week-1 (May), week-4 (May) and week-3 (April), and while least in week-3 (March), week-1 and 2 (March) and week-1 and 2 (April).

Table 11 Whole seller price, retailer selling price and price variation of lady's finger and papaya across weeks

Month	Weeks	Lady's finger			Papaya		
		Wholesaler selling price (Rs/kg)	Retailer selling price (Rs/kg)	Price variation of vegetables (Rs/kg)	Wholesaler selling price (Rs/kg)	Retailer selling price (Rs/kg)	Price variation of vegetables (Rs/kg)
March	Week 1	62.5	72.5	10	11	17.5	6.5
	Week 2	62.5	72.5	10	11	17.5	6.5
	Week 3	57.5	67.5	10	7.5	13.25	5.75
	Week 4	62.5	75	12.5	11	20	9
April	Week 1	42.5	55	12.5	12.5	20	7.5
	Week 2	45	57.5	12.5	12.5	20	7.5
	Week 3	32.5	50	17.5	12.5	22.5	10
	Week 4	27.5	40	12.5	12.25	21	8.75
May	Week 1	30	30	10	20	32.5	12.5
	Week 2	16	25	9	20	30	10
	Week 3	17.5	27.5	10	17.5	25	7.5
	Week 4	20	22.5	2.5	19	30	11

Table 12 Whole seller price, retailer selling price and price variation of cucumber and ridge gourd across weeks

Month	Weeks	Cucumber			Ridge gourd		
		Wholesaler selling price (Rs/kg)	Retailer selling price (Rs/kg)	Price variation of vegetables (Rs/kg)	Wholesaler selling price (Rs/kg)	Retailer selling price (Rs/kg)	Price variation of vegetables (Rs/kg)
March	Week 1	45	62.5	17.5	55	65	10
	Week 2	37.5	55	17.5	55	67.5	12.5
	Week 3	37.5	55	17.5	42.5	65	22.5
	Week 4	42.5	62.5	20	55	80	25
April	Week 1	37.5	55	17.5	45	60	15
	Week 2	37.5	62.5	25	42	62.5	20.5
	Week 3	42.5	65	22.5	45	62.5	17.5
	Week 4	50	65	15	40	60	20
May	Week 1	37.5	55	17.5	22.5	35	12.5
	Week 2	35	50	15	13.5	30	16.5
	Week 3	33.5	60	26.5	15	37.5	22.5
	Week 4	40	55	15	17.5	37.5	20

For cucumber

The (Table 12) discloses that the maximum price of cucumber charged by the farmer in the week-4 (April), week-1 (March) and week-3 (April) as compared to other weeks in the Maharajganj market in the studied period. On the flipside the maximum selling price whole seller is highest in week-3 and 4 (April), week-4 (March) and Week-2 (May). Moreover, price difference is highest in week-3 (May), week-3 (April) and in week-4 (March) and while least in week-2 (May) and Week-4 (April) followed by week-1, 2 and 3 (March).

For ridge gourd

Data in (Table 12) reveals that the maximum whole sale price of ridge gourd charged by the farmer in the week-1 and 2 (March), Week-1 and 3 (April) and week-3 (March) as compared to other weeks in the Maharajganj market in the studied period. On the flipside the maximum retailer selling price was charged in week-4 (March), week-2 (March) and in week-1 and 3 (March). Moreover, price difference is highest in week-4 (March), week-3 (May) and in week-3 (March) while least in week-1 (March), week-2 (March) and in week-1 (May).

Marketing channel

The disparity between the amount paid by the ultimate consumer and the sum received by the farmer for an identical amount of produce is referred to as the price spread. This encompasses the cost of carrying out various marketing functions and the margins of different agencies involved in the marketing process of the commodity. The degree of price spread aids policymakers in developing appropriate strategies to enhance marketing efficiency, either by reducing marketing expenses or eliminating superfluous intermediaries from the marketing process [10-11]. The marketing expenses, margins, and price spread involved in marketing vegetables in Tripura through the main channel have been presented on the basis of data obtained from market functionaries.

The channels identified in the study area were:

Channel- I: Wholesale → Consumer

Channel- II: Wholesale → Retailer → Consumer

The analysis of price spread in this current study pertains to the discrepancy between the amount paid by the consumer and the net amount received by the farmer for an equivalent quantity of vegetables. In channel-I, where consumers purchase directly from wholesalers, the producer's share in the consumer price was found to be exceedingly impressive. Conversely, in channel-II, where they buy from retailers, the producer's share in the consumer price is relatively low [12]. Further maximum percentage has been observed in the case of potato, ginger, garlic, lady's finger and papaya. In channel-II potato, garlic and lady's finger has a considerable share price [13].

Table 13 Price spread for marketing channel-I

Month	Week	Potato	Onion	Chili	Ginger	Garlic	Tomato	Brinjal	Pumpkin	Lady's finger	Papaya	Cucumber	Ridge ground
March	W1	85.19	60.34	72.22	78.82	93.33	67.11	53.85	88.24	88	81.82	76.67	77.27
	W2	81.82	62	86.67	84.71	90	70	46	50	88	81.82	86.67	62.73
	W3	87.04	96.55	81.43	84.8	88	75	42.31	58.82	82.61	73.33	86.67	81.18
	W4	75	75.81	86.67	85.6	76.67	72.37	56.92	73.33	92	77.27	88.24	83.64
April	W1	87.1	67.14	92.86	85.6	76.67	72.37	82.22	78.57	64.71	68	100	66.67
	W2	74.19	71.43	60	84	87.1	89.47	43.86	79.31	83.33	40	92	77.38
	W3	80	98.04	90	92.97	89.63	61.9	60	87.04	76.92	90	81.18	72.22
	W4	74.19	42.86	81.82	72.41	70	61.9	56.14	68	89.09	40.82	65	81.25
May	W1	69.7	59.52	24.67	48.08	76.67	80.95	59.26	51.72	66.67	48.75	100	77.78
	W2	84.38	84.21	17.24	90.48	56.67	67.11	79.55	50	68.75	46.25	81.43	62.96
	W3	75.76	72.73	16	77.27	56.67	71.43	58.33	48.28	62.86	51.43	67.16	46.67
	W4	78.13	83.33	17.78	80	56.13	65	74.07	40	65	43.42	56.25	40

Table 14 Price spread for marketing channel-II

Month	Week	Potato	Onion	Chilli	Ginger	Garlic	Tomato	Brinjal	Pumpkin	Lady's finger	Papaya	Cucumber	Ridge ground
March	W1	65.71	43.75	56.52	51.54	73.68	46.36	30.97	56.25	75.86	51.43	55.20	65.38
	W2	64.29	44.29	70.91	55.38	71.05	44.55	30.00	43.75	75.86	51.43	59.09	51.11
	W3	58.75	70.00	67.06	70.67	62.86	55.71	24.29	37.50	70.37	41.51	59.09	53.08
	W4	60.00	52.22	65.00	66.88	52.27	61.11	32.69	55.00	76.67	42.50	60.00	57.50
April	W1	67.50	42.73	59.09	53.50	52.27	50.00	52.86	55.00	50.00	42.50	68.18	50.00
	W2	54.76	62.50	40.91	51.22	61.36	61.82	35.71	54.76	65.22	25.00	55.20	52.00
	W3	60.00	45.45	50.00	58.05	53.78	47.27	53.33	55.95	50.00	50.00	53.08	52.00
	W4	54.76	27.27	56.25	50.00	47.73	43.33	40.00	42.50	61.25	23.81	50.00	54.17
May	W1	46.00	41.67	19.47	32.89	52.27	52.31	32.00	27.27	66.67	30.00	68.18	50.00
	W2	77.14	60.38	12.50	54.29	42.50	42.50	35.00	31.11	44.00	30.83	57.00	28.33
	W3	50.00	53.33	10.91	51.52	36.96	54.55	31.82	35.00	40.00	36.00	37.50	18.67
	W4	55.56	63.64	14.55	55.56	36.25	43.33	50.00	34.29	57.78	27.50	40.91	18.67

CONCLUSION

Based on the analysis, various significant findings are made, which are listed below:

1. Price variations vary for all the selected costs from seller to retailer and retailer to consumer.
2. It has been found that there is a maximum variation in prices for chilli, brinjal and ridge gourd from the wholesaler to the retailer. It is to be noted that in May, the price of chilli was skyrocketed.
3. It has been found that vegetables like ginger, garlic, lady's finger, ridge gourd and cucumber have the maximum price variation for the study period considering from retailer to consumer.
4. The study reveals two marketing channels: Channel-I-whole seller to consumer and channel-II- whole seller-retailer-consumer.

Moreover, in channel-I, where consumers procure directly from wholesalers, the producer's portion of the consumer price is astoundingly remarkable. On the contrary, the producer's consumer price cut is comparatively meagre in channel II, where they acquire goods from retailers. The utmost share has also been discerned in potato, ginger, garlic, lady's finger, and papaya. Notably, in channel II, potato, garlic, and lady's finger possess a substantial share of the price. The marketing of vegetables presents a multifaceted and intricate phenomenon, primarily due to their perishable nature, seasonality, and bulkiness. Furthermore, this complexity is compounded by farmers' tendency to have small areas under cultivation, resulting in small marketable quantities. Consequently, vegetables require a well-developed marketing system to ensure swift disposal and mitigate production and post-harvest losses. It is worth noting that there is significant variation in prices for all selected vegetables, from wholesalers to retailers and ultimately to consumers. Notably, chilli, brinjal, and ridge gourd exhibit the most substantial variation in prices from wholesalers to retailers, with chilli prices skyrocketing in May. During the study period, vegetables such as ginger, garlic, lady's finger, ridge gourd, and cucumber exhibited the most significant price variation from retailers to consumers. The study also reveals the existence of two primary marketing channels. Channel I involve direct procurement from wholesalers by consumers, with the producer's portion of the

consumer price being remarkably high. In contrast, in channel II, where goods are acquired from retailers, the producer's consumer price cut is comparatively meagre. Potatoes, ginger, garlic, lady's finger, and papaya exhibit the utmost share, notably potato, garlic, and lady's finger in channel II. Moreover, the study shows that the producer's share in the consumer price decreases as the number of intermediaries increases. Notably, producers receive higher absolute net returns in tomato, followed by cauliflower, cabbage, brinjal, and local beans in all channels. It is worth mentioning that producers receive a higher net price by selling produce directly to consumers.

LITERATURE CITED

1. Neill A. 2021. Distribution of the Workforce across Economic Sectors in India 2020. Statista. https://www.statista.com/statistics/271320/distribution-of-the-workforce-across-economic-sectors-in-india/.
2. Kumar V. 2019. Reversing Land Degradation in India. TERI, https://www.teriin.org/article/ reversing-land-degradation-India
3. Bisen J, Kumar R. 2018. Agricultural marketing reforms and e-national agricultural market (e-NAM) in India: A review. *Agricultural Economics Research Review*. https://doi.org/ 10.5958/0974-0279.2018.00032.0
4. Jana J. 2021. Food and the planet. Statesman. https://www.thestatesman.com/opinion/foodand-the-planet-1502945906.html
5. Zacharias T. 2021. India has a food wastage problem. Here's how individuals can make a difference. *Indian Express*, 7 April, https://indianexpress.com/article/opinion/ columns/food-waste-index-report-india-coronavirus-hunder-index-7261909/
6. Kathayat B. 2019. Performance of regulated markets in Odisha under new agricultural marketing reforms regime. *Economic Affairs* 64(2): 291-295.
7. Pawar ND, Misal DH. 2005. Behaviour of prices and arrivals of pomegranate in western Maharashtra. *Agricultural Marketing* 47(4): 22.
8. Kumar V, Sharma HR, Singh K. 2005. Behaviour of market arrivals and prices of selected vegetable crops: A study of four metropolitan markets. *Agricultural Economics Research Review* 18: 271-290.
9. Siddique SA. 2019. Price variation of vegetables in different seasons with reference to organized retailers. *Doctoral Dissertation*, Icfai University Jharkhand.
10. Rozhan AD, Mohd Hafizuddin Z, Noorlidawati AH. 2013. Marketing channels for fresh vegetables and fruits in Malaysia. *Acta Hortic*. 1012: 1371-1377.
11. Chand K, Kumar S, Suresh A, Dastagiri MB. 2020. Marketing efficiency of vegetables in developing economies: Evidences for critical intervention from Rajasthan, India. *Indian Journal of Agricultural Sciences* 90(8): 1419-1427.
12. Baba SH, Wani MH, Wani SA, Shahid Y. 2010. Marketed surplus and price spread of vegetables in Kashmir valley. *Agricultural Economics Research Review* 23(10): 115-128.
13. Ahmad MS, Siddiqui MW. 2015. Supply chain and marketing channels of fruits. *In*: Postharvest Quality Assurance of Fruits. Springer, Cham. pp 207-215.