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## A study on price spread and marketing efficiency of organic carrot and potato in Nilgiris district

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### Abstract

The study shows the value chain analysis of organic carrot and potato in the study area (Nilgiris district) which is a major supplier of organic vegetables to important markets within Tamil Nadu and in other states. The purposive random sampling method was used to interview the farmers and intermediaries like commission agents, wholesalers and retailers. The tools used were percentage analysis, price spread, farmer's share in the consumer's rupee and marketing efficiency. The marketing Channels identified in this study were Channel I: Producer – Pre-harvest contractor – Wholesaler – Retailer – Consumer, Channel II: Producer – Wholesaler – Retailer – Consumer, Channel III: Producer – Retailer – Consumer and Channel IV: Producer – Retailer. Among these Channel IV has the highest farmers' share in consumer rupee and marketing efficiency followed by Channel III, Channel II and Channel I. This showed that the efficiency of marketing Channels increases with the decrease in marketing intermediaries.

**Keywords:** Organic farming, value chain, marketing channel, price spread, farmers' share in consumers' rupee, marketing efficiency, organic carrot, organic potato

### 1. Introduction

Organic farming is a natural way of growing crops and raising animals. Unlike regular farming that uses chemicals and genetic modifications, organic farming focuses on working with nature. It uses methods like crop rotation, composting, and natural ways to deal with pests. The main goal is to keep the ecosystem healthy. This starts with taking care of the soil, which is crucial for plant growth. The important idea in organic farming is biodiversity. This means having many different plants and animals on the farm. This diversity makes the environment stronger and more self-sustaining. Organic farming is all about working together with nature to grow food in a natural and sustainable way.

In 2021, Australia, Argentina, Finland, the USA, and Sweden emerged as the leading countries in organic farming. Australia had the largest area for organic farming, followed by Argentina, Finland, the USA, and Sweden. These countries showcased a strong commitment to sustainable agricultural practices, setting an example for the rest of the world. Together with other nations, they contributed significantly to the global effort in organic farming, emphasizing the importance of eco-friendly approaches in agriculture (FiBL 2021) <sup>[17]</sup>.

India ranked 64<sup>th</sup> place among the countries in terms of organic farming as per FiBL 2021 <sup>[17]</sup>. India has taken steps to promote organic farming which is evident from various initiatives like schemes like Paramparagat Krishi Vikas Yojana and Mission Organic Value Chain Development for North Eastern Region (MOVCNDR) subsidies. In the year 2022-2023, Madhya Pradesh, Maharashtra, Gujarat, Rajasthan, and Odisha grew organic cultivation in India. These states demonstrated a significant commitment to organic farming practices, contributing to India's efforts in sustainable agriculture. Their collective contribution highlighted the growing importance of eco-friendly agricultural approaches in the country (APEDA 2022-2023).

Vegetables are important sources of proteins, vitamins, minerals, dietary fibre, micronutrients, phytochemicals, and antioxidants in our daily diet. They are not only nutritious, but they also include a variety of phytochemicals, such as antioxidants and anti-carcinogenic substances (e.g. Flavonoids, Glucosinolates and Isothiocyanates).

Dieticians recommended that the consumption of 300 g of vegetables every day increased the immunity level of human beings. When ingested in sufficient quantities, increased appetite and included a good amount of fibre. Furthermore, it neutralises the acids produced during the digestion of fatty and proteins foods, provides healthy roughage that promotes digestion and contributes to the prevention of heart disease.

## 2. Materials and Methods

### 2.1 Study area

The Nilgiris district was purposively selected for this study since the organic carrot and potatoes are largely grown in this area. The Purposive random sampling method will be used to select the farmers as sample respondents for the present study. Primary data was collected by personal interview with the help of a well-structured interview schedule. About 40 farmers are cultivating organic carrot and potato, 5

commission agents, 5 organic wholesalers and 10 organic vegetable retailers were chosen for this study.

### 2.2 Tools of Analysis

#### 2.2.1 Conventional Analysis

Percentage analysis was worked out to assess the general characteristics of sample farmers and intermediaries.

#### 2.2.2 Price Spread

Price spread is defined as the difference between the retail price paid by the consumer and the price obtained by the organic vegetable grower for an equivalent quantity of organic vegetable (Jeyanthi *et al.*, 2018) <sup>[4]</sup>. For this study, individual farmers, commission agents, wholesalers and retailers were surveyed in order to collect relevant information. Profits of the various intermediaries involved in the transfer of the produce from the point of origin to the final customer are estimated.

$$\text{Price Spread (PS)} = \frac{\text{Consumers' price} - \text{Net price obtained by the producer}}{\text{Consumers' price}} \times 100$$

#### 2.2.3 Farmer's share in consumer's rupee

Farmer's share in consumer's rupee refers to the share of vegetable producers in consumer's rupee is dynamic and subject to change. There is a positive relationship exists between producer's share and marketing efficiency. The higher the producer's share greater the marketing efficiency or vice versa. (Veerendrakumar *et al.*, 2020) <sup>[2]</sup>. The farmer's share in the consumer's rupee will be calculated with the help of the following formula.

$$F_s = (F_p/C_p) \times 100$$

Where,

F<sub>s</sub> = Farmer's share in consumer's rupee (percentage),

F<sub>p</sub> = Price received by the farmer (Rs/unit),

C<sub>p</sub> = Price paid by the consumer (Rs/unit),

#### 2.2.4 Marketing Efficiency

The most commonly used measures are the conventional output to input ratio, Shepherd's ratio of value (Price) of goods marketed to the cost of marketing (Shepherd, 1965) <sup>[15]</sup> and Acharya's modified marketing efficiency formula (Acharya and Agarwal, 2004) <sup>[16]</sup>

#### A. Shepherd's Formula

The efficiency of the supply chain was calculated with the help of the following formula. The higher this ratio, the higher would be the efficiency and vice versa. This can be expressed in the following form.

$$ME = [(V/I) - 1]$$

Where,

ME = Marketing efficiency

V = Value of goods sold

I = Total marketing cost

#### B. Acharya's Approach

According to Acharya (2003), an ideal measure of marketing efficiency, particularly for comparing the efficiency of alternate market Channels should take into account all of the following.

$$ME = FP \div (MC + MM)$$

Where,

ME = Marketing Efficiency

FP = Prices received by the farmer

MC = Total Marketing Costs

MM = Net marketing margin

## 3. Results and Discussions

### 3.1 Marketing Channels for Organic Vegetables

The most prominent intermediaries involved in the marketing Channel of organic carrot and potato were commission agents, wholesalers and retailers. These intermediaries played a crucial role in facilitating the movement of organic carrots and potato from the farmers to the consumers, ensuring the end customers' demand to be satisfied towards the selected organic vegetables. The marketing Channels followed in the study area by the selected organic cultivating farmers to sell their produce were:

I: Farmer → Commission agents → Wholesaler → Retailer → Customer

II: Farmer → Wholesaler → Retailer → Customer

III: Farmer → Retailer → Customer

IV: Farmer → Customer

### 3.2 Price spread of selected organic vegetables

**Table 1:** Price spread of organic carrot (per unit), (Rs. bag, 1 Bag = 80 Kgs)

S. No	Particulars	Channel 1	Channel 2	Channel 3	Channel 4
I	<b>Producer</b>				
	Producer's Price	3440	3440	3680	3600
	Washing and polishing	160	160	240	240
	Packing with gunny bags	160	320	240	240
	Transport	160	160	240	320
	Loading and Unloading	160	240	160	240
	Wastage during handling	320	320	400	400
	Commission paid to the agent	160			
	Total Marketing Cost	1120	1200	1280	1440
Producer's gross price	4560	4640	4960	5040	
II	<b>Wholesaler</b>				
	Purchase price	4560	4640	-	-
	Packing with gunny bags	240	240	-	-
	Transport	400	400	-	-
	Loading and unloading	400	400	-	-
	Wastage during handling	480	480	-	-
	Commission paid to the agent	160	0	-	-
	Total Marketing Cost	1680	1520	-	-
	Marketing Margin	800	800	-	-
Sale Price	7040	6960	-	-	
III	<b>Retailer</b>				
	Purchase price	7040	6960	4960	-
	Packing	240	320	400	-
	Transport	480	400	560	-
	Loading and unloading	240	240	400	-
	Wastage during handling	480	400	560	-
	Total Marketing Cost	1440	1360	1920	-
	Marketing Margin	800	800	1200	-
Sale Price	9280	9120	8080	-	
IV	<b>Consumer</b>				
	Purchase Price	9280	9120	8080	5040
	Price Spread	4720	4480	3120	0

Source: Primary data

Table 1 represented a comprehensive analysis of price spread across different Channels. The price spread was higher in case of Channel I (Rs. 4720) by involving commission agents, wholesalers, and retailers and lower in case of Channel IV

(zero). In Channel IV, farmers received the total amount paid by the consumer, resulting in a price spread of zero indicating a highly favourable situation for the farmers.

**Table 2:** Price spread of Organic Potato (per unit) (Rs/bag, 1bag = 50 Kgs)

S. No	Particulars	Channel 1	Channel 2	Channel 3	Channel 4
I	<b>Producer</b>				
	Producer's Price	1500	1600	1750	1900
	Packing with gunny bags	75	75	100	200
	Transport	125	100	125	250
	Loading and Unloading	50	50	100	150
	Wastage during handling	125	125	125	200
	Commission paid to the agent	100	-	-	-
	Total Marketing Cost	475	350	450	800
Producer's gross price	1975	1950	2200	2700	
II	<b>Wholesaler</b>				
	Purchase price	1975	1950	-	-
	Packing with gunny bags	100	75	-	-
	Transport	150	175	-	-
	Loading and unloading	100	100	-	-
	Wastage during handling	100	100	-	-
	Commission paid to the agent	100	-	-	-
	Total Marketing Cost	550	450	-	-
Marketing Margin	350	350	-	-	
Sale Price	2875	2750	-	-	
III	<b>Retailer</b>				
	Purchase price	2875	2750	2200	-
	Packing	100	100	100	-
	Transport	250	250	300	-

	Loading and unloading	100	100	150	-
	Wastage during handling	150	150	150	-
	Total Marketing Cost	600	600	700	-
	Marketing Margin	350	350	400	-
	Sale Price	3825	3700	3300	-
IV	<b>Consumer</b>				
	Purchase Price	3825	3700	3300	2700
	Price Spread	1850	1750	1100	-

Source: Primary data

It was inferred from Table 2 that the price spread of organic potato was higher in Channel I (Rs. 1850) by involving commission agents, wholesalers, and retailers and lower in the case of Channel IV. In Channel IV, farmers received the total amount paid by the consumer, resulting in a price spread of zero indicating that highly favourable situation for the farmers. This was similar to the price spread for organic carrot. These inferences were also in confirmative with the study conducted by Ahmad *et al.*, (2017) [3] that the price spread in bhendi was higher in Channels with more intermediaries compared to Channels involving less intermediaries.

### 3.3 Farmers' share in consumers' rupee of Selected Organic Vegetables

Table 3: Farmers' share in consumers' rupee of organic carrot

	Channel I	Channel II	Channel III	Channel IV
Farmers' Share in Consumers' Rupee (Rs.)	49.13	50.87	61.38	100.00

From Table 3, it could be concluded that Channel IV had a 100 per cent farmers' share followed by Channel III (61.38 per cent), Channels II (50.87 per cent) and Channel I (49.13 per cent). Channel IV indicated a highly favourable situation for the producers.

From Table 4, it could be inferred that Channel IV had a 100 per cent farmers' share followed by Channel III (66.66 per cent), Channels II (52.70 per cent) and Channel I (51.63 per cent). Channel IV indicated a highly favourable Channel for

the producers in the case of farmers' share. These findings were also aligned with those reported by Narasalagi *et al.* (2020) [2].

Table 4: Farmers' share in consumers' rupee of organic potato

	Channel I	Channel II	Channel III	Channel IV
Farmers' share in consumers' rupee (Rs.)	51.63	52.70	66.66	100.00

### 3.4 Marketing efficiency of selected organic vegetables

Marketing efficiency is defined as the transfer of commodities from producers to final customers at the lowest possible cost while offering the service demanded by the consumers is referred as marketing efficiency. The marketing efficiency of different Channels were analysed as per the following methods.

- a) Shepherd's Formula.
- b) Acharya's Approach.

Shepherd's method is used to evaluate how well a retailer can make a profit compared to their marketing costs. It focused on the retailer's effectiveness in a specific Channel. Acharya's approach considered the earnings of farmers along with marketing costs and intermediary margins. This gave a broader view of efficiency, making the farmer not only covered the production costs but also obtain a good share of the final sale price.

Manivenkatesh *et al.* (2020) [1] adopted Shepherd's formula and Acharya's approach for their research study. The results are disclosed in Table 5 & Table 6

Table 5: Marketing Efficiency of Organic Carrot

S. No	Particulars	Channel I	Channel II	Channel III	Channel IV
I	Retailer's sale price (RP)	9280	9120	8080	5040
II	Total marketing costs (MC)	4240	4080	3200	1440
III	Total margins of intermediaries (MM)	1600	1600	1200	-
IV	Price received by farmer (FP)	4560	4640	4960	5040
	Shepherd's marketing efficiency (RP/MC)	2.18	2.23	2.52	3.5
	Acharya's marketing efficiency (FP/MC+MM)	0.78	0.81	1.12	3.5

From Table 5, it could be concluded that Channel IV (3.5) had the highest marketing efficiency (3.5) in case of Shepherd's and Acharya's method of marketing efficiency hence, it was regarded as the most efficient Channel present among others. Further, Channel III had a relatively higher marketing efficiency in case of Shepherd's (2.52) and

Acharya's method (1.12) followed by Channel II (2.23 & 0.81 respectively) and Channel I had the lowest marketing efficiency of 2.18 & 0.78 respectively. Thus, Channel IV was considered to be the most efficient marketing Channel due to the direct selling of organic produce by the farmer to the end customer.

Table 6: Marketing Efficiency of Organic Potato

S. No	Particulars	Channel I	Channel II	Channel III	Channel IV
I	Retailer's sale price (RP)	3825	3700	3300	2700
II	Total marketing costs (MC)	1625	1400	1150	800
III	Total margins of intermediaries (MM)	700	700	400	-
IV	Price received by farmer (FP)	1975	1950	2200	2700
	Shepherd's marketing efficiency (RP/MC)	2.35	2.64	2.86	3.37
	Acharya's marketing efficiency (FP/MC+MM)	0.85	0.92	1.41	3.37

From Table 6, it could be reported that Channel IV (3.37) had the highest marketing efficiency in case of Shepherd's and Acharya's method of marketing efficiency therefore, it was regarded as the most efficient Channel present among others. Further Channel III had a relatively higher marketing efficiency in case of Shepherd's (2.86) and Acharya's method (1.41) followed by Channel II (2.64 & 0.92 respectively) and Channel I had the lowest marketing efficiency of 2.35 & 0.85 respectively. Thus Channel IV was considered to be the most efficient marketing Channel due to the direct selling of organic produce by the farmer to the end customer.

#### 4. Conclusion

From this study, it could be concluded that Channel IV is more efficient as it had a high farmer's share in consumer's rupee and marketing efficiency followed by Channel III, Channel II and Channel I. The price spread also suggested that it was less for Channel IV followed by Channel III, Channel II and Channel I. Thus, the Channel with less number of intermediaries (Channel IV) is more efficient than the Channel with more number of intermediaries (Channel I).

#### 5. Reference

1. Manivenkatesh KS, Selvanayaki S, Devi MN, Pandiyan M. Value chain analysis of jasmine in Madurai district of Tamil Nadu. *International Journal of Farm Sciences*. 2020;10(1):6-12.
2. Narasalagi V, Shivashankar D. Analysis of Producer's Share in Consumer's Rupee in Marketing of Selected Vegetable through Different Supply Chains. *Int. J Innov. Res. Stud*. 2020;8:243-250.
3. Ahmad N, Mishra RR, Sinha DK, Singh KM. Price spread and vegetables marketing in the Hinterlands of Pusa and Tajpur blocks of Samastipur district of Bihar (India). *International Journal of Advances in Agricultural Sciences and Technology*. 2017;4:10.
4. Jeyanthi P. Estimation of marketing efficiency and analysis of price data; c2018.
5. Ladaniya MS, Wanjari V, Mahalle BC. Price Spread of Pomegranates. *Indian Journal of Agricultural Economics*. 2003;58(4):800-811.
6. Swaroop AS. *Agricultural marketing in India*. Oxford and IBH publishing; c2004.
7. Dastagiri MB, Chand TKR, Immanuelraj CV, Hanumanthaiah P, Paramsivam RS, Sidhu M Sudha, *et al*. *Indian vegetables: production trends, marketing efficiency and export competitiveness*; c2013.
8. Narayanan S, Bastine CL. Price spread of coconut in the central region of Kerala. *Journal of tropical agriculture*. 2006;42:73-75.
9. Sharma A, Tungoe BL. Price spread and marketing efficiency in marketing of potato in Wokha district of Nagaland. *Progressive Agriculture*. 2011;11(1):23-27.
10. Sandika AL. *Impact of middlemen on vegetable marketing Channels in Sri Lanka*; c2011.
11. Elenchezhian T, Kombairaju S. Marketing efficiency of major vegetables in central vegetable market of Madurai. *Madras Agriculture Journal*. 2004;91(1-3):27-31.
12. Fazlul H, Sharmin A, Bisakha D, Akter A, Nazim TB. An analysis of farmer's share in consumer's price and BCR (benefit cost ratio) for some selected vegetables in Dhaka District of Bangladesh. *Inter. J of Economics, Commerce and Management*. 2018;6(12):620-632.
13. <https://www.apeda.gov.in/>
14. <https://www.fibl.org/en/>

15. Shepherd CM. Design of primary and secondary cells: II. An equation describing battery discharge. *Journal of the electrochemical society*. 1965 Jul 1;112(7):657.
16. Acharya SS. *Agricultural marketing in India*. Oxford and IBH Publishing; c2004.
17. Nicolay GL, Adamtey N, Kadzere I, Gräub B, Huber B. *Africa Strategy of FiBL*; c2021-2025.